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COMPLIANCE, RELAXATION AND CREEP RECOVERY OF NORMAL STRENGTH CONCRETE

by

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ABSTRACT

Calculating the long term serviceability of reinforced concrete structures requires an appropriate description of the mechanical properties of concrete. Among the long duration properties of concrete are shrinkage and creep of concrete. At relative humidities less than 96-99% concrete shrinks. For concrete, creep is the deformation under load after having subtracted the shrinkage and elastic deformation. For specimens loaded in a drying environment there is creep due to drying in addition to creep measured without moisture movement. The movement of moisture is a major complication in developing creep prediction equations. In addition, to estimate shrinkage and creep, the structural engineer is required to calculate the loss of prestress and strain/deflection under loads which vary in time. Superposition can be used to calculate recovery, relaxation, ageing and redistribution – the validity of superposition for concretes with moisture movement is discussed. In November 1999 ACI 209 adopted guidelines that should be met by prediction methods.

A revised, code type, prediction model, which meets the ACI guidelines, is presented and compared to the RILEM data bank of shrinkage and creep measurements. Providing moisture movement is considered irreversible, relaxation can be calculated by superposition. Calculated relaxations are compared to experimental results. Calculating recovery by superposition is sensitive to the assumptions made concerning moisture movement. Moisture movement, drying before loading, state of moisture on reloading or unloading are critical to the adaptability, and complication of a model.

Normal strength concretes, defined as concretes with mean compressive strengths less than 82 MPa, are concretes which do not experience self desiccation. The shrinkage due self desiccation is sensitive to the early age availability of moisture.

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a	Strength gain coefficient
b	Strength gain coefficient
c	Cement content of concrete, B3 model (kg/m^3)
$C_o(t,t_o)$	Compliance function for basic creep only, B3 model
$C_d(t,t_o,t_c)$	Compliance function for additional creep due to drying, B3 model
E	Modulus of elasticity
E_{cm28}	Modulus of elasticity of concrete at 28 days (MPa)
E_{cmt}	Modulus of elasticity of concrete at age t (MPa)
E_{cmto}	Modulus of elasticity of concrete when loading commenced (MPa)
f_{cm28}	Concrete mean compressive strength at 28 days (MPa)
f_{cmt}	Concrete mean compressive strength at age t (MPa)
f_{cmtc}	Concrete mean compressive strength when drying commenced (MPa)
f_{cmto}	Concrete mean compressive strength when loading commenced (MPa)
f_{ck28}	Concrete characteristic strength at 28 days (MPa)
h	Humidity expressed as a decimal
$H(t)$	Spatial average of pore relative humidity within the cross-section, B3 model
$H(t_o)$	Spatial average of pore relative humidity within the cross-section, B3 model
$J(t,t_o)$	Compliance (1/MPa)
K	Shrinkage constant
k_h	Humidity dependence, B3 model
k_s	Cross-section shape correction factor, B3 model
k_t	Function required to calculate τ_{sh}, B3 model
m	Constant = 0.5, B3 model
n	Constant = 0.1, B3 model
q_1	Instantaneous strain compliance parameter, B3 model
q_2	Ageing viscoelastic compliance parameter, B3 model
q_3	Non-ageing viscoelastic compliance parameter, B3 model
q_4	Ageing flow compliance parameter, B3 model
q_5	Drying creep compliance parameter, B3 model
$Q(t,t_o)$	Binomial integral function, B3 model
$Q_f(t_o)$	Function required to calculate $Q(t,t_o)$, B3 model
$r(t_o)$	Function required to calculate $Q(t,t_o)$, B3 model
$R(t,t_o)$	Relaxation (MPa)
s	Parameter for the cement type, CEB MC90 model
s	Slump of concrete (mm), ACI 209 method
$S(t)$	Time function for shrinkage, B3 model
$S(t_o)$	Time function for shrinkage, B3 model
t	Age of concrete (days)
t_c	Age drying commenced, end of moist curing (days)

t_o	Age of concrete at loading (days)
t_u	Age of concrete unloading (days)
V/S	Volume to surface ratio (mm)
w	Water content of concrete, B3 model (kg/m^3)
$Z(t,t_o)$	Function required for the calculation of $Q(t,t_o)$, B3 model
α_1	Cement type correction factor on creep, B3 model
α_2	Curing condition correction factor, B3 model
α_E	Aggregate type correction factor, CEB MC90 model
β_E	Parameter for the calculation of f_{cmt} and E_{cmt}, CEB MC90 model
$\beta(f_{cm28})$	Correction term for the effect of strength of concrete, CEB MC90 model
$\beta(h)$	Correction term for the effect of humidity on shrinkage
β_H	Correction term for the effect of humidity on creep, CEB MC90 model
β_{RH}	Relative humidity correction factor on shrinkage, CEB MC90 model
β_s	Coefficient for development of shrinkage with time, CEB MC90 model
β_{sc}	Cement type correction factor on shrinkage, CEB MC90 model
β_{sH}	Volume to surface ratio correction factor on shrinkage, CEB MC90 model
β_{sRH}	Relative humidity correction factor on shrinkage, CEB MC90 model
$\beta(t)$	Correction term for the effect of time on shrinkage
$\beta(t_o)$	Correction term for the effect of age of loading, CEB MC90 model
$\varepsilon_{c\sigma}(t)$	Stress dependant strain at time t
$\varepsilon_{sh\infty}$	Ultimate shrinkage strain, B3 model
ε_{sh}	Shrinkage strain
ε_{cso}	Notional ultimate shrinkage strain, CEB MC90 model
ε_{shu}	Notional ultimate shrinkage strain
γ_1	Correction term for the effect of age of loading, ACI 209 method
γ_2, γ_2'	Correction term for the effect of humidity, ACI 209 method
γ_3, γ_3'	Correction term for the effect of size, ACI 209 method
γ_4, γ_4'	Correction term for the effect of composition of concrete, ACI 209 method
γ_5, γ_5'	Correction term for the effect of composition of concrete, ACI 209 method
γ_6, γ_6'	Correction term for the effect of composition of concrete, ACI 209 method
γ_7	Correction term for the effect of composition of concrete, ACI 209 method
γ_8	Correction term for the effect of curing duration, ACI 209 method
ϕ	Creep coefficient
ϕ_{RH}	Correction term for the effect of humidity on creep, CEB MC90 model
$\Phi(t)$	Atlanta 97 time function
$\Phi(t_c)$	Correction term for the effect of drying before loading
ρ	Density of concrete (kg/m^3)
$\sigma_c(t)$	Variable stress at time t
τ_{sh}	Shrinkage half-time (days), B3 model
Ψ	Fine aggregate to total aggregate ratio, by weight, ACI 209 method

CHAPTER 1

Introduction

1.1 General

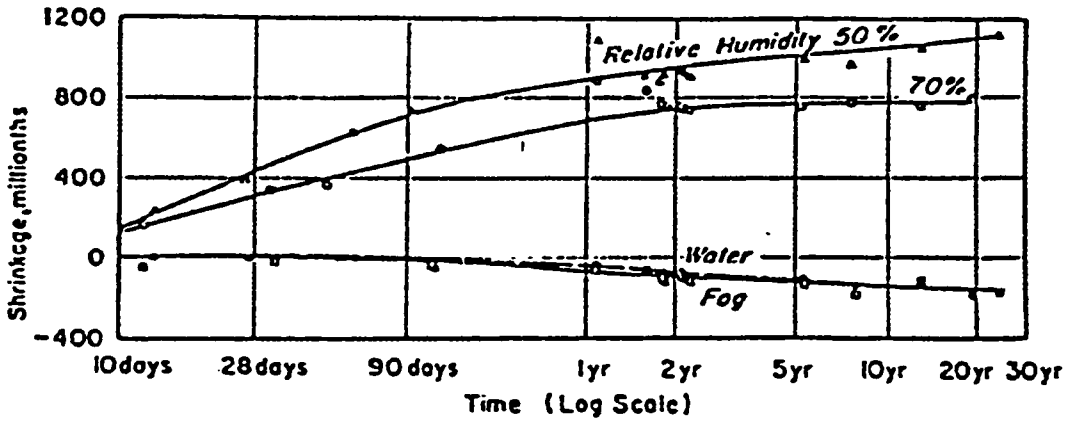
To predict the long term safety and serviceability of reinforced and prestressed concrete structures the structural engineer requires an appropriate description of the mechanical properties of the materials. For concrete structures this includes predicting the long duration behaviour of the concrete as a material. Among the long duration properties of concrete that are of interest to the structural engineer are shrinkage of the concrete due to loss of moisture to the environment and creep of the concrete under load.

Concrete is an engineered mixture of aggregate, cement and water. Hardened concrete contains approximately 75% (by volume) inert aggregate, hydrated cement paste, free water and voids. The hydrated cement paste develops as a series of complex, exothermic reactions between the cement powder and water. The consequence of the hydration reaction includes the formation of noncrystalline hydrated calcium silicate, which bonds the aggregate particles to form an artificial rock-like material. Cement hydration, as all chemical reactions, takes time to complete and the reaction rate is temperature dependent. During hydration the development of mechanical strength depends upon the degree of completion of the hydration reactions. It is noted that the mechanical properties of concrete are significantly affected by the temperature and availability of water during curing, relative humidity and temperature after curing, composition of the concrete and the mechanical properties of the aggregates.

Concrete immersed in water swells (expands). If the ambient humidity is less than some value close to 100%, concrete will shrink. Figure 1.1 shows the results of the shrinkage experiments of Troxell et al (1958), which demonstrate the validity of the preceding statement. At some relative humidity between 95-98%, normal water cement

ratio concretes (traditional concrete) will neither shrink nor swell. Low water cement ratio concrete, water cement ratios less than 0.4, can experience shrinkage by self-dessication.

Figure 1.1 Troxell et al (1958) shrinkage experiments



Creep is defined as the time-dependant strain of a material under constant applied stress. All materials experience creep, which is often temperature dependent. For concrete it is necessary to separate the effects of shrinkage from the load-induced strains. Basic creep is measured on specimens in which moisture is not allowed to migrate from the specimens. For specimens loaded in a drying environment there is drying creep, in addition to the basic creep and shrinkage. Drying creep is the strain remaining after subtracting shrinkage, elastic strain and basic creep from the total measured strain. Any effects of thermal strains resulting from heat of hydration effects have to be removed in all cases.

To measure creep, two nominally identical sets of specimens are made and subject to the same curing regime and environment; one set is not loaded and is used to determine shrinkage while the second set is loaded to 30% to 40% of the available concrete strength. Load induced strains are determined by subtracting the shrinkage strains from the strains measured on the loaded specimens. It is assumed that the shrinkage and creep are effectively independent. This is known as the additive principle. Without this assumption it would be necessary to do creep tests at all the stress levels envisaged in service.

The additive relationship can be written as:

$$Total\ strain = shrinkage + elastic + basic\ creep + drying\ creep \tag{1.1}$$

Total strain, shrinkage strain and elastic strain are measured; the creep strain is obtained by subtraction. Any errors in the measured modulus of elasticity, measured total strain or measured shrinkage strain are all reflected in the calculated creep strain. The immediate strain per unit stress, and its inverse the modulus of elasticity, are dependent upon the rate of loading.

Provided the stress applied is less than 40% of the available strength experimental research (Keeton, 1965) indicates that creep is approximately proportional to stress. The equation can be rearranged as follows:

$$Total\ strain = shrinkage + \frac{stress}{E_{cmto}}(1 + basic\ creep\ coef. + drying\ creep\ coef.) \tag{1.2}$$

Specific creep = creep coefficient × elastic strain/unit stress

Compliance = (1 + creep coef.) × elastic strain/unit stress

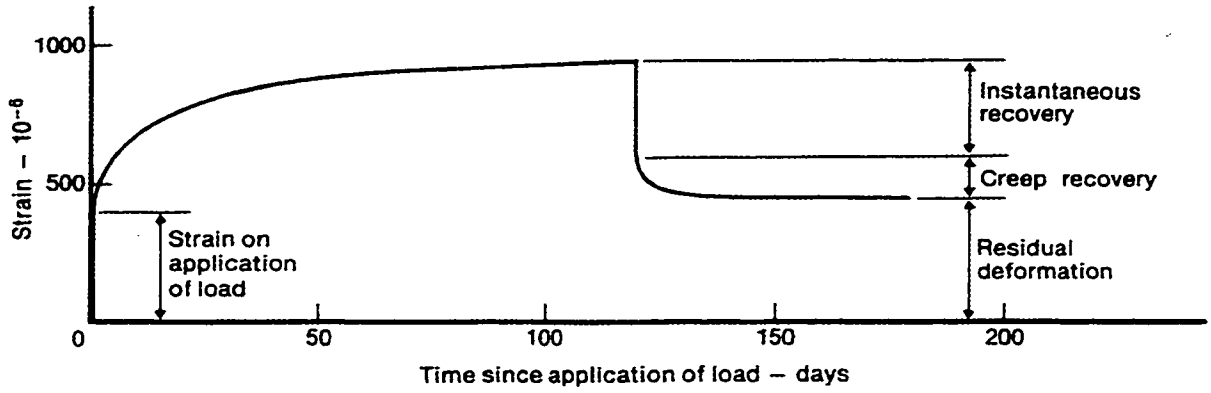
E_{cmto} = mean modulus of elasticity at loading

The definition of creep coefficient given above is that used in ACI 209-82 based upon the modulus of elasticity of the concrete at age of loading; other definitions exist.

1.2 Creep Recovery

When the load is reduced or totally removed from a previously loaded concrete member, the strain is changed accordingly. The strain recovered consists of 2 parts, an instantaneous, or elastic, recovery and a time-dependant recovery. The elastic recovery is simply the reciprocal of the modulus of elasticity at the age of unloading. The time-dependant recovery is generally referred as creep recovery. As shown in Figure 1.2, residual deformation remains after total removal of the load.

Figure 1.2 Creep recovery (Neville et al 1993)

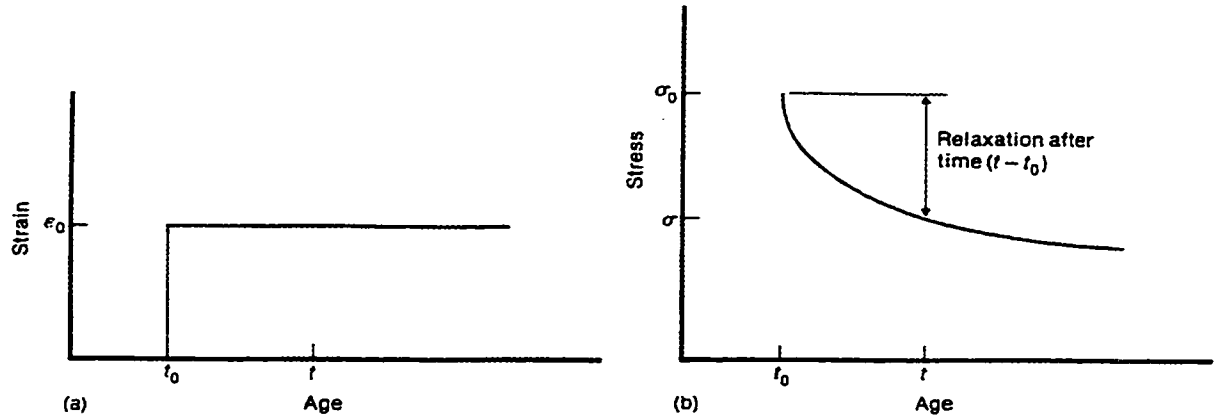


Experimental results show that the creep recovery is less than 100%, i.e. the reduction in strain due to adding a negative unit load is less that the increase in strain to due adding a positive unit load to a already loaded specimen.

1.3 Relaxation

Relaxation is the loss of stress under a state of constant strain. Figure 1.3 illustrates the relaxation of stress (b) under a constant strain (a). Relaxation is directly due to the creep and is independent of the shrinkage.

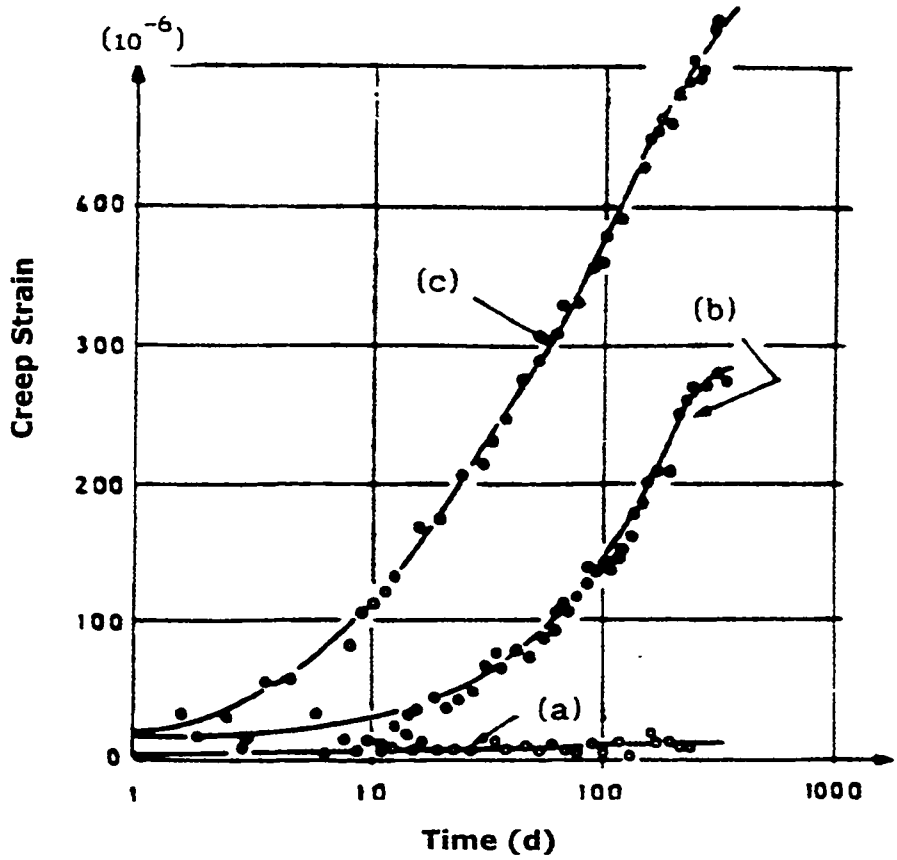
Figure 1.3 Relaxation of stress under a constant strain (Neville et al 1993)



1.4 Drying Before Loading: Pickett's Paradox

Figure 1.4 (Acker 1993), shows that both basic creep and drying creep are limited by the evaporable water available in the concrete at loading. Pickett's paradox states that a previously dried concrete (a) exhibits practically no creep; in the case of a concrete in which any exchange of moisture during loading is prevented (b), the more evaporable water it contains, the more it creeps; on the other hand a concrete that dries during loading (c) creeps even more, although it changes gradually from the hygral state of (b) to the hygral state of (a).

Figure 1.4 Pickett's paradox (Acker 1993)



Creep under 20 MPa, loaded at 42 days: (a) concrete dried at 40°C for 35 days and sealed, (b) sealed concrete, (c) concrete stored at 20°C and 50 % relative humidity.

1.5 RILEM Data Bank

The accuracy and reliability of prediction models for creep and shrinkage of concrete depend on the chosen constitutive approach and on the size and the characteristics of the data bank used for the derivation and optimization. RILEM TC 107 started, as part of its efforts, to develop a suitable, unbiased and generally accepted data bank. The work is still far from completion, various data sets could not be included, and important data such as those on creep at variable stresses including relaxation and recovery as well as creep and shrinkage at variable ambient conditions have been omitted to date (January 2000). This data bank has a very high permanent value. It may be used for the derivation and optimization of prediction models for creep and shrinkage of concrete and for the evaluation of models on the basis of the statistics. Further, it may serve to evaluate the soundness of new creep and shrinkage data, and it represents in itself a "prediction model" for the creep and shrinkage behaviour.

Models are developed from short term experimental results and are expected to be valid for long term prediction. Shrinkage and compliance data for experiments with durations up to 8500 days (23 years) are available in the RILEM data bank. However, most reported experiments are of much shorter duration. Relaxation experiments are of still shorter duration, the longest relaxation experiment is about 1300 days. Data durations for creep recovery are even shorter, they generally last only several days after unloading.

Graphs using a logarithmic scale for time are often used for the shrinkage, compliance, relaxation or creep recovery versus time graphs. For this type of information, a log time scale is convenient since most of the strain or stress variation occurs during the first couple of days of the experiments. There is a major inconvenience with the log time scale; the graph shapes are distorted which can be misleading.

A major problem with reported results is the description of the cement type or cement hydration characteristics. Different countries use different notations and the increasing use of supplementary cementing materials and admixtures to change the hydration or strength gain characteristics requires more than describing a cement simply as ASTM Type I or Normal Portland Cement.

1.6 Requirements of the Structural Engineer

In addition to the uncertainties described above the structural engineer may be required to calculate loss of prestress and strains/deflections under loads varying with time. Consequently he/she would like to adopt the concept that superposition can be used to determine the deformations under non-constant stresses. If valid, the method of superposition can be used to calculate recovery, relaxation, ageing and redistribution.

McHenry (1943) proposed the following definition for superposition: "The strains produced in concrete at any time t by a stress increment applied at any time t_o are independent of the effects of any stress applied either earlier or later than t_o. The increment may be either positive or negative but stresses which approach the ultimate strength are excluded." Using this principle, creep recovery and relaxation are easy to calculate.

The validity of the hypothesis of superposition could be resolved by experimental research; however relaxation tests, maintaining the strain constant and measuring the decreasing stress while adjusting for shrinkage in a drying environment, are very difficult. If drying creep is consequent to moisture being expelled from the concrete due to load, superposition would require on unloading that the concrete would absorb moisture which is difficult to justify. Hence it is difficult to accept the hypothesis of superposition for concretes subject to drying under decreasing stresses. This problem has been avoided in this thesis by eliminating moisture movement when calculating relaxation.

Calculating recovery by superposition is subject to more problems than calculating relaxation by superposition. If the moisture does not ingress into the concrete, drying creep is not recoverable. If recovery is to be calculated by superposition both basic and drying creep compliance curves have to be parallel in time to give a constant compliance after unloading. If as described in Section 1.4, drying before loading reduces both basic and drying creep, it is not yet possible to determine a formulation that permits calculating recovery by superposition in a drying environment. Experimental evidence is inconclusive on whether either drying creep and basic creep are completely recoverable.

1.7 Ageing

The majority of experimental creep data was measured on concretes loaded at relatively early ages. In many cases the termination of moist curing coincided with the concrete being loaded. This raises the question, does the creep coefficient decrease with age of loading? Inspection of the data indicates that creep decreases with age of loading – is the reduction in specific creep greater than the increase in concrete stiffness? A third question is the effect of drying before loading. In a creep equation the reduction of specific creep (creep coefficient) with increased age of loading can be ascribed to increased concrete stiffness/strength and/or increased drying before loading or some other phenomena. Unfortunately the experimental data available is not sufficient to resolve this dilemma. The code equations describing strength and stiffness development with time are given in Chapter 3.

1.8 Desired Features of Code Expressions

1- Preferably the code should require only those values readily known to the engineer at the design stage, namely; 28 day specified concrete strength, anticipated concrete age/strength at end of curing or loading, duration of load, element size and humidity.

2- It should allow substitution of measured values of concrete strength and modulus of elasticity.

3- It should allow extrapolation of measured shrinkage and creep compliance results to get long term values.

4- Any formula should be able to accommodate aggregate stiffness; either directly as reflected by the modulus of elasticity of the concrete or indirectly by adjusting concrete cylinder strength.

5- Preferably formulae should not require correction terms for the curing regime, type of cement, admixtures etc.

6- Equations should be easy to use and not too sensitive to changes in input parameters i.e. a small change in a parameter should not change the calculated result significantly.

1.9 Evaluation Criteria for Creep and Shrinkage Models

RILEM committee TC 107 published in 1995 a list of criteria to be used for evaluating shrinkage and creep models. In November 1999, ACI committee 209, which has a number of members in common with RILEM TC 107, discussed the RILEM guidelines and agreed upon the following.

1- Drying shrinkage and drying creep should be bounded.

2- Both shrinkage and creep equations should be capable of extrapolation in time and size.

3- All shrinkage and creep models should be compared to the data in the data bank limited by the limits of applicability of the model. Some experimental data with high water to cement ratios or low modulus concrete may not be appropriate to the model.

4- Equations should be easy to use and not sensitive to changes in input parameters i.e. a small change in a parameter should not change significantly the calculated result.

5- The shape of the individual shrinkage and creep curves should agree with individual test results.

6- Creep values should be compared as compliance or specific creep rather than creep coefficient. Immediate strain per unit stress, and its inverse the modulus of elasticity, is dependent upon the rate of loading.

7- Both shrinkage and creep expressions should be able to accommodate concretes containing fly ash, slag, silica fume and chemical admixtures.

8- Creep strains under complete unloading, recovery, should asymptotically approach a constant value.

9- Stress relaxation, reduction of stress under constant strain, should not become negative.

1.10 How Good Can a Model Be?

The coefficients of variation for shrinkage measured by Bazant, Wittman, Alou and Kim (1987) in a statistically significant investigation were 10% at 7 days and 7% at 1100 days and can be used as a benchmark. Due to the lack of precision and

accuracy of the experimental results, there is no point in developing an overly complex model to predict the shrinkage and compliance for design purposes. It cannot be expected that a model would agree perfectly with all experimental results. A simple model that could predict the shrinkage within 15% would be excellent and 20% would be adequate. Obviously for compliance, the range of expected agreement would be worse because compliance is measured by subtracting a large number from another large number.

1.11 Objective

It is relatively easy to develop models that replicate the shrinkage and creep data in the RILEM data bank. However, developing models that can be used in calculating relaxation and creep recovery is more difficult. It is important to establish/deny the validity of the principle of superposition for concretes subject to moisture loss and changing microstructure.

The object of this thesis was to examine the equations being considered for adoption by ACI 209 with respect to their ability to model the results in the RILEM data bank for normal strength concretes and their ability to calculate relaxation and recovery using superposition. In CSA A23.1 normal strength concrete is defined as concrete with specified, characteristic strength between 20 and 70 MPa (mean strength less than 82 MPa). Concretes in this strength range would not experience self desiccation.

CHAPTER 2

Creep Recovery and Relaxation Calculation Procedures

2.1 Creep Recovery

Calculation of the creep recovery using the principle of superposition is simple and convenient. The creep recovery can be calculated in three steps:

1- Calculate the compliance, $J(t,t_o)$, at the age of loading t_o;
2- Calculate the compliance, $J(t,t_u)$, at the age of loading t_u;
3- Subtract $J(t,t_u)$ from $J(t,t_o)$.

2.2 Relaxation

The numerical procedure illustrated in the following consists of the step-by-step solution of the superposition integral equation (2.2) for the determination of the relaxation function $R(t,t_o)$ from a given compliance function $J(t,t_o)$, and is based on the approximation (with the trapezoidal rule) of the superposition integral with finite sums.

The stress dependant strain at time t, $\varepsilon_{c\sigma}(t)$, of a concrete member uniaxially loaded at time t_o, with a variable stress $\sigma_c(t)$, may be written as:

$$\varepsilon_{c\sigma}(t) = \sigma_c(t_o)J(t,t_o) + \int_{t_o}^{t} J(t,\tau)d\sigma(\tau) \qquad (2.1)$$

Considering the history of the stress dependent strain to be a unit step function, the history of stress is consequently represented by the relaxation function, $\sigma_c(t,t_o) = R(t,t_o)$, and Equation 2.1 yields:

$$1 = R(t_o, t_o)J(t, t_o) + \int_{t_o}^{t} J(t, \tau)d\sigma(\tau) = E(t_o)J(t, t_o) + \int_{t_o}^{t} J(t, \tau)d\sigma(\tau) \qquad (2.2)$$

Subdividing time t by discrete times t_o, t_1, t_2,...t_i...t_k into sub intervals $\Delta t_i = t_i - t_{i-1}$ (i=1,2,...,k) (with t_o t_1 and $\Delta t_1 = t_1 - t_o = 0$ and consequently $\Delta\varepsilon_{c\sigma}(t_1) = 1$) Equation 2.2 may then be written:

$$1 = \sum_{i=1}^{k} \frac{1}{2}\left[J(t_k, t_i) + J(t_k, t_{i-1})\right]\Delta R(t_i) \qquad (2.3)$$

Rewriting Equation 2.3 for $t = t_{k-1}$ (for $k > 1$):

$$1 = \sum_{i=1}^{k-1} \frac{1}{2}\left[J(t_{k-1}, t_i) + J(t_{k-1}, t_{i-1})\right]\Delta R(t_i) \qquad (2.4)$$

and subtracting this equation from 2.3:

for $k > 1$

$$\Delta R(t_k) = -\frac{\sum_{i=1}^{k-1}\left[J(t_k, t_i) + J(t_k, t_{i-1}) - J(t_{k-1}, t_i) - J(t_{k-1}, t_{i-1})\right]\Delta R(t_i)}{J(t_k, t_k) + J(t_k, t_{k-1})} \qquad (2.5)$$

for $k = 1$

$$\Delta R(t_1) = \frac{1}{J(t_1, t_1)} = \frac{1}{J(t_0, t_0)} = E(t_0) \qquad (2.6)$$

CHAPTER 3

Literature Review: Existing Models

3.1 Introduction

Over the past 50 years, various code type formulations have been adopted or proposed in lieu of extensive testing programs. The most widely used are the ACI 209 method and those developed by the Comité Européen du Béton. The CEB proposed different models in the 1970, 1978 and 1990 Model Codes. The CEB MC 1990 proposal has been adopted as the Eurocode 2 proposal. In this chapter, four shrinkage and compliance models are described; ACI 209 (ACI Committee 209 1982), CEB MC90 (CEB Comité Euro-International du Béton 1990), B3 (Bazant and Baweja 1995) and Atlanta 97 (Gardner 1997). The development of a modified version of the Atlanta 97 is described in Chapter 4.

Other models have been proposed and/or adopted in various national codes, but the discussion is restricted to those models currently being considered by ACI Committee 209 for adoption.

ACI 209 method and B3 model use the same equations to calculate the modulus of elasticity, strength development with time and mean compressive strength as a function of the characteristic compressive strength. CEB MC90 and Atlanta 97 provide their own formulae.

3.1.1 Modulus of Elasticity

According to ACI, the modulus of elasticity of concrete can be calculated using the following formula:

$$E_{cmt} = 0.043\rho^{1.5}\sqrt{f_{cmt}} \tag{3.1}$$

where E_{cmt} and f_{cmt} are respectively the modulus of elasticity and mean compressive strength of concrete at the age t (MPa) and ρ is the density of concrete (kg/m^3).

For normal density concrete, Equation 3.1 leads to:

$$E_{cmt} = 4733\sqrt{f_{cmt}} \tag{3.2}$$

CEB considers the aggregate type in the modulus of elasticity expression which can be calculated using Equation 3.3.

$$E_{cm28} = 10000\alpha_E(f_{cm28})^{1/3} \tag{3.3}$$

where E_{cmt} and f_{cmt} are respectively the modulus of elasticity and mean compressive strength of concrete at 28 days (MPa) and α_E, a correction factor for the effect of aggregate type, given in Table 3.1

Table 3.1 α_E as a function of the aggregate type, CEB MC90 model

Aggregate type	α_E
Sandstone	0.7
Ordinary limestone	0.9
Quartzitic aggregate	1.0
Dense limestone	1.2
Basalt	1.2

For concrete containing ordinary limestone, the equation is simplified to:

$$E_{cm28} = 9000(f_{cm28})^{1/3} \tag{3.4}$$

Gardner (Atlanta 97) considers only the compressive strength of concrete in the calculation of the modulus of elasticity.

$$E_{cmt} = 3500 + 4300\sqrt{f_{cmt}} \tag{3.5}$$

3.1.2 Strength Development with Time

ACI and Gardner provide equations to approximate the strength development with time when experimental results are not available. The CEB MC90 model provides expressions for both the strength and stiffness development with time.

ACI:

$$f_{cmt} = f_{cm28}\frac{t}{a+bt} \tag{3.6}$$

The constants a and b are related to the cement type and curing conditions. For moist cured concrete, a and b are given in the following table.

Table 3.2 a and b as functions of the cement type, ACI 209 method

Cement type	a	b
Type I	4.0	0.85
Type III	2.3	0.92

CEB:

$$f_{cmt} = \beta e^2 \cdot f_{cm28} \tag{3.7}$$

$$E_{cmt} = \beta e \cdot E_{cm28} \tag{3.8}$$

where:

$$\beta e = e^{\frac{s}{2}\left[1-\sqrt{\frac{28}{t}}\right]} \tag{3.9}$$

where s is a constant related to the cement type, refer to Table 3.3. Unfortunately, it is difficult to convert the cement type descriptions to ASTM nomenclature.

Table 3.3 s as a function of the cement type, CEB MC90 model

Cement type	s
Rapid hardening, high strength (RS)	0.20
Normal (N) or rapid (R) hardening	0.25
Slowly hardening (SL)	0.38

Gardner:

$$f_{cmt} = f_{cm28}\frac{t^{3/4}}{a + bt^{3/4}} \tag{3.10}$$

The constants a and b are related to the cement type, refer to Table 3.4.

Table 3.4 a and b as functions of the cement type, Atlanta 97 model

Cement type	a	b
Type I	2.8	0.77
Type II	3.4	0.72
Type III	1.0	0.92

3.1.3 Mean Strength vs. Characteristic Strength

ACI and CEB add a constant to the characteristic compressive strength (5% lower bound) to obtain the mean compressive strength. CEB uses the same value for the entire range of concrete strength. For ACI, the added constant varies depending on the value of the characteristic compressive strength. Gardner suggests a more progressive alternative with a linear equation.

ACI:

$$f_{cm28} = f_{ck28} + 6.9 \quad \text{for } f_{ck28} < 20\,\text{MPa} \tag{3.11}$$

$$f_{cm28} = f_{ck28} + 8.3 \quad \text{for } 20\,\text{MPA} \le f_{ck28} \le 35\,\text{MPa} \tag{3.12}$$

$$f_{cm28} = f_{ck28} + 9.6 \quad \text{for } f_{ck28} > 35\,\text{MPa} \tag{3.13}$$

CEB

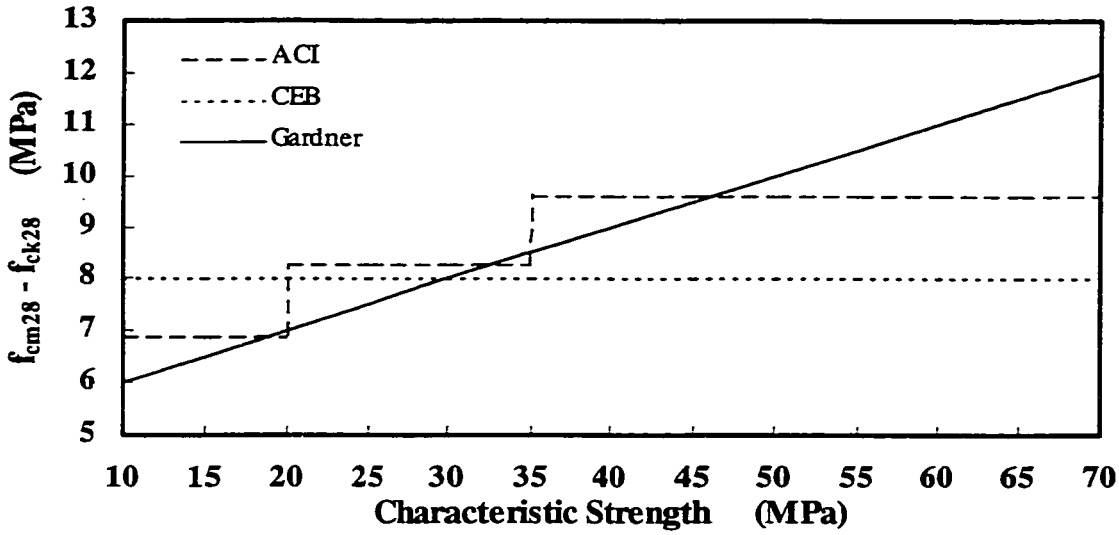
$$f_{cm28} = f_{ck28} + 8.0 \tag{3.14}$$

Gardner:

$$f_{cm28} = 1.1 f_{ck28} + 5.0 \tag{3.15}$$

Figure 3.1 shows the difference between mean strength and characteristic strength vs. the characteristic strength. At 70 MPa, $f_{cm28} - f_{ck28}$ is 9.6 MPa for ACI, 8.0 MPa for CEB and 12.0 MPa for Gardner.

Figure 3.1 Mean compressive strength vs. characteristic compressive strength



3.2 ACI 209 Method 1978

3.2.1 Introduction

The ACI 209 Method is by far the simplest model discussed in this thesis. The creep coefficient is simply the ultimate shrinkage multiplied by a hyperbolic function in time with corrections factors for the age of loading, element size effects, relative humidity and concrete composition. The current version ACI 209R-92 is basically identical to ACI 209-72.

3.2.2 Shrinkage

3.2.2.1 Required Parameters

When calculating shrinkage strain using the ACI 209 method, the following parameters are required:

- Age drying commenced, end of moist curing (days);
- Air content expressed as a decimal;
- Cement content (kg/m^3);
- Curing method;
- Fine aggregate to total aggregate ratio, by weight;
- Relative humidity expressed as a decimal;
- Slump of fresh concrete (mm);
- Volume to surface ratio (mm).

3.2.2.2 Shrinkage Equations

The shrinkage strain is calculated using the following equations:

For moist cured concrete:

$$\varepsilon_{sh} = 780\gamma_2'\gamma_3'\gamma_4'\gamma_5'\gamma_6'\gamma_7\gamma_8\frac{(t-t_c)}{(t-t_c)+35}\times 10^{-6} \tag{3.16}$$

For steam cured concrete:

$$\varepsilon_{sh} = 780\gamma_2'\gamma_3'\gamma_4'\gamma_5'\gamma_6'\gamma_7\gamma_8\frac{(t-t_c)}{(t-t_c)+55}\times 10^{-6} \tag{3.17}$$

γ_2' is a correction term for the effect of humidity.

$$\gamma_2' = 1.40 - 1.0h \qquad \text{for } 0.40 \le h \le 0.80 \tag{3.18}$$

$$\gamma_2' = 3.00 - 3.0h \qquad \text{for } 0.80 < h \le 1.00 \tag{3.19}$$

γ_3' is a correction term for the effect of size.

When $V/S \le 37.5$ mm, the modification factors given in Table 3.5 can be used.

Table 3.5 γ_3' as a function of *V/S*, ACI 209 method

V/S	γ_3'
12.5	1.35
18.8	1.25
25.0	1.17
31.2	1.08
37.5	1.00

When 37.5 mm < *V/S* < 95 mm:

$$\gamma_3' = 1.23 - 0.0060(V/S) \qquad \text{when } (t - t_c) \le 365 \text{ days} \tag{3.20}$$

$$\gamma_3' = 1.17 - 0.0044(V/S) \qquad \text{when } (t - t_c) > 365 \text{ days} \tag{3.21}$$

When *V/S* ≥ 95 mm:

$$\gamma_3' = 1.2\exp(-0.00472(V/S)) \tag{3.22}$$

γ_4', γ_5', γ_6', γ_7 are correction terms related to the composition of concrete.

$$\gamma_4' = 0.89 + 0.00161s \tag{3.23}$$

where s is the slump of fresh concrete in mm.

$$\gamma_5' = 0.30 + 1.40\Psi \qquad \text{for } \Psi \le 0.50 \tag{3.24}$$

$$\gamma_5' = 0.90 + 0.20\Psi \qquad \text{for } \Psi > 0.50 \tag{3.25}$$

where Ψ is the fine to total aggregate ratio, by weight.

$$\gamma_6' = 0.95 + 0.8a \ge 1.0 \tag{3.26}$$

where a is the air content expressed as a decimal.

$$\gamma_7 = 0.75 + 0.00061c \quad (3.27)$$

where c is the cement content in kg/m^3.

γ_8 is a correction term for duration of curing.

For steam cured concrete, cured for a period between 1 and 3 days, $\gamma_8 = 1.00$.

For moist cured concrete, the modification factors given in Table 3.6 can be used.

Table 3.6 γ_8 as a function of t_c, ACI 209 method

t_c	γ_8
1.0	1.20
3.0	1.10
7.0	1.00
14.0	0.93
28.0	0.86
90.0	0.75

3.2.3 Compliance

3.1.3.1 Required Parameters

When calculating compliance using the ACI 209 method, the following parameters are required:

- Age of concrete at loading (days);
- Air content expressed as a decimal;
- Curing method;
- Fine aggregate to total aggregate ratio, by weight;
- Modulus of elasticity of concrete when loading commenced (MPa);
- Relative humidity expressed as a decimal;
- Slump of fresh concrete (mm);
- Volume to surface ratio (mm).

3.2.3.2 Compliance Equations

$$J(t,t_o)=\frac{1+\phi}{E_{cmto}} \tag{3.28}$$

$$\phi=2.35\gamma_1\gamma_2\gamma_3\gamma_4\gamma_5\gamma_6\frac{(t-t_o)^{0.6}}{(t-t_o)^{0.6}+10} \tag{3.29}$$

γ_1 is a correction term for the effect of age of loading.

For moist cured concrete:

$$\gamma_1=1.25t_o^{-0.118} \qquad \text{for } t_o \geq 7 \text{ days} \tag{3.30}$$

For stream cured concrete:

$$\gamma_1=1.25t_o^{-0.094} \qquad \text{for } t_o \geq 3 \text{ days} \tag{3.31}$$

γ_2 is a correction term for the effect of humidity.

$$\gamma_2=1.27-0.67h \qquad \text{for } h>0.40 \tag{3.32}$$

γ_3 is a correction term for the effect of size.

When $V/S \leq 37.5$ mm, the modification factors given in Table 3.7 can be used.

Table 3.7 γ_3 as a function of V/S, ACI 209 method

V/S	γ_3
12.5	1.30
18.8	1.17
25.0	1.11
31.2	1.04
37.5	1.00

When 37.5 mm $<$ V/S $<$ 95 mm:

$$\gamma_3 = 1.14 - 0.00368(V/S) \qquad \text{when } (t - t_o) \leq 365 \text{ days} \tag{3.33}$$

$$\gamma_3 = 1.10 - 0.00268(V/S) \qquad \text{when } (t - t_o) > 365 \text{ days} \tag{3.34}$$

When $V/S \geq 95$ mm:

$$\gamma_3 = \frac{2}{3}\left[1 + 1.13\exp(-0.0213(V/S))\right] \tag{3.35}$$

γ_4, γ_5, γ_6 are correction terms related to the composition of concrete.

$$\gamma_4 = 0.82 + 0.00264s \tag{3.36}$$

where s is the slump of fresh concrete in mm.

$$\gamma_5 = 0.88 + 0.24\Psi \tag{3.37}$$

where Ψ is the fine to total aggregate ratio, by weight.

$$\gamma_6 = 0.46 + 9a \geq 1.0 \tag{3.38}$$

where a is the air content expressed as a decimal.

3.3 CEB MC90 Model

3.3.1 Introduction

Similar to ACI 209, the CEB MC90 model calculates a creep coefficient to predict the creep. However, instead of basing the creep coefficient on the modulus of elasticity at the age of loading, it is based on the modulus at 28 days. This model does

not consider the effects of curing (duration or method) for the calculation of compliance.

3.3.2 Shrinkage

3.3.2.1 Required Parameters

When calculating shrinkage strain using the CEB MC90 model, the following parameters are required:

- Age drying commenced, end of moist curing (days);
- Cement type;
- Concrete mean compressive strength at 28 days (MPa);
- Relative humidity expressed as a decimal;
- Volume to surface ratio (mm).

3.3.2.2 Shrinkage Equations

The shrinkage strain is calculated using the following equation:

$$\varepsilon_{sh} = \varepsilon_{cso}\beta_s(t - t_c) \tag{3.39}$$

where ε_{cso} is the notional shrinkage coefficient and β_s is a coefficient to describe the development of shrinkage with time.

The notional shrinkage coefficient may be obtained from Equation 3.40.

$$\varepsilon_{sho} = \varepsilon_s(f_{cm28})\beta_{RH} \tag{3.40}$$

with

$$\varepsilon_s(f_{cm28}) = \left[160 + \beta_{sc}(90 - f_{cm28})\right] \times 10^{-6} \tag{3.41}$$

where β_{sc} is a coefficient which depends on the cement type, refer to Table 3.8.

Table 3.8 β_{sc} as a function of the cement type, CEB MC90 model

Cement type	β_{sc}
Rapid hardening, high strength (RS)	8
Normal (N) or rapid (R) hardening	5
Slowly hardening (SL)	4

and

$$\beta_{RH} = -1.55\beta_{sRH} \quad \text{for } 0.40 < h < 0.99 \tag{3.42}$$

$$\beta_{RH} = 0.25 \quad \text{for h} > 0.99 \tag{3.43}$$

where

$$\beta_{sRH} = 1 - h^3 \tag{3.44}$$

The development of shrinkage with time is given by:

$$\beta_s(t - t_c) = \left[\frac{(t - t_c)}{\beta_{sH} + (t - t_c)}\right]^{0.5} \tag{3.45}$$

with

$$\beta_{sH} = 0.14(V/S)^2 \tag{3.46}$$

3.3.3 Compliance

3.3.3.1 Required Parameters

When calculating compliance using the CEB MC90 model, the following parameters are required:

- Age of concrete at loading (days);
- Concrete mean compressive strength at 28 days (MPa);
- Modulus of elasticity of concrete at 28 days (MPa);
- Modulus of elasticity of concrete when loading commenced (MPa);

- Relative humidity expressed as a decimal;
- Volume to surface ratio (mm).

3.3.3.2 Compliance Equations

$$J(t,t_o)=\frac{1}{E_{cmto}}+\frac{\phi}{E_{cm28}} \tag{3.47}$$

where E_{cmto} is the modulus of elasticity of concrete at loading, ϕ is the creep coefficient and E_{cm28} is the modulus of elasticity of concrete at 28 days.

The creep coefficient is given by the following expression:

$$\phi = \phi_{RH}\beta(f_{cm28})\beta(t_o)\left(\frac{t-t_o}{t-t_o+\beta_H}\right)^{1/3} \tag{3.48}$$

β_H and ϕ_{RH}, are correction terms for the relative humidity.

$$\beta_H = 1.5[1+(1.2h)^{18}](2V/S)+250 < 1500 \text{ days} \tag{3.49}$$

$$\phi_{RH}=1+\frac{(1-h)}{0.1(2V/S)^{1/3}} \tag{3.50}$$

$\beta(f_{cm28})$ and $\beta(t_o)$ are correction factors for the effect of strength of concrete and age of loading respectively.

$$\beta(f_{cm28})=\frac{16.8}{\sqrt{f_{cm28}}} \tag{3.51}$$

$$\beta(t_o)=\frac{1}{0.1+t_o^{0.2}} \tag{3.52}$$

3.4 Bazant-Baweja B3 Model

3.4.1 Introduction

This model is not based on the same principles as the other models listed in this thesis; its formulation is unique and quite complex. The B3 model requires more parameters and calculations than Atlanta 97, CEB MC90 or ACI 209. According to Bazant (1998): "This is the only foolproof, unambiguous method of data fitting, a method that always works, a method that always gives a unique answer." It may be true but this model is very complex to be considered as a design code model for the prediction of compliance. The B3 model is the latest variant in a number of shrinkage and creep prediction methods developed by Bazant and his co-workers at North Western University.

3.4.2 Shrinkage

3.4.2.1 Required Parameters

When calculating shrinkage strain using the B3 model, the following parameters are required:

- Age drying commenced, end of moist curing (days);
- Cement type;
- Concrete mean compressive strength at 28 days (MPa);
- Curing condition;
- Modulus of elasticity of concrete at 28 days (MPa);
- Relative humidity expressed as a decimal;
- Shape of specimen;
- Volume to surface ratio (mm);
- Water content in concrete (kg/m^3).

3.4.2.2 Shrinkage Equations

The shrinkage strain is calculated using the following equation:

$$\varepsilon_{sh} = -\varepsilon_{sh\infty} k_h S(t) \tag{3.53}$$

where $\varepsilon_{sh\infty}$ is the time dependence of ultimate shrinkage, k_h is the humidity dependence (Table 3.11) and $S(t)$ is the time curve.

$$\varepsilon_{sh\infty} \approx -\alpha_1 \alpha_2 [0.019 w^{2.1} f_{cm28}{}^{-0.28} + 270] \times 10^{-6} \tag{3.54}$$

where w is the water content in kg/m^3, α_1 and α_2 are constants related to the cement type and curing condition. The negative sign is the model proposer's convention.

Table 3.9 α_1 as a function of the cement type, B3 model

Type of cement	α_1
Type I	1.00
Type II	0.85
Type III	1.10

Table 3.10 α_2 as a function of the curing condition, B3 model

Curing method	α_2
Stream cured	0.75
Cured in water	1.00
Cured at 100% humidity	1.00
Sealed during curing	1.20

Table 3.11 Humidity dependence, B3 model

Relative humidity	k_h
$h \leq 0.98$	$1 - h^3$
$h = 1.00$	-0.2
$0.98 < h < 1.00$	Linear interpolation

$$S(t) = \tanh\left[\left(\frac{t - t_c}{\tau_{sh}}\right)^{1/2}\right] \tag{3.55}$$

where

$$\tau_{sh} = 0.085 t_c^{-0.08} f_{cm28}^{-0.25} \left[2k_s(V/S)\right]^2 \tag{3.56}$$

k_s is the cross-section shape correction factor , refer to Table 3.12.

Table 3.12 k_s as a function of the cross-section shape, B3 model

Cross-section shape	k_s
Infinite slab	1.00
Infinite cylinder	1.15
Infinite square prism	1.25
Sphere	1.30
Cube	1.55

3.4.3 Compliance

3.4.3.1 Required Parameters

When calculating compliance using the B3 model, the following parameters are required:

- Age drying commenced, end of moist curing (days);
- Age of concrete at loading (days);
- Aggregate content in concrete (kg/m^3);
- Cement content in concrete (kg/m^3);
- Cement type;
- Concrete mean compressive strength at 28 days (MPa);
- Curing condition;
- Modulus of elasticity of concrete at 28 days (MPa);
- Relative humidity expressed as a decimal;
- Shape of specimen;
- Volume to surface ratio (mm);
- Water content in concrete (kg/m^3).

3.4.3.2 Compliance Equations

The compliance $J(t,t_o)$ is calculated from:

$$J(t,t_o) = [q_1 + C_o(t,t_o) + C_d(t,t_o,t_c)] \tag{3.57}$$

where q_1 is the instantaneous strain, $C_o(t,t_o)$ is the compliance function for basic creep and $C_d(t,t_o,t_c)$ is the compliance function for drying creep.

The instantaneous strain is calculated using the modulus of elasticity of concrete at 28 days.

$$q_1 = 0.6 / E_{cm28} \tag{3.58}$$

According to Bazant and Baweja, the basic creep is composed of three terms, an ageing viscoelastic term, a non-ageing viscoelastic term and an ageing flow term.

$$C_o(t,t_o) = q_2 Q(t,t_o) + q_3 \ln[1 + (t - t_o)^n] + q_4 \ln(t/t_o) \tag{3.59}$$

q_2 is the ageing viscoelastic compliance parameter. The cement content and the concrete mean compressive strength at 28 days are required to calculate this parameter.

$$q_2 = 185.4 \times 10^{-6} c^{0.5} f_{cm28}{}^{-0.9} \tag{3.60}$$

$$Q(t,t_o) = Q_f(t_o)\left[1 + \left(\frac{Q_f(t_o)}{Z(t,t_o)}\right)^{r(t_o)}\right]^{-1/r(t_o)} \tag{3.61}$$

$Q(t,t_o)$ is a binomial integral, which must be multiplied by the parameter q_2 to obtain the ageing viscoelastic term. The three following equations can be used to approximate the binomial integral.

$$Q_f(t_o) = [0.086(t_o)^{2/9} + 1.21(t_o)^{4/9}]^{-1} \tag{3.62}$$

$$Z(t,t_o) = (t_o)^{-m} \ln[1 + (t - t_o)^n] \tag{3.63}$$

$$r(t_o) = 1.7(t_o)^{0.12} + 8 \tag{3.64}$$

q_3 is the non-ageing viscoelastic compliance parameter and q_4 is the ageing flow compliance parameter. These parameters are a function of the concrete mean compressive strength at 28 days, the cement content (c), the water to cement ratio (w/c) and the aggregate cement ratio (a/c).

$$q_3 = 0.29 q_2 (w/c)^4 \tag{3.65}$$

$$q_4 = 20.3 \times 10^{-6} (a/c)^{-0.7} \tag{3.66}$$

The compliance function for drying creep is defined by Equation 3.67. This equation takes into account drying before loading. It can be noted that drying before loading is considered only for drying creep.

$$C_d(t, t_o, t_c) = q_5 [\exp\{-8H(t)\} - \exp\{-8H(t_o)\}]^{1/2} \tag{3.67}$$

q_5 is the drying creep compliance parameter. This parameter is a function of the concrete mean compressive strength at 28 days, water content, cement type, method of curing and $\varepsilon_{sh\infty}$, the ultimate shrinkage strain.

$$q_5 = 0.757 f_{cm28}^{-1} \left| \varepsilon_{sh\infty} \times 10^6 \right|^{-0.6} \tag{3.68}$$

$$\varepsilon_{sh\infty} \approx -\alpha_1 \alpha_2 [0.019 w^{2.1} f_{cm28}^{-0.28} + 270] \times 10^{-6} \tag{3.69}$$

The values of α_1 and α_2 are given in Tables 3.9 and 3.10.

$H(t)$ and $H(t_o)$ are spatial averages of pore relative humidity. Equations 3.70 to 3.71 are required to calculate $H(t)$ and $H(t_o)$.

$$H(t) = 1 - (1 - h) S(t) \tag{3.70}$$

$$H(t_o) = 1 - (1 - h) S(t_o) \tag{3.71}$$

$S(t)$ and $S(t_o)$ are the time function for shrinkage and τ_{sh} is the shrinkage half-time.

$$S(t) = \tanh\left[\left(\frac{t - t_c}{\tau_{sh}}\right)^{1/2}\right] \tag{3.72}$$

$$S(t_o) = \tanh\left[\left(\frac{t_o - t_c}{\tau_{sh}}\right)^{1/2}\right] \tag{3.73}$$

$$\tau_{sh} = 0.085 t_c^{-0.08} f_{cm28}^{-0.25} \left[2k_s(V/S)\right]^2 \tag{3.74}$$

k_s is the cross-section shape correction factor, given in Table 3.12.

3.5 Gardner-Zhao Atlanta 97 Model

3.5.1 Introduction

Presented at the Atlanta ACI convention in 1997, this model was developed as a simple design-office procedure for calculating the shrinkage and compliance of concrete using the information available at design; namely the mean compressive strength of concrete at 28 days, concrete strength at the end of curing or at loading, element size and relative humidity. This method includes strength development with age, the relationship between the strength and the modulus of elasticity, and equations for the prediction of shrinkage and compliance. The original version of this method was published by Gardner and Zhao in 1993.

3.5.2 Shrinkage

3.5.2.1 Required Parameters

When calculating shrinkage strain using the Atlanta 97 model, the following parameters are required:

- Age drying commenced, end of moist curing (days);
- Cement type;
- Concrete mean compressive strength at 28 days (MPa);
- Concrete mean compressive strength when drying commenced (MPa);
- Relative humidity expressed as a decimal;
- Volume to surface ratio (mm).

3.5.2.2 Shrinkage Equations

The shrinkage strain is calculated using Equations 3.75 to 3.78.

$$\varepsilon_{sh} = \varepsilon_{shu}\beta(h)\beta(t) \tag{3.75}$$

where ε_{shu} is the notional ultimate shrinkage strain (20000 days).

$$\varepsilon_{shu} = 900 \times 10^{-6} K \left(\frac{f_{cm28}}{f_{cmtc}}\right)^{1/2} \left(\frac{25}{f_{cm28}}\right)^{1/2} \tag{3.76}$$

K depends on the cement type, refer to Table 3.13.

Table 3.13 K as a function of the cement type, Atlanta 97 model

Cement Type	K
Type I	1.00
Type II	0.70
Type III	1.33

The cement type is determined from the strength development characteristic of the concrete regardless of the nominal designation of the cement. This enables the formulae to accommodate concretes incorporating any chemical or mineral admixtures. If experimental results for strength development are available, the shrinkage term can be improved by interpolating K from Table 3.13, using the experimentally determined cement type/characteristic.

$\beta(h)$ and $\beta(t)$ are correction terms for the effect of humidity and time respectively.

$$\beta(h) = (1 - 1.18h^4) \tag{3.77}$$

$$\beta(t) = \left(\frac{7.27 + \ln(t - t_c)}{17.18}\right)\left(\frac{t - t_c}{t - t_c + 0.015(V/S)^2}\right) \tag{3.78}$$

3.5.3 Compliance

3.5.3.1 Required Parameters

When calculating compliance using the Atlanta 97 model, the following parameters are required:

- Age of concrete at loading (days);
- Concrete mean compressive strength at 28 days (MPa);
- Concrete mean compressive strength when loading commenced (MPa);
- Modulus of elasticity of concrete when loading commenced (MPa);
- Relative humidity expressed as a decimal;
- Shrinkage strain at (t_o-t_c) calculated using the Atlanta 97 shrinkage model;
- Shrinkage strain at (20000-t_c) calculated using the Atlanta 97 shrinkage model;
- Volume to surface ratio (mm).

3.5.3.2 Compliance Equations

The compliance $J(t,t_o)$ is calculated using the following equations:

$$J(t,t_o) = \frac{1+\phi}{E_{cmto}} \tag{3.79}$$

where ϕ is the creep coefficient

$$\phi = \Phi(t)\Phi(t_c)\left(\frac{f_{cm28}}{f_{cmto}}\right)^{1/2}\left[1.5+3.0\left(\frac{25}{f_{cmto}}\right)^{1/2}(1-1.086h^2)\left(\frac{t-t_o}{t-t_o+0.05(V/S)^2}\right)\right] \quad (3.80)$$

where $\Phi(t)$ is a time function and $\Phi(t_c)$ is the correction term for drying before loading.

$$\Phi(t) = \left[\frac{7.27+\ln(t-t_o)}{17.18}\right] \quad (3.81)$$

$\Phi(t_c)$ takes account of drying before loading, often known as the Pickett effect, which reduces both basic and drying creep. It is known that the creep of concrete is related to the evaporable water. The remaining evaporable water is approximated as the fraction remaining potential shrinkage relative to the shrinkage from end of moist curing to 20000 days.

If $t_o = t_c$

$$\Phi(t_c) = 1 \quad (3.82)$$

When $t_o > t_c$

$$\Phi(t_c) = \sqrt{1-\frac{\varepsilon_{sh}(t_o-t_c)}{\varepsilon_{sh}(20000-t_c)}} \quad (3.83)$$

CHAPTER 4

Proposed Model

4.1 Gardner-Lockman GL2000 Model

4.1.1 Introduction

The model is basically a modified Atlanta 97, which itself was influenced by CEB MC90, developed to correct the negative relaxation at early ages of loading and the unrealistic creep recovery of Atlanta 97. The compliance expression is based on the modulus of elasticity at 28 days instead of the modulus elasticity at the age of loading. This model also includes a term for drying before loading, which applies to both basic and drying creep. Since it is believed that drying creep is proportional to drying shrinkage, Gamble et Parrott (1978), a revised shrinkage expression was also developed. The shrinkage equation is simplified (compared with Atlanta 97) and bounded to conform to the ACI 209 November 99 guidelines given in Section 1.9.

If experimental values are not available, the modulus of elasticity and the strength development with time can be calculated using the same equations as Atlanta 97. The relation between the characteristic compressive strength and the mean compressive strength is defined using Gardner's expressions.

Modulus of elasticity:

$$E_{cmt} = 3500 + 4300\sqrt{f_{cmt}} \tag{4.1}$$

Strength development with time:

$$f_{cmt} = f_{cm28}\frac{t^{3/4}}{a + bt^{3/4}} \tag{4.2}$$

The constants a and b are related to the cement type, refer to the Table 4.1.

Table 4.1 a and b as a function of the cement type, GL2000 model

Cement type	a	b
Type I	2.8	0.77
Type II	3.4	0.72
Type III	1.0	0.92

Mean strength vs. characteristic strength:

$$f_{cm28} = 1.1 f_{ck28} + 5.0 \tag{4.3}$$

4.1.2 Shrinkage

4.1.2.1 Required Parameters

When calculating the shrinkage strain using the GL2000 model, the following parameters are required:

- Age drying commenced, end of moist curing (days);
- Cement type;
- Concrete mean compressive strength at 28 days (MPa);
- Relative humidity expressed as a decimal;
- Volume to surface ratio (mm).

4.1.2.2 Shrinkage Equations

The shrinkage strain ε_{sh} can be calculated using the following expression:

$$\varepsilon_{sh} = \varepsilon_{shu} \beta(h) \beta(t) \tag{4.4}$$

where ε_{shu} is the ultimate shrinkage strain, $\beta(h)$ is a correction term for the effect of humidity and $\beta(t)$ is a correction term for the effect of time.

$$\varepsilon_{shu} = 1000 \times 10^{-6} K \left(\frac{30}{f_{cm28}} \right)^{1/2} \tag{4.5}$$

$$\beta(h) = (1 - 1.18h^4) \tag{4.6}$$

$$\beta(t) = \left(\frac{t - t_c}{t - t_c + 0.15(V/S)^2} \right)^{1/2} \tag{4.7}$$

K is the shrinkage constant, which depends on the cement type, refer to Table 4.2. At a relative humidity of 0.96, there is no shrinkage. At higher relative humidity, swelling occurs.

Table 4.2 K as a function of the cement type, GL2000 model

Cement type	K
Type I	1.00
Type II	0.70
Type III	1.15

The cement type is determined from the strength development characteristic of the concrete regardless of the nominal designation of the cement. This enables the formulae to accommodated concretes incorporating any chemical or mineral admixtures. If experimental results for strength development are available, the shrinkage term can be improved by interpolating K from Table 4.2, using the experimentally determined cement type/characteristic.

4.1.3 Compliance

4.1.3.1 Required Parameters

When calculating compliance using the GL2000 model, the following parameters are required:

- Age drying commenced, end of moist curing (days);
- Age of concrete at loading (days);
- Modulus of elasticity of concrete at 28 days (MPa);

- Modulus of elasticity of concrete when loading commenced (MPa);
- Relative humidity expressed as a decimal;
- Volume to surface ratio (mm).

4.1.3.2 Compliance Equations

The compliance is composed of two parts: The elastic strain and the creep strain. The elastic strain is simply the reciprocal of the modulus of elasticity at the age of loading and the creep strain is the creep coefficient divided by the modulus of elasticity at 28 days, as expressed in Equation 4.8.

$$J(t,t_o)=\frac{1}{E_{cmto}}+\frac{\phi}{E_{cm28}} \tag{4.8}$$

where ϕ is the creep coefficient and is calculated using Equation 4.9

$$\phi=\Phi(t_c)\left(2\frac{(t-t_o)^{0.3}}{(t-t_o)^{0.3}+14}+\left(\frac{7}{t_o}\right)^{0.5}\left(\frac{t-t_o}{t-t_o+7}\right)^{0.5}+2.5(1-1.086h^2)\left(\frac{t-t_o}{t-t_o+0.15(V/S)^2}\right)^{0.5}\right) \tag{4.9}$$

The creep coefficient includes three terms. The first two terms are required to calculate basic creep and the third term is for drying creep. Similar to the shrinkage expression, at a relative humidity of 0.96, there is no drying creep, only basic creep. $\Phi(t_c)$ is the correction term for the effect of drying before loading.

If $t_o = t_c$

$$\Phi(t_c)=1 \tag{4.10}$$

When $t_o > t_c$

$$\Phi(t_c)=\left[1-\left(\frac{t_o-t_c}{t_o-t_c+0.15(V/S)^2}\right)^{0.5}\right]^{0.5} \tag{4.11}$$

To calculate relaxation, $\Phi(t_c)$ remains constant at the initial value throughout the relaxation period. For creep recovery calculations, $\Phi(t_c)$ remains constant at the value at the age of loading. Section 6.3 and Chapter 7 discuss the problems in calculating recovery and relaxation by superposition.

4.2 Model's Limitations

4.2.1 General Limitations

Using the RILEM shrinkage and compliance data bank, the following limits for the GL2000 model were established:

- Cement Types I, II or III;
- 16 MPa $\leq f_{cm28} \leq$ 82 MPa;
- $0.40 \leq w/c \leq 0.60$;
- $0.20 \leq h \leq 1.00$;
- 19 mm $\leq V/S \leq \infty$;
- $t_c \geq 1$ day;
- $t_o \geq 1$ day;
- $t_o \geq t_c$.

The GL2000 model is currently limited to concretes whose hydration characteristics resemble those of cement types I, II and III. Due to the lack of experimental results for cement type IV and V, strength gain coefficients (a and b) and shrinkage constant (K) have not been established for these two cement types.

This model was developed for normal strength concrete for both shrinkage and compliance. Normal strength concretes are defined as concretes with a mean compressive strength at 28 days between 16 MPa but not more than 82 MPa (concrete characteristic strength of 70 MPa).

Water to cement ratios above 0.60 are rarely used in today's construction. Water to cement ratios lower than 0.40 are generally used for high strength concrete which experience self desiccation or autogeneous shrinkage.

The RILEM data bank contains experimental results for relative humidities between 0.20 and 1.00. Situations where the relative humidity is lower than 0.20 are very unlikely to occur.

A volume to surface ratio as low as 19 mm can be used with GL2000, which corresponds to a cylinder of diameter 76 mm (3.0 inches). Comparison with the RILEM data bank demonstrated that Mamillan's (1965) experimental results were not in agreement with GL2000, using a volume to surface ratio of 17.5 mm. Brooks (1984) and Keeton (1965) conducted shrinkage and compliance experiments using a volume to surface ratio of 19.1 mm and their results agree relatively well with GL2000.

The curing period should be at least 1 day and the age of loading must be 1 day or more. Improved shrinkage and compliance predictions can be achieved if the age of curing and the age of loading are 3 days or more. Note that the age of loading must be greater or equal to the age of curing. GL2000, as all the other models, does not apply for the case when loading occurs before moist curing ceases.

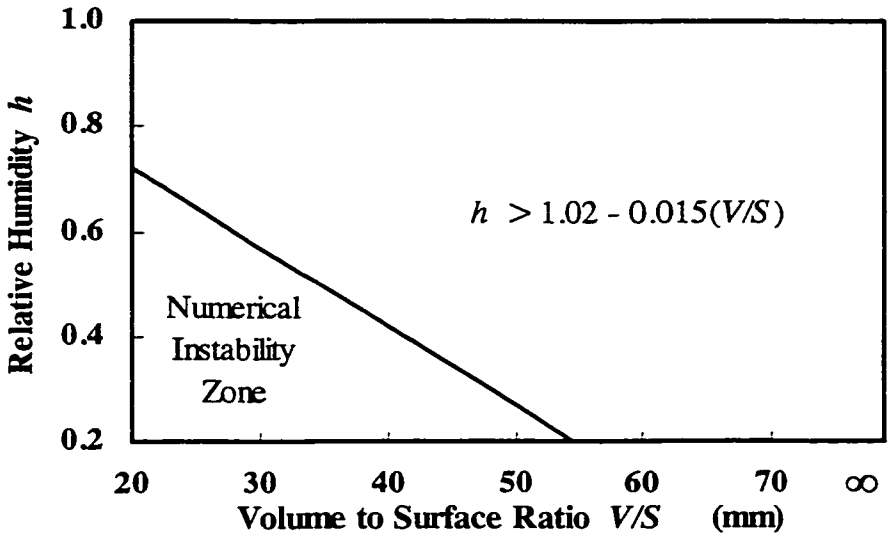
4.2.2 Limitations for Relaxation

Two additional requirements must be satisfied in order to calculate relaxation by superposition from the GL2000 compliance expression: The additional requirements are:

- $t\text{-}t_o \leq 10000$ days
- $h \geq 1.02 - 0.015(V/S)$

When verifying the relaxation calculations using various combinations of relative humidity and volume to surface ratio, it was found that the GL2000 model could experience some unexpected oscillations due to a numerical instability. The numerical instability occurs with a combination of low relative humidity and small volume to surface ratio. The oscillations can be avoided if the two additional requirements are satisfied. At 10000 days, which is about 27 years, the relaxation is practically completed. If a longer period of time is required, a linear extrapolation (using a log scale only) could be performed. Figure 4.1 shows the combinations of relative humidity and volume to surface ratio for which the numerical calculations are stable and those combinations for which numerical instability occurs. In real life situations, it is unlikely to have a combination of relative humidity and volume to surface ratio that would be in the numerical instability zone.

Figure 4.1 Relative humidity vs. volume to surface ratio



CHAPTER 5

RILEM Data Bank and Rostasy et al (1972) Experiments

5.1 RILEM Data Bank

As shrinkage and creep are long term effects, only data sets with duration of 500 days or longer are considered in this thesis.

5.1.1 GL2000

The RILEM shrinkage data bank includes more than 130 series with durations longer than 500 days. The experimental series which fall inside the limits stated in Section 4.2.1 (about 115), are listed in Table D.1. The series outside the model limits (about 15) are listed in Table D.3.

For the calculation of the shrinkage strain, the concrete mean compressive strength at 28 days is required. For most series, two values of f_{cm28} are available for the calculations, the experimental f_{cm28} and the value back-calculated from the experimental modulus of elasticity at 28 days using Equation 4.1. These two values of f_{cm28} are equally valid and both should be used for the shrinkage calculations. When both are available, the average of the two values should be used.

Figure 5.1 compares the calculated shrinkage strain, using GL2000, versus the measured shrinkage strain. This graph includes only the data points listed in Table D.1. Figure 5.1 indicates that GL2000 agrees well with the majority of the data points.

It should be noted that it is likely that the RILEM data bank contains some errors. Due to the size of the RILEM data bank, it is impossible to verify each series

individually to ensure that the input information was correct. For example, just entering the wrong cement type is enough to cause a significant difference. Appendix B includes part of a letter written by Gardner and sent to Muller indicating labelling errors that were found in the data bank regarding Wesche's compliance (1978) results.

Figure C.1, given in Appendix C, represents the series listed in Table D.3 with parameters outside the set limits.

The RILEM compliance data bank is about 50% larger than the RILEM shrinkage data bank, comprising some 185 series with durations under load greater than 500 days. Figure 5.2 shows the calculated compliance versus the measured compliances, for the series that satisfy the limits of Section 4.2.1. Out of the 185 series, some 20 series were rejected. The RILEM data bank for compliance is included in Appendix D, Table D.2 for the series used and Table D.4 for the series outside the limits.

Similar to the calculations of the shrinkage strains, both experimental and calculated modulus of elasticity at 28 days should be used. Instead of using the average of the experimental and calculated E_{cm28}, the average of the experimental and back-calculated f_{cm28} should be used to calculate E_{cm28}. From the average f_{cm28}, E_{cm28}, can be calculated using Equation 4.1. The experimental value E_{cmto} is required to calculate the elastic strain. The reason being that the purpose of the compliance expression is to predict the specific creep strain, not the elastic strain, even thought the graphs are plotted as compliance.

From Figure 5.2, with the exception of a few series (Brooks 74/B/60/04 (1984), Stockl (1983) and Wischers 61/C/3/08 (1977)), the prediction of compliance by GL2000 is relatively good. Due to the large amount of information available from the RILEM data bank, it is reasonable that a few series do not fit GL2000 within the target range of 30%.

Wesche (1978) conducted 13 compliance experiments with ages of loading ranging from 2400 to 3300 days. These experiments undoubtedly indicate the effect of drying before loading. Specimens dried for 6 plus years before loading experienced significantly less creep than analogous specimens loaded at 28 days. The drying before loading correction factor, $\Phi(t_c)$, is only 0.26 for an age of loading of 2400 days (with $t_c = 7$ days and $V/S = 50$ mm). 10 out of the 13 series were accurate within 10% compared to GL2000. The remaining three series were within 20%. From these long term experiments, it can be inferred that drying before loading affects both basic and drying creep.

Figure C.2, Appendix C, Compares the calculated compliance versus the measured compliance for the data listed in Table D.4 which include only the series with parameters outside the set limits.

Figure 5.1 GL2000 vs. RILEM shrinkage data bank

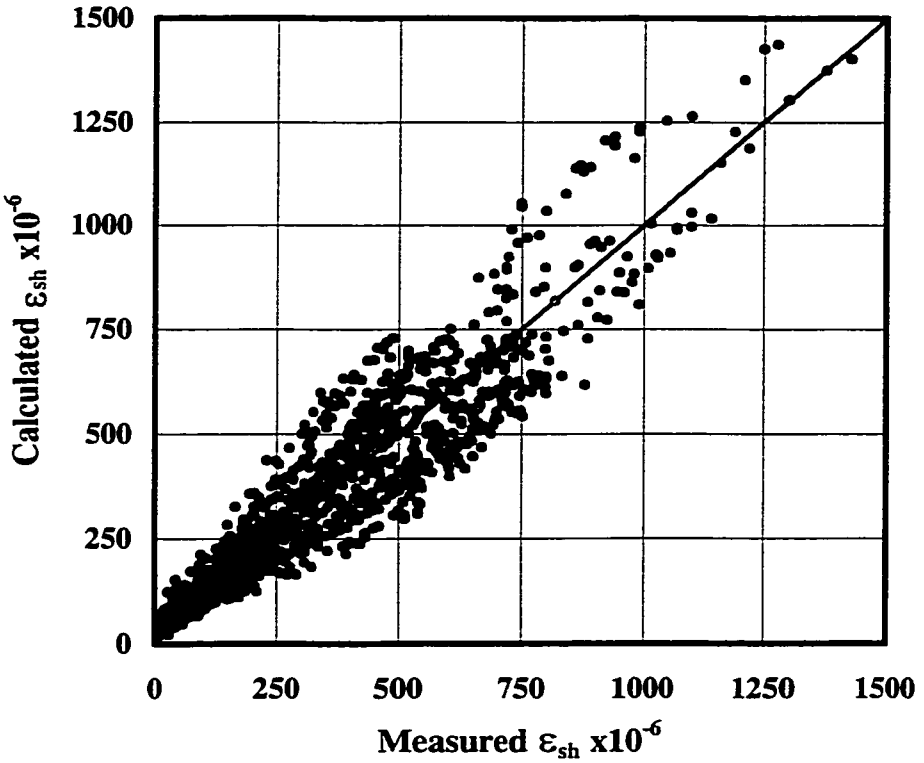
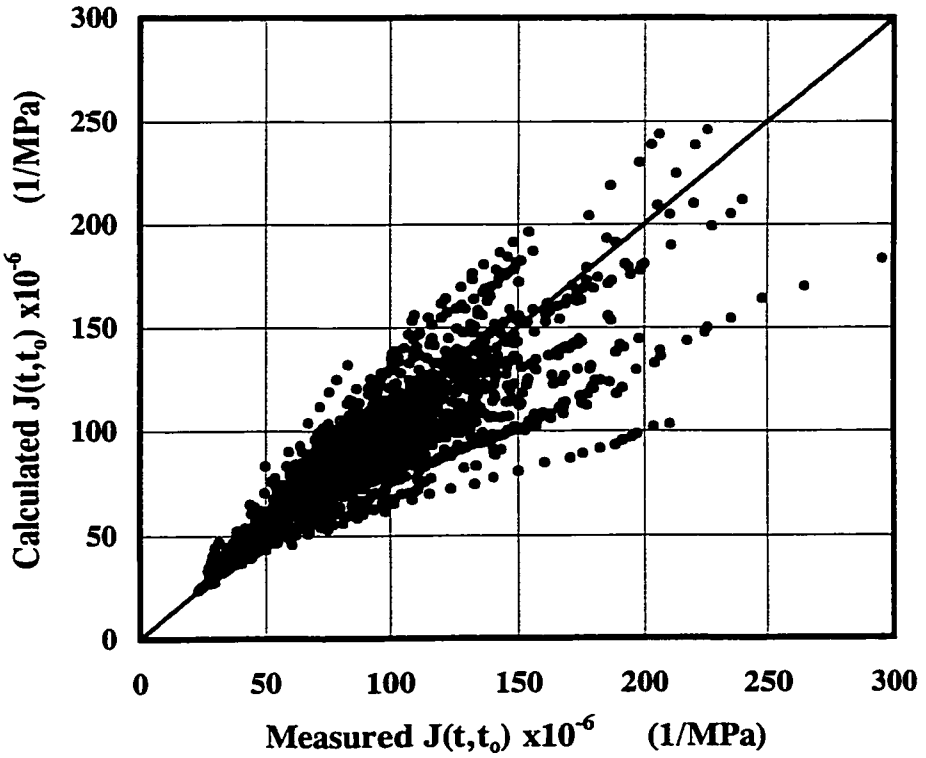


Figure 5.2 GL2000 vs. RILEM compliance data bank



5.1.2 Atlanta 97, B3, CEB MC90 and ACI 209

The RILEM data bank was also compared with the four models described in Chapter 3. For each model, explanations are provided on how the shrinkages and compliances were calculated to allow easy duplication of the graphs. For B3, CEB MC90 and ACI 209, the exact calculation procedures are not clear – should the experimental f_{cm28} (f_{cmto}) or experimental E_{cm28} (E_{cmto}) or both should be used? For each model, the best scenario was considered. The same data bank used for GL2000 (Tables D.1 and D.2) was used for every model. The series listed in Tables D.3 and D.4 were not included.

Figures 5.3 and 5.4 show the RILEM shrinkage and compliance data bank compared with Atlanta 97. The calculations were similar those used for GL2000, f_{cmtc} was calculated from f_{cm28} using Equation 3.8. f_{cm28} was the average of the experimental f_{cm28} and back-calculated f_{cm28} from experimental E_{cm28} using Equation 3.5. f_{cmto} is the average value between the back-calculated f_{cmto} from experimental E_{cmto} (Equation 3.5) and calculated f_{cmto} from experimental f_{cm28} (Equation 3.8). For the elastic part of the compliance, the experimental E_{cmto} was used. For the creep part, E_{cmto} was calculated from the average f_{cmto}.

For B3, the average of the experimental f_{cm28} and the back-calculated f_{cm28} from the experimental E_{cm28} (Equation 3.2) was used. Figures 5.5 and 5.6 show the comparison of the RILEM data bank with the B3 model.

Bazant and Baweja provide an alternative solution if the mix parameters of concrete are unknown. Appendix A includes a letter from Z.P. Bazant explaining how to use the B3 model when only f_{cm28} is known. The water to cement ratio can be determined using Equation 5.1.

$$w/c = \left[(f_{cm28}/22.8) + 0.535\right]^{-1} \tag{5.1}$$

Typical values of c and a/c should be assumed. Figures C.3 and C.4, Appendix C, show the comparison of the RILEM data bank with the B3 model using this "simplification". Concrete density of 2400 kg/m^3 and aggregate content of 1800 kg/m^3 were assumed. From these assumptions and Equation 5.1, the water and cement contents were determined.

Figures 5.7 and 5.8 compare the RILEM shrinkage and compliance data bank with the values calculated by the CEB model. The experimental $E_{cm\infty}$ was used for the elastic strain. For this model also, the average between the experimental f_{cm28} and the back-calculated f_{cm28} from the experimental E_{cm28} using Equation 3.4 was used. E_{cm28} was calculated from the average f_{cm28}.

The ACI 209 method is illustrated in Figures 5.9 and 5.10. The calculations were very simple, only the experimental $E_{cm\infty}$ was used.

Of the five shrinkage models, B3, GL2000 and Atlanta 97 offer the best predictions. The CEB MC90 shrinkage is very low, this model underestimates the shrinkage by about 40%. As for the ACI 209 method, the points on the graph are more scattered than the other models. The "simplified" B3 is also good, with the exception of some series where the shrinkage is overestimate by a factor of two.

GL2000 and CEB MC90 agree very well with the RILEM compliance data bank. Atlanta 97 agrees also with the data bank with slightly more scattered results. The points on the B3 graph are a little more spread-out than Atlanta 97. ACI 209 generally underestimates the compliance by close to 20%.

Figure 5.3 Atlanta 97 vs. RILEM shrinkage data bank

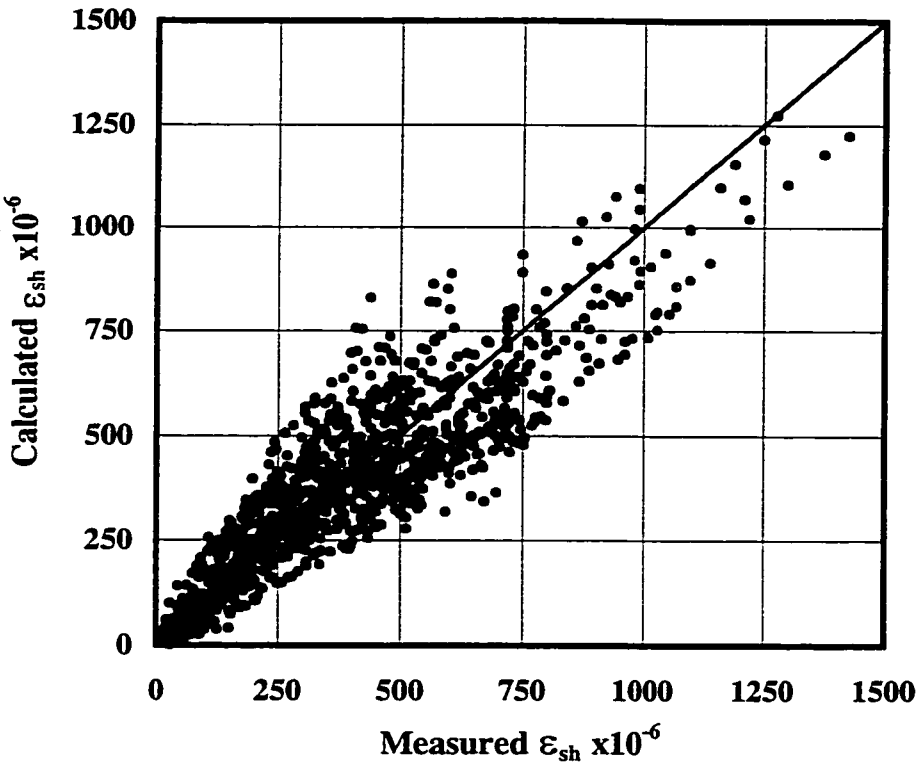


Figure 5.4 Atlanta 97 vs. RILEM compliance data bank

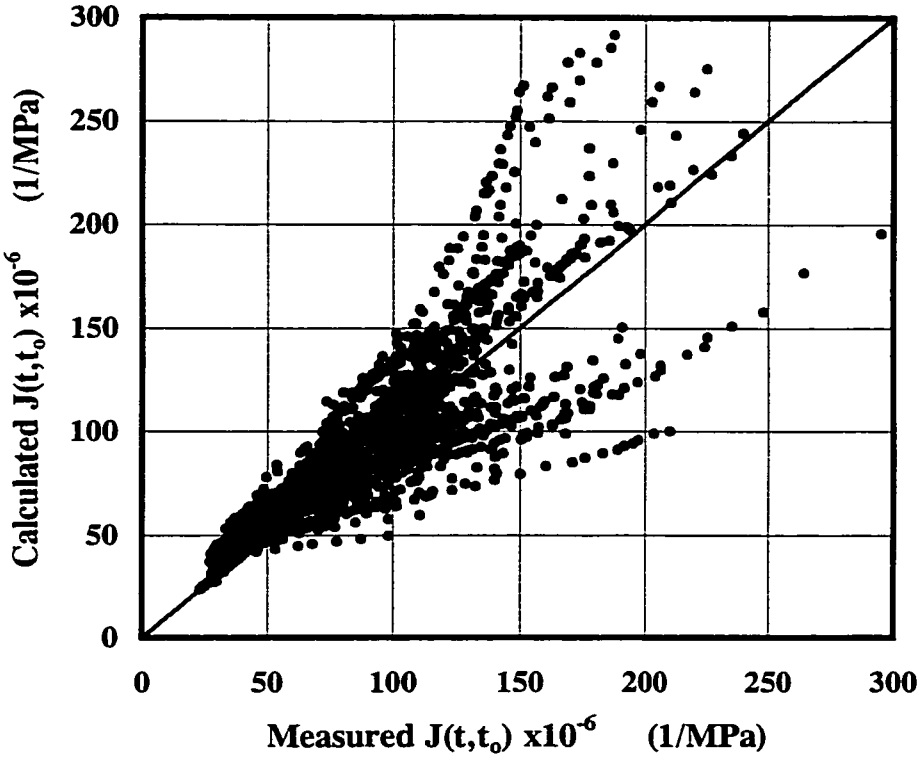


Figure 5.5 B3 vs. RILEM shrinkage data bank

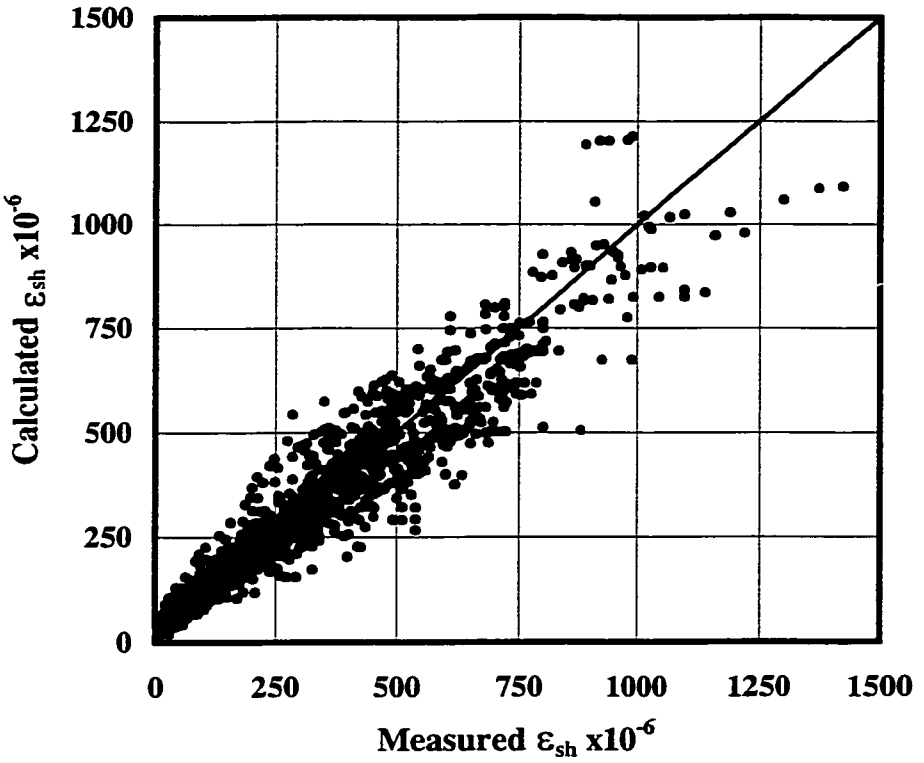


Figure 5.6 B3 vs. RILEM compliance data bank

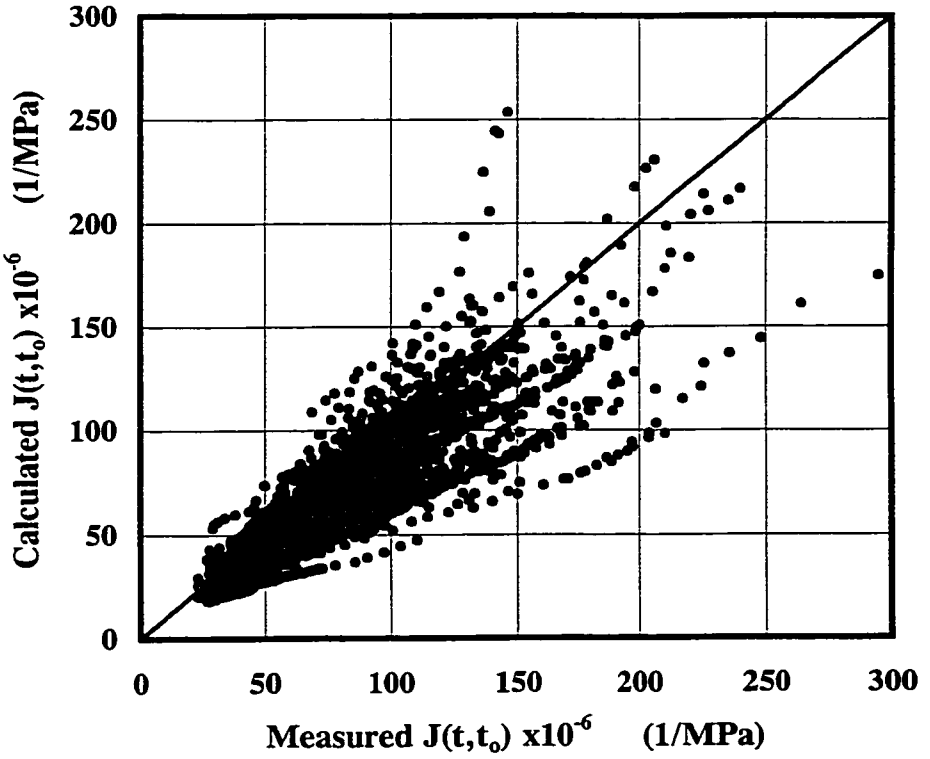


Figure 5.7 CEB MC90 vs. RILEM shrinkage data bank

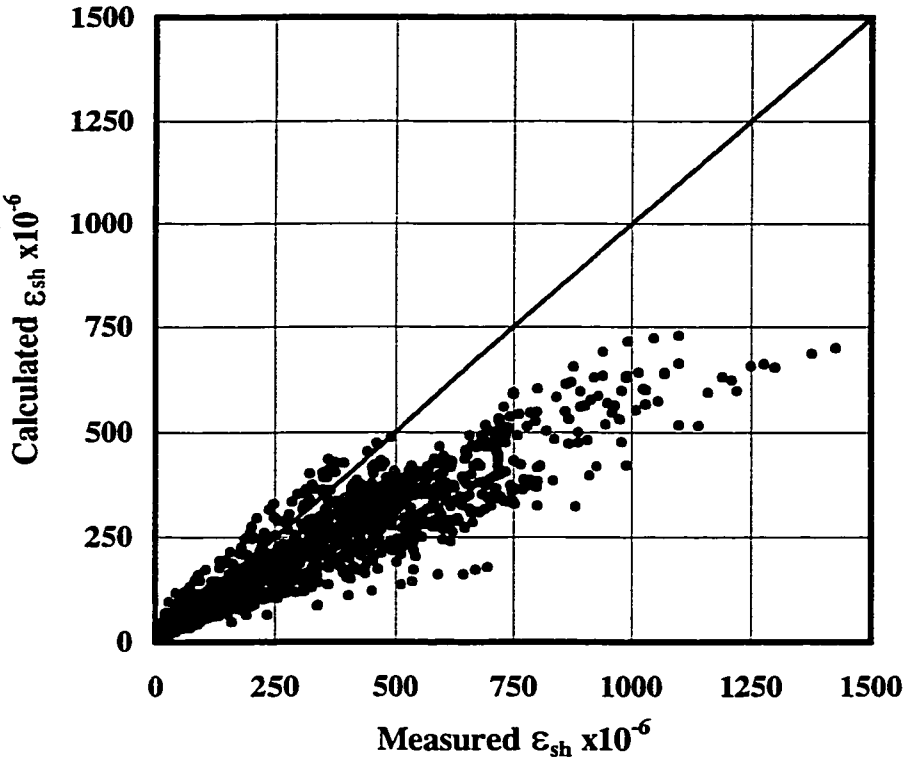


Figure 5.8 CEB MC90 vs. RILEM compliance data bank

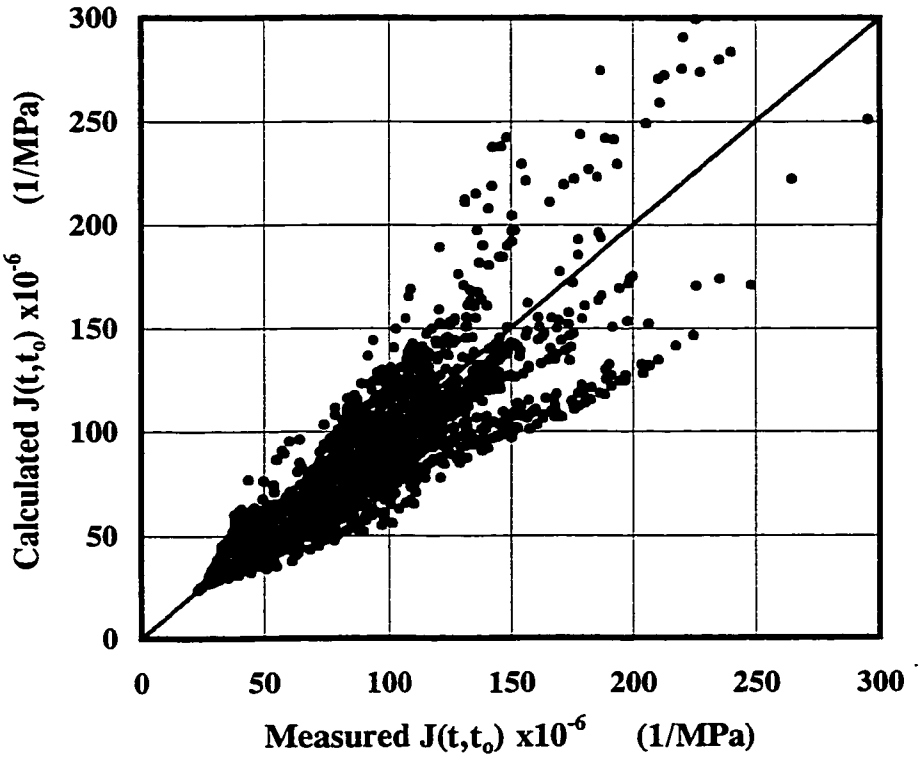


Figure 5.9 ACI 209 vs. RILEM shrinkage data bank

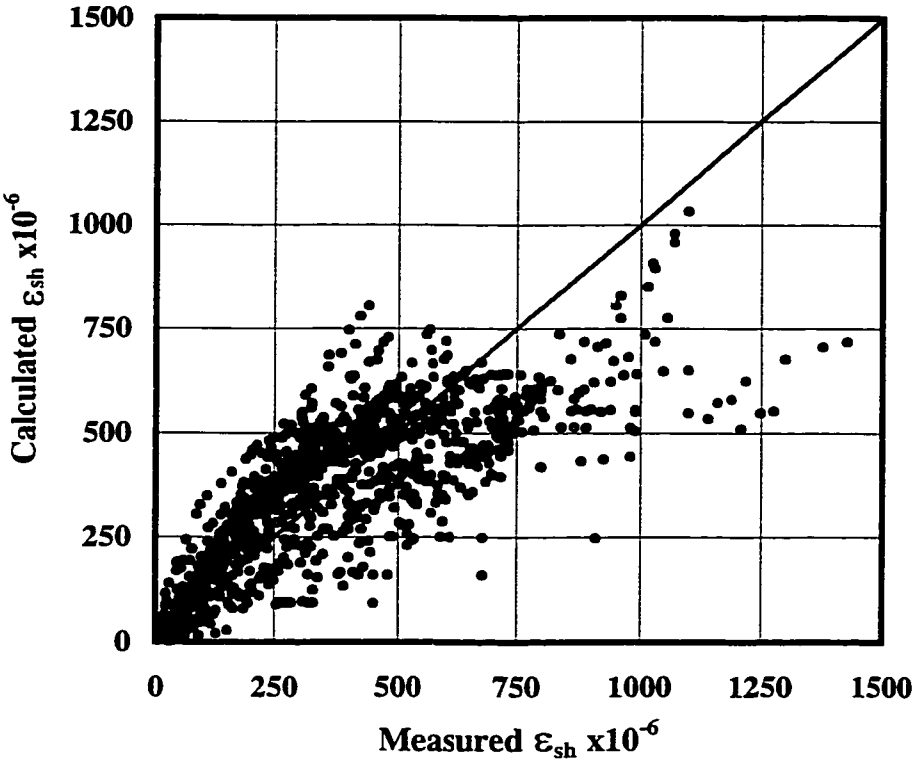
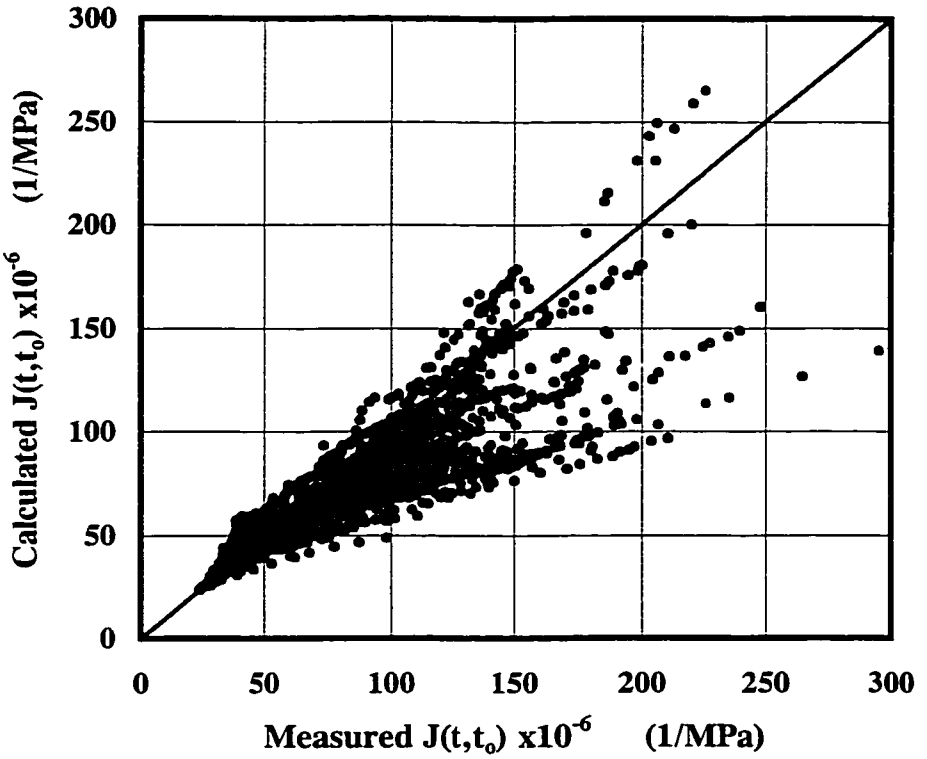


Figure 5.10 ACI 209 vs. RILEM compliance data bank



5.2 Rostasy et al (1972) Experiments

Experimental results of the relaxation of concrete are relatively rare. This is mainly due to the fact that this kind of experiment is difficult to perform and requires specialized equipment or considerable skilled labour. By definition, the relaxation of concrete consists of maintaining the strain due to load constant while monitoring the stress. Normally, the constant strain value corresponds to the elastic strain after loading. Shrinkage effects must be taken into account. The stress value must be adjusted to compensate for any shrinkage or swelling that may occur since it is a strain not generated by the applied load.

Table 5.1 Rostasy et al (1972) experiments

Series	O	L	LF
Cement content	275 kg/m^3	332 kg/m^3	
Water content	154 kg/m^3	136 kg/m^3	
Aggregate content	1952 kg/m^3	1855 kg/m^3	
Age of drying	7 days		28 days
Age of loading	28 days		
Duration of experiment	1315 days		
Volume to surface ratio	50 mm		
Relative humidity	0.65		0.96
Air entrained concrete	No (2%)	Yes (5%)	
Experimental f_{cm28}	41.5 MPa	42.3 MPa	37.9 MPa
Experimental E_{cm28}	36400 MPa	37100 MPa	37500 MPa
Calculated f_{cm28}	58.5 MPa	60.9 MPa	62.6 MPa
Average f_{cm28}	50.0 MPa	51.6 MPa	50.3 MPa
Average E_{cm28}	33900 MPa	34400 MPa	34000 MPa
Initial stress σ_o	10.1 MPa	9.40 MPa	9.29 MPa

Several researchers have performed relaxation tests, including Brooks and Neville (1976), Neilsen (1996) and Rostasy, Teichen and Engelke (1972). Unfortunately, the duration in Neilsen's relaxation experiment was only 10 days. Brooks and Neville's experiments lasted slightly longer, about 40 days, but still too

short to be analysed in this thesis. Only the experiments of Rostasy et al (1972) were of reasonable duration, their experiments lasted 1315 days.

Rostasy et al (1972) performed both compliance and relaxation experiments, using different relative humidities. Table 5.1 provides the information concerning the three experiments.

In Figures 5.11 to 5.22, the experimental results are compared with those calculated using the five models discussed in this thesis. The mechanical properties of the O series and L series were almost identical, the main difference is that the O series was non-air entrained concrete and the L series were air entrained.

5.2.1 GL2000

Since for the O and L series the age of loading was different from the age of drying, the correction term for drying before loading, $\Phi(t_c)$, in the GL2000 model is not 1.000 but, $\Phi(t_c) = 0.877$. For relaxation calculations $\Phi(t_c)$ remains constant at the initial value, as required by the GL2000 model.

GL2000 does not account for the air content of concrete. Therefore, the calculated compliances and relaxations are basically the same for the two series. Experimentally, the non-air entrained concrete experienced slightly more creep than the air entrained concrete. For both the O series and the L series, the GL2000 model overestimated the compliance. At 1315 days, the compliance was overestimated by 15% for the O series and by 25% for the L Series. The relaxations are within 10% and 26% for the O series and L series, respectively, again at 1315 days.

The LF series, represented in Figures 5.15, 5.16, 5.21 and 5.22, had essentially the same concrete properties as the L series, except that it was sealed and not subjected

drying. In this case also, GL2000 overestimated the compliance, but only by 7% at 1315 days. The experimental and calculated relaxations are relatively close, within 12% at 1315 days.

This experiments indicate that the principle of superposition is valid when calculating the relaxation using GL2000. The calculated compliances and relaxations are within 26% of the experimental values for the three series.

5.2.2 Atlanta 97, B3, CEB MC90 and ACI 209

Considering the shape of the graphs, Atlanta 97 and CEB MC90 are the models that best fit the compliance of the O series. The B3 model is also good, but the shape of the compliance curve differs from the experimental results. GL2000 overestimates the compliance and ACI 209 underestimates it. ACI 209 agrees almost perfectly with the experimental compliance of the L series while the four other models overestimate the compliance. For the LF series, B3, CEB MC90 and ACI209 agrees with experimental results. GL2000 and Atlanta 97 overestimate the compliance, especially at early ages.

Atlanta 97 is the model which agrees the best with Rostasy et al (1972) experimental relaxation for the O series. GL2000 and CEB MC90 are almost as good as Atlanta 97. B3 overestimates the relaxation and ACI underestimates it. For compliance, ACI 209 fits the experimental relaxation for the L series. GL2000, Atlanta 97, B3 and CEB MC90 predict too much relaxation for the same series. For the LF series, CEB MC90 is the best of the five models. GL2000 and Atlanta 97 predict good long term relaxation, the immediate relaxation is overestimated. Similar to the O series, B3 and ACI 209 overestimate and underestimate the relaxation respectively.

Figure 5.11 GL2000 and Atlanta 97: Rostasy et al O series compliance

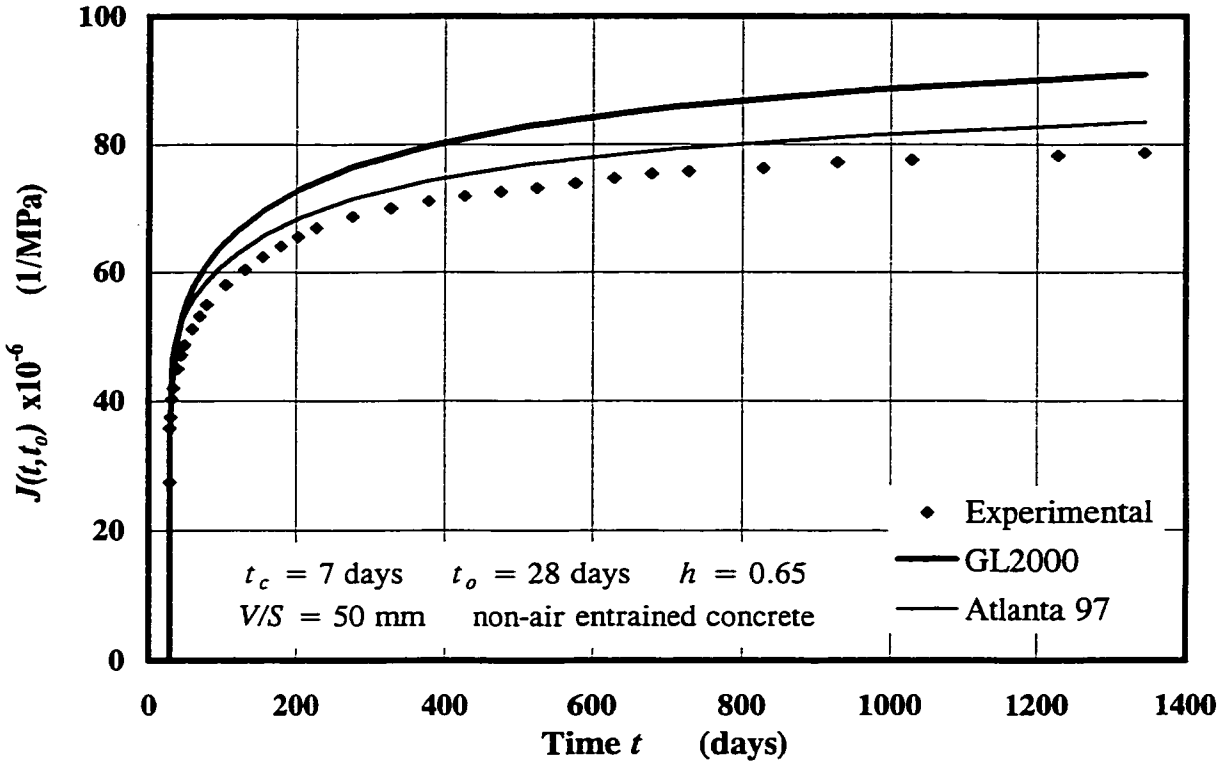


Figure 5.12 B3, CEB MC90 and ACI 209: Rostasy et al O series compliance

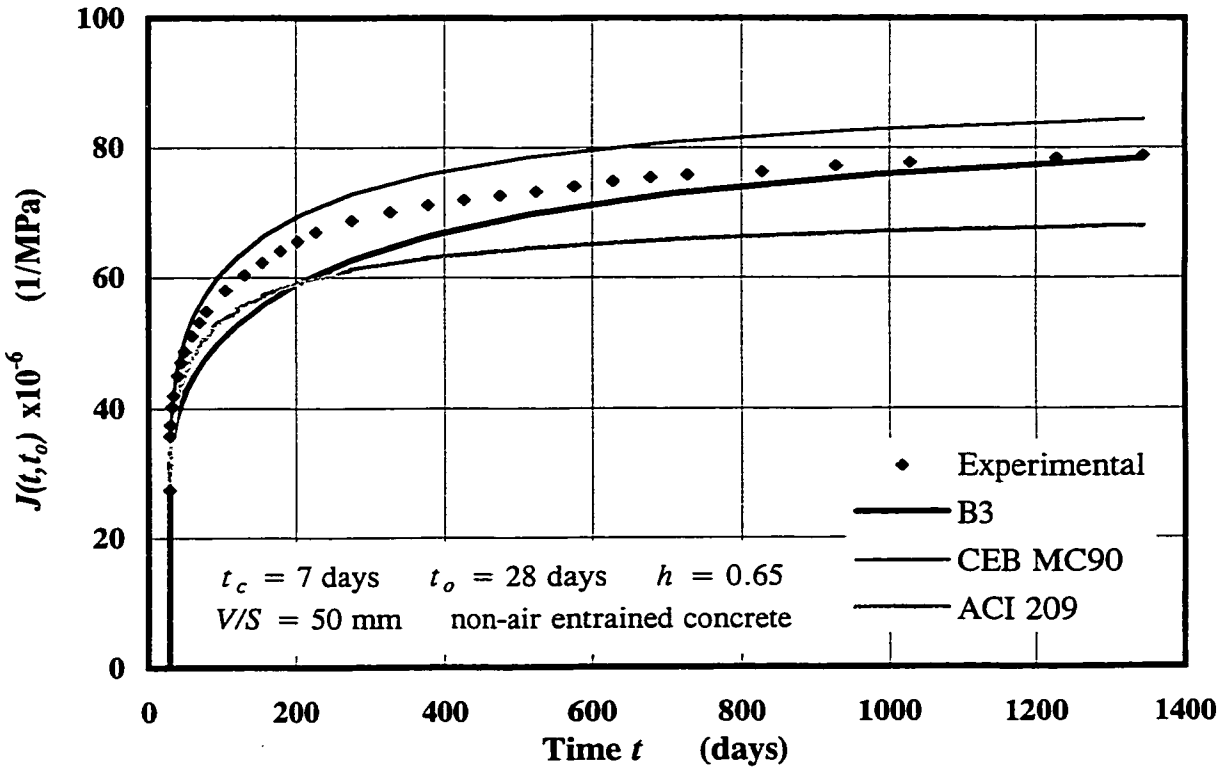


Figure 5.13 GL2000 and Atlanta 97: Rostasy et al L series compliance

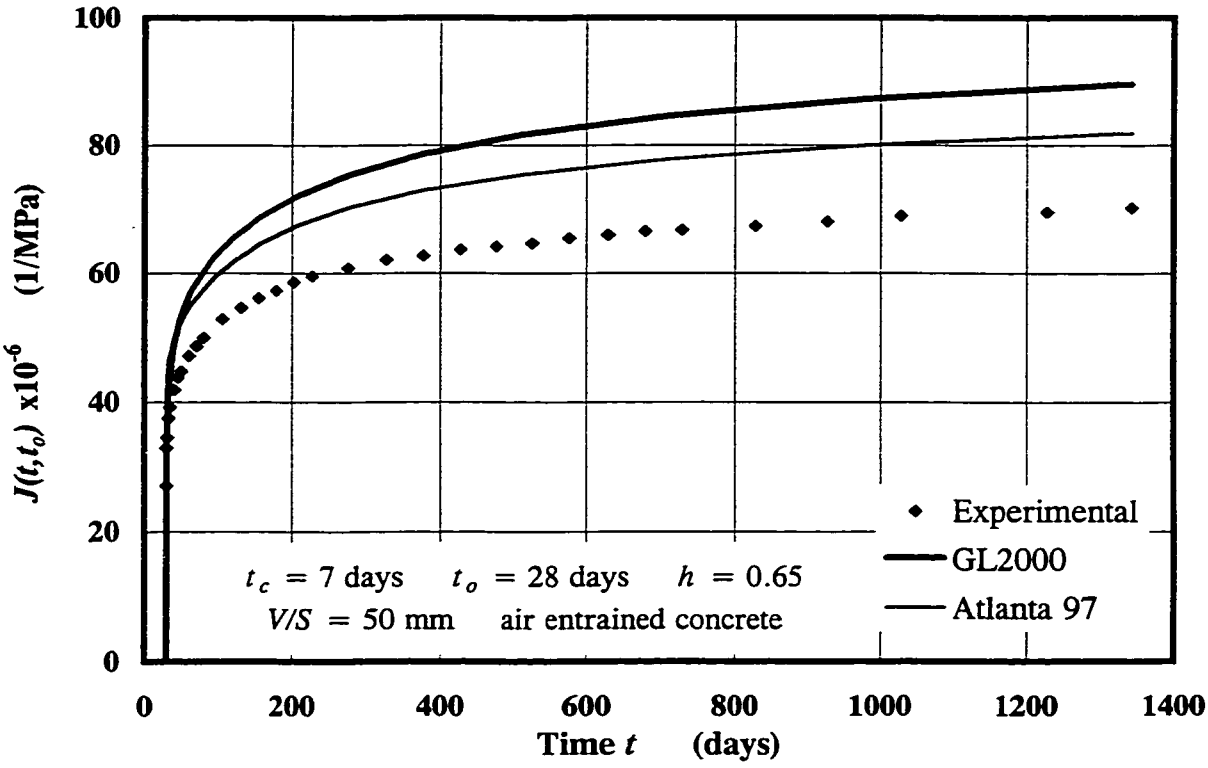


Figure 5.14 B3, CEB MC90 and ACI 209: Rostasy et al L series compliance

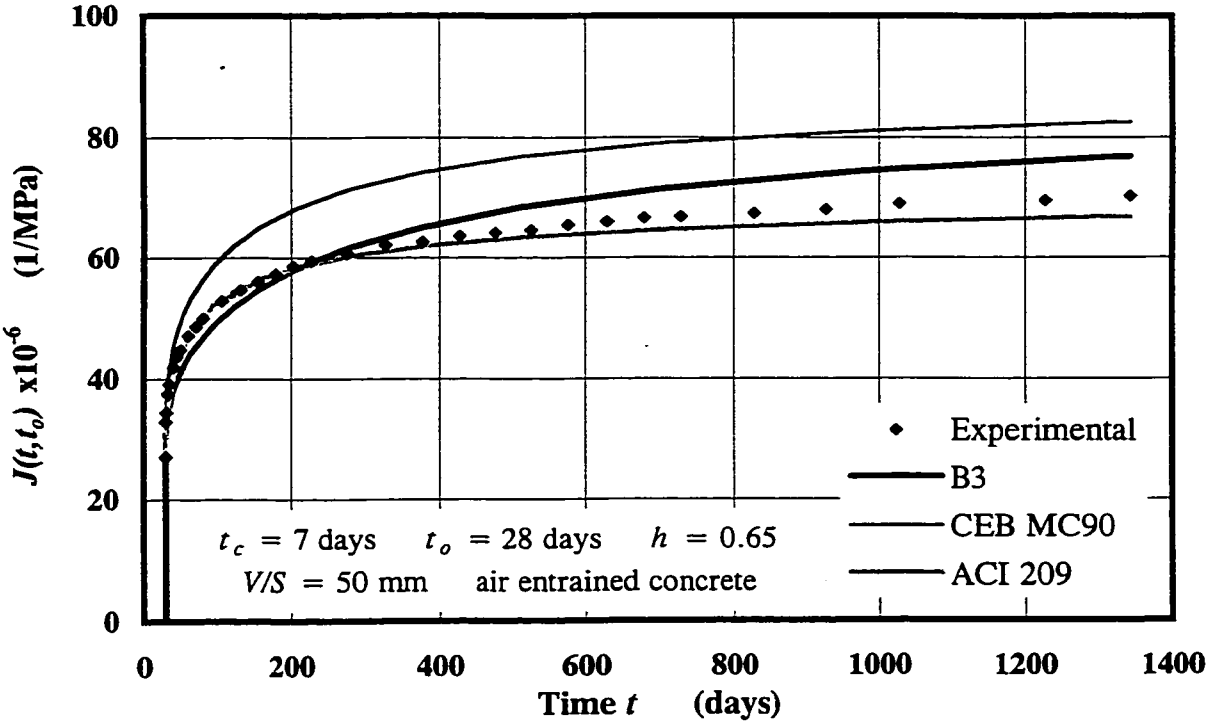


Figure 5.15 GL2000 and Atlanta 97: Rostasy et al LF series compliance

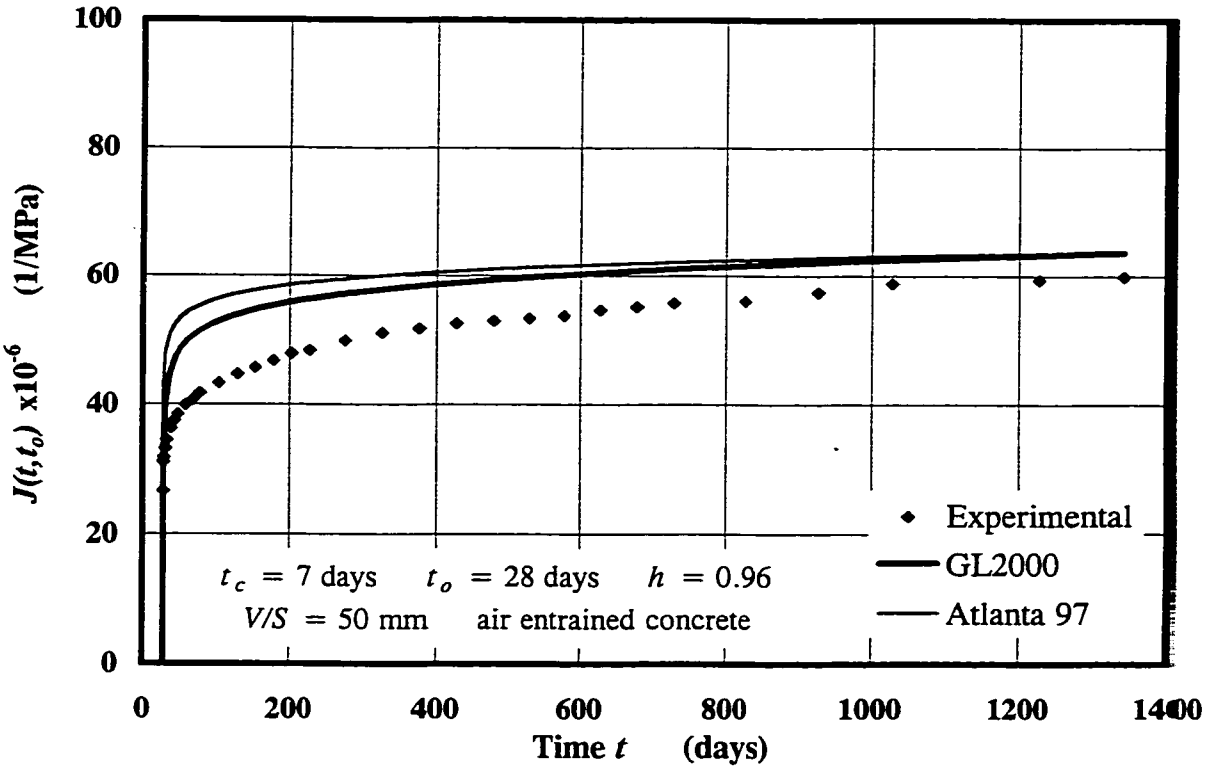


Figure 5.16 B3, CEB MC90 and ACI 209: Rostasy et al LF series compliance

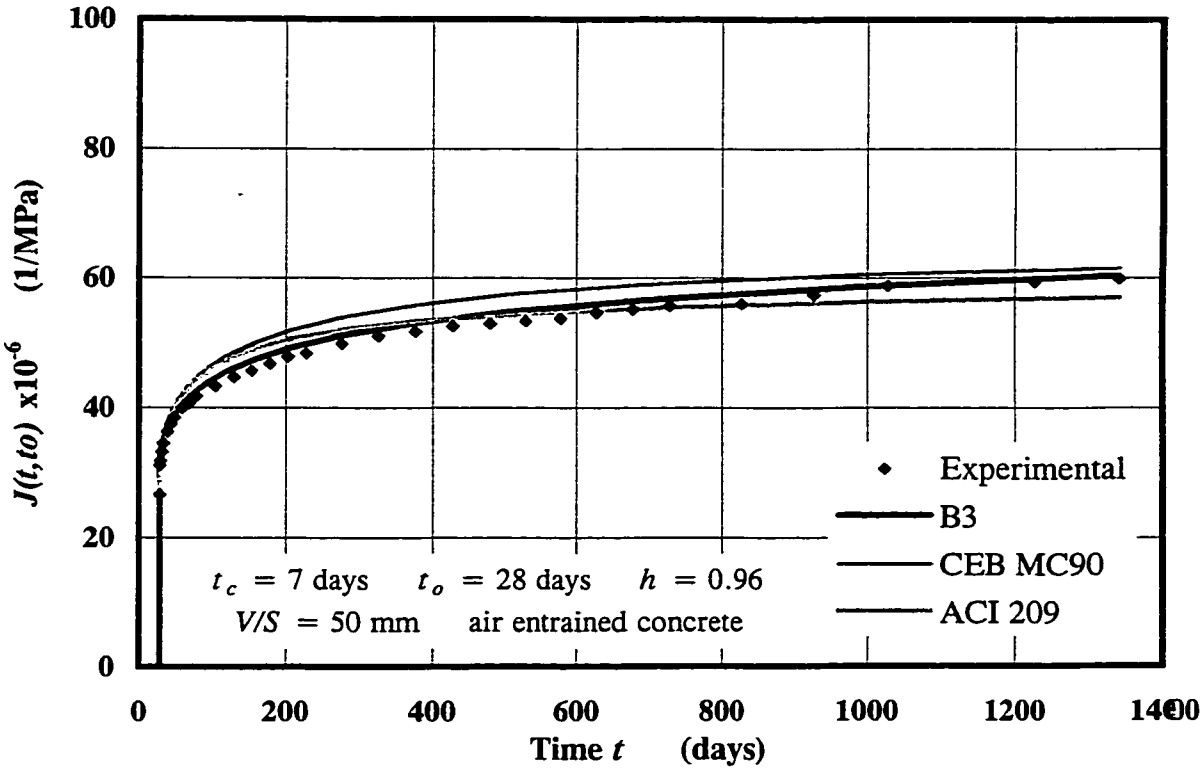


Figure 5.17 GL2000 and Atlanta 97: Rostasy et al O series relaxation

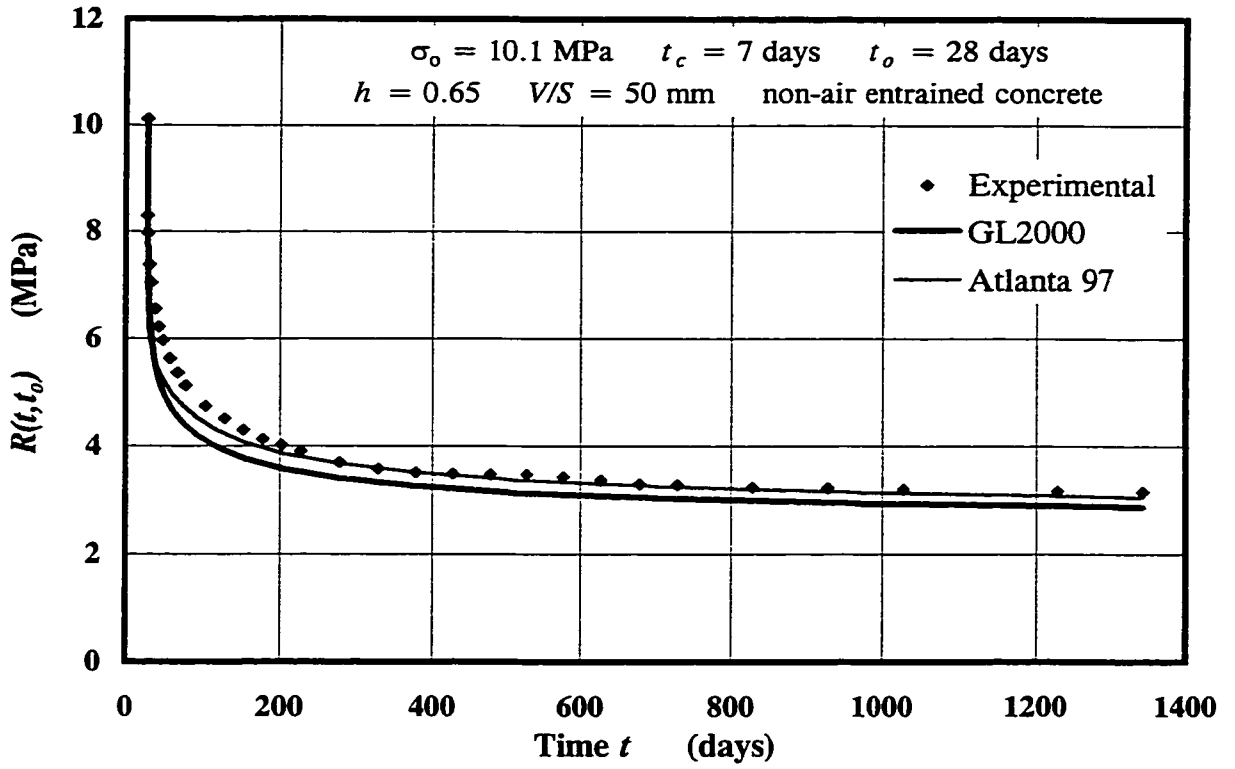


Figure 5.18 B3, CEB MC90 and ACI 209: Rostasy et al O series relaxation

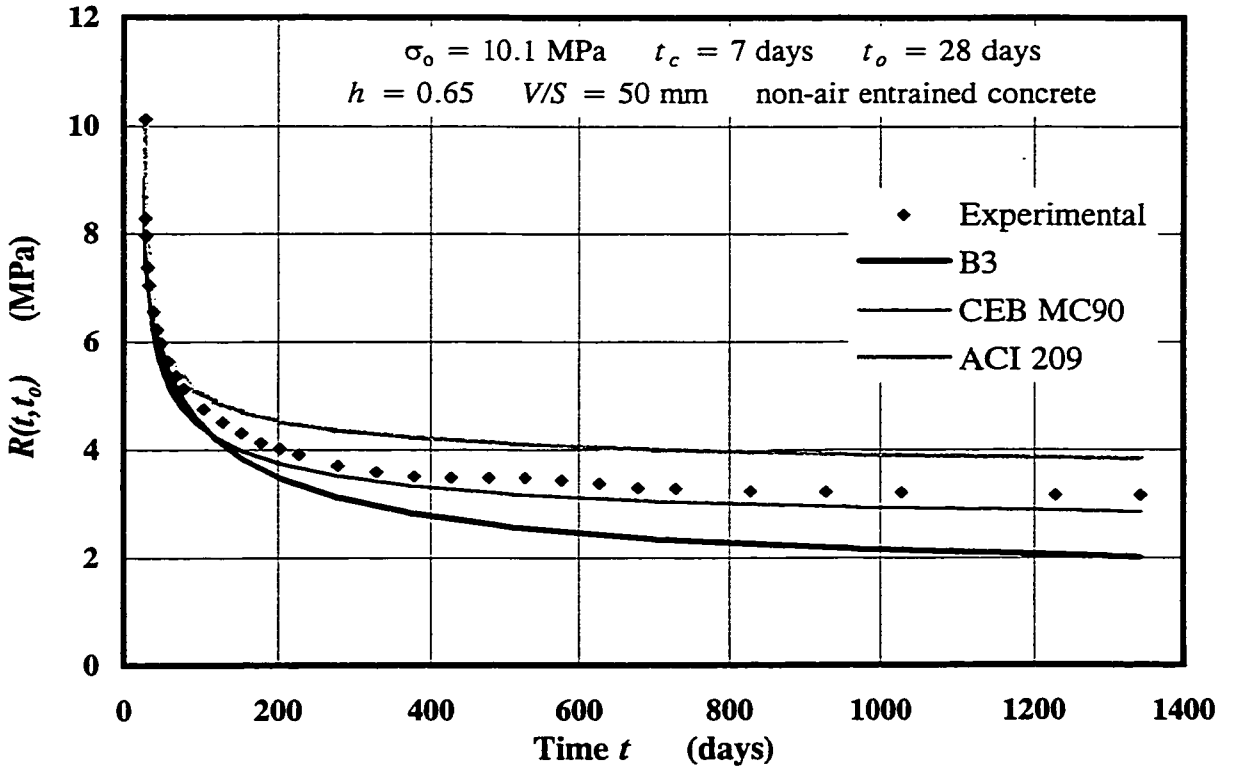


Figure 5.19 GL2000 and Atlanta 97: Rostasy et al L series relaxation

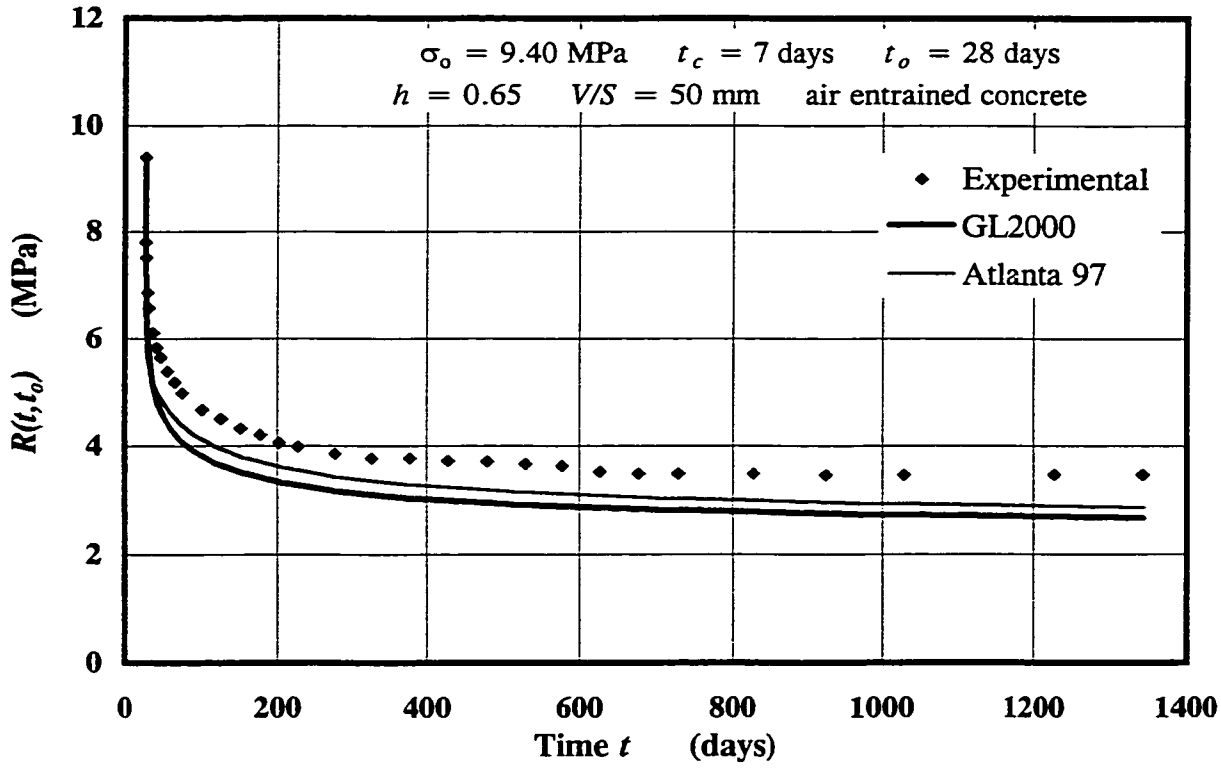


Figure 5.19 B3, CEB MC90 and ACI 209: Rostasy et al L series relaxation

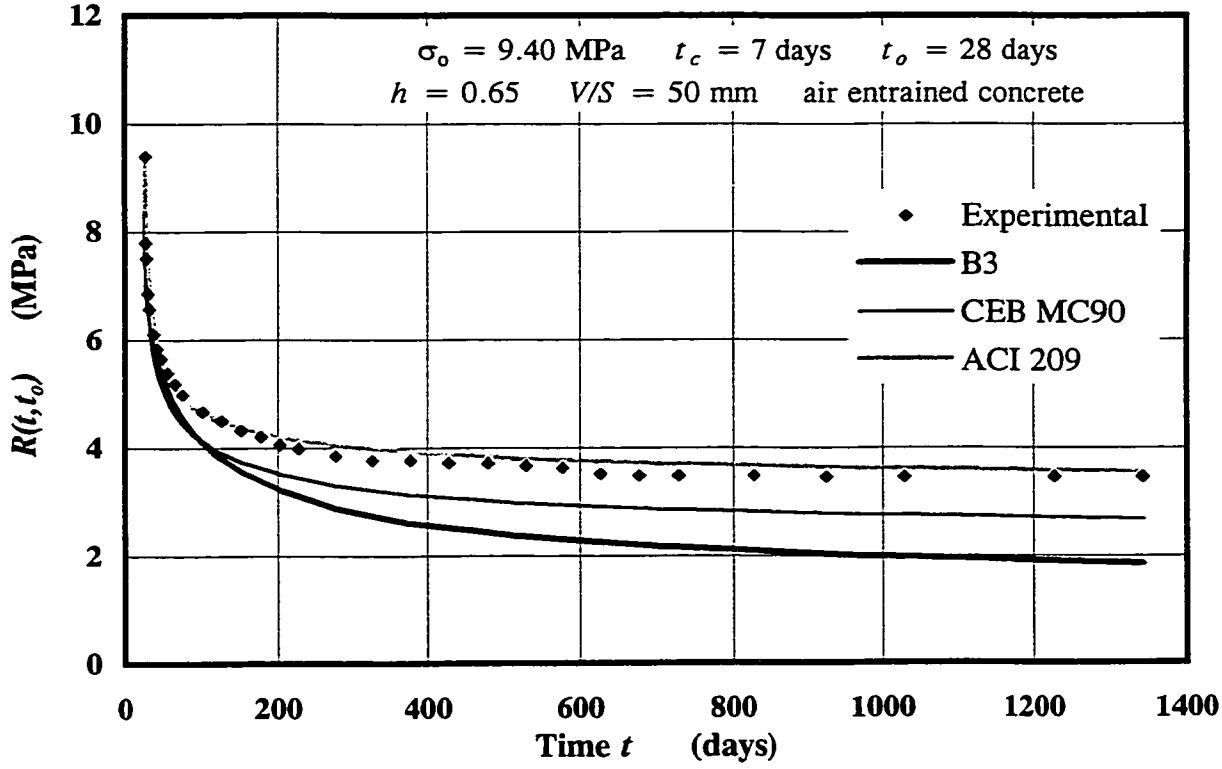


Figure 5.21 GL2000 and Atlanta 97: Rostasy et al LF series relaxation

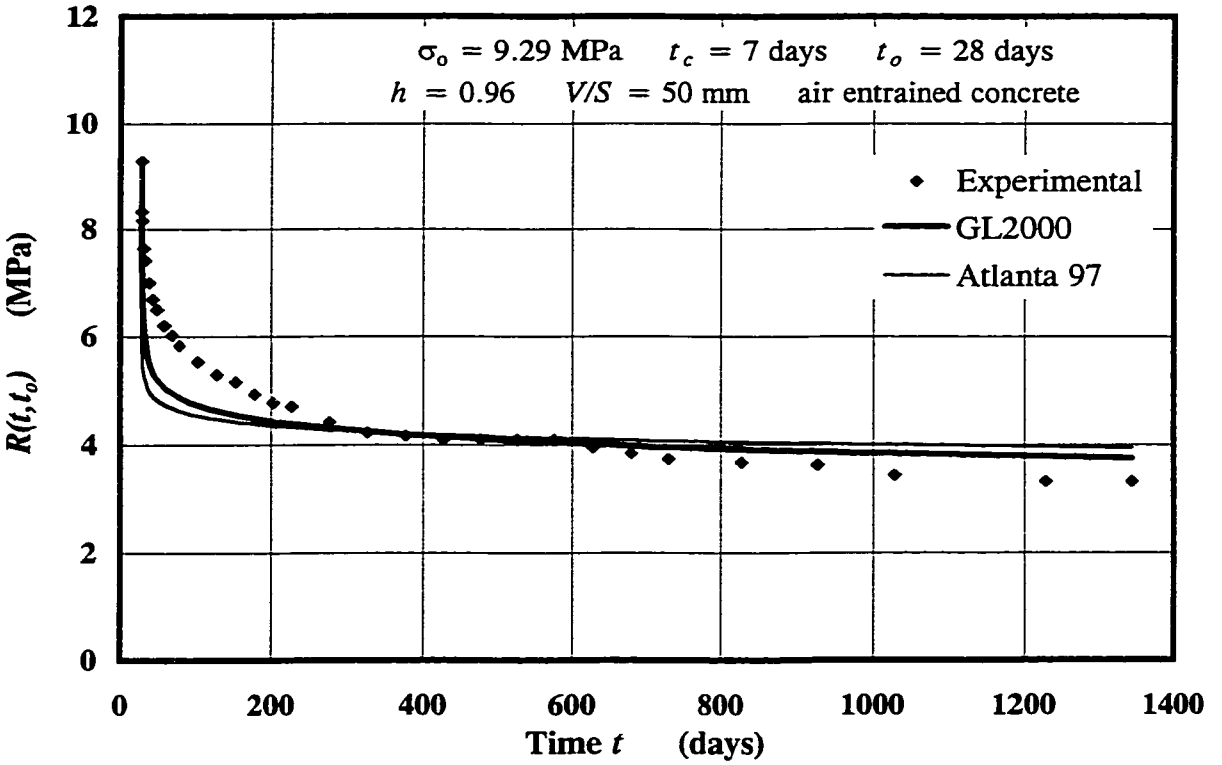
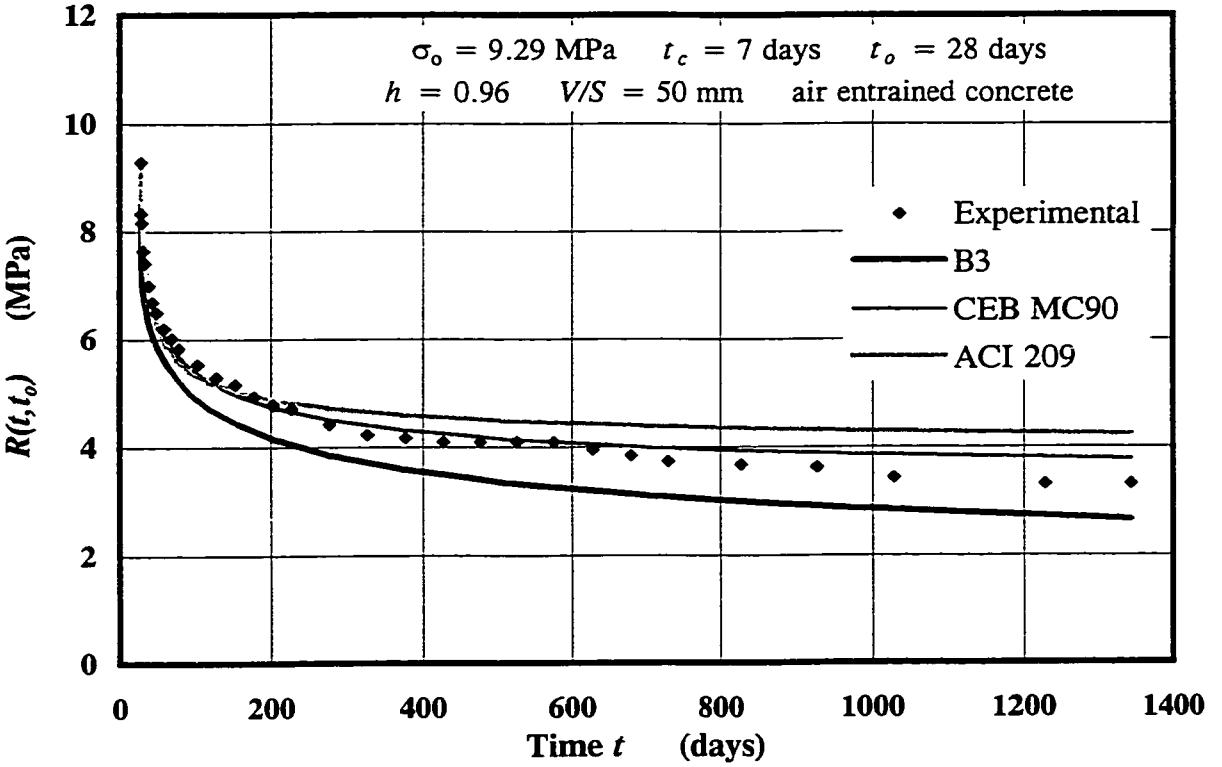


Figure 5.22 B3, CEB MC90 and ACI 209: Rostasy et al LF series relaxation



5.3 Summary

From the comparison with the RILEM data bank for shrinkage, B3 and GL2000 best predicts the results followed by Atlanta 97. CEB MC90 underestimates shrinkage and ACI 209 has too much scatter. It must be noted that the full version of B3 requires details of mix proportions which generally are not available at the time of the structural design.

From the comparison with the RILEM data bank for compliance, GL2000 best predicts the experimental results followed by Atlanta 97, CEB MC90, B3. ACI 209 underestimates, on average, the experimental results.

The summary above agrees with the conclusion provided by Al-Manasser and Lakshmikantan (1999) who used all the RILEM test series with relative humidities between 40% and 80%.

Considering both compliance and relaxation, the five models agree to a certain extent with Rostasy et al (1972) experimental results.

CHAPTER 6

Parametric Comparison of Models

Five compliance models have been described and discussed briefly. To compare these models, various graph of compliance, relaxation and creep recovery are required. Following the format of Chiorino and Lacidogna (1998), graphs of compliance and relaxation were calculated and plotted for all models using the same data. It must be noted that time has been plotted on a logarithmic axis which distorts the graphs.

Table 6.1 Parameters used for the comparison of models

Models	GL2000	Atlanta 97	B3	CEB MC90	ACI 209
t_c	3 days			-	-
t_o †	3, 7, 14, 28, 90, 365 and 730 days				
Cement type	I			N	I
f_{cm28}	38 MPa				
Concrete density††	-	-	2400 kg/m^3	-	-
Cement content††	-	-	400 kg/m^3	-	-
Water content††	-	-	180 kg/m^3	-	-
Aggregate content††	-	-	1820 kg/m^3	-	-
Curing method, factor	-	-	1.20	-	Moist cured
Cross section factor	-	-	1.00	-	-
Slump†††	-	-	-		68 mm
Fine/total aggregate†††	-	-	-	-	0.50
Air content†††	-	-	-	-	0.06
Scenario 1: *V/S*, *h*	100 mm, 0.50				
Scenario 2: *V/S*, *h*	100 mm, 0.96		100 mm, 1.00		

† ACI 209 method specifies $t_o \geq 7$ days for moist cured concrete. $t_o = 3$ days was used anyway.

†† Same values as Chiorino and Lacidogna (1998).

††† Values used to obtain a correction factor of 1.00.

Table 6.1 gives the parameters used by each model for the compliance and relaxation graphs. Only the mean compressive strength at 28 days is listed, the

appropriate strength gain and modulus of elasticity equations were used to obtain the additional required information to perform the calculations. Two different combinations (scenarios) of volume to surface ratio and relative humidity were selected for the analysis. Scenario 1 consists of the same values as Chiorino. This combination of parameters was intentionally selected to ensure that calculations performed for Atlanta 97, B3 and CEB MC90 were correct. The same results as Chiorino were obtained. Scenario 2 is the case where there is no drying creep. For GL2000 and Atlanta 97, basic creep is achieved at a relative humidity of 0.96. For B3, CEB MC90 and ACI 209, a relative humidity of 1.00 is required.

6.1 Compliance

Figures 6.1 to 6.10 present the calculated compliances versus time, up to 10000 days, using a log time scale. Using the same input information, CEB MC90 and ACI 209 predict lower compliances than the three others. GL2000 and B3 have similar shapes. At a relative humidity of 0.50, Atlanta 97 has a slightly different shape than the other models, the effect of the age of loading is more significant in this model than the other models.

Atlanta 97 requires almost the same parameters as GL2000. The compressive strength at the age of loading is required but the modulus of elasticity at 28 days is not. Drying before loading has the same function, however it is calculated differently; its calculation is slightly more complex, requiring some shrinkage calculations. The creep expression is based on the modulus of elasticity at the age of loading in Atlanta 97 instead of the modulus of elasticity at 28 days.

The graphs of GL2000 and B3 have a striking resemblance. However, the GL2000 model is significantly simpler than B3. To calculate compliance using the B3 model, complex and incomprehensible calculations are required. Many parameters,

such as the concrete density, cement, water and aggregate contents, are required, but may not always be available. In some circumstances, these parameters may need to be assumed, reducing the rigor of this complex model. Since GL2000 requires fewer parameters to calculate essentially the same compliance as B3, it is necessary to question why B3 is so complex?

The B3 model considers drying before loading for drying creep only. According to Acker (1993) previously dried concrete exhibits less creep than concrete not exposed to drying. In other words, drying before loading affects both basic and drying creep. Wesche's experimental results confirm this hypothesis.

The CEB MC90 model is relatively simple to use, the equations are straight forward. However, it does not consider drying before loading. Actually, it does not require any information regarding the curing condition or the curing period. The duration of the curing does have a direct impact on the creep of concrete and should not be ignored when predicting the compliance. It does simplify the calculations, but it may simplify them too much. The correction term for the relative humidity, β_H, is extremely sensitive to any variation of the relative humidity since the expression uses h to the power 18.

The ACI 209 Method is the oldest and simplest model of the five described in this thesis. It does not take into consideration duration of curing period, but does consider the curing method (moist cured or steam cured). Similar to B3, it can use information related to the composition of concrete such as, the slump of fresh concrete, the fine to total aggregate ratio and the air content.

Figure 6.1 GL2000 compliance

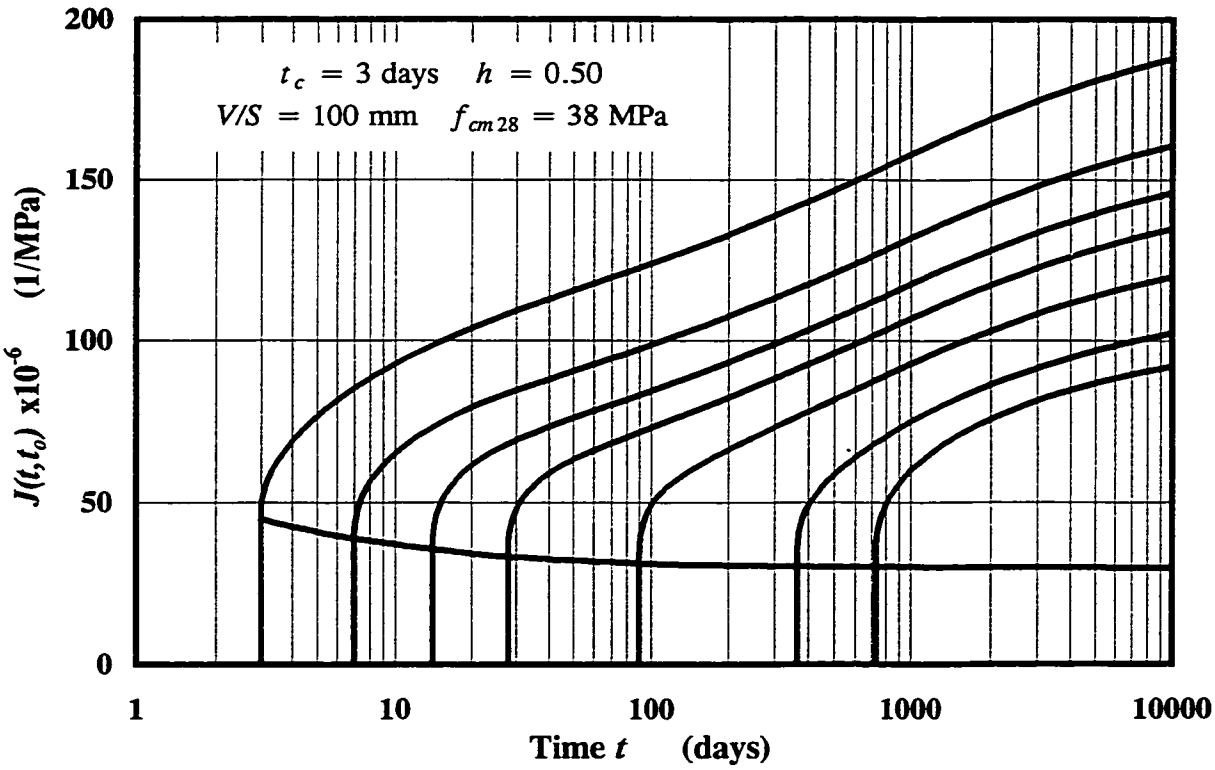


Figure 6.2 Atlanta 97 compliance

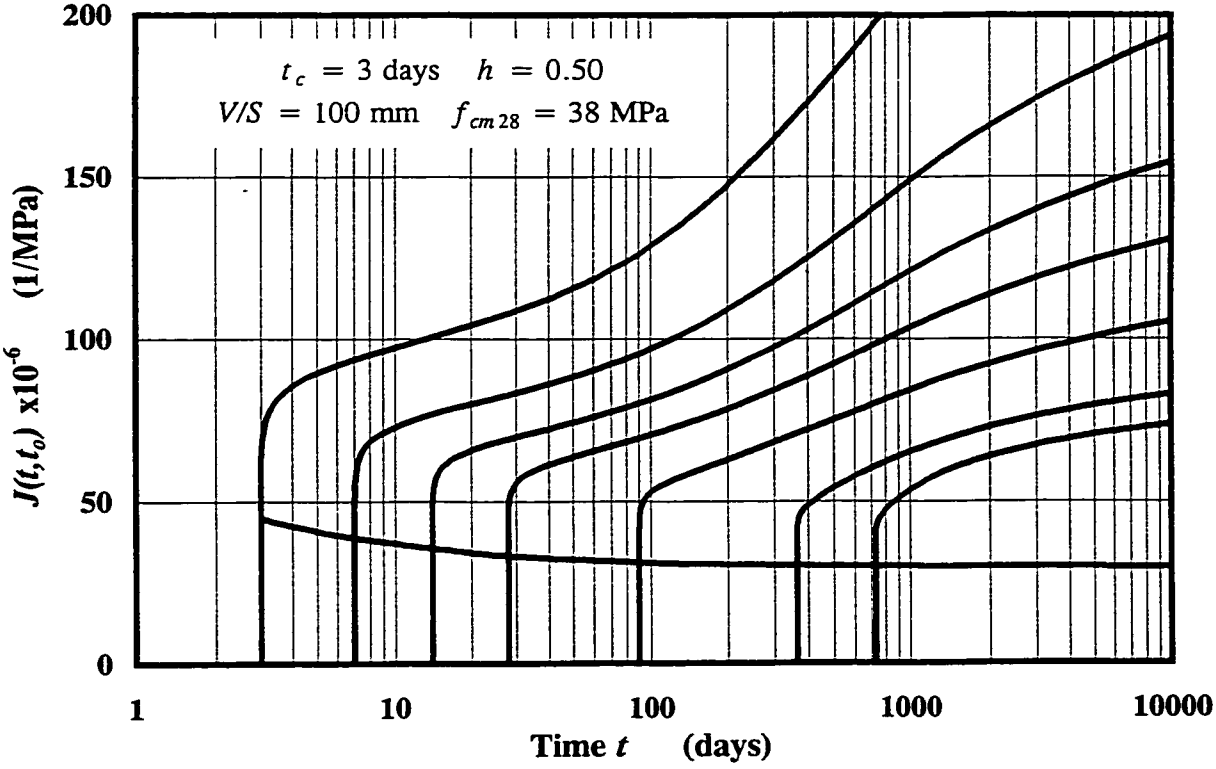


Figure 6.3 B3 compliance

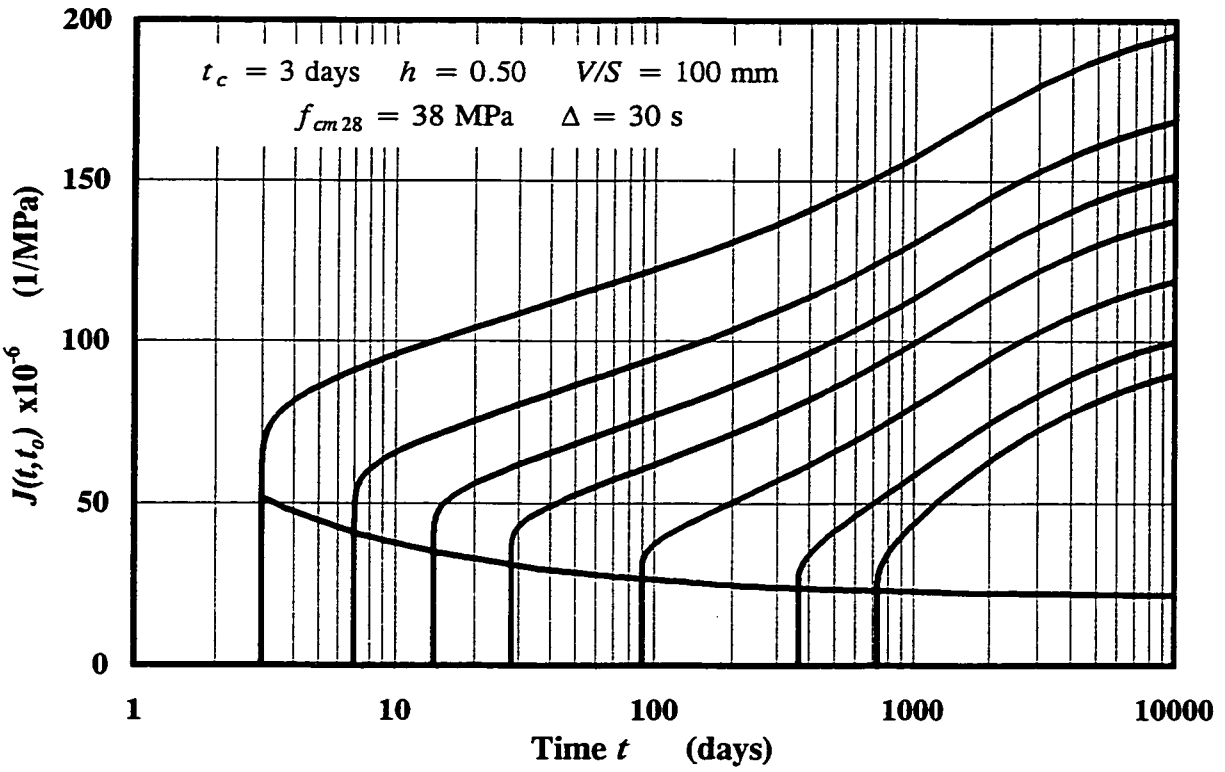


Figure 6.4 CEB MC90 compliance

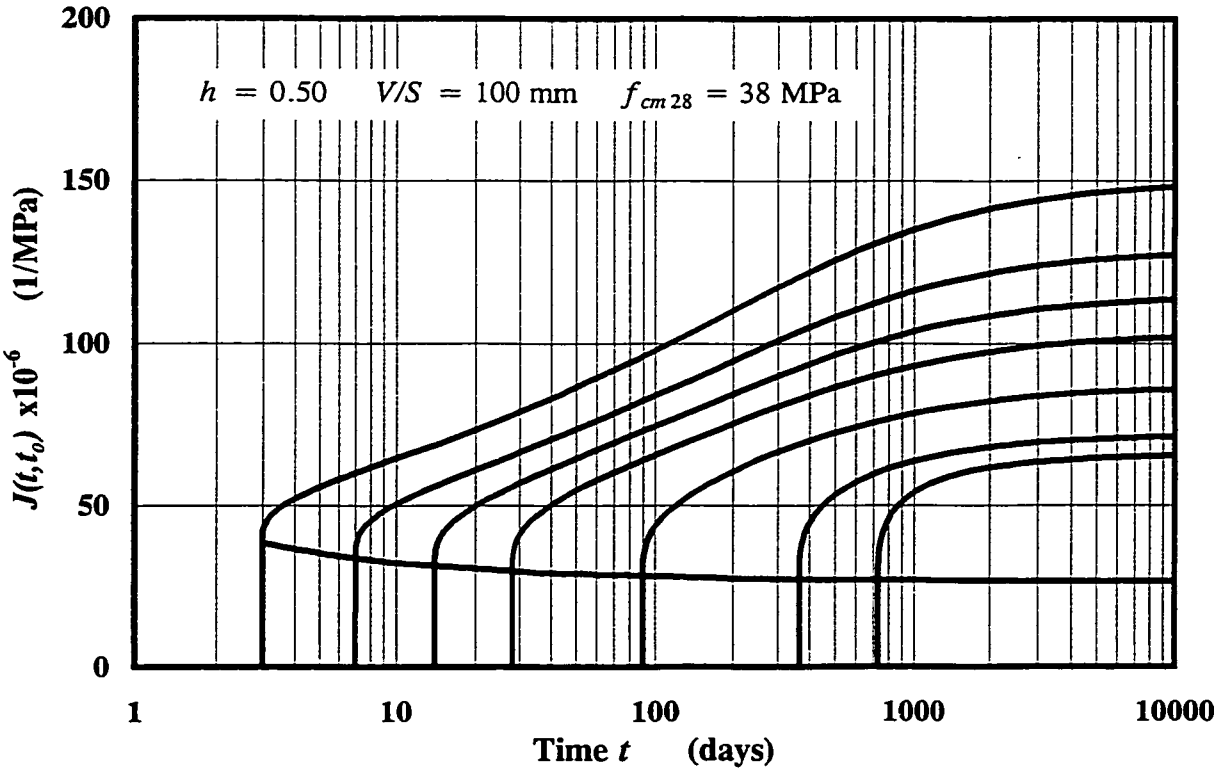


Figure 6.5 ACI 209 compliance

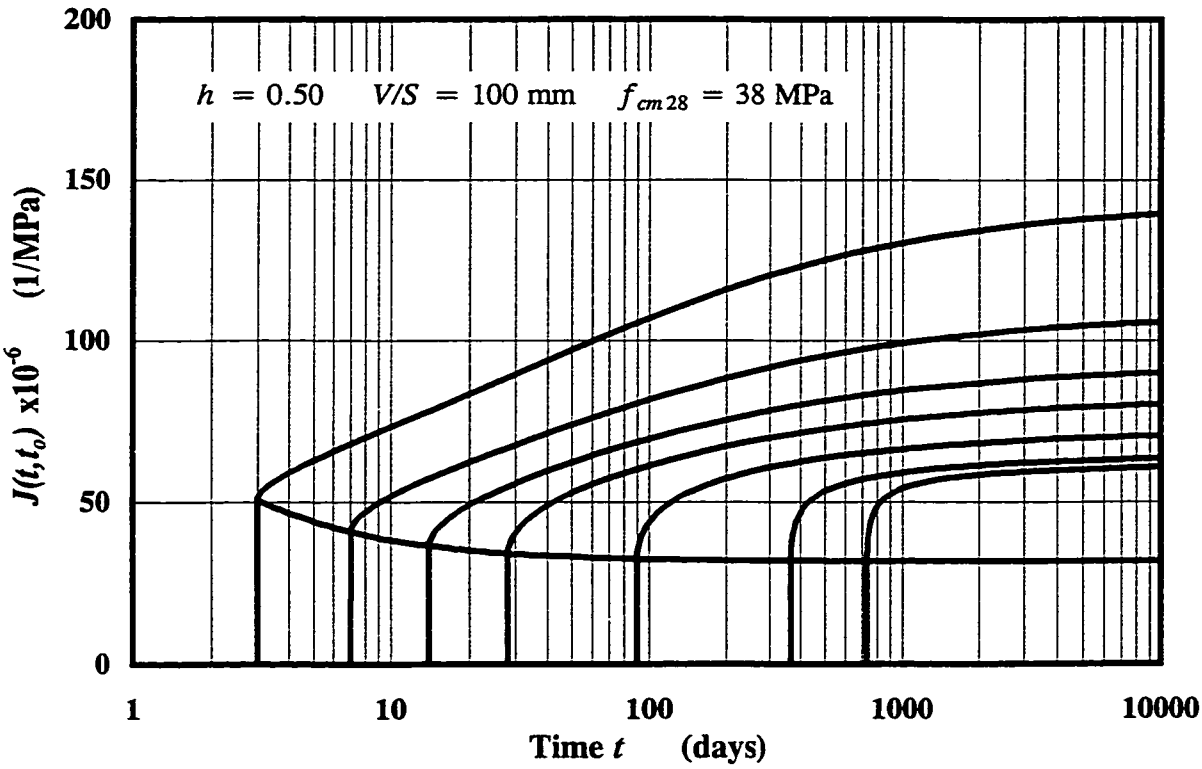


Figure 6.6 GL2000 compliance

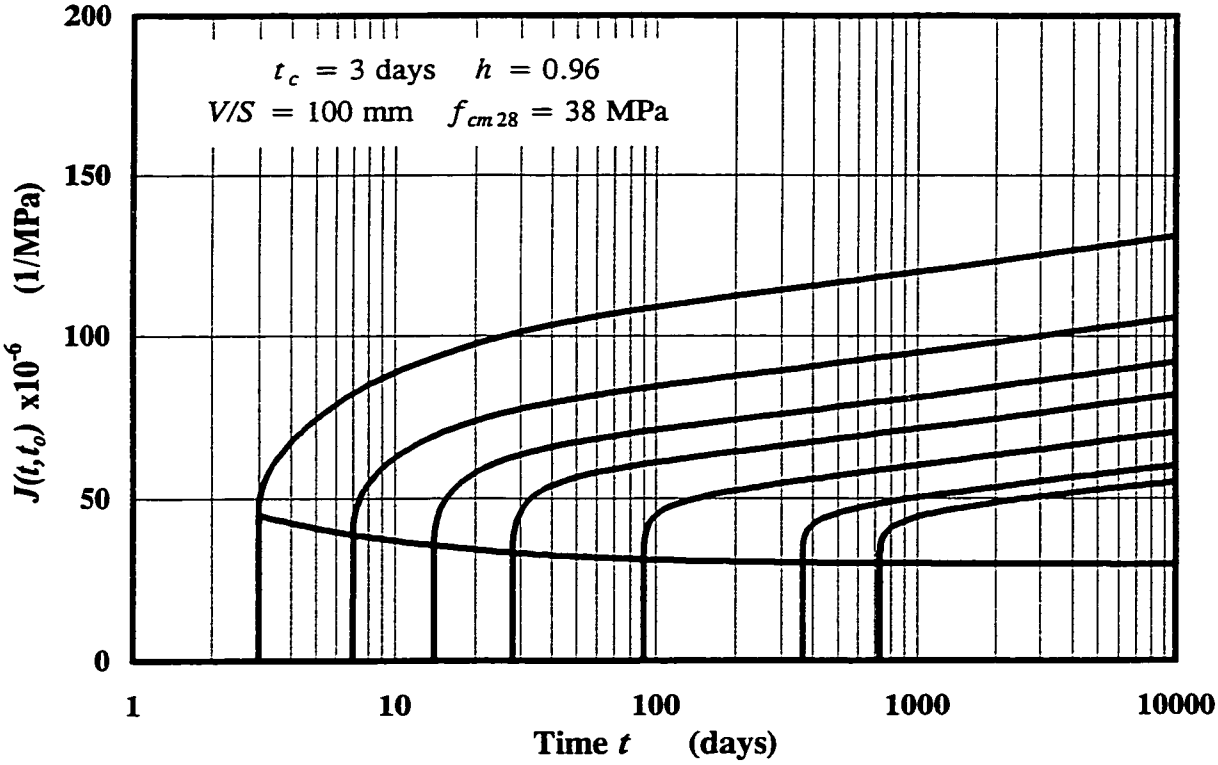


Figure 6.7 Atlanta 97 compliance

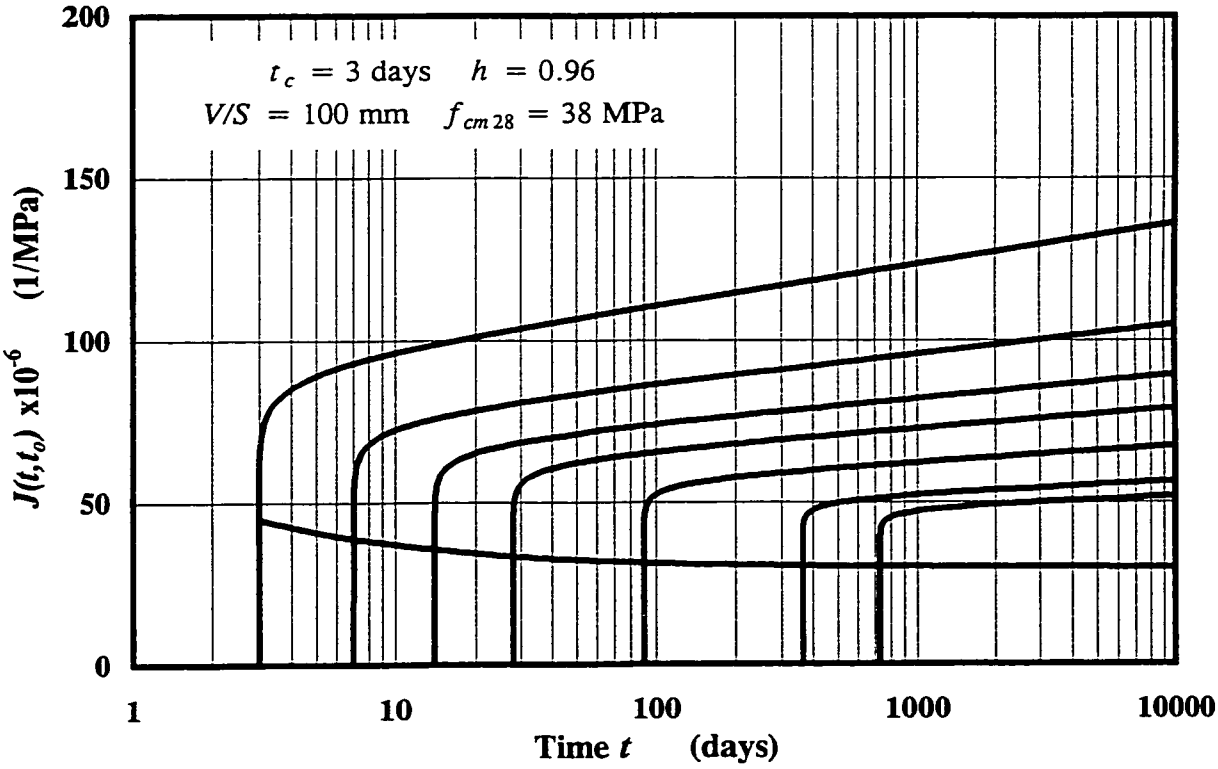


Figure 6.8 B3 compliance

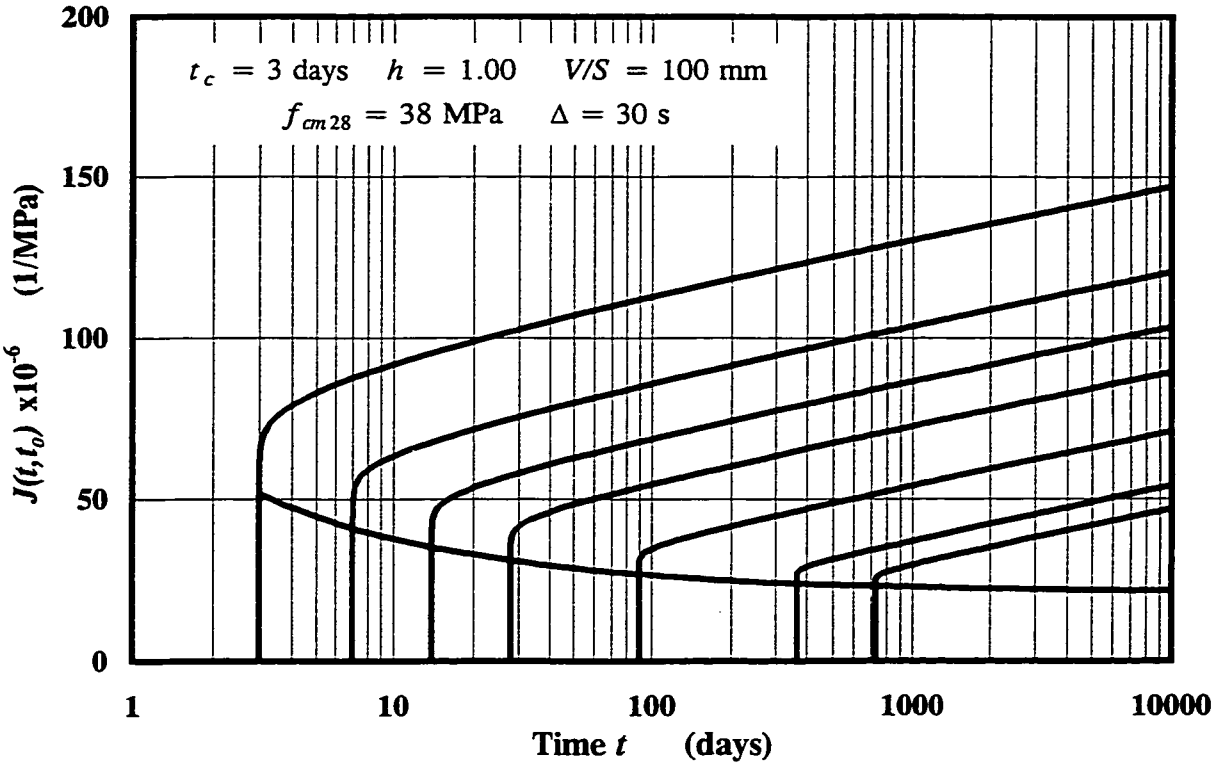


Figure 6.9 CEB MC90 compliance

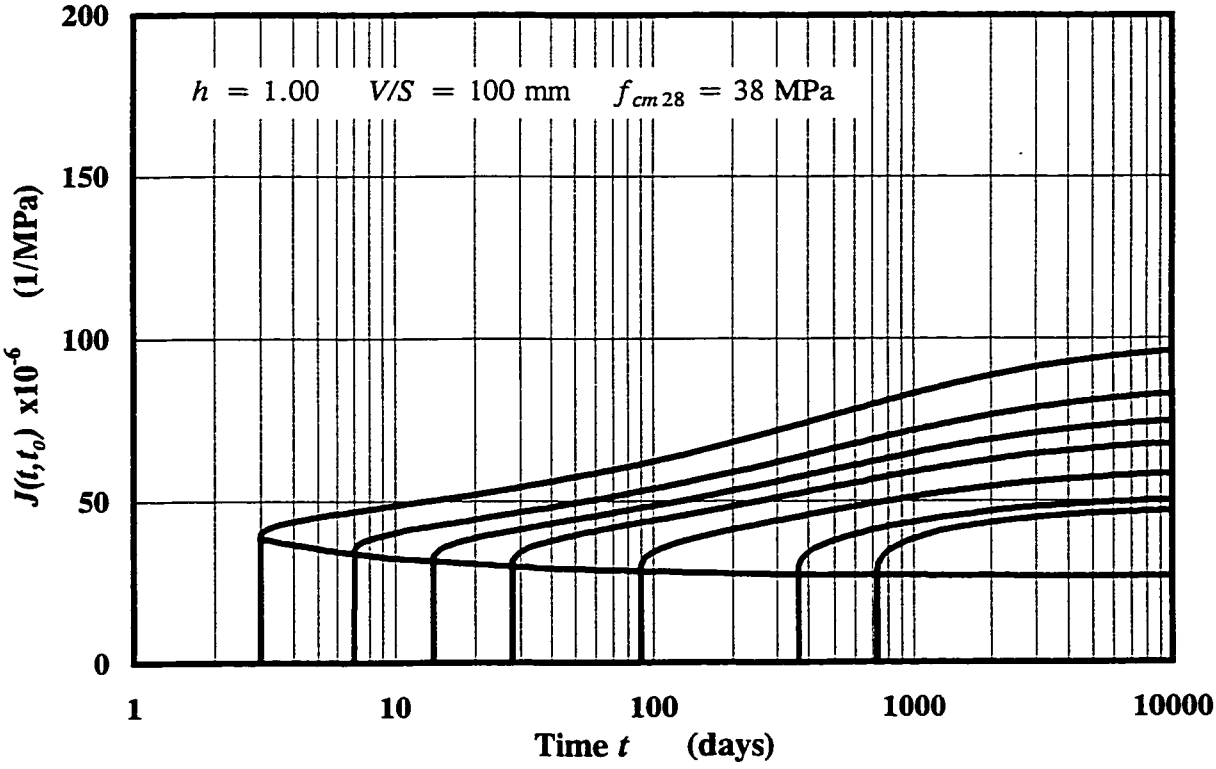
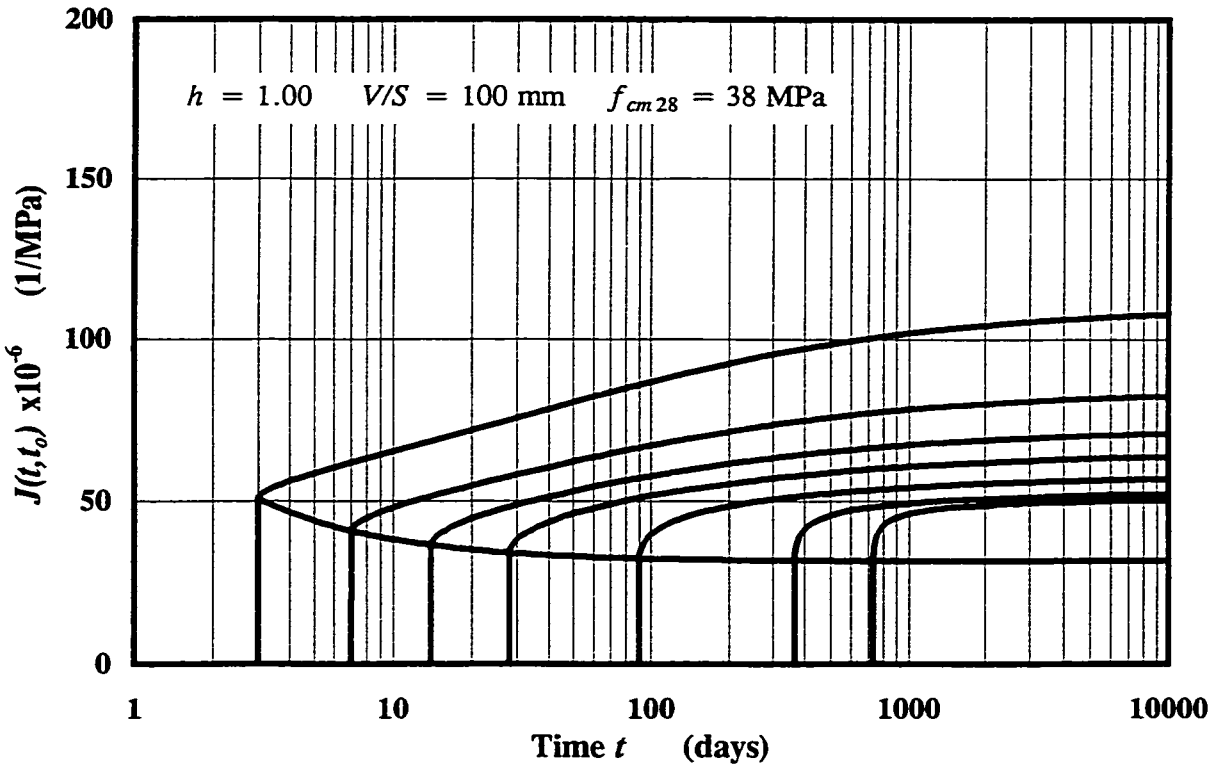


Figure 6.10 ACI 209 compliance



6.2 Relaxation

The graphs of relaxation are presented in Figures 6.11 to 6.20. For all the models except B3, the initial relaxation stress is equal to $E_{cm28}/10000$. The strain of 1/10000 was arbitrarily chosen for all models. For B3, the initial stress for relaxation is not the instantaneous stress, but the stress 30 seconds (Δ = 30 s) after loading. The elastic strain for the B3 model was calculated also at 30 seconds after loading. Relaxation was calculated assuming superposition is valid.

GL2000 was designed to avoid negative relaxation for ages of loading of 1 day and greater, using parameters inside the limits listed in Sections 4.2.1 and 4.2.2.

When the concrete is subjected basic creep only, sealed conditions, the relaxation from Atlanta 97 is as good as any other model. However, when the concrete is subjected to drying creep, the same cannot be said. At ages of loading less than 7 days, the relaxation tends to become negative depending on the input parameters.

The relaxation of the B3 model is significantly different compared to the other four models. At late ages of loading, the initial stress is radically higher than the other models (for the same strain) and the residual stress at 10000 days is much lower. At a relative humidity of 1.00, the stress reduction is not as significant. The shapes of the relaxation curves are odd in comparison with GL2000, Atlanta 97 CEB MC90 and ACI 209.

Using a relative humidity of 0.50, the relaxation calculated using the CEB MC90 model is close to zero at 10000 days for an age of loading of 3 days. The shape of the relaxation curves is very similar to GL2000, but the numerical values are different.

The first comment about the ACI 209 method is that the curves for an age of loading of 3 days are shown on Figures 6.15 and 6.20. However the model stipulates that it should only be used for ages of loading greater or equal to 7 days if the concrete is moist cured. This explains why the relaxation curve for 3 days for a relative humidity of 0.50 is close to or below zero at 10000 days. The curve was calculated and plotted for comparison with the other models and to visualise the behaviour of this model at early age of loading.

Figure 6.11 GL2000 relaxation

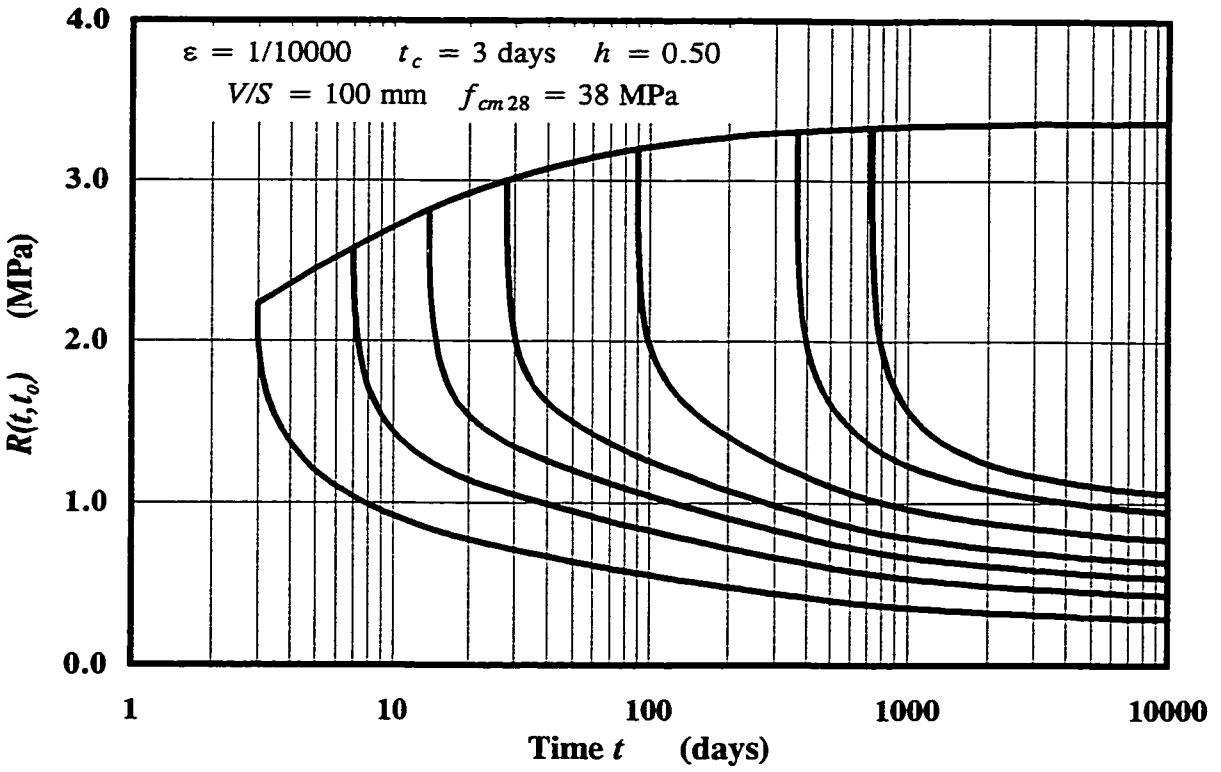


Figure 6.12 Atlanta 97 relaxation

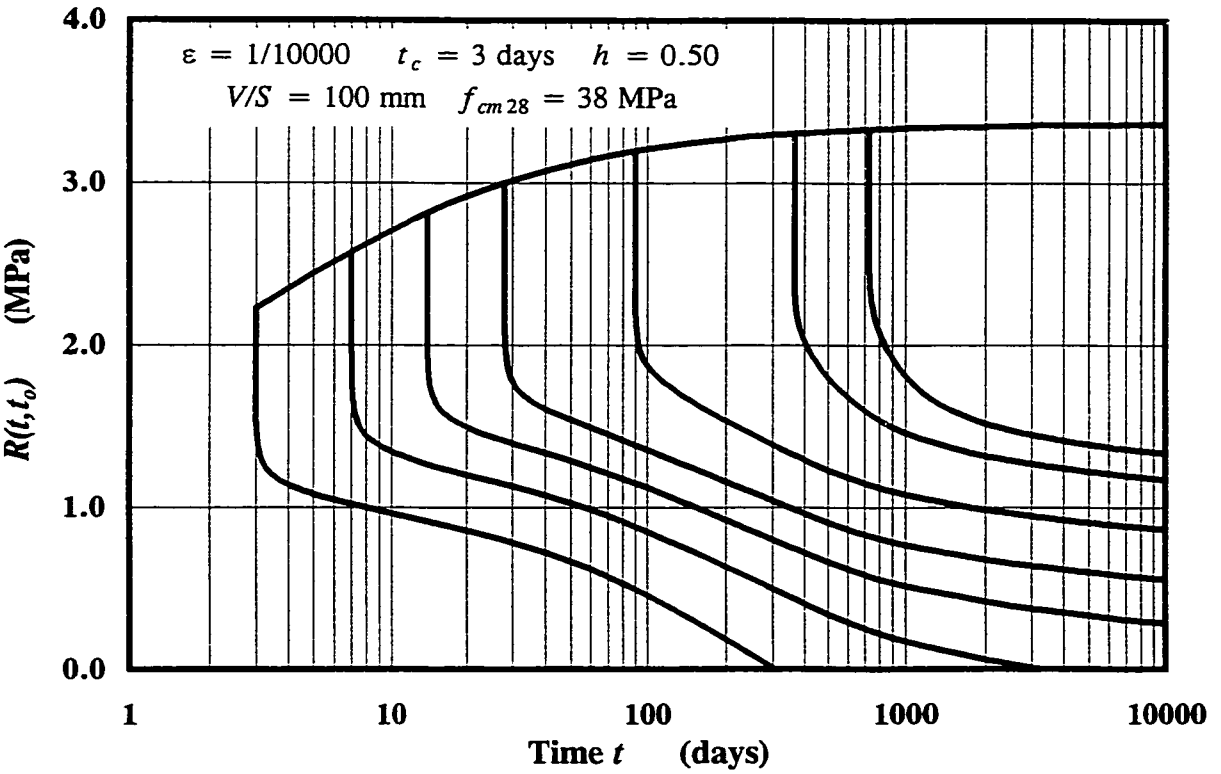


Figure 6.13 B3 relaxation

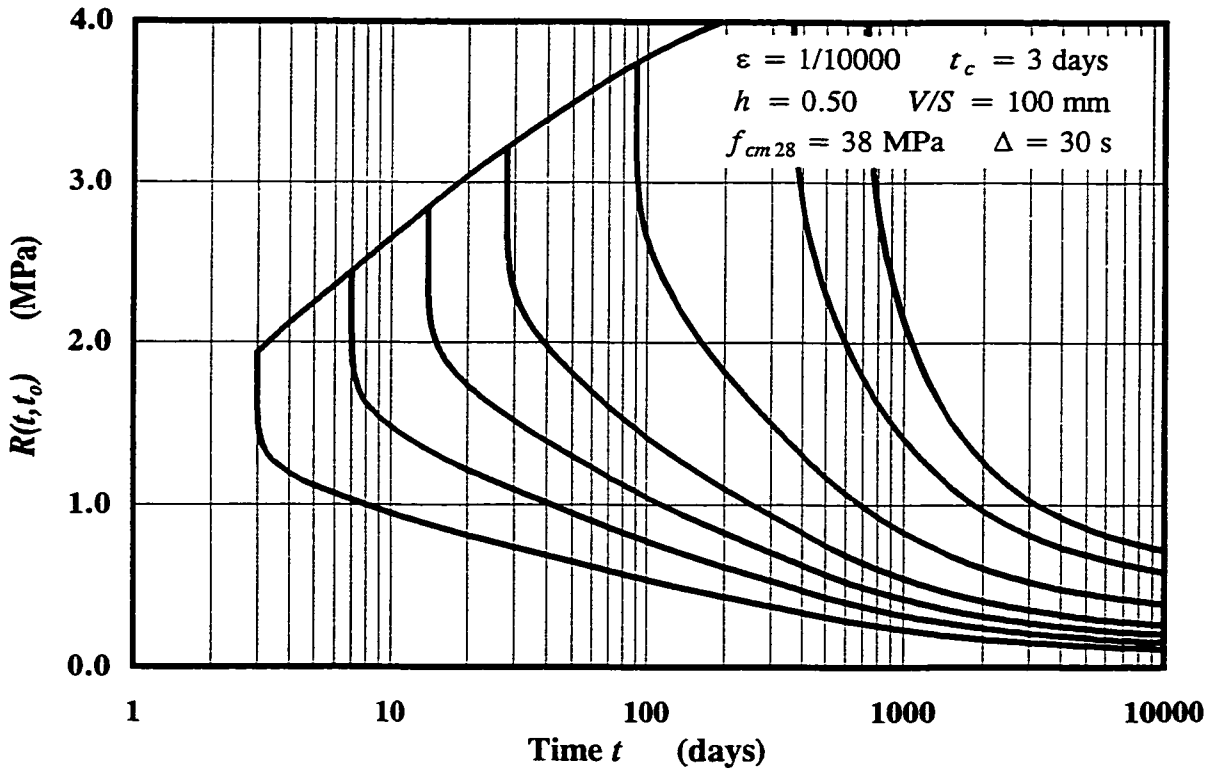


Figure 6.14 CEB MC90 relaxation

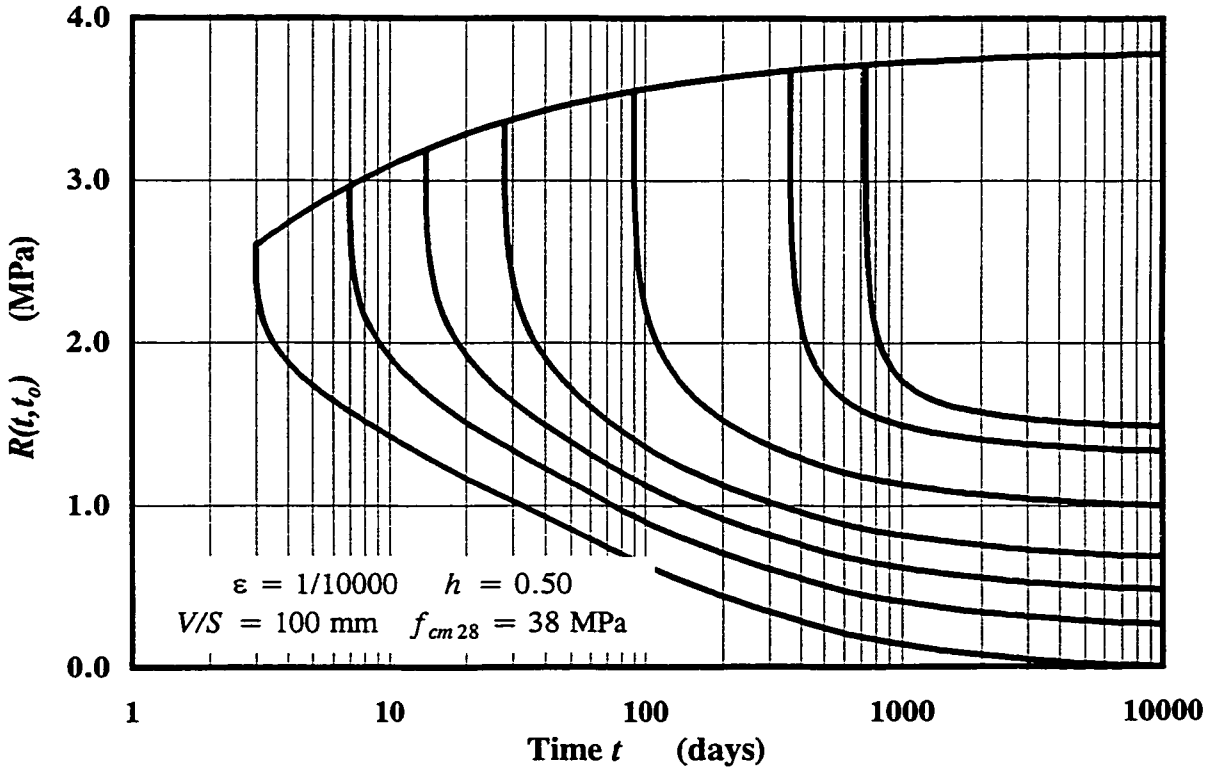


Figure 6.15 ACI 209 relaxation

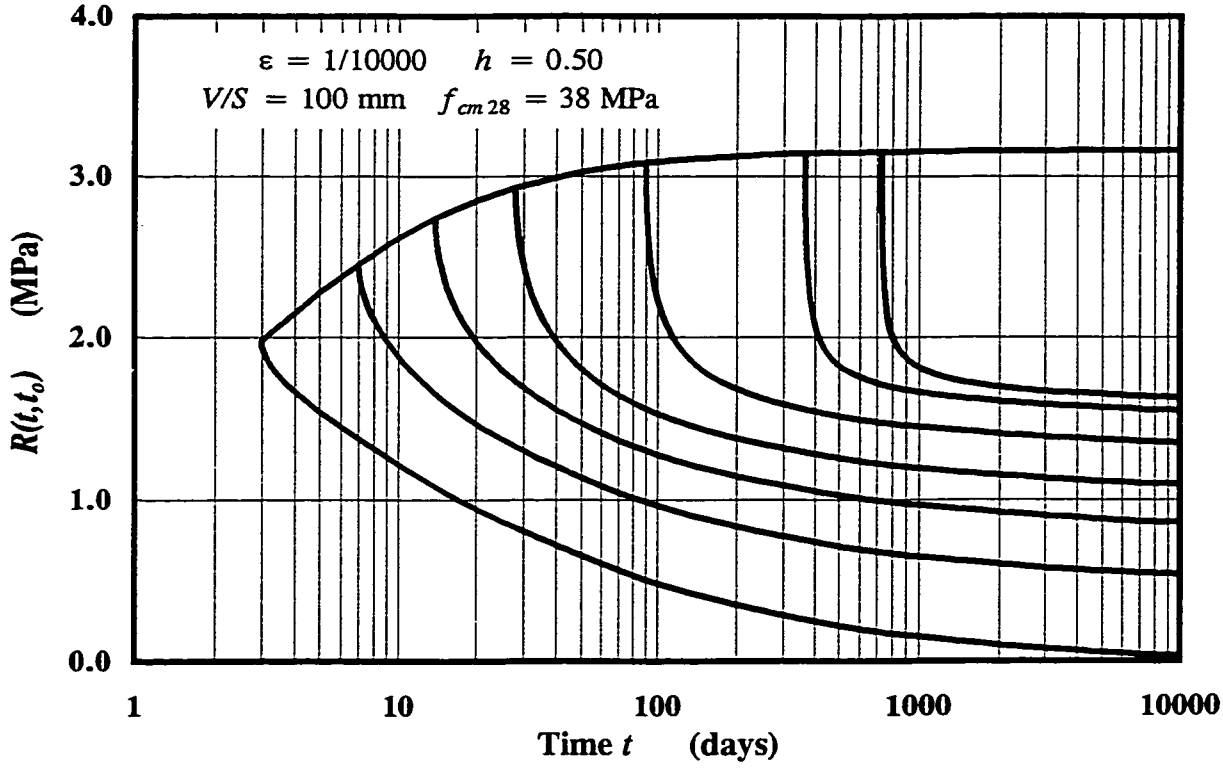


Figure 6.16 GL2000 relaxation

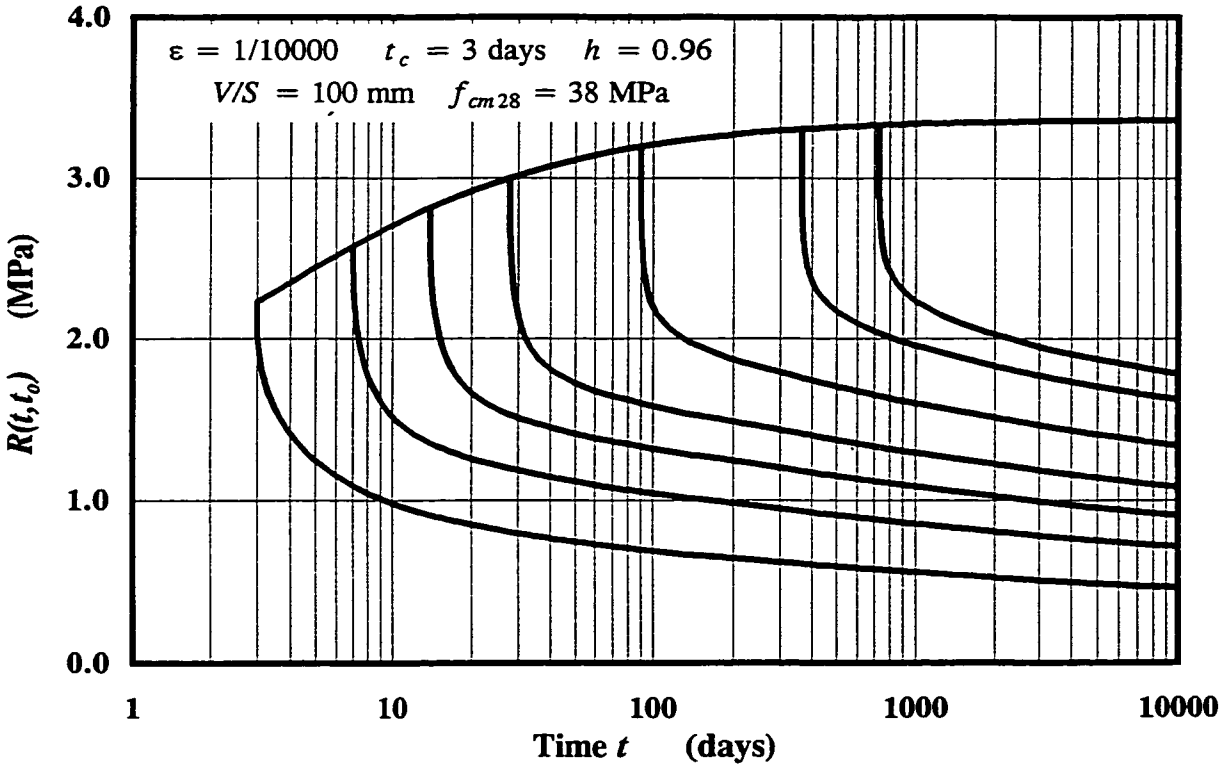


Figure 6.17 Atlanta 97 relaxation

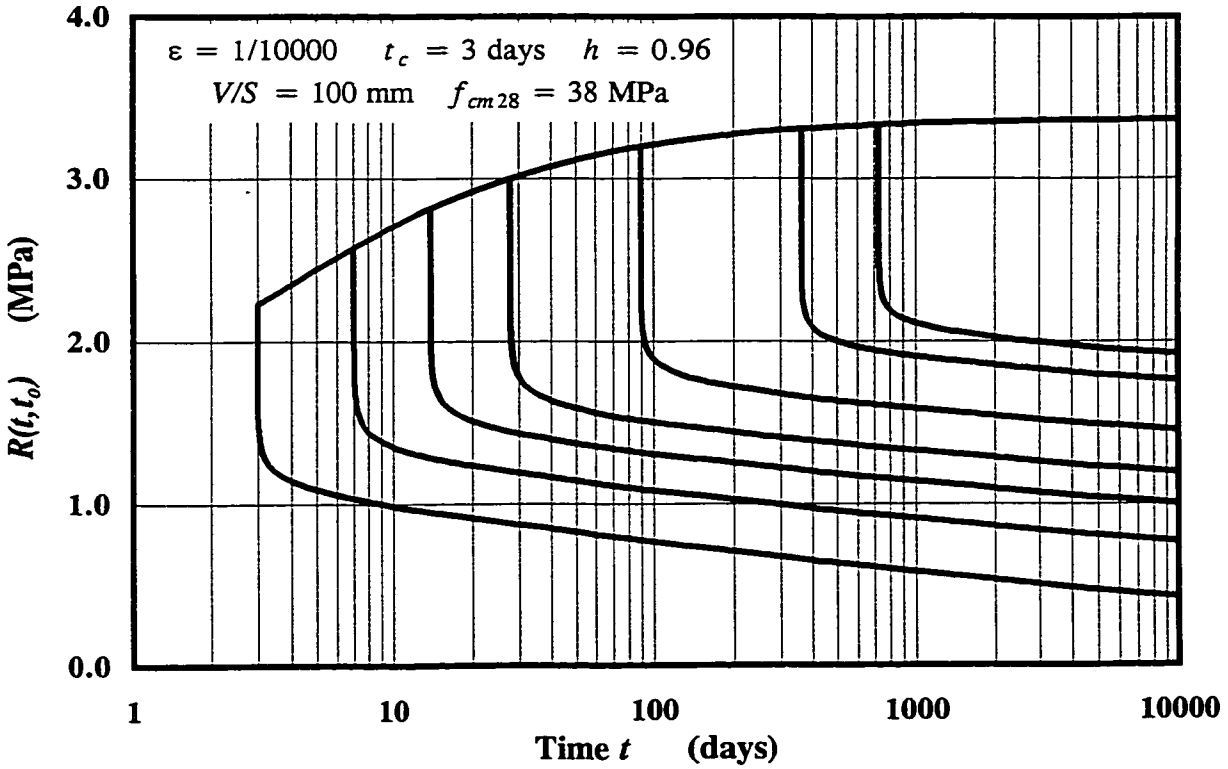


Figure 6.18 B3 relaxation

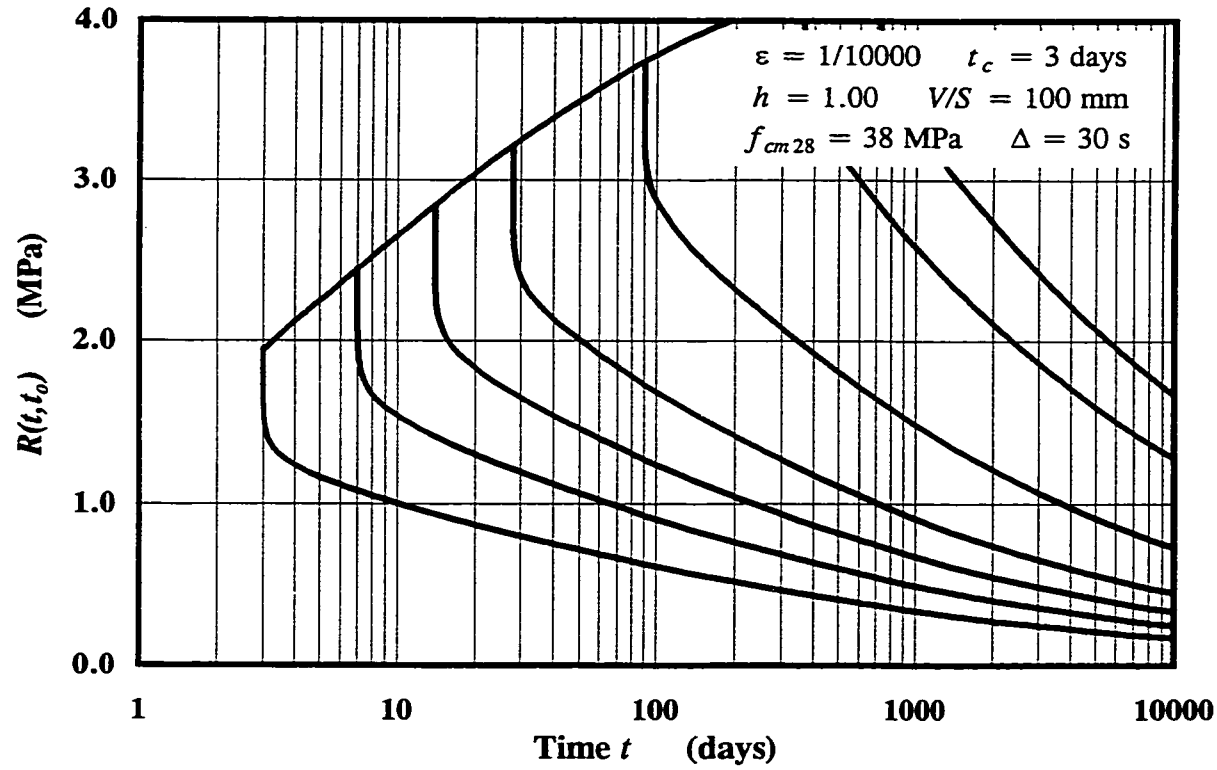


Figure 6.19 CEB MC90 relaxation

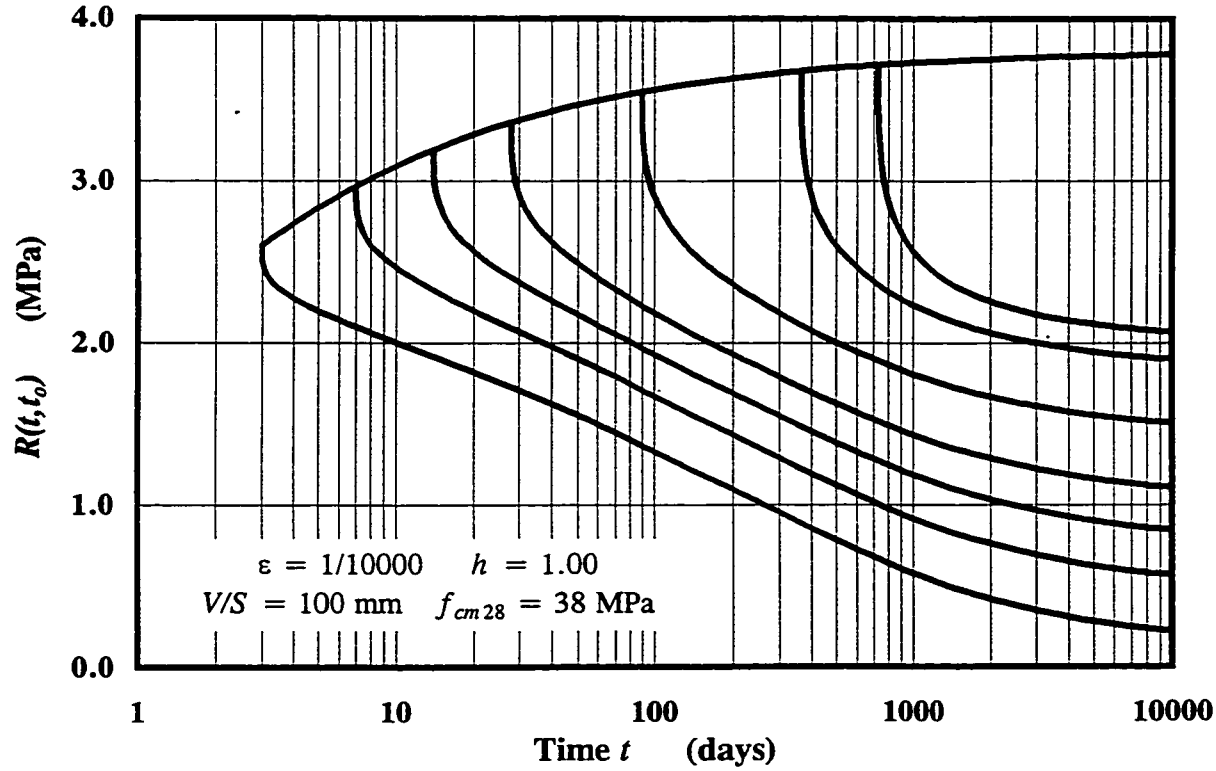
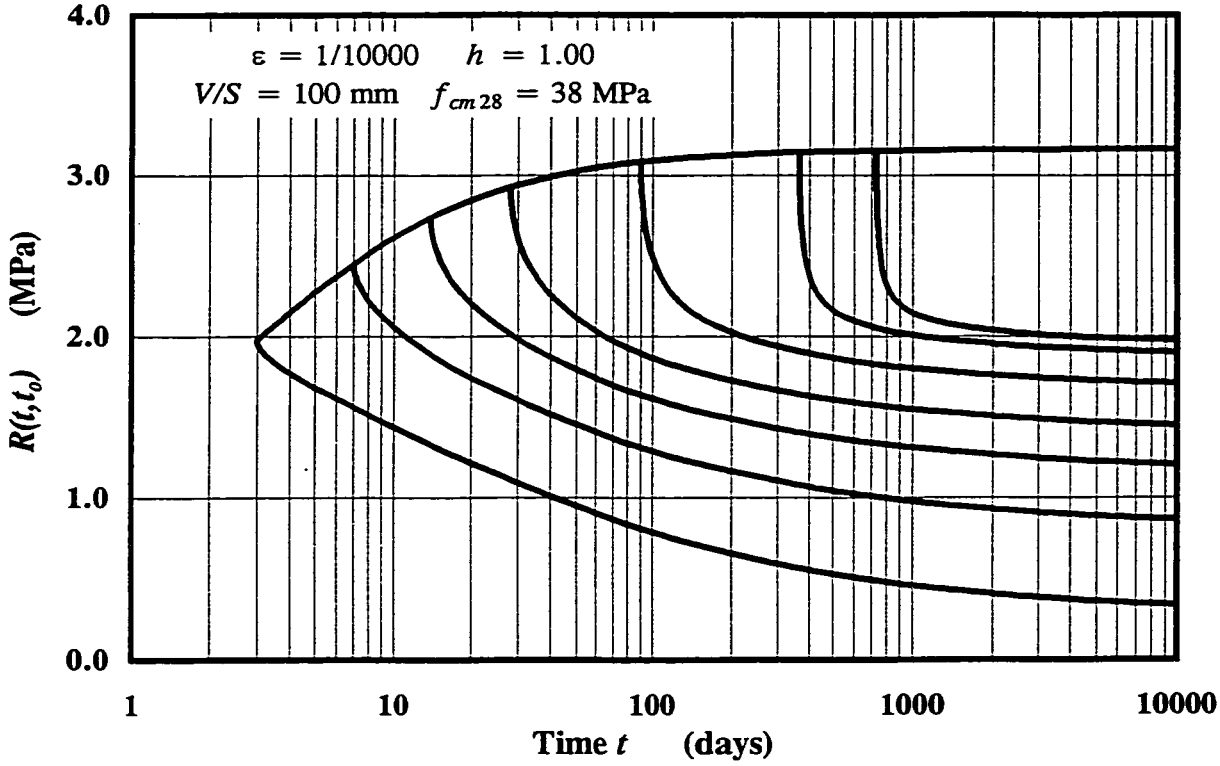


Figure 6.20 ACI 209 relaxation



6.3 Creep Recovery

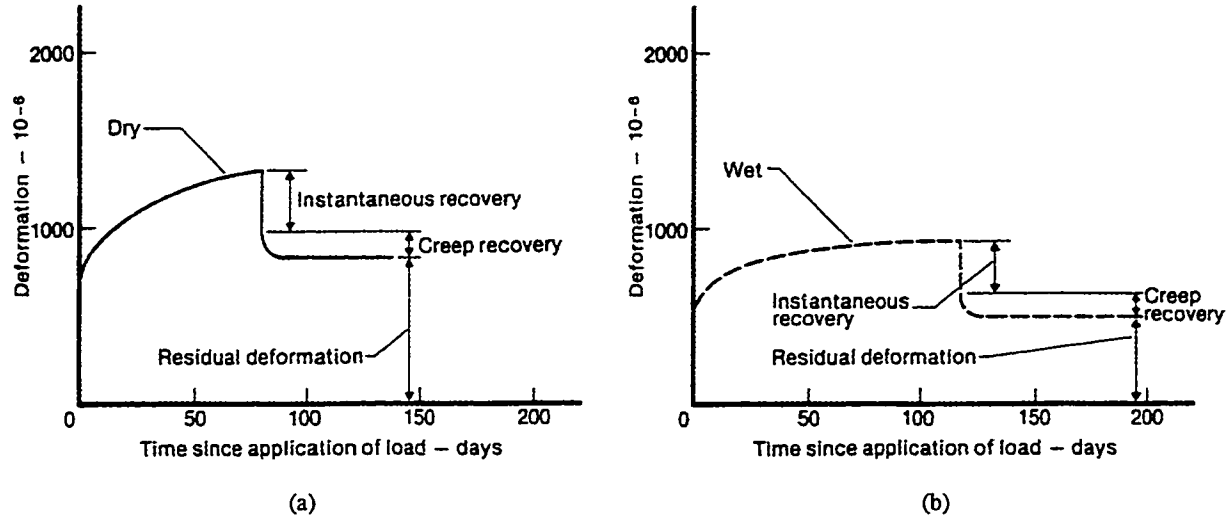
For creep recovery, the situation is not as clear and simple as for relaxation. Two different arguments indicate that the recovery cannot be calculated by superposition.

Many experiments have been conducted with various conclusions. According to Gamble and Parrott (1978) basic and drying creep are recoverable to the same extent but only 20 to 24% of the original creep is recoverable. McHenry (1943) verified experimentally the principle of superposition for the creep recovery on sealed concrete. However, he reported a later series of tests in which the agreement between predicted and measured recovery was less satisfactory. The US Bureau of Reclamation (1953) conducted recovery experiments for two concrete mixes (using Type IV and II cements) in sealed conditions. The experiment using Type IV cement indicated close agreement. However, for the concrete containing Type II cement, the principle of superposition overestimated the recovery. Polivka, Pirtz and Adams (1964) confirmed experimentally that the principle of superposition overestimates the recovery for basic creep. Finally, Ross (1958) reported similar observations for concrete subjected to both basic and drying creep. In general, most of the experimental observations lead toward the fact that neither basic nor drying creep are 100% recoverable. Therefore, the principle of superposition cannot be valid for creep recovery.

An alternative argument can be made. It is believed that drying creep due to loading is a consequence of moisture expulsion. When the load is partially or totally removed, it is unlikely that the water returns inside the specimen. In other words, drying creep is not recoverable. Therefore, the principle of superposition would not apply for creep recovery for concrete subjected to drying creep. Superposition always overestimates the recovery for drying specimens. For the case of sealed specimens, where there cannot be any moisture loss, calculating recovery by superposition could be more realistic.

Neville (1960), from observations on mortars stored wet and stored dry, suggested that creep and creep recovery may be two different mechanisms. With the exception of the coarse aggregate, mortar is basically concrete. Figure 6.21 shows typical creep recovery of mortars stored dry (a) and stored wet (b) for a stress-strength ratio of 0.4. In addition to the creep recovery being less than the creep, the shape of the curves is significantly different. The creep recovery curve is much steeper initially and full recovery is completed within a couple of weeks. If creep and creep recovery are in fact two different mechanisms, the principle of superposition cannot be valid for creep recovery.

Figure 6.21 Typical creep recovery of mortars stored dry and wet (Neville 1960)



Consequently, to investigate the use of superposition to calculate recovery five different assumptions are used. Complete recovery of sealed concrete, complete recovery of concrete in a drying environment, incomplete recovery of sealed concrete, incomplete recovery of concrete in a drying environment and basic recovery of concrete in a drying environment.

Figures 6.22 and 6.23 describe the graphs of compliance versus time for complete recovery of sealed concrete. The concrete was loaded at 7 days and unloaded at 107 days. Only GL2000 and B3 provide realistic creep recovery. In other words, after a sufficient period of time following the removal of the load, the strain becomes constant. The creep recoveries of Atlanta 97, CEB MC90 and ACI 209 do not work as well. The strain deceases following the removal of the load, which is as expected, but eventually, it increases. For sealed concrete, the strain increase after the removal of the load is not very significant. Complete recovery of concrete in a drying environment is shown in Figures 6.24 and 6.25. Similar to complete recovery of sealed concrete, GL2000 and B3 predict realistic recovery and Atlanta 97, CEB MC90 and ACI 209 predict an eventual strain increase. The recoveries of ACI 209 and CEB MC90 are not too bad. However, the creep recovery of Atlanta 97 is definitively not acceptable.

All the models, except B3 calculate about the same amount of creep recovery. B3 predicts much less recovery. The strain becomes constant shortly after the load is removed, as if only the elastic strain is recovered and the creep recovery is almost inexistent. The B3 model was intentionally designed this way; the compliance curves of B3 for various age of loading are all perfectly parallel to each other.

Incomplete recovery of sealed concrete is described in Figures 6.26 and 6.27. A 50% creep recovery values was arbitrarily chosen. As expected, none of five models achieve a constant strain after complete unloading and partial creep recovery. GL2000 and B3 provide realistic results for full recovery only, they were not designed to satisfy partial recovery. The recoveries of the five models are relatively similar, ACI 209 is slightly better. Figures 6.28 and 6.29 show the incomplete recovery of concrete in a drying environment. Since the partial recovery of sealed concrete is unrealistic, it was not expected that partial recovery of concrete in a drying environment would be satisfactory. In these circumstances, ACI 209 provides the most acceptable recovery, followed GL2000, B3 and CEB MC90.

Figures 6.30 and 6.31 described the basic recovery of concrete in a drying environment. Similar comments as for the incomplete recovery of concrete in a drying environment can be made. ACI 209 is the most realistic model in this particular case, followed in order by, CEB MC90, GL2000, B3 and Atlanta 97.

In summary, GL2000 and B3 perform well for full recovery scenarios but provide poor results for partial recovery. The recoveries of Atlanta 97, CEB MC90 and ACI 209 are unrealistic for both partial and complete recovery.

Figure 6.22 GL2000 and Atlanta 97: Complete recovery of sealed concrete

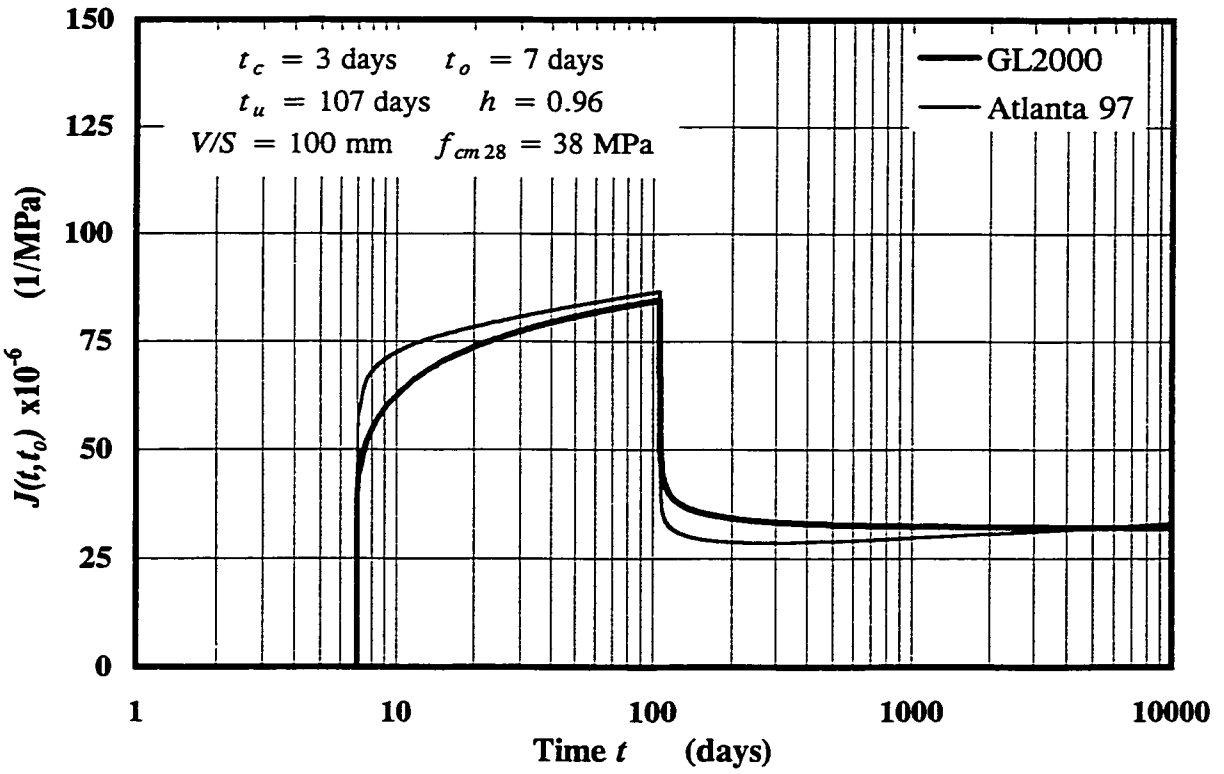


Figure 6.23 B3, CEB MC90 and ACI 209: Complete recovery of sealed concrete

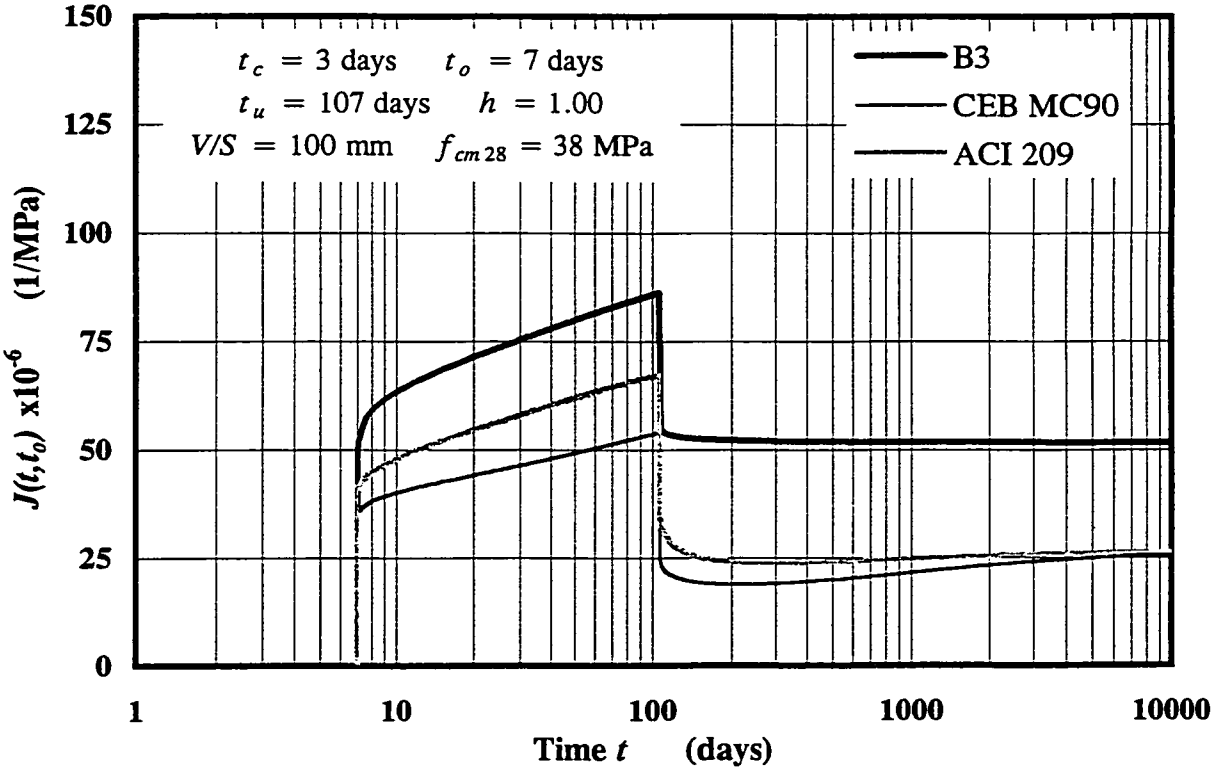


Figure 6.24 GL2000 and Atlanta 97: Complete recovery of drying concrete

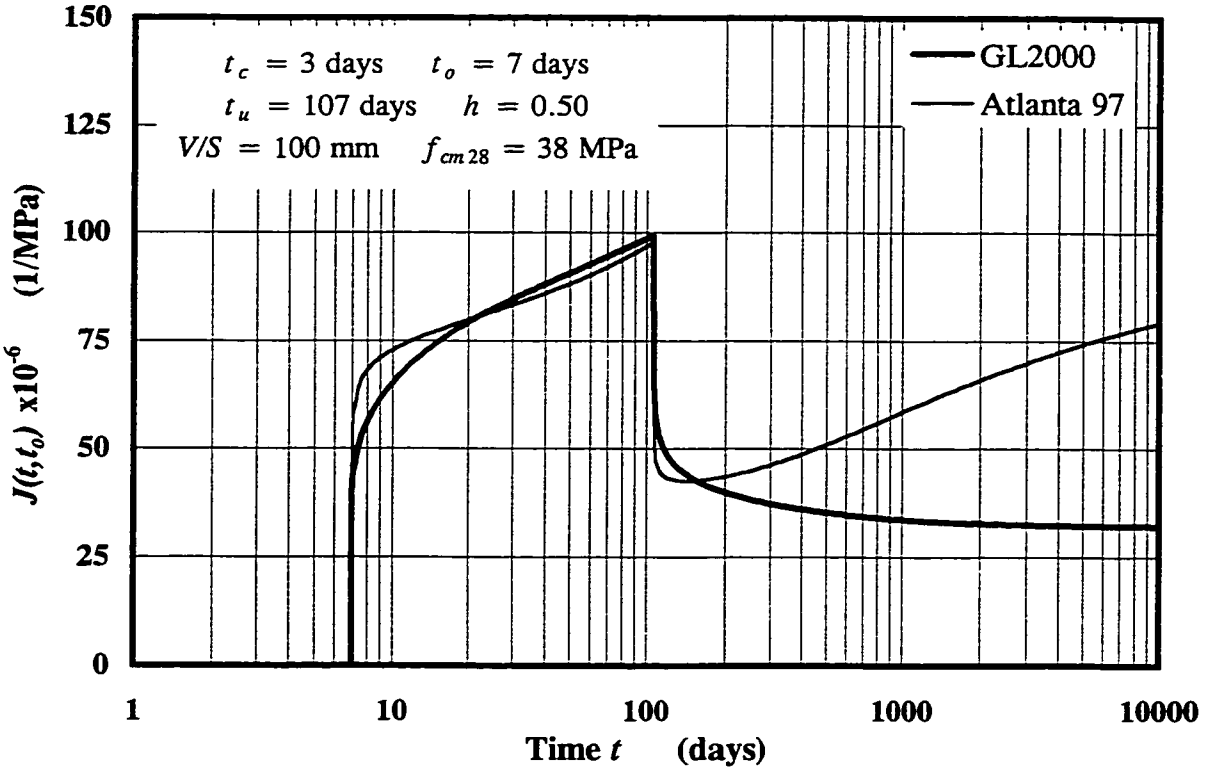


Figure 6.25 B3, CEB MC90 and ACI 209: Complete recovery of drying concrete

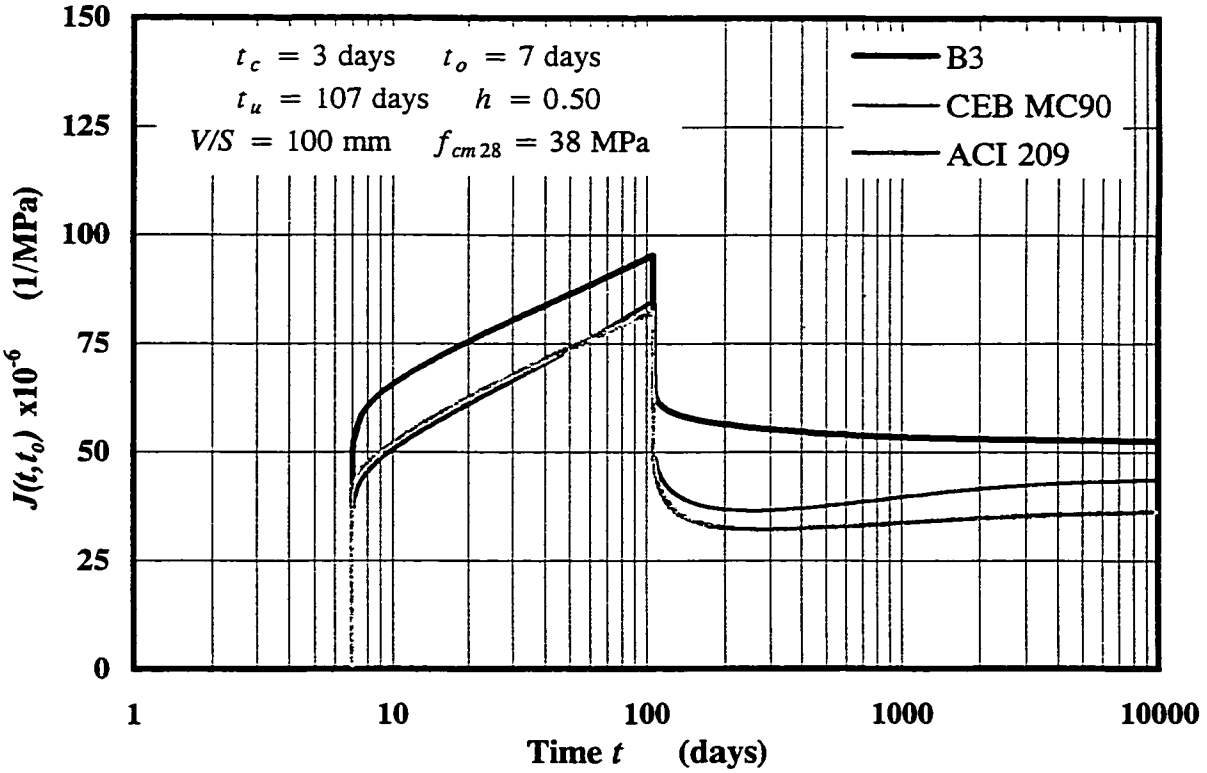


Figure 6.26 GL2000 and Atlanta 97: 50% recovery of sealed concrete

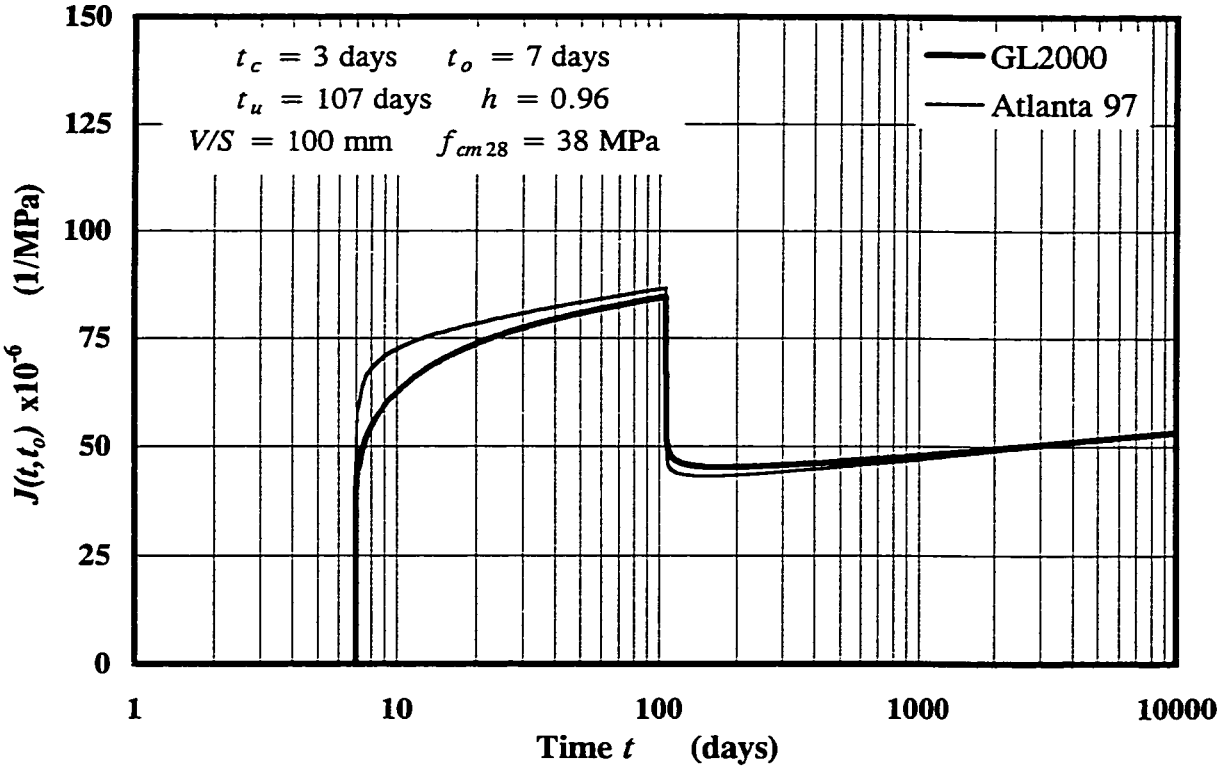


Figure 6.27 B3, CEB MC90 and ACI 209: 50% recovery of sealed concrete

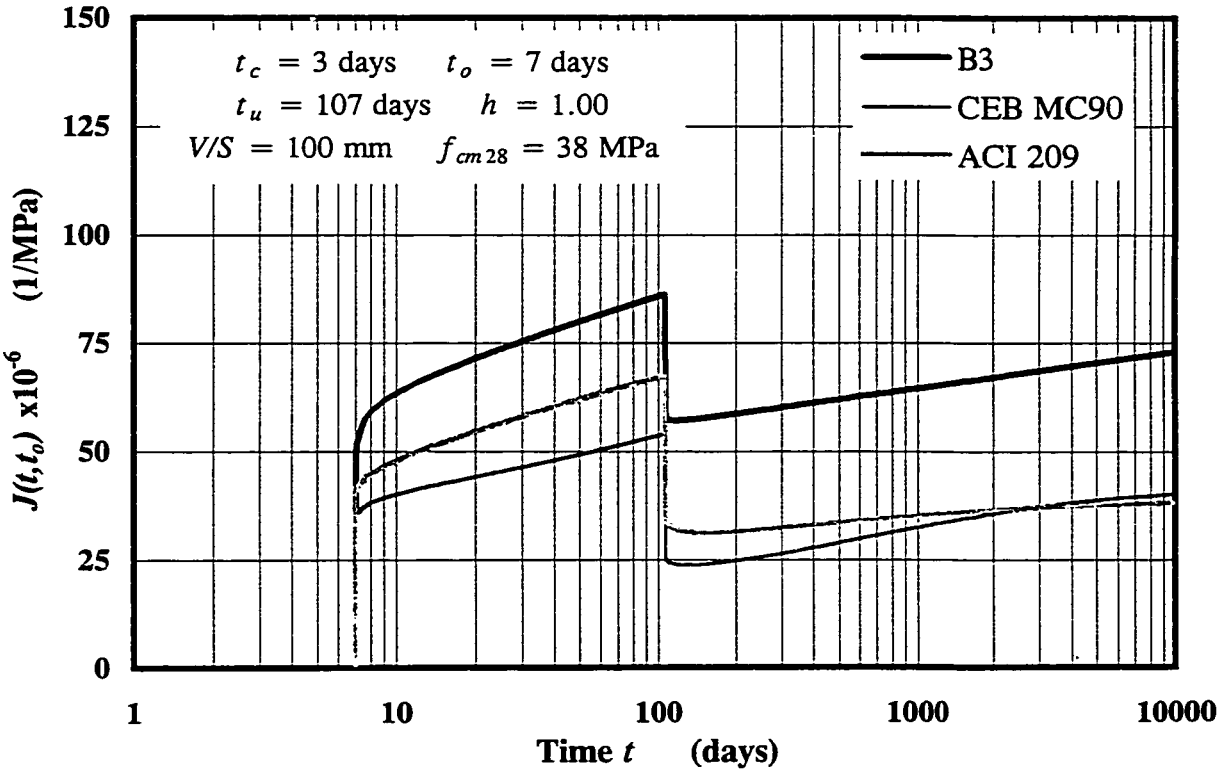


Figure 6.28 GL2000 and Atlanta 97: 50% recovery of drying concrete

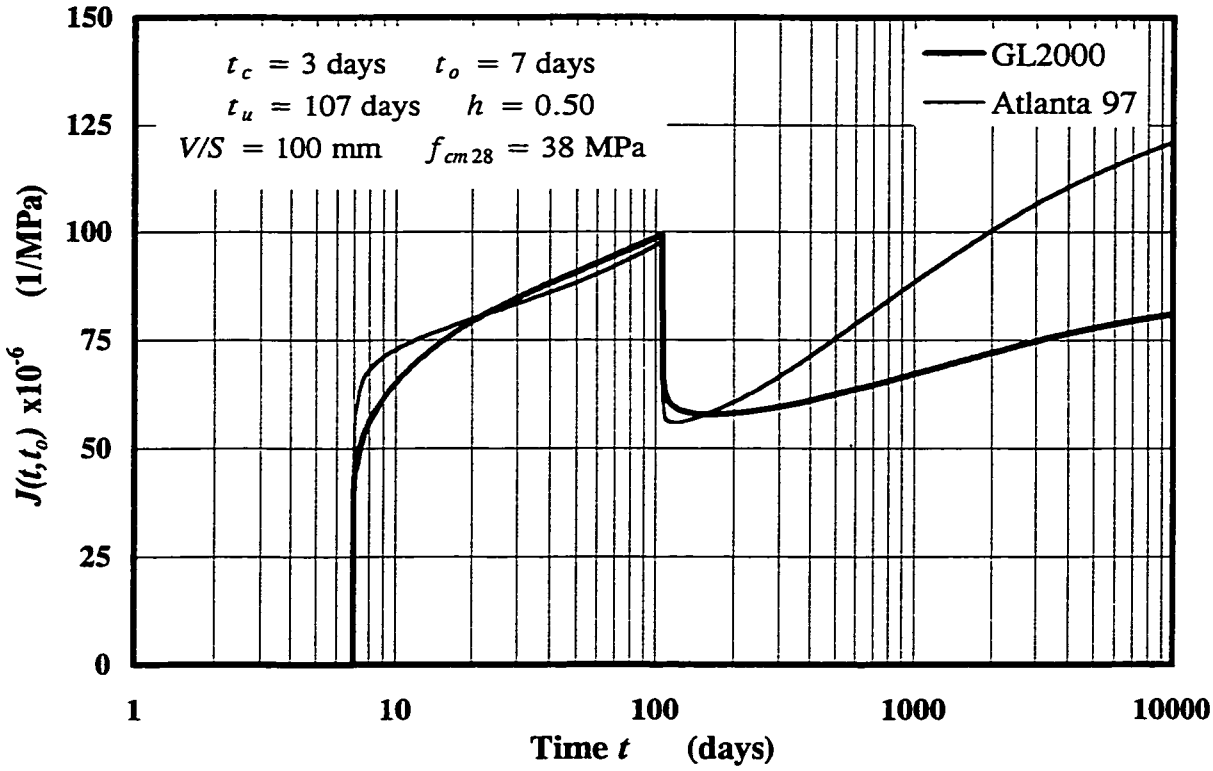


Figure 6.29 B3, CEB MC90 and ACI 209: 50% recovery of drying concrete

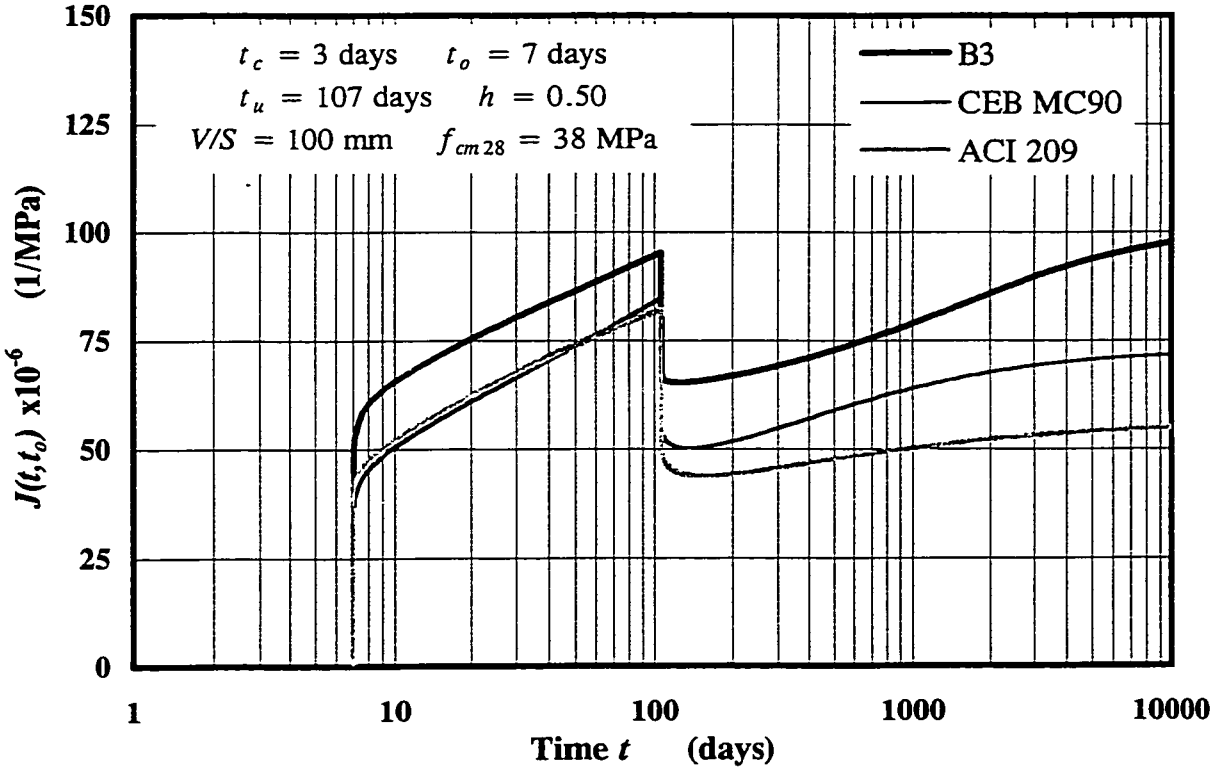


Figure 6.30 GL2000 and Atlanta 97: Basic recovery of drying concrete

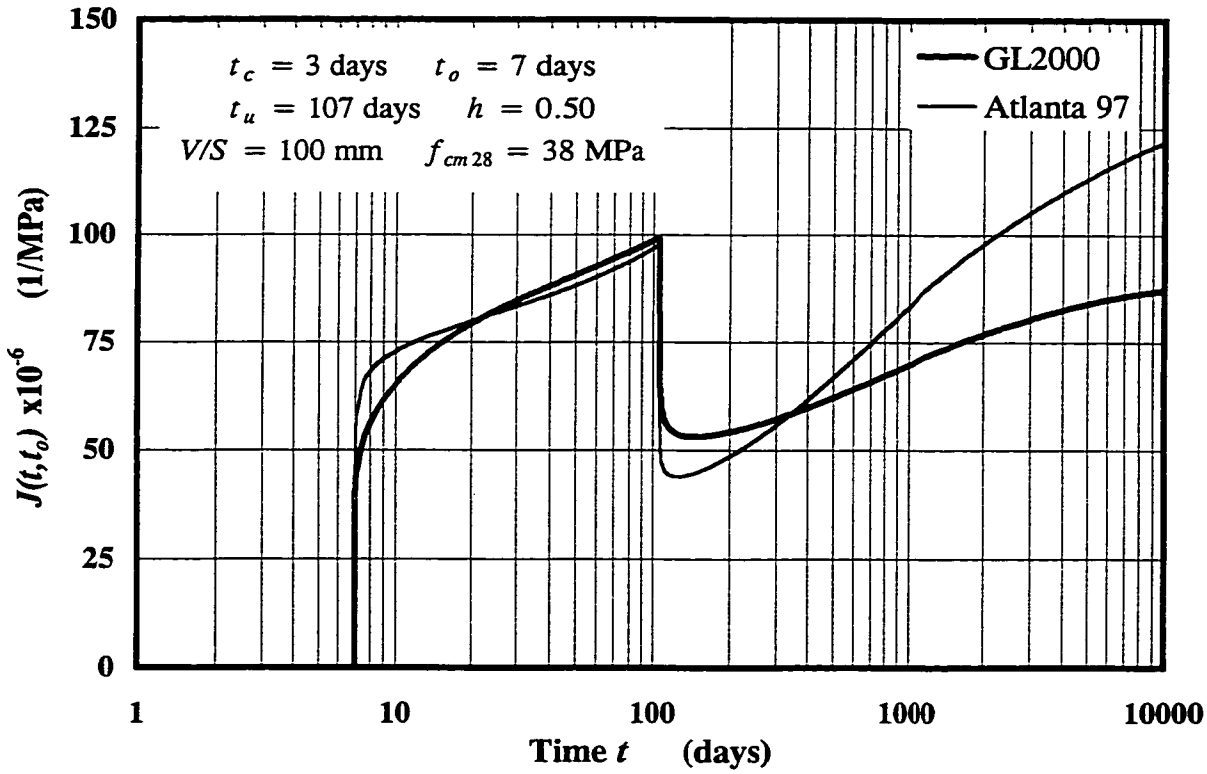
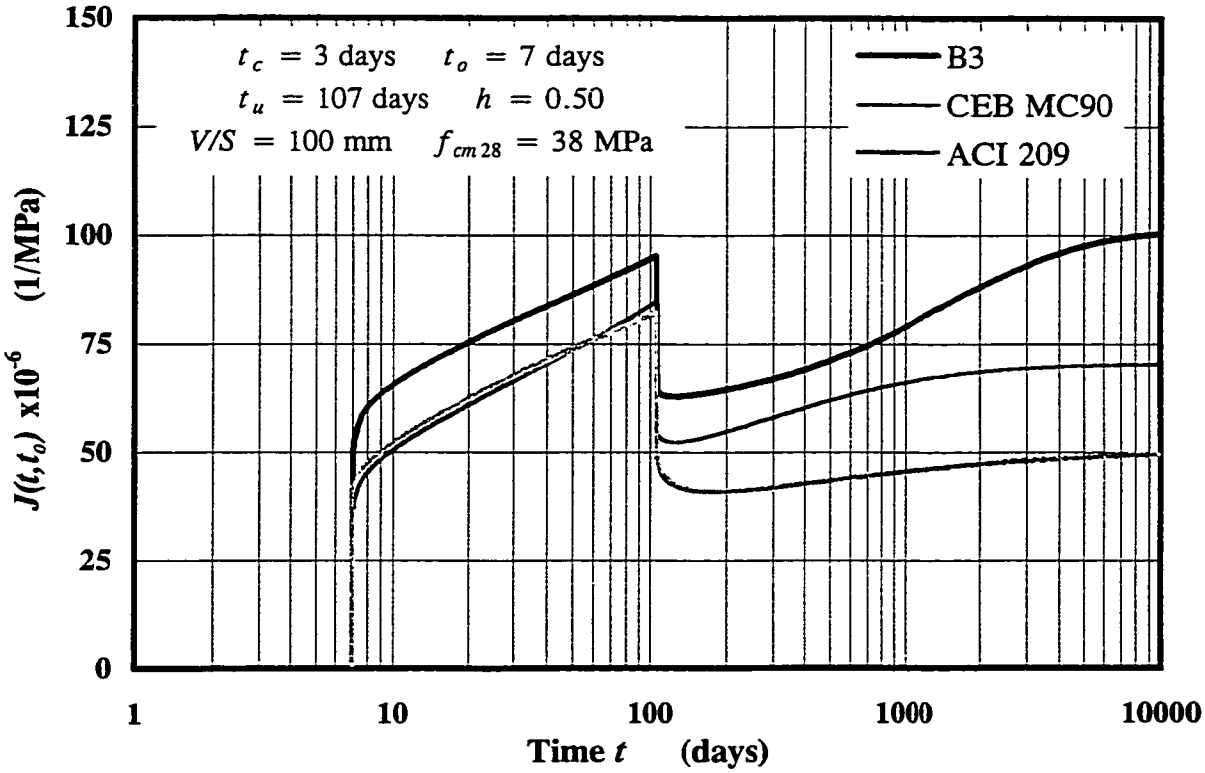


Figure 6.31 B3, CEB MC90 and ACI 209: : Basic recovery of drying concrete



CHAPTER 7

Observations and Discussion

7.1 Additive Assumption

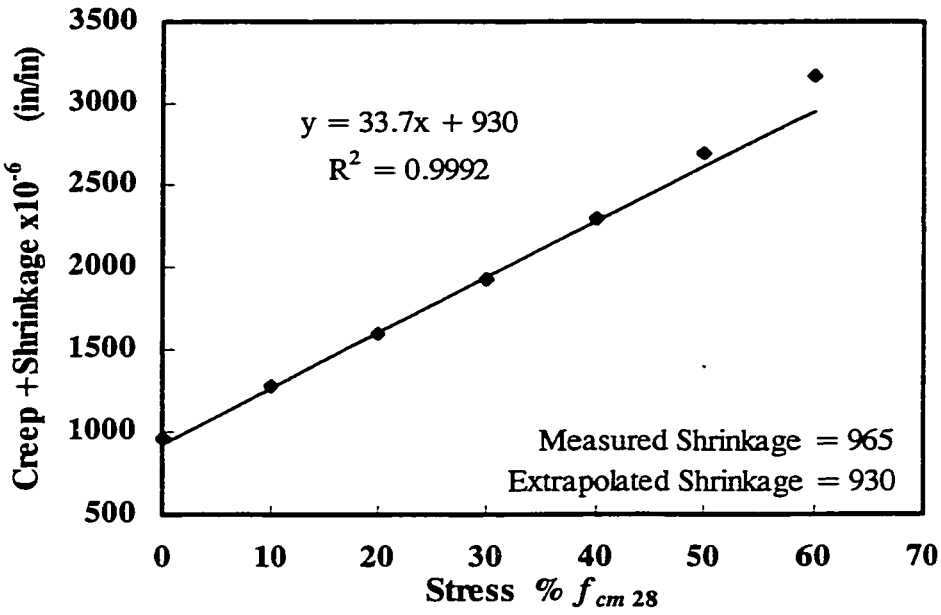
The additive assumption states that shrinkage and creep are effectively independent. Without this assumption, it would be necessary to do creep tests at all stress levels envisaged in service.

$$Total\ Strain = Shrinkage + Elastic + Basic\ Creep + Drying\ Creep \qquad (7.1)$$

This equation is simple and convenient, it allows each individual component of the total strain, except creep, to be determined independently. Rejecting the validity of this equation would be very inconvenient.

Keeton (1965), in a very extensive experimental investigation, measured the total deformations of specimens subjected to zero stress (shrinkage) and stresses of 0.1, 0.2, 0.3, 0.4, 0.5 and 0.6 of available strength at relative humidities of 75%, 50%, 20% and immersed in water. Within the stress range of 10% to 40% of available strength, the creep strains are proportional to stress. Back extrapolating Keeton's experimental results at stresses of 0.1, 0.2, 0.3 and $0.4f_{cm28}$ to zero stress does not give the measured shrinkage strain – however the difference is too small to abandon the principle that shrinkage and creep strains are independent and additive. Figure 7.1 shows Keeton's experimental results of the creep-plus-shrinkage as a function of the applied stress for 6 by 18-inch specimens loaded for 897 days at a relative humidity of 50%. The measured shrinkage was 965×10^{-6} and the back extrapolated shrinkage was 930×10^{-6}, a difference of 4%.

Figure 7.1 Keeton's (1965) experiment, relative humidity of 50 %



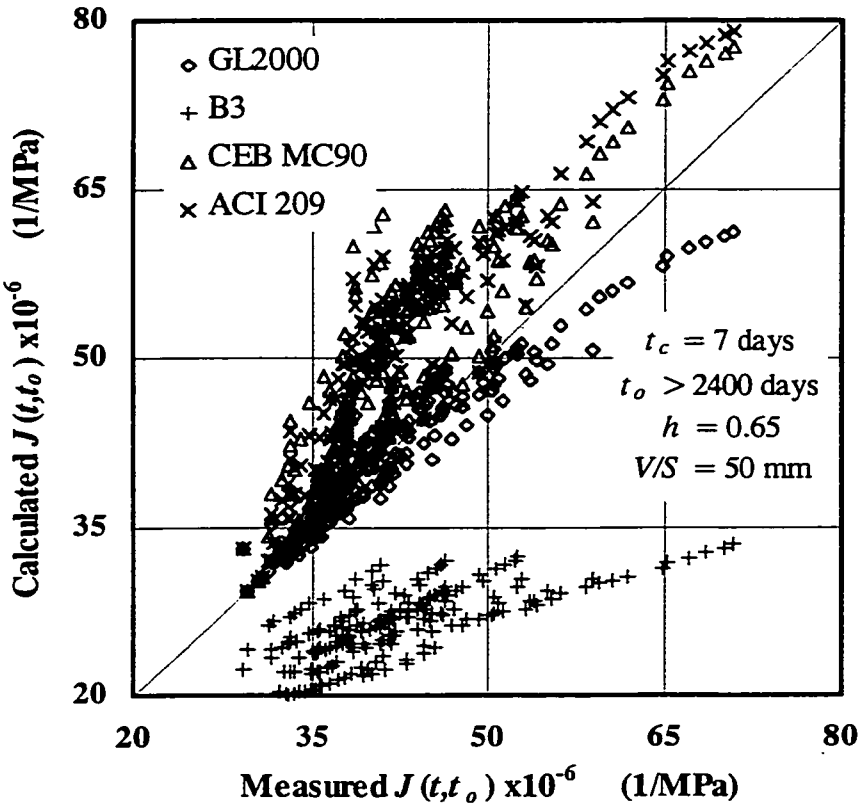
7.2 Drying before Loading

Acker (1993) suggested that drying before loading affects both basic and drying creep. GL2000 takes into account drying before loading for both basic and drying creep, using the $\Phi(t_c)$ correction term. The B3 model considers drying before loading for drying creep only, while ACI 209 and CEB MC90 simply ignore it.

Figure 7.2 shows the GL2000, B3, ACI 209 and CEB MC90 models compared with Wesche's (1978) experimental results for the series with ages of loading greater than 2400 days. The specimens were cured for 7 days. The results are surprising. GL2000 agrees with the experimental results, CEB MC90 and ACI 209 slightly overestimate the compliance and B3 underestimates significantly the compliance. Figure 7.3 shows the same models compared with Browne's (1967) experimental results for a specimen cured until loading at 400 days. GL2000 is the model which

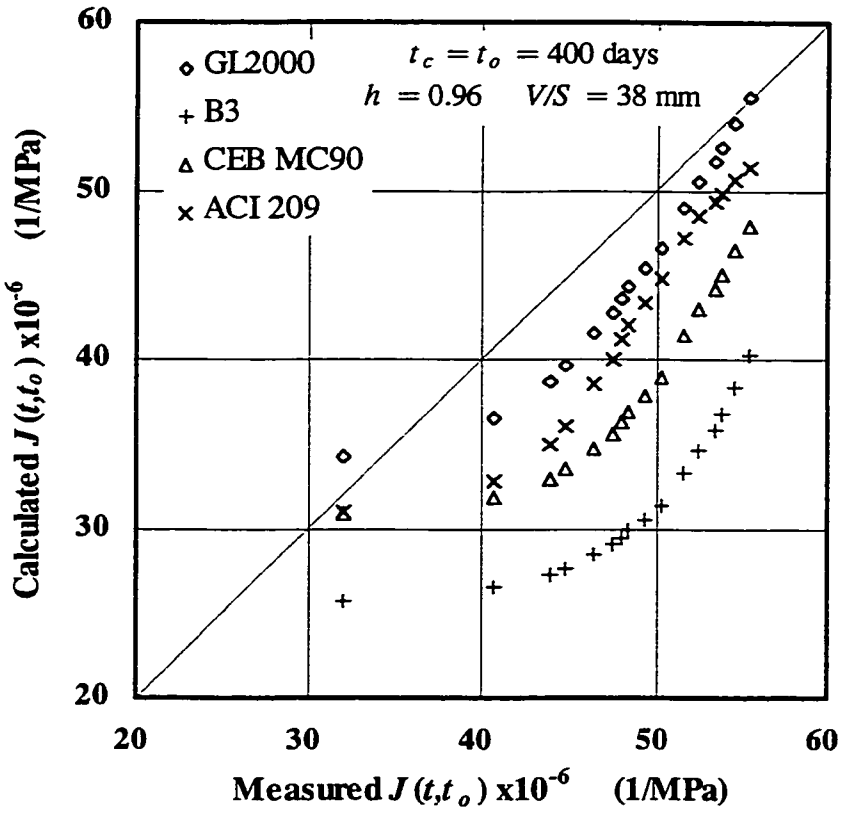
agrees the best with Browne's results, closely followed by ACI 209. CEB MC90 and B3 underestimate the compliance. From these two experiments, the effect of drying before loading can be observed.

Figure 7.2 Wesche's (1978) experiment: t_o > 2400 days



All other conditions being kept constant, creep reduces as the age of loading increases. B3, ACI 209 and CEB MC90 achieve this differently than GL2000. The ACI 209 and CEB MC90 models do not consider drying before loading, but agree with Wesche's results. These two models include correction terms for the age of loading, γ_1 and $\beta(t_o)$ respectively. In a real life situation, concrete is generally cured for several days only, it is probable these models were developed with this information in mind.

Figure 7.3 Browne's (1967) experiment: $t_c = t_o = 400$ days



The compliance is composed of two parts, the elastic strain and the creep strain. For the GL2000, ACI 209 and CEB MC90 models, the elastic strains are calculated using the same formula, $1/E_{cmio}$. B3 calculates it differently and gives much lower elastic strains for concrete loaded at late ages. The formulation of the B3 model is too complex to pinpoint exactly why it underestimates the compliance. The effect of the age of loading seems to be very significant in this model, especially for late ages of loading. GL2000 reduces the creep of older concrete mainly through the drying before loading correction term $\Phi(t_c)$. The second term in the creep coefficient expression of GL2000 has a similar function, but with a lesser degree of importance. The combination of these two terms provides a good balance for old concrete with any duration of curing. For Wesche's experiment, the concrete was cured for 7 days and loaded after 2400 days. For Browne's experiment, the concrete was cured for 400 days and loaded at 400 days. In both cases, GL2000 predicts the measured values.

7.3 Relaxation

Comparison of the five models with Rostasy et al (1972) experimental results indicates that the principle of superposition can be used to calculate relaxation for all the prediction models presented in this thesis. The relaxation calculated by superposition using GL2000 fits the experimental results rather well. For relaxation, the strain remains constant and the stress is reduced due to a creep related phenomena. Since the strain remains constant, the concrete does not really creep. There is no movement of water into or from the specimen. From a general point of view, the principle of superposition could apply when the material properties remain constant. If the strain remains constant, the concrete properties remain constant. Therefore, it is logical that the principle of superposition applies for relaxation, provided that calculations are done keeping the drying before loading term constant at the initial value.

7.4 GL2000 Drying Before Loading Correction Term

For creep recovery calculation using the GL2000 model, the drying before loading correction term, $\Phi(t_c)$, remains constant at the value at the time of loading. $\Phi(t_c)$ remains constant at unloading because the model was developed based on the assumption that no moisture movement, in or out, occurs when the load is removed. Maintaining $\Phi(t_c)$ constant allows the model to achieve constant strain after total removal of the load.

For relaxation, $\Phi(t_c)$ remains constant throughout the relaxation period since the relaxation is essentially an infinite series of unloading with no length change. Since relaxation begins as soon as the concrete is loaded, $\Phi(t_c)$ shall be calculated for that time. Maintaining $\Phi(t_c)$ constant during the relaxation period is essential in order to agree with experimental results and avoid negative relaxation.

Figure 7.4 Concrete subjected to multiple loadings

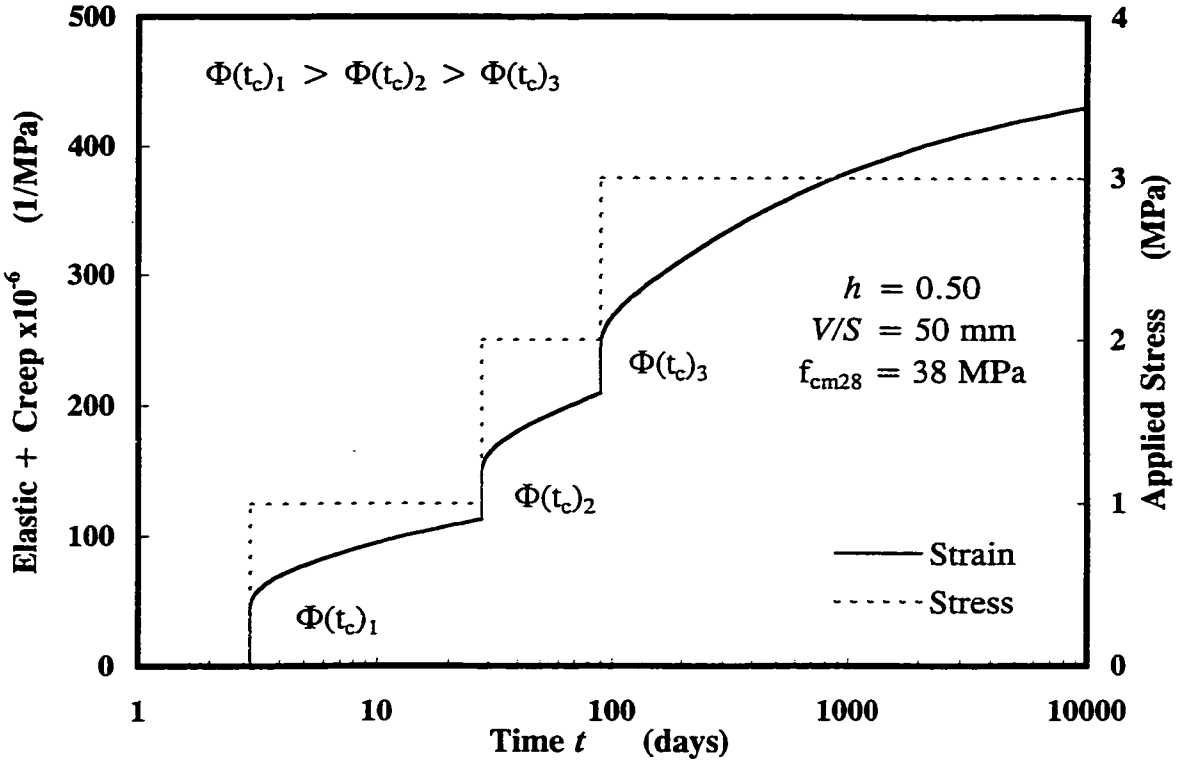
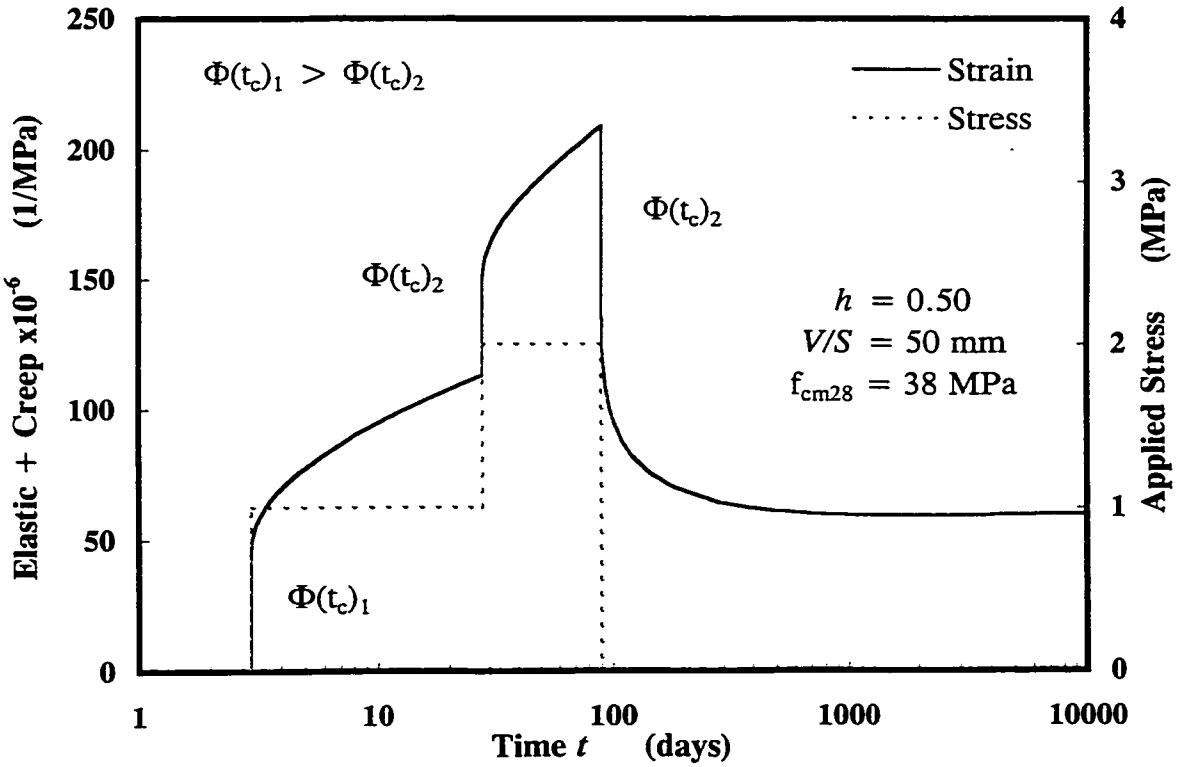


Figure 7.5 Concrete subjected to multiple loading and unloading(s)



Drying before loading is a major complication for concrete subjected to multiple loadings and unloading(s). For the initial loading, the amount of evaporable water can be related to the remaining shrinkage. For a second loading, the amount of evaporable water will be less than calculated by the remaining shrinkage because some of the water will have been lost due to the drying creep between initial loading and the second loading load application. Consequently calculating compliance for a second load or unloading, by superposition is extremely uncertain.

For concrete subjected to multiple loadings (Figure 7.4), a new $\Phi(t_c)$ shall be calculated for each loading. For concrete subjected to multiple loadings and unloading(s) (Figure 7.5), $\Phi(t_c)$ at unloading corresponds to the value calculated at the last loading since it is assumed that no moisture movement occurs when the load is removed. Multiple loadings prior to complete unloading may prevent the model from approaching a constant strain. Depending on the input parameters, the strain may eventually increase slightly after complete unloading. The increase is generally very small and should not be of any concern.

CHAPTER 8

Conclusions and Recommendations

8.1 Conclusions

New shrinkage and compliance expressions, identified as GL2000, were developed based on the Atlanta 97 model. This new model, agrees with most of the data provided in the RILEM shrinkage and compliance data bank. Assuming that the principle of superposition is valid, GL2000 can predict the relaxation of concrete without producing negative relaxation values for ages of loading as early as 1 day. GL2000 agrees with the relaxation experimental results of Rostasy et al (1972). For creep recovery prediction, GL2000 achieves constant strain after complete removal of the load.

The prediction capabilities of the five shrinkage and compliance models being considered by ACI 209 were evaluated by comparison with the RILEM data bank. For shrinkage strain prediction, B3, GL2000 and Atlanta 97 provide the best results. The CEB MC90 gives unsatisfactory results by significantly underestimating the shrinkage. For compliance, GL2000, CEB MC90 and Atlanta 97 give the best prediction. The results calculated by the ACI 209 method are not acceptable since the measured compliances are underestimated for the most of the RILEM data bank. It should be noted that for shrinkage predictions, B3 using the "simplified" approach (Section 5.1.2) provides less satisfactory results.

Relaxation calculated using the five compliance models described in this thesis (GL2000, Atlanta 97, B3, CEB MC90 and ACI 209) agreed with Rostasy et al (1972) experimental results indicating that the principle of superposition can be used to calculate relaxation, provided that calculations are performed keeping the drying before loading term constant at the initial value.

The parametric comparison of models provides a fair analysis of the various compliance models. From a general point of view, CEB MC90 and ACI 209 predict less compliance than GL2000, Atlanta 97 and B3, using the same input parameters. The relaxations calculated by B3 are significantly different than those calculated for the other four models. The "elastic strains" , calculated at $\Delta = 30$ seconds, for this model are very different to those calculated by the other four models. The method of calculating the elastic strain being unique to this model, the initial stresses of relaxation differ radically. For all ages of loading, especially in a drying environment, B3 predicts much more relaxation than any of the other models. For early ages of loading the relaxations calculated using Atlanta 97, CEB MC90 and ACI 209 are nearly 100% of the initial stress with residual stresses close to zero.

For creep recovery, assuming that full creep recovery occurs, GL2000 and B3 are the only models that predict realistic recoveries by superposition. For partial creep recovery, with complete removal of the load, no model provides realistic results.

The principle of superposition should not be used to calculate recovery since experiments conducted by many organisations and researchers demonstrated that creep is not 100% recoverable. GL2000 and B3 were developed to conform to RILEM and ACI 209 guidelines which state that creep strains under complete unloading, recovery, should not become negative and should asymptotically approach a constant value. They were not designed to predict partial recovery.

As all the models are equally competent to calculate relaxation the choice of a code type model can be determined from the parametric study and comparison with the RILEM data bank. B3 and Atlanta 97 exhibit unsatisfactory relaxation, if calculated by superposition, at late and early ages of loading respectively. Comparison with the RILEM data bank shows ACI 209 to be unsatisfactory for creep and the CEB MC90 to

be unsatisfactory for shrinkage. By elimination the only model to satisfy the parametric study and the comparison is GL2000.

8.2 Recommendations

Fundamental experimental research is needed to determine the validity of superposition for concrete under sealed and drying conditions.

Experimental research is also needed to clarify the role of drying before loading in both sealed and drying environments.

Loading before drying is another unexplored topic of research.

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APPENDIX A

Bazant's Letter

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July 6, 1998

To. Members of ACI-209 Working on Prediction Models

Dear Friends:

Enclosed are a few pages from the presentation of the B3 Model submitted to the ACI Symposium volume edited by Al-Manaseer.

It has been claimed that the B3 Model has the disadvantage of requiring more input parameters than just the strength of concrete. As you see on the enclosed pages, however, Model B3 can also be applied when only the strength is known. Of course, when the mix parameters are known also, the predictions are better.

Second, please see the figures A2 and A3 from the appendix to that report, in which comparisons with some other models are made. Long ago I pointed out that the B3 Model is the only one for which the creep recovery curves obtained by the principle of superposition cannot reverse from decent to ascent, i.e. exhibit recovery reversal (negative recovery), and for which the stress relaxation curves obtained by the principles of superposition cannot cross the horizontal axis into stress values of opposite sign. These are pathological phenomena unacceptable for a good model. For a solidifying material, such phenomena imply violation of the second law of thermodynamics and, in the case of Maxwell or Kelvin chain representation used in numerical computations, negative viscosities or negative elastic moduli of the elements of the chain. Such phenomena must be expected to lead to convergence difficulties. Dr Baweja and I have now worked out examples documenting that these phenomena indeed occur for both the GZ Model and the CEB-FIP Model. A model to be recommended by our committees should not exhibit such pathological phenomena.

With best regards.

Sincerely yours,

Zdeněk P. Bažant
Walter P. Murphy Professor
of Civil Engineering and Materials Science

ZPB/djh

To appear in Proc., ACI Symposium on
Creep and Shrinkage, ed. by A. Al-Manaseer,
held in Atlanta in November 1997
American Concrete Institute, Detroit

Creep and Shrinkage Prediction Model for Analysis and Design of Concrete Structures: Model B3

By Z. P. Bažant and S. Baweja

Structural Engineering Report 96-3/ITIc

Department of Civil Engineering
Northwestern University
Evanston, Illinois 60208, USA

March 1996
(Revised May 1998)

1.4.4 Estimation from Concrete Strength and Composition

In the following q_1, q_2, q_3, q_4 and q_5 are in the units of $(10^6 \text{ psi})^{-1}$ or $(\text{MPa})^{-1}$, $\bar{f}_c$ and E_{28} in the units of psi or MPa and $\epsilon_{s\infty}$ and $\epsilon_{sh\infty}$ in the units of 10^{-6}.

Basic Creep

$$\begin{aligned} q_1 &= 0.6 \times 10^6/E_{28}, \qquad E_{28} = 57000\sqrt{\bar{f}_c} \quad \text{inch-pound system} \\ q_1 &= 0.6 \times 10^6/E_{28}, \qquad E_{28} = 4734\sqrt{\bar{f}_c} \quad \text{S.I.} \end{aligned} \tag{1.16}$$

$$\begin{aligned} q_2 &= 451.1\sqrt{c}\bar{f}_c^{-0.9}, \quad q_4 = 0.14(a/c)^{-0.7} \quad \text{inch-pound system} \\ q_2 &= 185.4\sqrt{c}\bar{f}_c^{-0.9}, \quad q_4 = 20.3(a/c)^{-0.7} \quad \text{S.I.} \end{aligned} \tag{1.17}$$

$$q_3 = 0.29(w/c)^4 q_2 \tag{1.18}$$

Shrinkage

$$\begin{aligned} \epsilon_{s\infty} &= -\alpha_1\alpha_2\left[26w^{2.1}\bar{f}_c^{-0.28} + 270\right] \quad (\text{in } 10^{-6}) \quad \text{inch-pound system} \\ \epsilon_{s\infty} &= -\alpha_1\alpha_2\left[1.9 \times 10^{-2}w^{2.1}\bar{f}_c^{-0.28} + 270\right] \quad (\text{in } 10^{-6}) \quad \text{S.I.} \end{aligned} \tag{1.19}$$

and

$$\begin{aligned} k_t &= 190.8t_0^{-0.08}\bar{f}_c^{-1/4} \text{ days/in}^2 \quad \text{inch-pound system} \\ k_t &= 8.5t_0^{-0.08}\bar{f}_c^{-1/4} \text{ days/cm}^2 \quad \text{S.I.} \end{aligned} \tag{1.20}$$

where

$$\alpha_1 = \begin{cases} 1.0 & \text{for type I cement;} \\ 0.85 & \text{for type II cement;} \\ 1.1 & \text{for type III cement.} \end{cases} \tag{1.21}$$

and

$$\alpha_2 = \begin{cases} 0.75 & \text{for steam-curing;} \\ 1.2 & \text{for sealed or normal curing in air with initial protection against drying;} \\ 1.0 & \text{for curing in water or at 100\% relative humidity.} \end{cases} \tag{1.22}$$

Creep at Drying (Same in both inch-pound system and S.I. units)

$$q_5 = 7.57 \times 10^5 \bar{f}_c^{-1} \mid \epsilon_{sh\infty} \mid^{-0.6} \tag{1.23}$$

When only strength $\bar{f}_c$ is known: In that case typical values for c and a/c should be assumed and the w/c should be determined from its relation to $\bar{f}_c$, e.g. $w/c = [(\bar{f}_c/f_w) + 0.535]^{-1}$ with $f_w = 22.8$ MPa (3307 psi) which describes the graph in Fig. 5.6 of Neville[59].

$C_d(t,t',t_0) = q_5[\exp\{-8H(t)\} - \exp\{-8H(t')\}]^{1/2}$ (Eq. 1.14)

$\alpha_1 = 1.0,\ \alpha_2 = 1.0$ (Eq. 1.21–1.22)

$\epsilon_{s\infty} = \alpha_1\alpha_2[26w^{2.1}(\bar{f}_c)^{-0.28}+270] = 1.0\times1.0\times[26\times9.5^{2.1}\times5200^{-0.28}+270] = 537.74 \approx \epsilon_{sh\infty}$ (Eq. 1.19)

$q_5 = 7.57\times10^5(\bar{f}_c)^{-1} \mid \epsilon_{s\infty} \mid^{-0.6} = 3.348(\times10^{-6}/\text{ psi})$ (Eq. 1.23)

$k_s = 1.00$ (Eq. 1.12)

$k_t = 190.8t_0^{-0.08}\bar{f}_c^{-1/4} = 18.192$ (Eq. 1.20)

$D = 2V/S = 6$ in.

$\tau_{sh} = k_t(k_sD)^2 = 18.192\times(1\times36) = 654.9$ days (Eq. 1.11)

$S(t) = \tanh[(t-t_0)/\tau_{sh}]^{0.5} = 1$ (Eq. 1.9)

$S(t') = \tanh[(t'-t_0)/\tau_{sh}]^{0.5} = 0.1449$

$H(t) = 1-(1-h)S(t) = 1-(1-0.6)\times1 = 0.6$ (Eq. 1.15)

$H(t') = 1-(1-h)S(t') = 1-(1-0.6)\times0.1449 = 0.942$

$C_d(t,t',t_0) = 3.348\times[\exp(-8\times0.6)-\exp(-8\times0.94)]^{1/2} = 0.293$

$J(t,t') = q_1 + C_0(t,t') + C_d(t,t',t_0)$

$J(t,t') = 0.146+0.42+0.293 = 0.86\times10^{-6}$ /psi

Creep strain $= J(t,t')\sigma = 0.86\times2000 = 1720\times10^{-6}$

Shrinkage strain $= \epsilon_{sh}(t,t_0) = \epsilon_{sh\infty}k_hS(t)$ (Eq. 1.8)

$k_h = 1-0.6^3$ (Eq. 1.10)

Shrinkage strain $= \epsilon_{sh}(t,t_0) = 537.7\times0.784 = 421.5\times10^{-6}$

Case 2 Concrete Mix Parameters Unknown: Only strength $\bar{f}_c = 5200$ psi is given. The water cement ratio may then be estimated as $w/c = [(\bar{f}_c/f_w) + 0.535]^{-1} = (5200/3307+0.535)^{-1} = 0.474$. Parameters no. 7–11 must be estimated as typical values for the concretes in the geographical region. The subsequent calculation is the same as above. In the absence of availability of information on typical values of parameters 7–11, values around the middle of the parameter ranges of the applicability of the model (Eq. 1.1–1.2) may be used for rough estimates on creep and shrinkage values.

APPENDIX B

Gardner's Letter to Muller

1999-11-08

Hello Harald

I checked Wesche's data against the data bank and found the following - however I do not speak German so I cannot guarantee my translation. Cement PZ275 W and S are omitted. The following files are out of order compared with the legend - I have only checked Wesche 63.

N.J. Gardner

Cement Type C is Type III
Cement Types H, I, J are Type II due to slag addition
All other cements are Type I.

File Number	Should be	
15	63/H/3/3	
16	63/H/7/7	
17	63/H/7/28	
18	63/H/7/2737	
19	63/I/7/7	
20	63/I/7/28	
21	63/I/7/3300	
22	63/J/7/7	
23	63/J/7/28	
24	63/J/7/2707	
25	63/D/7/28	
26	63/E/7/28	
27	63/F/7/28	
28	63/G/7/28	
29	63/D/7/2477	
30	63/E/7/2477	
31	63/F/7/2477	
32	63/G/7/2446	

APPENDIX C

RILEM Data Bank: Additional Graphs

Figure C.1 GL2000 vs. RILEM shrinkage data bank: rejected data

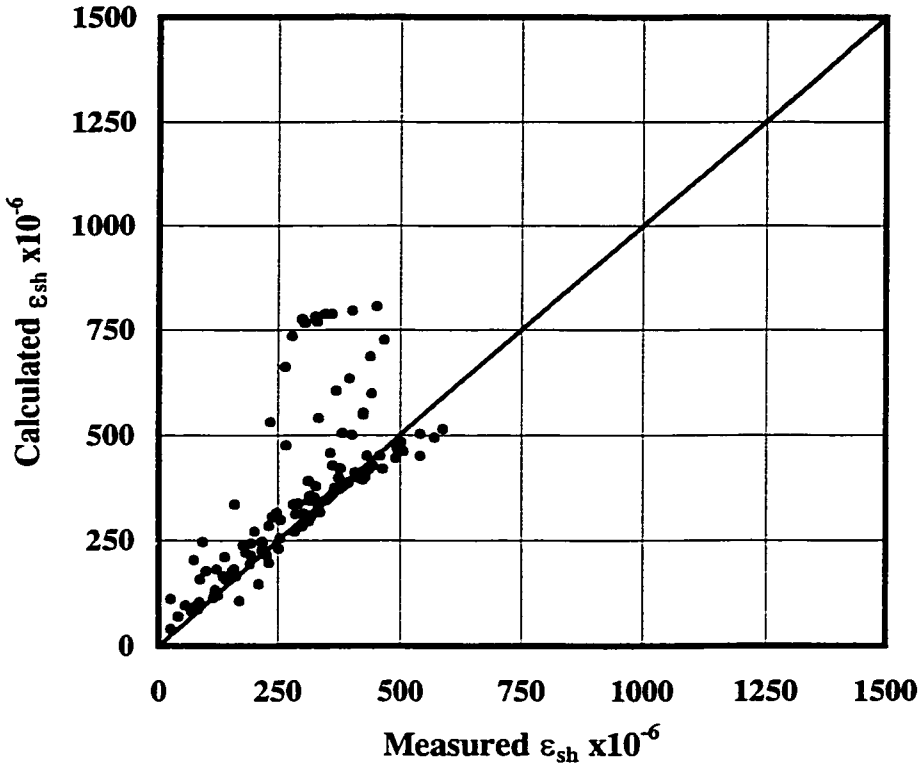


Figure C.2 GL2000 vs. RILEM compliance data bank: rejected data

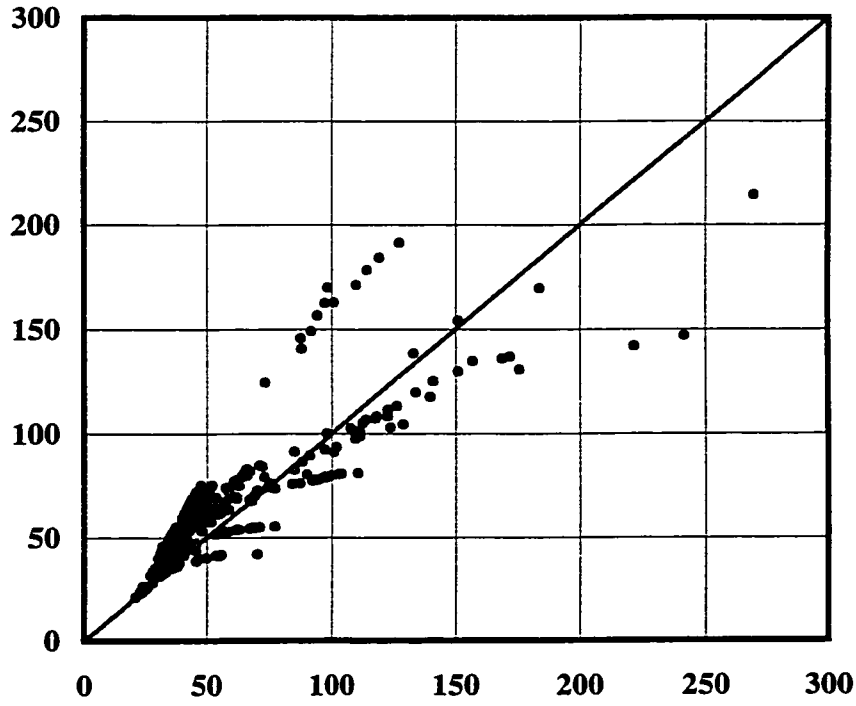


Figure C.3 "Simplified" B3 vs. RILEM shrinkage data bank

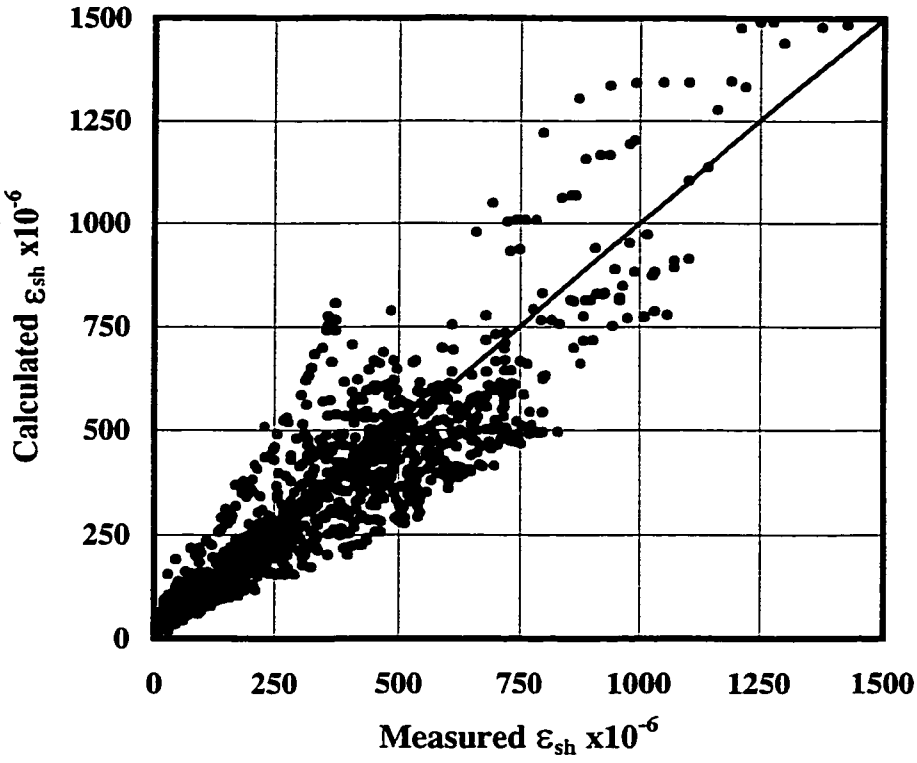
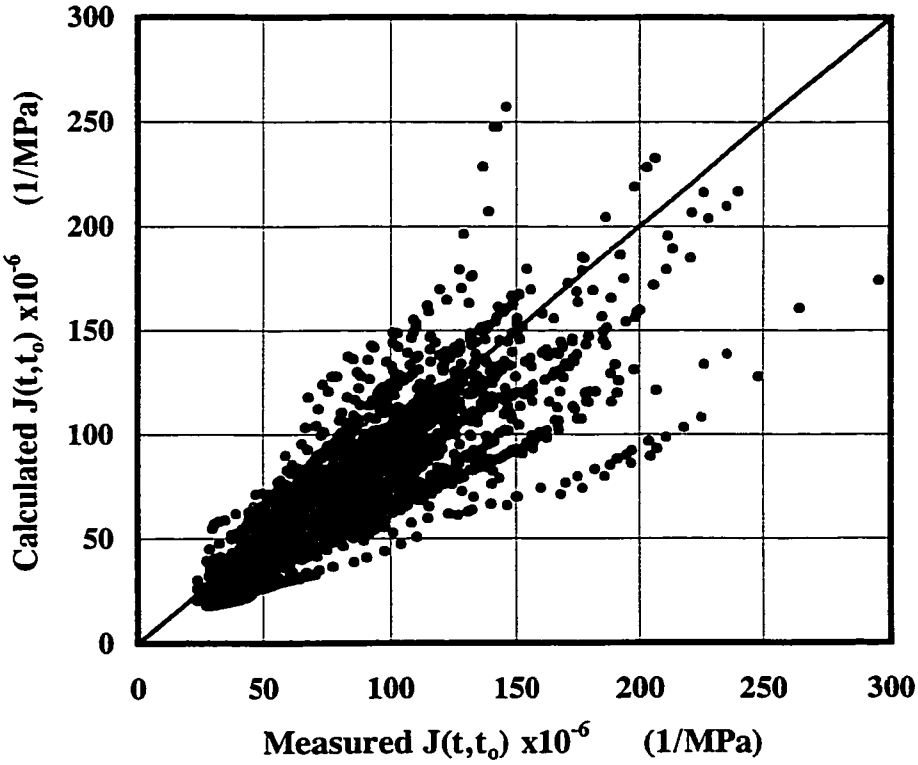


Figure C.4 "Simplified" B3 vs. RILEM compliance data bank



APPENDIX D

RILEM Data Bank: Tables

Table D.1 RILEM shrinkage data bank

Series	V/S	h	days		Cem	Content kg/m^3			Exp. MPa		Shrinkage x10^{-6}						
	mm	%	t_c	t	Type	c	w	a	f_{cm28}	E_{cm28}	EXP	GL	ATL	B3	CEB	ACI	S.B3
Troxell	25	50	28	41	1	320	189	1814	17.2	20000	230	437	342	311	260	177	507
5/50/1	25	50	28	56	1	320	189	1814	17.2	20000	406	602	478	433	356	290	705
	25	50	28	118	1	320	189	1814	17.2	20000	693	881	645	643	517	470	1048
	25	50	28	218	1	320	189	1814	17.2	20000	800	1034	723	748	602	551	1220
	25	50	28	393	1	320	189	1814	17.2	20000	876	1129	779	799	655	596	1303
	25	50	28	758	1	320	189	1814	17.2	20000	940	1193	831	819	690	623	1335
	25	50	28	1853	1	320	189	1814	17.2	20000	992	1237	893	823	714	641	1342
	25	50	28	3678	1	320	189	1814	17.2	20000	1047	1253	937	823	723	647	1342
	25	50	28	8988	1	320	189	1814	17.2	20000	1100	1263	993	823	728	650	1342
Troxell	25	70	28	40	1	320	189	1814	17.2	20000	165	326	254	225	188	130	367
5/70/02	25	70	28	56	1	320	189	1814	17.2	20000	277	465	370	325	267	226	530
	25	70	28	118	1	320	189	1814	17.2	20000	485	682	499	483	388	366	787
	25	70	28	393	1	320	189	1814	17.2	20000	660	874	603	600	492	463	978
	25	70	28	758	1	320	189	1814	17.2	20000	725	923	643	615	518	485	1002
	25	70	28	1853	1	320	189	1814	17.2	20000	743	957	691	618	536	498	1007
	25	70	28	3678	1	320	189	1814	17.2	20000	762	970	725	618	543	503	1008
	25	70	28	7094	1	320	189	1814	17.2	20000	785	976	757	618	546	505	1008
Brooks	19	60	14	21	3	374	251	1777	20.7	21419	285	412	360	442	221	93	428
74/B/60/03	19	60	14	28	3	374	251	1777	20.7	21399	420	552	496	597	296	160	579
	19	60	14	42	3	374	251	1777	20.7	21399	610	712	617	778	379	249	754
	19	60	14	379	3	374	251	1777	20.7	21399	890	1140	903	1 193	597	511	1156
	19	60	14	1839	3	374	251	1777	20.7	21399	920	1205	1025	1 202	629	550	1165
	19	60	14	3664	3	374	251	1777	20.7	21399	940	1214	1075	1 202	633	555	1165
Brooks	19	60	14	21	3	379	220	1800	32.7	26254	330	326	285	347	197	94	314
74/C/60/05	19	60	14	28	3	379	220	1800	32.7	26254	450	437	393	467	263	161	423
	19	60	14	42	3	379	220	1800	32.7	26254	610	563	489	604	337	250	547
	19	60	14	379	3	379	220	1800	32.7	26254	865	903	715	894	531	513	809
	19	60	14	1839	3	379	220	1800	32.7	26254	890	954	812	899	559	551	814
	19	60	14	3664	3	379	220	1800	32.7	26254	900	961	851	899	563	557	814
Brooks	19	60	14	21	3	382	206	1815	34.7	28826	270	305	267	313	186	94	287
74/D/60/07	19	60	14	28	3	382	206	1815	34.7	28826	380	409	367	421	249	161	386
	19	60	14	42	3	382	206	1815	34.7	28826	485	527	457	543	319	250	498
	19	60	14	379	3	382	206	1815	34.7	28826	700	845	669	797	502	514	730
	19	60	14	1839	3	382	206	1815	34.7	28826	720	892	759	801	529	553	734
	19	60	14	3664	3	382	206	1815	34.7	28826	720	899	796	801	532	558	734
Brooks	19	60	14	21	3	384	192	1824	38.9	30513	275	287	251	283	175	94	265
74/E/60/09	19	60	14	28	3	384	192	1824	38.9	30513	380	385	345	380	234	161	355
	19	60	14	42	3	384	192	1824	38.9	30513	485	496	430	490	300	251	457
	19	60	14	379	3	384	192	1824	38.9	30513	700	795	629	712	473	514	665
	19	60	14	1839	3	384	192	1824	38.9	30513	720	840	714	715	498	553	668
	19	60	14	3664	3	384	192	1824	38.9	30513	720	846	749	715	501	558	668
Brooks	19	60	14	21	3	366	293	1739	21.5	13746	450	488	426	594	231	93	528
F	19	60	14	28	3	366	293	1739	21.5	13746	680	654	587	805	309	159	716
	19	60	14	42	3	366	293	1739	21.5	13746	910	842	731	1·055	396	248	939
	19	60	14	379	3	366	293	1739	21.5	13746	1210	1350	1069	1·660	623	509	1477
	19	60	14	1839	3	366	293	1739	21.5	13746	1250	1427	1214	1·676	656	547	1491
	19	60	14	3664	3	366	293	1739	21.5	13746	1278	1437	1273	1·676	661	552	1491
Brooks	19	60	14	21	3	374	251	1777	29.3	15196	320	419	366	443	221	93	439
G	19	60	14	28	3	374	251	1777	29.3	15196	480	562	505	600	296	160	594
	19	60	14	42	3	374	251	1777	29.3	15196	680	725	628	782	379	249	775
	19	60	14	379	3	374	251	1777	29.3	15196	980	1161	919	1 203	597	511	1192

	19	60	14	1839	3	374	251	1777	29.3	15196	990	1227	1044	1212	629	550	1201
	19	60	14	3664	3	374	251	1777	29.3	15196	990	1236	1095	1212	633	555	1201
Brooks	19	60	14	21	3	380	213	1805	31.6	17840	260	389	340	340	216	94	397
H	19	60	14	28	3	380	213	1805	31.6	17840	420	521	468	459	288	161	536
	19	60	14	42	3	380	213	1805	31.6	17840	590	671	582	597	370	250	697
	19	60	14	379	3	380	213	1805	31.6	17840	840	1076	852	907	582	513	1060
	19	60	14	1839	3	380	213	1805	31.6	17840	860	1137	967	914	613	552	1068
	19	60	14	3664	3	380	213	1805	31.6	17840	870	1145	1014	914	617	557	1068
Brooks	19	60	14	21	3	385	185	1829	38.7	18303	195	357	312	277	208	94	355
I	19	60	14	28	3	385	185	1829	38.7	18303	320	479	430	373	277	161	478
	19	60	14	42	3	385	185	1829	38.7	18303	490	617	535	484	356	251	620
	19	60	14	379	3	385	185	1829	38.7	18303	730	989	783	726	560	515	931
	19	60	14	1839	3	385	185	1829	38.7	18303	750	1045	889	731	590	554	937
	19	60	14	3664	3	385	185	1829	38.7	18303	750	1053	933	731	594	559	937
Wischers	38	65	4.5	8	1	325	156	1905	50.1	35707	29	70	38	62	45	49	62
61/A/4.54/01	38	65	4.5	12	1	325	156	1905	50.1	35707	62	106	84	95	68	103	94
	38	65	4.5	33	1	325	156	1905	50.1	35707	174	203	222	181	130	274	180
	38	65	4.5	96	1	325	156	1905	50.1	35707	295	326	351	291	208	446	289
	38	65	4.5	187	1	325	156	1905	50.1	35707	350	404	411	360	256	518	356
	38	65	4.5	371	1	325	156	1905	50.1	35707	385	473	458	413	298	563	409
	38	65	4.5	735	1	325	156	1905	50.1	35707	409	523	495	442	328	589	438
	38	65	4.5	2195	1	325	156	1905	50.1	35707	432	567	544	453	354	607	449
Wischers	38	65	8	11	1	325	156	1905	50.1	35707	15	70	34	64	45	46	63
61/A/28/03	38	65	8	15	1	325	156	1905	50.1	35707	48	106	76	97	68	97	96
	38	65	8	36	1	325	156	1905	50.1	35707	172	203	200	185	130	258	183
	38	65	8	99	1	325	156	1905	50.1	35707	298	326	316	296	208	419	293
	38	65	8	190	1	325	156	1905	50.1	35707	357	404	370	364	256	487	360
	38	65	8	373	1	325	156	1905	50.1	35707	394	472	412	416	298	530	412
	38	65	8	738	1	325	156	1905	50.1	35707	421	523	446	443	328	554	439
	38	65	8	2198	1	325	156	1905	50.1	35707	455	567	490	453	354	572	449
Wischers	38	65	28	35	1	325	156	1905	50.1	35707	40	106	65	101	68	85	101
61/A/8/02	38	65	28	56	1	325	156	1905	50.1	35707	159	203	172	193	130	226	191
	38	65	28	119	1	325	156	1905	50.1	35707	292	326	271	306	208	367	304
	38	65	28	210	1	325	156	1905	50.1	35707	351	404	317	373	256	427	369
	38	65	28	393	1	325	156	1905	50.1	35707	384	472	353	421	298	464	417
	38	65	28	758	1	325	156	1905	50.1	35707	413	523	382	445	328	485	441
	38	65	28	2218	1	325	156	1905	50.1	35707	440	567	421	454	354	501	449
Wischers	38	65	5	6	1	410	197	1738	45.7	33508	22	43	13	48	29	18	39
61/B/4.92/04	38	65	5	8	1	410	197	1738	45.7	33508	64	75	40	82	51	51	67
	38	65	5	12	1	410	197	1738	45.7	33508	114	113	88	124	76	107	101
	38	65	5	33	1	410	197	1738	45.7	33508	259	215	231	239	145	286	193
	38	65	5	96	1	410	197	1738	45.7	33508	415	345	365	385	232	465	312
	38	65	5	187	1	410	197	1738	45.7	33508	486	428	426	476	286	540	385
	38	65	5	370	1	410	197	1738	45.7	33508	520	501	475	547	332	587	443
	38	65	5	735	1	410	197	1738	45.7	33508	548	554	514	587	366	614	475
	38	65	5	2195	1	410	197	1738	45.7	33508	575	601	565	603	395	633	488
Wischers	38	65	10	11	1	410	197	1738	45.7	33508	24	43	11	49	29	17	40
61/B/10/05	38	65	10	13	1	410	197	1738	45.7	33508	61	75	35	84	51	47	68
	38	65	10	17	1	410	197	1738	45.7	33508	81	113	78	128	76	100	104
	38	65	10	38	1	410	197	1738	45.7	33508	240	215	205	245	145	266	198
	38	65	10	100	1	410	197	1738	45.7	33508	381	344	323	391	231	431	317
	38	65	10	192	1	410	197	1738	45.7	33508	447	428	379	482	286	502	391
	38	65	10	375	1	410	197	1738	45.7	33508	484	501	422	552	332	546	447
	38	65	10	740	1	410	197	1738	45.7	33508	514	554	457	589	366	571	477
	38	65	10	2200	1	410	197	1738	45.7	33508	545	601	502	603	395	589	488
Wischers	38	65	28	29	1	410	197	1738	45.7	33508	6	43	10	51	29	15	41
61/B/28/E/06	38	65	28	31	1	410	197	1738	45.7	33508	27	75	31	88	51	42	71
	38	65	28	35	1	410	197	1738	45.7	33508	77	113	69	133	76	89	108

	38	65	28	56	1	410	197	1738	45.7	33508	228	215	182	254	145	238	206
	38	65	28	119	1	410	197	1738	45.7	33508	382	345	288	404	232	387	327
	38	65	28	210	1	410	197	1738	45.7	33508	463	428	336	492	286	450	399
	38	65	28	393	1	410	197	1738	45.7	33508	498	501	375	558	332	490	452
	38	65	28	758	1	410	197	1738	45.7	33508	538	554	405	591	366	512	479
	38	65	28	2218	1	410	197	1738	45.7	33508	575	601	446	603	395	528	488
Wischers	38	65	3	4	3	325	156	1905	48.8	38194	44	45	14	39	24	18	37
	38	65	3	6	3	325	156	1905	48.8	38194	81	78	44	67	41	51	64
	38	65	3	10	3	325	156	1905	48.8	38194	134	118	98	102	62	107	98
	38	65	3	31	3	325	156	1905	48.8	38194	236	226	257	196	118	286	187
	38	65	3	93	3	325	156	1905	48.8	38194	361	360	405	315	187	464	301
	38	65	3	185	3	325	156	1905	48.8	38194	426	448	475	391	231	540	373
	38	65	3	368	3	325	156	1905	48.8	38194	471	525	529	449	269	588	429
	38	65	3	733	3	325	156	1905	48.8	38194	496	580	572	482	296	615	460
	38	65	3	2193	3	325	156	1905	48.8	38194	508	629	629	494	320	634	472
Wischers	38	65	28	31	3	325	156	1905	48.8	38194	28	78	38	74	41	40	70
	38	65	28	35	3	325	156	1905	48.8	38194	93	118	84	111	62	85	106
	38	65	28	56	3	325	156	1905	48.8	38194	211	226	221	212	118	226	203
	38	65	28	119	3	325	156	1905	48.8	38194	331	362	349	336	188	367	321
	38	65	28	210	3	325	156	1905	48.8	38194	392	448	408	408	231	427	389
	38	65	28	393	3	325	156	1905	48.8	38194	432	525	454	460	269	464	439
	38	65	28	758	3	325	156	1905	48.8	38194	456	580	492	486	296	485	464
	38	65	28	2218	3	325	156	1905	48.8	38194	479	629	541	495	320	501	472
Wischers	38	65	1.5	3	3	410	197	1738	44.1	31301	39	52	18	50	32	20	43
	38	65	1.5	5	3	410	197	1738	44.1	31301	92	90	56	87	54	58	74
	38	65	1.5	9	3	410	197	1738	44.1	31301	132	136	124	131	82	122	112
	38	65	1.5	30	3	410	197	1738	44.1	31301	264	260	327	253	157	325	216
	38	65	1.5	93	3	410	197	1738	44.1	31301	397	417	517	412	249	528	352
	38	65	1.5	184	3	410	197	1738	44.1	31301	484	516	604	515	307	613	440
	38	65	1.5	367	3	410	197	1738	44.1	31301	529	604	673	600	358	667	513
	38	65	1.5	732	3	410	197	1738	44.1	31301	571	668	728	650	394	697	556
	38	65	1.5	2192	3	410	197	1738	44.1	31301	601	725	801	673	425	719	575
Wischers	38	65	3	4	3	410	197	1738	44.1	31301	57	52	16	52	32	19	44
	38	65	3	6	3	410	197	1738	44.1	31301	96	90	51	89	54	54	76
	38	65	3	10	3	410	197	1738	44.1	31301	161	136	112	135	82	113	115
	38	65	3	31	3	410	197	1738	44.1	31301	322	260	296	259	157	302	222
	38	65	3	93	3	410	197	1738	44.1	31301	463	415	466	419	248	489	358
	38	65	3	185	3	410	197	1738	44.1	31301	558	516	547	523	307	570	447
	38	65	3	368	3	410	197	1738	44.1	31301	605	604	609	605	358	620	518
	38	65	3	733	3	410	197	1738	44.1	31301	644	668	659	653	394	648	558
	38	65	3	2193	3	410	197	1738	44.1	31301	677	725	725	673	425	668	575
Wischers	38	65	28	31	3	410	197	1738	44.1	31300	40	90	44	97	54	42	83
	38	65	28	35	3	410	197	1738	44.1	31300	90	136	96	147	82	89	126
	38	65	28	56	3	410	197	1738	44.1	31300	234	260	254	281	157	238	240
	38	65	28	119	3	410	197	1738	44.1	31300	378	417	402	447	249	387	382
	38	65	28	210	3	410	197	1738	44.1	31300	456	516	470	547	307	450	467
	38	65	28	393	3	410	197	1738	44.1	31300	506	604	523	621	358	490	531
	38	65	28	758	3	410	197	1738	44.1	31300	547	668	566	659	394	512	564
	38	65	28	2218	3	410	197	1738	44.1	31300	593	725	622	673	425	528	576
Wischers	38	65	1.6	30	3	400	160	1813	54.6	35500	189	230	286	197	127	321	186
	38	65	1.6	93	3	400	160	1813	54.6	35500	269	368	452	319	202	522	302
	38	65	1.6	184	3	400	160	1813	54.6	35500	325	456	528	396	249	606	375
	38	65	1.6	362	3	400	160	1813	54.6	35500	360	532	587	458	289	658	433
	38	65	1.6	732	3	400	160	1813	54.6	35500	385	591	637	494	319	689	467
	38	65	1.6	2192	3	400	160	1813	54.6	35500	414	640	700	509	345	711	481
Wischers	38	65	0.5	29	3	400	160	1813	54.6	39809	228	215	338	188	102	363	166
	38	65	0.5	92	3	400	160	1813	54.6	39809	313	344	535	307	163	590	271
	38	65	0.5	183	3	400	160	1813	54.6	39809	361	426	625	383	200	685	338

	38	65	0.5	366	3	400	160	1813	54.6	39809	401	499	696	447	233	745	394
	38	65	0.5	731	3	400	160	1813	54.6	39809	423	552	753	484	257	779	427
	38	65	0.5	2191	3	400	160	1813	54.6	39809	441	599	828	500	277	804	441
Wischers	38	65	28	56	3	400	160	1813	54.6	39809	141	215	210	217	102	237	192
	38	65	28	119	3	400	160	1813	54.6	39809	215	344	332	343	163	386	302
	38	65	28	210	3	400	160	1813	54.6	39809	255	426	388	415	200	448	366
	38	65	28	393	3	400	160	1813	54.6	39809	303	499	432	467	233	487	412
	38	65	28	758	3	400	160	1813	54.6	39809	328	552	467	493	257	510	434
	38	65	28	2218	3	400	160	1813	54.6	39809	344	599	514	501	277	526	442
Hummel I	50	65	7	14	2	334	184	1802	28.1	26300	65	77	49	76	65	91	92
11/A/01	50	65	7	28	2	334	184	1802	28.1	26300	140	132	124	130	111	204	157
	50	65	7	56	2	334	184	1802	28.1	26300	200	194	212	192	163	318	233
	50	65	7	118	2	334	184	1802	28.1	26300	285	273	300	273	228	414	331
	50	65	7	299	2	334	184	1802	28.1	26300	390	378	385	382	314	486	463
	50	65	7	572	2	334	184	1802	28.1	26300	430	443	428	446	366	513	541
	50	65	7	1606	2	334	184	1802	28.1	26300	455	514	480	500	422	533	606
Hummel 2	50	65	7	31	1	334	184	1802	42.7	30900	140	164	156	160	115	222	151
11/A/01	50	65	7	31	1	334	184	1802	42.7	30900	140	164	156	160	115	222	151
	50	65	7	93	1	334	184	1802	42.7	30900	280	289	312	283	201	387	268
	50	65	7	184	1	334	184	1802	42.7	30900	390	379	392	371	262	455	353
	50	65	7	363	1	334	184	1802	42.7	30900	470	468	454	456	321	496	433
	50	65	7	719	1	334	184	1802	42.7	30900	490	542	502	519	370	519	493
	50	65	7	1309	1	334	184	1802	42.7	30900	500	590	536	549	401	531	521
Hummel 4	50	65	7	28	2	345	155	1860	40.6	31800	115	108	102	105	94	206	120
	50	65	7	42	2	345	155	1860	40.6	31800	150	137	143	133	119	274	153
	50	65	7	90	2	345	155	1860	40.6	31800	210	199	221	195	173	386	224
	50	65	7	178	2	345	155	1860	40.6	31800	275	261	279	257	226	455	295
	50	65	7	360	2	345	155	1860	40.6	31800	305	325	326	318	279	499	366
	50	65	7	755	2	345	155	1860	40.6	31800	310	381	363	365	325	524	420
	50	65	7	1447	2	345	155	1860	40.6	31800	350	416	389	386	354	536	444
Hummel 5	50	65	7	28	2	328	213	1769	34.2	32300	95	111	105	155	96	204	125
	50	65	7	42	2	328	213	1769	34.2	32300	110	141	148	196	122	271	159
	50	65	7	90	2	328	213	1769	34.2	32300	185	205	228	288	177	382	233
	50	65	7	178	2	328	213	1769	34.2	32300	225	269	288	380	231	451	308
	50	65	7	388	2	328	213	1769	34.2	32300	275	342	340	480	291	497	389
	50	65	7	762	2	328	213	1769	34.2	32300	285	393	374	542	334	519	440
	50	65	7	1454	2	328	213	1769	34.2	32300	350	429	401	574	362	530	465
Hanson	152	50	8	50	3	303	215	1818	39.8	25100	95	112	71	117	70	204	105
20/303/07	152	50	8	50	3	303	215	1818	39.8	25100	95	112	71	117	70	204	105
	152	50	8	100	3	303	215	1818	39.8	25100	161	164	148	173	103	270	155
	152	50	8	200	3	303	215	1818	39.8	25100	242	234	268	247	146	316	221
	152	50	8	400	3	303	215	1818	39.8	25100	322	325	422	345	203	343	308
	152	50	8	800	3	303	215	1818	39.8	25100	403	440	583	469	274	357	420
	152	50	8	1367	3	303	215	1818	39.8	25100	483	542	694	580	336	364	519
Hanson	102	50	8	50	3	303	215	1818	37.4	27920	215	161	137	174	101	248	150
20/203/05	102	50	8	50	3	303	215	1818	37.4	27920	215	161	137	174	101	248	150
	102	50	8	100	3	303	215	1818	37.4	27920	289	234	255	255	147	330	219
	102	50	8	200	3	303	215	1818	37.4	27920	389	328	403	358	205	385	308
	102	50	8	400	3	303	215	1818	37.4	27920	493	444	552	487	277	418	419
	102	50	8	800	3	303	215	1818	37.4	27920	564	575	678	634	357	436	545
	102	50	8	1367	3	303	215	1818	37.4	27920	611	676	756	744	417	444	640
Hanson	51	50	8	50	3	303	215	1818	41.5	24340	403	320	345	339	200	325	303
20/101/03	51	50	8	50	3	303	215	1818	41.5	24340	403	320	345	339	200	325	303
	51	50	8	100	3	303	215	1818	41.5	24340	540	449	500	477	279	432	427
	51	50	8	200	3	303	215	1818	41.5	24340	570	589	628	631	365	504	565
	51	50	8	400	3	303	215	1818	41.5	24340	718	726	725	777	447	547	696
	51	50	8	800	3	303	215	1818	41.5	24340	779	839	800	884	513	571	791
	51	50	8	1300	3	303	215	1818	41.5	24340	799	898	843	927	548	581	830

Hanson	25	50	8	50	3	303	215	1818	41.1	25720	698	551	527	600	343	402	524
20/51/01	25	50	8	50	3	303	215	1818	41.1	25720	698	551	527	600	343	402	524
	25	50	8	100	3	303	215	1818	41.1	25720	752	700	629	761	433	534	665
	25	50	8	200	3	303	215	1818	41.1	25720	819	817	703	875	502	623	764
	25	50	8	400	3	303	215	1818	41.1	25720	859	897	761	931	549	677	813
	25	50	8	800	3	303	215	1818	41.1	25720	913	946	812	949	577	706	828
	25	50	8	1150	3	303	215	1818	41.1	25720	930	962	836	951	586	715	830
Hanson	102	50	8	100	3	303	215	1818	34.3	12537	540	314	343	265	172	330	326
	102	50	8	100	3	303	215	1818	34.3	12537	540	314	343	265	172	330	326
	102	50	8	200	3	303	215	1818	34.3	12537	620	440	541	375	240	385	460
	102	50	8	400	3	303	215	1818	34.3	12537	800	596	740	512	324	418	630
	102	50	8	800	3	303	215	1818	34.3	12537	926	771	909	673	418	436	826
	102	50	8	1236	3	303	215	1818	34.3	12537	980	882	996	775	476	443	952
Hanson	51	50	8	100	3	303	215	1818	30.1	12537	880	616	685	504	323	432	660
	51	50	8	100	3	303	215	1818	30.1	12537	880	616	685	504	323	432	660
	51	50	8	200	3	303	215	1818	30.1	12537	990	809	861	673	422	504	882
	51	50	8	400	3	303	215	1818	30.1	12537	1100	996	995	841	517	547	1102
	51	50	8	800	3	303	215	1818	30.1	12537	1160	1151	1098	973	593	571	1275
	51	50	8	1256	3	303	215	1818	30.1	12537	1190	1227	1153	1028	631	580	1346
Hanson	25	50	8	100	3	303	215	1818	27.7	12537	1140	1016	913	834	514	534	1135
	25	50	8	100	3	303	215	1818	27.7	12537	1140	1016	913	834	514	534	1135
	25	50	8	200	3	303	215	1818	27.7	12537	1220	1186	1020	979	597	623	1332
	25	50	8	400	3	303	215	1818	27.7	12537	1300	1303	1105	1058	653	677	1440
	25	50	8	800	3	303	215	1818	27.7	12537	1376	1373	1178	1086	686	706	1478
	25	50	8	1261	3	303	215	1818	27.7	12540	1426	1402	1223	1091	699	717	1484
Bryant	25	60	8	14	1	390	183	1985	50.1	26000	160	183	147	173	131	84	172
	25	60	8	28	1	390	183	1985	50.1	26000	350	313	290	297	222	210	295
	25	60	8	84	1	390	183	1985	50.1	26000	557	499	429	474	352	395	471
	25	60	8	182	1	390	183	1985	50.1	26000	622	601	490	561	421	480	557
	25	60	8	392	1	390	183	1985	50.1	26000	695	668	536	601	466	528	597
	25	60	8	695	1	390	183	1985	50.1	26000	714	699	566	610	486	549	606
	25	60	8	1943	1	390	183	1985	50.1	26000	732	728	614	612	505	566	609
	25	60	8	3500	1	390	183	1985	50.1	26000	740	736	639	612	509	571	609
Bryant	38	60	8	14	1	390	183	1985	50.1	26000	125	124	83	117	89	75	116
	38	60	8	28	1	390	183	1985	50.1	26000	260	219	208	207	157	186	206
	38	60	8	84	1	390	183	1985	50.1	26000	515	384	377	365	272	351	363
	38	60	8	182	1	390	183	1985	50.1	26000	610	501	461	476	353	427	473
	38	60	8	392	1	390	183	1985	50.1	26000	682	599	521	559	419	470	556
	38	60	8	695	1	390	183	1985	50.1	26000	716	652	556	593	455	488	589
	38	60	8	1943	1	390	183	1985	50.1	26000	735	708	610	611	491	503	607
	38	60	8	3500	1	390	183	1985	50.1	26000	719	724	637	612	502	507	609
Bryant	50	60	8	14	1	390	183	1985	50.1	26000	99	94	52	88	67	68	88
	50	60	8	28	1	390	183	1985	50.1	26000	200	168	148	158	120	170	157
	50	60	8	84	1	390	183	1985	50.1	26000	423	306	323	290	218	320	289
	50	60	8	182	1	390	183	1985	50.1	26000	544	420	425	400	297	389	397
	50	60	8	392	1	390	183	1985	50.1	26000	628	530	500	503	373	428	499
	50	60	8	695	1	390	183	1985	50.1	26000	669	600	544	560	420	444	556
	50	60	8	1943	1	390	183	1985	50.1	26000	697	682	605	606	475	459	602
	50	60	8	3500	1	390	183	1985	50.1	26000	686	708	634	611	492	462	608
Bryant	75	60	8	14	1	390	183	1985	50.1	26000	32	63	25	59	45	59	59
	75	60	8	28	1	390	183	1985	50.1	26000	97	113	82	107	81	146	106
	75	60	8	84	1	390	183	1985	50.1	26000	278	214	228	203	153	276	201
	75	60	8	182	1	390	183	1985	50.1	26000	399	308	348	293	219	335	291
	75	60	8	392	1	390	183	1985	50.1	26000	519	417	450	397	295	369	395
	75	60	8	695	1	390	183	1985	50.1	26000	567	499	511	475	352	383	472
	75	60	8	1943	1	390	183	1985	50.1	26000	602	622	591	575	435	396	572
	75	60	8	3500	1	390	183	1985	50.1	26000	596	669	626	601	466	399	597
Bryant	100	60	8	14	1	390	183	1985	50.1	26000	23	47	14	44	34	52	44

	100	60	8	28	1	390	183	1985	50.1	26000	74	86	50	81	61	130	80
	100	60	8	84	1	390	183	1985	50.1	26000	192	164	162	154	117	245	154
	100	60	8	182	1	390	183	1985	50.1	26000	325	240	277	227	172	297	226
	100	60	8	392	1	390	183	1985	50.1	26000	455	337	395	320	239	327	318
	100	60	8	695	1	390	183	1985	50.1	26000	529	418	471	398	296	340	396
	100	60	8	1943	1	390	183	1985	50.1	26000	594	559	572	528	393	351	525
	100	60	8	3500	1	390	183	1985	50.1	26000	585	623	615	576	436	354	573
Bryant	50	60	8	14	1	390	183	1985	50.1	26000	110	94	52	88	67	68	88
	50	60	8	28	1	390	183	1985	50.1	26000	259	168	148	158	120	170	157
	50	60	8	84	1	390	183	1985	50.1	26000	493	306	323	290	218	320	289
	50	60	8	182	1	390	183	1985	50.1	26000	601	420	425	400	297	389	397
	50	60	8	392	1	390	183	1985	50.1	26000	694	530	500	503	373	428	499
	50	60	8	695	1	390	183	1985	50.1	26000	718	600	544	560	420	444	556
	50	60	8	1943	1	390	183	1985	50.1	26000	734	682	605	606	475	459	602
	50	60	8	3500	1	390	183	1985	50.1	26000	725	708	634	611	492	462	608
Bryant	75	60	8	14	1	390	183	1985	50.1	26000	69	63	25	59	45	59	59
	75	60	8	28	1	390	183	1985	50.1	26000	151	113	82	107	81	146	106
	75	60	8	84	1	390	183	1985	50.1	26000	398	214	228	203	153	276	201
	75	60	8	182	1	390	183	1985	50.1	26000	541	308	348	293	219	335	291
	75	60	8	392	1	390	183	1985	50.1	26000	635	417	450	397	295	369	395
	75	60	8	695	1	390	183	1985	50.1	26000	687	499	511	475	352	383	472
	75	60	8	1943	1	390	183	1985	50.1	26000	718	622	591	575	435	396	572
	75	60	8	3500	1	390	183	1985	50.1	26000	703	669	626	601	466	399	597
Bryant	100	60	8	14	1	390	183	1985	50.1	26000	40	47	14	44	34	52	44
	100	60	8	28	1	390	183	1985	50.1	26000	104	86	50	81	61	130	80
	100	60	8	84	1	390	183	1985	50.1	26000	273	164	162	154	117	245	154
	100	60	8	182	1	390	183	1985	50.1	26000	419	240	277	227	172	297	226
	100	60	8	392	1	390	183	1985	50.1	26000	541	337	395	320	239	327	318
	100	60	8	695	1	390	183	1985	50.1	26000	601	418	471	398	296	340	396
	100	60	8	1943	1	390	183	1985	50.1	26000	652	559	572	528	393	351	525
	100	60	8	3500	1	390	183	1985	50.1	26000	650	623	615	576	436	354	573
Bryant	150	60	8	14	1	390	183	1985	50.1	26000	18	31	7	30	22	43	29
	150	60	8	28	1	390	183	1985	50.1	26000	62	57	24	54	41	107	54
	150	60	8	84	1	390	183	1985	50.1	26000	172	111	89	104	79	201	104
	150	60	8	182	1	390	183	1985	50.1	26000	293	165	176	156	118	244	155
	150	60	8	392	1	390	183	1985	50.1	26000	427	238	292	225	170	269	224
	150	60	8	695	1	390	183	1985	50.1	26000	514	307	385	291	218	279	289
	150	60	8	1943	1	390	183	1985	50.1	26000	595	450	525	429	318	288	426
Bryant	200	60	8	14	1	390	183	1985	50.1	26000	12	24	4	22	17	36	22
	200	60	8	28	1	390	183	1985	50.1	26000	45	43	14	40	31	90	40
	200	60	8	84	1	390	183	1985	50.1	26000	104	83	54	79	60	170	78
	200	60	8	182	1	390	183	1985	50.1	26000	209	125	116	118	90	206	117
	200	60	8	392	1	390	183	1985	50.1	26000	325	183	214	173	131	227	172
	200	60	8	695	1	390	183	1985	50.1	26000	424	239	306	226	171	236	225
	200	60	8	1943	1	390	183	1985	50.1	26000	532	368	471	350	261	243	348
	200	60	8	3500	1	390	183	1985	50.1	26000	535	452	547	431	320	245	428
Bryant	38	60	8	14	1	390	183	1985	50.1	26000	125	124	83	117	89	75	116
	38	60	8	28	1	390	183	1985	50.1	26000	260	219	208	207	157	186	206
	38	60	8	84	1	390	183	1985	50.1	26000	515	384	377	365	272	351	363
	38	60	8	182	1	390	183	1985	50.1	26000	610	501	461	476	353	427	473
	38	60	8	392	1	390	183	1985	50.1	26000	682	599	521	559	419	470	556
	38	60	8	695	1	390	183	1985	50.1	26000	716	652	556	593	455	488	589
	38	60	8	1943	1	390	183	1985	50.1	26000	735	708	610	611	491	503	607
	38	60	8	3500	1	390	183	1985	50.1	26000	719	724	637	612	502	507	609
Bryant	38	60	8	21	1	390	183	1985	50.1	26000	202	180	156	170	128	139	169
	38	60	8	28	1	390	183	1985	50.1	26000	260	219	208	207	157	186	206
	38	60	8	42	1	390	183	1985	50.1	26000	372	278	277	263	198	253	262
	38	60	8	84	1	390	183	1985	50.1	26000	515	384	377	365	272	351	363

	38	60	8	182	1	390	183	1985	50.1	26000	610	501	461	476	353	427	473
	38	60	8	392	1	390	183	1985	50.1	26000	682	599	521	559	419	470	556
	38	60	8	695	1	390	183	1985	50.1	26000	716	652	556	593	455	488	589
	38	60	8	1943	1	390	183	1985	50.1	26000	735	708	610	611	491	503	607
	38	60	8	3500	1	390	183	1985	50.1	26000	719	724	637	612	502	507	609
Bryant	38	60	8	28	1	390	183	1985	50.1	26000	260	219	208	207	157	186	206
	38	60	8	42	1	390	183	1985	50.1	26000	372	278	277	263	198	253	262
	38	60	8	63	1	390	183	1985	50.1	26000	452	339	339	322	241	313	320
	38	60	8	84	1	390	183	1985	50.1	26000	515	384	377	365	272	351	363
	38	60	8	182	1	390	183	1985	50.1	26000	610	501	461	476	353	427	473
	38	60	8	392	1	390	183	1985	50.1	26000	682	599	521	559	419	470	556
	38	60	8	695	1	390	183	1985	50.1	26000	716	652	556	593	455	488	589
	38	60	8	1943	1	390	183	1985	50.1	26000	735	708	610	611	491	503	607
	38	60	8	3500	1	390	183	1985	50.1	26000	719	724	637	612	502	507	609
Bryant	38	60	8	84	1	390	183	1985	50.1	26000	515	384	377	365	272	351	363
	38	60	8	112	1	390	183	1985	50.1	26000	560	428	412	408	303	383	406
	38	60	8	182	1	390	183	1985	50.1	26000	610	501	461	476	353	427	473
	38	60	8	392	1	390	183	1985	50.1	26000	682	599	521	559	419	470	556
	38	60	8	695	1	390	183	1985	50.1	26000	716	652	556	593	455	488	589
	38	60	8	1943	1	390	183	1985	50.1	26000	735	708	610	611	491	503	607
	38	60	8	3500	1	390	183	1985	50.1	26000	719	724	637	612	502	507	609
Bryant	38	60	8	182	1	390	183	1985	50.1	26000	610	501	461	476	353	427	473
	38	60	8	212	1	390	183	1985	50.1	26000	628	523	474	496	368	437	493
	38	60	8	252	1	390	183	1985	50.1	26000	650	546	488	516	384	448	513
	38	60	8	303	1	390	183	1985	50.1	26000	664	569	502	536	399	458	533
	38	60	8	392	1	390	183	1985	50.1	26000	682	599	521	559	419	470	556
	38	60	8	695	1	390	183	1985	50.1	26000	716	652	556	593	455	488	589
	38	60	8	1943	1	390	183	1985	50.1	26000	735	708	610	611	491	503	607
	38	60	8	3500	1	390	183	1985	50.1	26000	719	724	637	612	502	507	609
WTC7500	38	50	7	56	3	432	187	1745	52.4	31580	502	364	389	377	222	376	324
78/A/01	38	50	7	102	3	432	187	1745	52.4	31580	568	467	484	485	284	471	417
Rusell	38	50	7	212	3	432	187	1745	52.4	31580	581	590	572	608	357	551	523
	38	50	7	445	3	432	187	1745	52.4	31580	620	692	639	696	416	597	598
	38	50	7	927	3	432	187	1745	52.4	31580	651	761	692	737	456	621	633
	38	50	7	1480	3	432	187	1745	52.4	31580	682	790	721	745	472	630	640
	38	50	7	3830	3	432	187	1745	52.4	31580	719	823	775	749	490	639	643
	38	50	7	6349	3	432	187	1745	52.4	31580	733	832	802	749	495	641	643
WTC9000	38	50	7	28	3	502	196	1677	63.1	36270	309	223	226	273	120	228	194
78/B/02	38	50	7	56	3	502	196	1677	63.1	36270	463	322	344	394	173	354	281
Rusell	38	50	7	83	3	502	196	1677	63.1	36270	545	382	402	467	205	415	332
	38	50	7	197	3	502	196	1677	63.1	36270	650	512	500	618	272	512	440
	38	50	7	384	3	502	196	1677	63.1	36270	692	597	556	702	316	555	500
	38	50	7	792	3	502	196	1677	63.1	36270	717	664	604	748	349	581	533
	38	50	7	1576	3	502	196	1677	63.1	36270	799	703	642	762	368	594	542
	38	50	7	4277	3	502	196	1677	63.1	36270	800	731	692	764	383	602	544
	38	50	7	6796	3	502	196	1677	63.1	36270	772	738	714	764	386	604	544
Bazant	21	65	7	8	1	350	168	1900	33.2	36300	61	78	35	71	52	15	71
	21	65	7	10	1	350	168	1900	33.2	36300	115	133	95	121	88	43	122
	21	65	7	13	1	350	168	1900	33.2	36300	162	184	157	168	121	80	169
	21	65	7	21	1	350	168	1900	33.2	36300	245	267	245	245	175	156	246
	21	65	7	41	1	350	168	1900	33.2	36300	351	373	329	342	243	269	344
	21	65	7	59	1	350	168	1900	33.2	36300	427	424	363	388	276	326	390
	21	65	7	98	1	350	168	1900	33.2	36300	485	487	400	440	315	394	442
	21	65	7	176	1	350	168	1900	33.2	36300	541	542	435	478	349	452	480
	21	65	7	265	1	350	168	1900	33.2	36300	629	571	456	492	367	480	494
	21	65	7	561	1	350	168	1900	33.2	36300	702	605	490	501	387	513	503
	21	65	7	1112	1	350	168	1900	33.2	36300	716	621	517	502	397	528	505
	21	65	7	1406	1	350	168	1900	33.2	36300	719	625	527	502	399	532	505

	21	65	7	1560	1	350	168	1900	33.2	36300	723	626	531	502	400	533	505
Bazant	40	65	7	8	1	350	168	1900	33.2	36300	44	40	10	36	26	12	37
	40	65	7	10	1	350	168	1900	33.2	36300	72	71	34	65	47	36	65
	40	65	7	13	1	350	168	1900	33.2	36300	102	100	66	91	66	66	91
	40	65	7	21	1	350	168	1900	33.2	36300	161	150	133	137	99	129	138
	40	65	7	41	1	350	168	1900	33.2	36300	237	225	231	206	148	223	207
	40	65	7	59	1	350	168	1900	33.2	36300	293	270	280	247	177	271	249
	40	65	7	98	1	350	168	1900	33.2	36300	366	335	340	307	219	327	309
	40	65	7	176	1	350	168	1900	33.2	36300	443	411	396	376	268	375	378
	40	65	7	265	1	350	168	1900	33.2	36300	533	460	428	418	299	399	421
	40	65	7	561	1	350	168	1900	33.2	36300	652	534	475	473	344	426	476
	40	65	7	1112	1	350	168	1900	33.2	36300	663	580	509	495	372	439	498
	40	65	7	1406	1	350	168	1900	33.2	36300	682	591	520	498	379	442	501
	40	65	7	1560	1	350	168	1900	33.2	36300	688	595	525	499	382	443	502
Bazant	75	65	7	8	1	350	168	1900	33.2	36300	30	21	3	19	14	9	19
	75	65	7	10	1	350	168	1900	33.2	36300	42	38	10	35	25	29	35
	75	65	7	13	1	350	168	1900	33.2	36300	56	54	22	49	35	53	49
	75	65	7	21	1	350	168	1900	33.2	36300	82	82	51	74	54	104	75
	75	65	7	41	1	350	168	1900	33.2	36300	129	126	113	115	83	179	115
	75	65	7	59	1	350	168	1900	33.2	36300	156	154	156	140	102	217	141
	75	65	7	98	1	350	168	1900	33.2	36300	197	200	223	182	131	262	183
	75	65	7	176	1	350	168	1900	33.2	36300	274	261	302	239	172	301	241
	75	65	7	265	1	350	168	1900	33.2	36300	340	310	352	284	203	320	285
	75	65	7	561	1	350	168	1900	33.2	36300	465	403	430	369	262	342	371
	75	65	7	1112	1	350	168	1900	33.2	36300	535	482	484	436	312	352	438
Weigler	38	65	3	7	2	350	175	*1800*	41.3	31120	66	64	46	69	56	64	70
e_071_01	38	65	3	10	2	350	175	*1800*	41.3	31120	99	84	77	90	74	104	91
	38	65	3	17	2	350	175	*1800*	41.3	31120	143	118	132	126	103	179	128
	38	65	3	24	2	350	175	*1800*	41.3	31120	169	142	172	152	124	235	154
	38	65	3	31	2	350	175	*1800*	41.3	31120	198	161	203	173	141	279	176
	38	65	3	38	2	350	175	*1800*	41.3	31120	223	178	226	192	155	313	194
	38	65	3	45	2	350	175	*1800*	41.3	31120	234	192	245	207	167	342	210
	38	65	3	59	2	350	175	*1800*	41.3	31120	266	216	275	234	188	386	237
	38	65	3	983	2	350	175	*1800*	41.3	31120	526	427	464	445	364	605	451
Weigler	38	65	3	7	1	350	175	*1800*	40.7	32710	47	90	61	81	62	64	79
e_071_02	38	65	3	10	1	350	175	*1800*	40.7	32710	69	118	102	106	81	104	104
	38	65	3	17	1	350	175	*1800*	40.7	32710	107	164	175	148	112	179	146
	38	65	3	24	1	350	175	*1800*	40.7	32710	140	197	228	179	136	235	176
	38	65	3	31	1	350	175	*1800*	40.7	32710	165	225	268	204	154	279	201
	38	65	3	38	1	350	175	*1800*	40.7	32710	184	248	300	225	170	313	221
	38	65	3	45	1	350	175	*1800*	40.7	32710	209	267	325	243	183	342	240
	38	65	3	52	1	350	175	*1800*	40.7	32710	225	285	346	260	195	366	256
	38	65	3	59	1	350	175	*1800*	40.7	32710	248	301	364	274	205	386	270
	38	65	3	976	1	350	175	*1800*	40.7	32710	496	595	614	520	398	605	512
Weigler	38	65	3	7	1	350	175	*1800*	44.9	36180	40	82	56	80	53	64	72
e_071_04	38	65	3	10	1	350	175	*1800*	44.9	36180	50	108	94	105	70	104	94
	38	65	3	17	1	350	175	*1800*	44.9	36180	90	151	161	147	97	179	131
	38	65	3	24	1	350	175	*1800*	44.9	36180	130	182	210	178	117	235	159
	38	65	3	31	1	350	175	*1800*	44.9	36180	150	207	247	202	133	279	181
	38	65	3	38	1	350	175	*1800*	44.9	36180	170	228	276	223	146	313	200
	38	65	3	45	1	350	175	*1800*	44.9	36180	180	246	299	241	158	342	216
	38	65	3	52	1	350	175	*1800*	44.9	36180	210	262	318	258	168	366	230
	38	65	3	59	1	350	175	*1800*	44.9	36180	220	276	335	272	177	386	243
	38	65	3	955	1	350	175	*1800*	44.9	36180	480	546	564	508	343	604	454
Weigler	38	65	3	7	3	350	175	*1800*	55.5	35490	47	91	59	88	50	64	75
e_071_05	38	65	3	10	3	350	175	*1800*	55.5	35490	68	120	99	116	66	104	99
	38	65	3	17	3	350	175	*1800*	55.5	35490	110	167	170	161	92	179	138
	38	65	3	24	3	350	175	*1800*	55.5	35490	142	201	222	195	111	235	166

	38	65	3	31	3	350	175	*1800*	55.5	35490	168	229	260	222	126	279	189
	38	65	3	38	3	350	175	*1800*	55.5	35490	193	252	291	245	139	313	209
	38	65	3	45	3	350	175	*1800*	55.5	35490	213	272	315	265	150	342	226
	38	65	3	52	3	350	175	*1800*	55.5	35490	236	290	336	282	160	366	241
	38	65	3	59	3	350	175	*1800*	55.5	35490	242	306	353	298	168	386	254
	38	65	3	969	3	350	175	*1800*	55.5	35490	526	605	596	553	326	605	472
Weigler	38	65	3	7	2	292	175	*1800*	34.2	30940	62	67	49	69	59	62	74
e_071_06	38	65	3	10	2	292	175	*1800*	34.2	30940	76	89	81	90	77	101	98
	38	65	3	17	2	292	175	*1800*	34.2	30940	118	123	139	126	107	172	136
	38	65	3	24	2	292	175	*1800*	34.2	30940	143	149	181	153	129	226	165
	38	65	3	31	2	292	175	*1800*	34.2	30940	170	169	213	174	147	268	188
	38	65	3	38	2	292	175	*1800*	34.2	30940	193	187	238	192	162	302	208
	38	65	3	45	2	292	175	*1800*	34.2	30940	212	201	258	208	175	329	225
	38	65	3	52	2	292	175	*1800*	34.2	30940	232	215	274	222	186	352	240
	38	65	3	59	2	292	175	*1800*	34.2	30940	246	226	289	235	196	372	253
	38	65	3	983	2	292	175	*1800*	34.2	30940	536	449	487	451	380	583	487
Weigler	38	65	3	7	1	292	175	*1800*	38.5	32350	37	91	62	81	63	62	81
e_071_07	38	65	3	10	1	292	175	*1800*	38.5	32350	57	120	104	106	83	101	107
	38	65	3	17	1	292	175	*1800*	38.5	32350	92	167	179	148	115	172	149
	38	65	3	24	1	292	175	*1800*	38.5	32350	127	201	233	179	139	226	180
	38	65	3	31	1	292	175	*1800*	38.5	32350	157	229	274	204	158	268	206
	38	65	3	38	1	292	175	*1800*	38.5	32350	177	252	306	225	174	302	227
	38	65	3	45	1	292	175	*1800*	38.5	32350	202	273	331	244	187	329	246
	38	65	3	52	1	292	175	*1800*	38.5	32350	220	290	353	260	200	352	262
	38	65	3	59	1	292	175	*1800*	38.5	32350	238	306	371	275	210	372	277
	38	65	3	976	1	292	175	*1800*	38.5	32350	498	607	626	523	408	583	527
Weigler	38	65	3	7	3	269	175	*1800*	40.3	33290	45	102	67	89	61	61	86
e_071_08	38	65	3	10	3	269	175	*1800*	40.3	33290	56	134	111	116	80	99	114
	38	65	3	17	3	269	175	*1800*	40.3	33290	94	187	191	163	111	170	158
	38	65	3	24	3	269	175	*1800*	40.3	33290	129	225	248	196	134	223	192
	38	65	3	31	3	269	175	*1800*	40.3	33290	156	256	292	224	152	264	218
	38	65	3	38	3	269	175	*1800*	40.3	33290	183	282	326	247	167	297	241
	38	65	3	45	3	269	175	*1800*	40.3	33290	205	305	353	267	180	324	261
	38	65	3	52	3	269	175	*1800*	40.3	33290	226	325	376	285	192	347	278
	38	65	3	59	3	269	175	*1800*	40.3	33290	240	343	396	301	203	366	294
	38	65	3	969	3	269	175	*1800*	40.3	33290	527	678	668	571	392	574	557
Epison	38	60	1	14	1	375	*177*	*1800*	36.0	37800	111	158	223	149	101	207	134
e_077_01	38	60	1	15	1	375	*177*	*1800*	36.0	37800	115	164	235	155	105	218	139
	38	60	1	17	1	375	*177*	*1800*	36.0	37800	109	175	257	165	112	239	148
	38	60	1	21	1	375	*177*	*1800*	36.0	37800	151	193	297	183	124	277	165
	38	60	1	27	1	375	*177*	*1800*	36.0	37800	185	218	345	206	139	325	186
	38	60	1	35	1	375	*177*	*1800*	36.0	37800	198	245	396	233	156	376	210
	38	60	1	42	1	375	*177*	*1800*	36.0	37800	233	265	431	252	169	411	228
	38	60	1	49	1	375	*177*	*1800*	36.0	37800	237	283	460	270	180	441	243
	38	60	1	51	1	375	*177*	*1800*	36.0	37800	247	288	467	275	183	449	248
	38	60	1	56	1	375	*177*	*1800*	36.0	37800	244	299	484	286	190	466	258
	38	60	1	63	1	375	*177*	*1800*	36.0	37800	266	313	505	300	199	487	270
	38	60	1	70	1	375	*177*	*1800*	36.0	37800	282	326	523	313	207	506	282
	38	60	1	84	1	375	*177*	*1800*	36.0	37800	306	349	554	336	222	536	303
	38	60	1	91	1	375	*177*	*1800*	36.0	37800	306	359	566	346	228	549	312
	38	60	1	97	1	375	*177*	*1800*	36.0	37800	325	368	576	354	233	559	319
	38	60	1	105	1	375	*177*	*1800*	36.0	37800	327	378	588	365	239	571	328
	38	60	1	175	1	375	*177*	*1800*	36.0	37800	403	442	658	429	279	635	387
	38	60	1	272	1	375	*177*	*1800*	36.0	37800	457	493	709	479	310	675	431
	38	60	1	936	1	375	*177*	*1800*	36.0	37800	561	594	820	557	370	735	502
	38	60	1	1673	1	375	*177*	*1800*	36.0	37800	568	619	862	566	385	747	510
Russel	38	50	7	9	1	432	187	1745	52.4	31556	77	70	28	76	50	35	65
e_078_01	38	50	7	10	1	432	187	1745	52.4	31556	100	86	43	93	61	51	80

	38	50	7	11	1	432	187	1745	52.4	31556	121	99	57	107	70	66	92
	38	50	7	14	1	432	187	1745	52.4	31556	178	130	94	141	92	107	121
	38	50	7	15	1	432	187	1745	52.4	31556	205	139	106	150	98	120	129
	38	50	7	21	1	432	187	1745	52.4	31556	280	181	163	196	128	184	169
	38	50	7	31	1	432	187	1745	52.4	31556	390	233	230	252	164	262	216
	38	50	7	32	1	432	187	1745	52.4	31556	400	237	236	256	167	269	220
	38	50	7	36	1	432	187	1745	52.4	31556	436	253	256	274	178	292	235
	38	50	7	42	1	432	187	1745	52.4	31556	453	275	281	298	193	322	256
	38	50	7	49	1	432	187	1745	52.4	31556	513	297	305	322	209	352	276
	38	50	7	56	1	432	187	1745	52.4	31556	502	316	325	343	222	376	295
	38	50	7	64	1	432	187	1745	52.4	31556	511	336	344	365	236	399	313
	38	50	7	71	1	432	187	1745	52.4	31556	525	352	358	382	247	417	328
	38	50	7	80	1	432	187	1745	52.4	31556	548	370	374	401	259	436	345
	38	50	7	102	1	432	187	1745	52.4	31556	568	407	404	441	285	471	379
	38	50	7	122	1	432	187	1745	52.4	31556	598	434	424	470	303	494	404
	38	50	7	142	1	432	187	1745	52.4	31556	577	456	440	494	319	512	425
	38	50	7	164	1	432	187	1745	52.4	31556	583	477	455	516	333	527	444
	38	50	7	190	1	432	187	1745	52.4	31556	590	498	468	538	347	541	462
	38	50	7	212	1	432	187	1745	52.4	31556	581	513	478	553	357	551	475
	38	50	7	225	1	432	187	1745	52.4	31556	573	521	483	561	363	556	482
	38	50	7	252	1	432	187	1745	52.4	31556	610	536	492	576	373	564	495
	38	50	7	345	1	432	187	1745	52.4	31556	595	575	516	611	398	584	525
	38	50	7	445	1	432	187	1745	52.4	31556	620	602	534	633	416	597	544
	38	50	7	550	1	432	187	1745	52.4	31556	623	622	547	648	430	606	557
	38	50	7	750	1	432	187	1745	52.4	31556	656	648	566	663	446	616	570
	38	50	7	927	1	432	187	1745	52.4	31556	651	662	578	670	456	621	575
	38	50	7	1129	1	432	187	1745	52.4	31556	675	674	588	674	463	625	579
	38	50	7	1338	1	432	187	1745	52.4	31556	665	683	597	676	469	628	581
	38	50	7	1480	1	432	187	1745	52.4	31556	682	687	602	678	472	630	582
	38	50	7	3830	1	432	187	1745	52.4	31556	719	716	648	681	491	639	585
	38	50	7	4328	1	432	187	1745	52.4	31556	758	718	653	681	492	640	585
	38	50	7	5176	1	432	187	1745	52.4	31556	725	721	661	681	494	640	585
	38	50	7	6349	1	432	187	1745	52.4	31556	733	724	670	681	496	641	585
Russel	38	50	7	8	1	502	196	1677	63.0	36241	44	44	12	57	28	17	40
e_078_02	38	50	7	9	1	502	196	1677	63.0	36241	70	62	25	80	39	33	57
	38	50	7	10	1	502	196	1677	63.0	36241	95	76	38	97	47	48	69
	38	50	7	13	1	502	196	1677	63.0	36241	154	107	73	137	67	89	98
	38	50	7	17	1	502	196	1677	63.0	36241	202	137	112	175	85	135	125
	38	50	7	28	1	502	196	1677	63.0	36241	309	194	189	248	120	228	177
	38	50	7	35	1	502	196	1677	63.0	36241	359	221	222	282	137	270	201
	38	50	7	42	1	502	196	1677	63.0	36241	405	243	249	311	151	303	222
	38	50	7	49	1	502	196	1677	63.0	36241	437	263	270	336	163	331	240
	38	50	7	56	1	502	196	1677	63.0	36241	463	280	288	358	173	354	255
	38	50	7	69	1	502	196	1677	63.0	36241	504	308	314	393	190	388	280
	38	50	7	83	1	502	196	1677	63.0	36241	545	332	336	425	205	415	302
	38	50	7	135	1	502	196	1677	63.0	36241	603	398	385	505	244	476	360
	38	50	7	171	1	502	196	1677	63.0	36241	625	428	406	542	263	500	386
	38	50	7	197	1	502	196	1677	63.0	36241	650	446	418	562	273	512	400
	38	50	7	234	1	502	196	1677	63.0	36241	667	467	431	585	285	526	417
	38	50	7	336	1	502	196	1677	63.0	36241	663	507	456	626	309	548	446
	38	50	7	384	1	502	196	1677	63.0	36241	692	520	464	639	317	555	455
	38	50	7	448	1	502	196	1677	63.0	36241	705	534	473	651	325	562	464
	38	50	7	485	1	502	196	1677	63.0	36241	753	541	478	657	329	565	468
	38	50	7	528	1	502	196	1677	63.0	36241	741	548	483	662	333	569	472
	38	50	7	549	1	502	196	1677	63.0	36241	732	551	485	664	335	570	473
	38	50	7	559	1	502	196	1677	63.0	36241	741	553	486	665	336	571	474
	38	50	7	570	1	502	196	1677	63.0	36241	748	554	487	666	337	571	475
	38	50	7	660	1	502	196	1677	63.0	36241	720	565	495	674	343	576	480

	38	50	7	674	1	502	196	1677	63.0	36241	712	567	496	674	344	577	480
	38	50	7	701	1	502	196	1677	63.0	36241	725	569	498	676	345	578	482
	38	50	7	792	1	502	196	1677	63.0	36241	717	577	504	681	350	581	485
	38	50	7	997	1	502	196	1677	63.0	36241	747	591	515	687	358	586	489
	38	50	7	1197	1	502	196	1677	63.0	36241	770	600	524	690	363	589	491
	38	50	7	1576	1	502	196	1677	63.0	36241	799	611	536	693	369	594	493
	38	50	7	1785	1	502	196	1677	63.0	36241	777	616	542	693	372	595	494
	38	50	7	1927	1	502	196	1677	63.0	36241	788	618	545	694	373	596	494
	38	50	7	4277	1	502	196	1677	63.0	36241	800	636	578	695	383	602	495
	38	50	7	4775	1	502	196	1677	63.0	36241	832	638	583	695	384	602	495
	38	50	7	5623	1	502	196	1677	63.0	36241	785	640	589	695	385	603	495
	38	50	7	6796	1	502	196	1800	63.0	36241	772	642	596	695	387	604	495
Hilsdorf	50	65	3	5	3	337	185	1820	40.3	30200	20	58	21	51	35	31	49
e_091_02	50	65	3	7	3	337	185	1820	40.3	30200	40	81	43	72	50	58	70
	50	65	3	11	3	337	185	1820	40.3	30200	68	114	84	101	70	105	98
	50	65	3	15	3	337	185	1820	40.3	30200	93	139	121	123	85	145	120
	50	65	3	21	3	337	185	1820	40.3	30200	123	169	168	149	103	192	146
	50	65	3	35	3	337	185	1820	40.3	30200	183	222	252	196	135	270	191
	50	65	3	43	3	337	185	1820	40.3	30200	208	246	289	218	149	302	212
	50	65	3	56	3	337	185	1820	40.3	30200	235	279	336	247	169	341	241
	50	65	3	70	3	337	185	1820	40.3	30200	265	308	376	274	187	372	267
	50	65	3	90	3	337	185	1820	40.3	30200	293	344	419	307	208	404	299
	50	65	3	120	3	337	185	1820	40.3	30200	328	386	465	346	233	436	337
	50	65	3	180	3	337	185	1820	40.3	30200	373	448	524	403	270	473	393
	50	65	3	270	3	337	185	1820	40.3	30200	420	511	576	461	307	501	449
	50	65	3	365	3	337	185	1820	40.3	30200	450	555	609	501	333	516	488
	50	65	3	500	3	337	185	1820	40.3	30200	486	598	640	538	357	529	525
	50	65	3	730	3	337	185	1820	40.3	30200	519	643	673	575	383	540	560
	50	65	3	1095	3	337	185	1820	40.3	30200	553	683	704	602	406	549	587
	50	65	3	1460	3	337	185	1820	40.3	30200	570	706	724	615	419	553	599
	50	65	3	1825	3	337	185	1820	40.3	30200	583	721	739	621	427	556	605
Hilsdorf	50	65	7	11	3	337	185	1820	40.3	30200	53	81	39	74	50	53	72
e_091_03	50	65	7	15	3	337	185	1820	40.3	30200	90	114	77	104	70	96	101
	50	65	7	21	3	337	185	1820	40.3	30200	125	150	127	137	91	148	133
	50	65	7	28	3	337	185	1820	40.3	30200	159	182	174	166	111	194	162
	50	65	7	35	3	337	185	1820	40.3	30200	183	209	213	190	127	230	186
	50	65	7	43	3	337	185	1820	40.3	30200	208	234	250	214	142	263	209
	50	65	7	56	3	337	185	1820	40.3	30200	233	269	297	246	163	302	240
	50	65	7	70	3	337	185	1820	40.3	30200	250	300	336	275	182	333	268
	50	65	7	90	3	337	185	1820	40.3	30200	290	337	379	309	204	364	301
	50	65	7	104	3	337	185	1820	40.3	30200	308	359	402	330	217	381	321
	50	65	7	120	3	337	185	1820	40.3	30200	325	381	423	350	230	395	341
	50	65	7	145	3	337	185	1820	40.3	30200	347	411	451	378	248	413	368
	50	65	7	180	3	337	185	1820	40.3	30200	369	445	480	410	268	431	399
	50	65	7	210	3	337	185	1820	40.3	30200	388	469	499	432	283	442	421
	50	65	7	170	3	337	185	1820	40.3	30200	415	436	473	401	263	426	391
	50	65	7	365	3	337	185	1820	40.3	30200	442	553	560	508	332	472	495
	50	65	7	500	3	337	185	1820	40.3	30200	475	597	589	545	357	484	531
	50	65	7	730	3	337	185	1820	40.3	30200	510	643	619	580	383	494	565
	50	65	7	1095	3	337	185	1820	40.3	30200	545	683	648	605	406	502	590
Hilsdorf	50	65	28	35	3	337	185	1820	40.3	30200	105	107	64	103	65	75	100
e_091_04	50	65	28	43	3	337	185	1820	40.3	30200	152	155	125	149	95	134	145
	50	65	28	56	3	337	185	1820	40.3	30200	195	209	199	201	127	199	195
	50	65	28	70	3	337	185	1820	40.3	30200	229	251	255	242	153	244	235
	50	65	28	90	3	337	185	1820	40.3	30200	262	298	311	287	181	286	279
	50	65	28	104	3	337	185	1820	40.3	30200	286	325	341	312	197	306	304
	50	65	28	120	3	337	185	1820	40.3	30200	308	351	367	337	213	324	329
	50	65	28	145	3	337	185	1820	40.3	30200	332	386	399	370	233	344	361

	50	65	28	180	3	337	185	1820	40.3	30200	358	425	432	407	257	364	397
	50	65	28	210	3	337	185	1820	40.3	30200	378	453	453	433	273	375	422
	50	65	28	270	3	337	185	1820	40.3	30200	408	496	484	472	298	391	460
	50	65	28	365	3	337	185	1820	40.3	30200	442	545	516	514	327	405	501
	50	65	28	500	3	337	185	1820	40.3	30200	470	591	545	552	353	416	538
	50	65	28	730	3	337	185	1820	40.3	30200	504	639	575	586	381	426	571
	50	65	28	1095	3	337	185	1820	40.3	30200	540	681	603	610	405	433	594
Hilsdorf	50	65	90	95	3	337	185	1820	40.3	30200	68	91	45	91	55	49	89
e_091_05	50	65	90	104	3	337	185	1820	40.3	30200	119	150	115	151	91	113	147
	50	65	90	112	3	337	185	1820	40.3	30200	148	186	164	187	113	153	182
	50	65	90	120	3	337	185	1820	40.3	30200	170	216	203	216	131	183	211
	50	65	90	133	3	337	185	1820	40.3	30200	195	254	252	254	154	218	248
	50	65	90	145	3	337	185	1820	40.3	30200	217	283	287	283	172	242	276
	50	65	90	180	3	337	185	1820	40.3	30200	257	348	355	347	211	285	338
	50	65	90	210	3	337	185	1820	40.3	30200	285	390	393	387	236	306	377
	50	65	90	270	3	337	185	1820	40.3	30200	322	451	441	444	272	331	433
	50	65	90	365	3	337	185	1820	40.3	30200	357	515	485	501	309	351	488
	50	65	90	500	3	337	185	1820	40.3	30200	394	572	521	547	343	364	533
	50	65	90	730	3	337	185	1820	40.3	30200	428	629	555	586	375	375	571
	50	65	90	1095	3	337	185	1820	40.3	30200	453	676	585	611	402	382	595
	50	65	90	1460	3	337	185	1820	40.3	30200	470	702	603	621	416	386	605
	50	65	90	1825	3	337	185	1820	40.3	30200	478	718	617	625	425	388	609
Hilsdorf	38	65	1	3	3	337	185	1820	40.3	30200	48	77	42	65	47	38	63
e_091_06	38	65	1	7	3	337	185	1820	40.3	30200	98	132	122	111	80	102	108
	38	65	1	11	3	337	185	1820	40.3	30200	136	168	187	142	103	155	139
	38	65	1	18	3	337	185	1820	40.3	30200	180	216	274	183	131	228	179
	38	65	1	28	3	337	185	1820	40.3	30200	222	267	360	227	162	304	222
	38	65	1	56	3	337	185	1820	40.3	30200	300	360	495	310	218	427	302
	38	65	1	90	3	337	185	1820	40.3	30200	348	431	577	375	260	501	366
	38	65	1	180	3	337	185	1820	40.3	30200	430	536	676	473	322	584	461
	38	65	1	366	3	337	185	1820	40.3	30200	410	630	756	557	376	637	543
	38	65	1	731	3	337	185	1820	40.3	30200	573	697	818	606	414	666	591
	38	65	1	1096	3	337	185	1820	40.3	30200	598	725	849	621	429	676	605
	38	65	1	1826	3	337	185	1820	40.3	30200	605	750	887	628	443	685	612
Keeton	26	75	8	9	3	452	208	1687	45.3	25860	90	66	26	68	41	15	60
15/8/75/08	26	75	8	15	3	452	208	1687	45.3	25860	255	170	149	175	105	90	154
	26	75	8	22	3	452	208	1687	45.3	25860	340	233	225	241	143	154	211
	26	75	8	29	3	452	208	1687	45.3	25860	400	276	272	287	170	202	252
	26	75	8	36	3	452	208	1687	45.3	25860	440	310	303	322	190	239	283
	26	75	8	64	3	452	208	1687	45.3	25860	535	396	371	413	242	331	363
	26	75	8	99	3	452	208	1687	45.3	25860	600	456	411	475	277	389	417
	26	75	8	183	3	452	208	1687	45.3	25860	660	526	455	540	318	449	474
	26	75	8	373	3	452	208	1687	45.3	25860	710	583	495	579	351	491	508
	26	75	8	905	3	452	208	1687	45.3	25860	745	623	537	592	373	518	520
Keeton	26	50	8	9	3	452	208	1687	45.3	25860	125	98	39	103	62	21	90
15/8/50/7	26	50	8	15	3	452	208	1687	45.3	25860	330	251	220	265	159	124	233
	26	50	8	22	3	452	208	1687	45.3	25860	445	344	333	364	217	213	320
	26	50	8	29	3	452	208	1687	45.3	25860	525	408	402	434	257	280	381
	26	50	8	36	3	452	208	1687	45.3	25860	580	458	449	488	288	331	428
	26	50	8	64	3	452	208	1687	45.3	25860	715	586	549	626	366	459	549
	26	50	8	99	3	452	208	1687	45.3	25860	805	674	607	718	419	538	631
	26	50	8	183	3	452	208	1687	45.3	25860	905	777	672	817	481	621	717
	26	50	8	373	3	452	208	1687	45.3	25860	975	862	732	876	531	680	770
	26	50	8	905	3	452	208	1687	45.3	25860	1030	921	794	897	565	718	787
Keeton	26	20	8	9	3	452	208	1687	45.3	25860	150	105	42	117	70	28	102
15/8/20/6	26	20	8	15	3	452	208	1687	45.3	25860	385	271	237	301	180	166	264
	26	20	8	22	3	452	208	1687	45.3	25860	505	370	359	413	246	284	363
	26	20	8	29	3	452	208	1687	45.3	25860	585	440	433	492	291	373	432

	26	20	8	36	3	452	208	1687	45.3	25860	645	494	483	553	326	442	486
	26	20	8	64	3	452	208	1687	45.3	25860	800	631	591	709	415	612	623
	26	20	8	99	3	452	208	1687	45.3	25860	885	726	654	814	476	718	715
	26	20	8	183	3	452	208	1687	45.3	25860	960	838	724	926	546	828	813
	26	20	8	373	3	452	208	1687	45.3	25860	1025	929	788	994	602	907	872
	26	20	8	905	3	452	208	1687	45.3	25860	1070	993	855	1016	641	957	892
Keeton	38	50	8	9	3	452	208	1687	45.3	25860	35	66	18	69	42	18	61
15/8/50/25	38	50	8	15	3	452	208	1687	45.3	25860	180	172	128	181	109	111	159
	38	50	8	36	3	452	208	1687	45.3	25860	325	328	341	348	207	295	305
	38	50	8	64	3	452	208	1687	45.3	25860	415	440	465	468	276	408	411
	38	50	8	99	3	452	208	1687	45.3	25860	495	528	543	563	331	479	494
	38	50	8	183	3	452	208	1687	45.3	25860	605	649	631	692	404	553	608
	38	50	8	373	3	452	208	1687	45.3	25860	720	769	709	809	476	605	710
	38	50	8	738	3	452	208	1687	45.3	25860	795	852	768	871	525	633	765
Keeton	19	75	8	15	3	452	208	1687	46.8	25856	310	219	198	228	135	97	198
15/38/8/75/03	19	75	8	22	3	452	208	1687	46.8	25856	410	293	272	307	180	166	266
	19	75	8	36	3	452	208	1687	46.8	25856	520	378	339	397	231	258	345
	19	75	8	99	3	452	208	1687	46.8	25856	670	513	424	532	311	420	461
	19	75	8	183	3	452	208	1687	46.8	25856	725	567	461	572	342	485	496
	19	75	8	373	3	452	208	1687	46.8	25856	755	606	496	588	364	531	510
	19	75	8	903	3	452	208	1687	46.8	25856	775	631	534	591	378	560	513
Keeton	19	50	8	15	3	452	208	1687	47.5	25512	390	324	292	346	205	134	300
15/38/8/50/02	19	50	8	22	3	452	208	1687	47.5	25512	520	434	403	465	273	230	404
	19	50	8	36	3	452	208	1687	47.5	25512	660	559	501	602	351	358	522
	19	50	8	99	3	452	208	1687	47.5	25512	865	759	628	805	471	581	699
	19	50	8	183	3	452	208	1687	47.5	25512	945	839	681	865	518	671	751
	19	50	8	373	3	452	208	1687	47.5	25512	1010	896	733	890	552	735	773
	19	50	8	903	3	452	208	1687	47.5	25512	1055	933	790	895	573	775	777
Keeton	19	20	8	15	3	452	208	1687	46.5	24480	430	357	322	393	237	179	351
15/20/01	19	20	8	22	3	452	208	1687	46.5	24480	570	479	444	529	316	307	472
	19	20	8	36	3	452	208	1687	46.5	24480	735	617	553	685	406	477	611
	19	20	8	99	3	452	208	1687	46.5	24480	960	838	693	919	546	775	820
	19	20	8	183	3	452	208	1687	46.5	24480	1030	925	752	988	600	895	882
	19	20	8	373	3	452	208	1687	46.5	24480	1070	989	809	1017	639	979	908
	19	20	8	903	3	452	208	1687	46.5	24480	1100	1029	872	1023	663	1033	913
Keeton	38	75	8	15	3	452	208	1687	45.2	21029	185	125	93	120	76	80	116
15/75/11	38	75	8	22	3	452	208	1687	45.2	21029	240	174	161	168	106	137	162
	38	75	8	36	3	452	208	1687	45.2	21029	315	239	248	231	145	213	223
	38	75	8	99	3	452	208	1687	45.2	21029	485	385	396	376	231	346	363
	38	75	8	183	3	452	208	1687	45.2	21029	570	473	461	464	283	399	448
	38	75	8	373	3	452	208	1687	45.2	21029	625	561	519	545	334	437	526
	38	75	8	903	3	452	208	1687	45.2	21029	655	636	573	596	376	460	576
Keeton	38	50	8	15	3	452	208	1687	47.5	21029	220	181	135	181	113	110	171
15/50/10	38	50	8	22	3	452	208	1687	47.5	21029	305	253	234	253	158	189	239
	38	50	8	36	3	452	208	1687	47.5	21029	415	347	361	349	216	294	329
	38	50	8	99	3	452	208	1687	47.5	21029	640	558	575	567	346	478	535
	38	50	8	183	3	452	208	1687	47.5	21029	765	687	670	699	423	552	660
	38	50	8	373	3	452	208	1687	47.5	21029	885	815	753	821	499	605	775
	38	50	8	903	3	452	208	1687	47.5	21029	965	924	832	897	562	638	847
Keeton	38	20	8	15	3	452	208	1687	46.5	21029	250	197	147	206	129	147	196
15/20/9	38	20	8	22	3	452	208	1687	46.5	21029	340	274	254	287	180	252	274
	38	20	8	36	3	452	208	1687	46.5	21029	465	377	391	396	247	393	377
	38	20	8	99	3	452	208	1687	46.5	21029	710	606	625	644	394	638	613
	38	20	8	183	3	452	208	1687	46.5	21029	835	746	727	794	482	736	756
	38	20	8	373	3	452	208	1687	46.5	21029	950	885	817	932	569	806	888
	38	20	8	903	3	452	208	1687	46.5	21029	1015	1003	903	1020	641	850	972
Keeton	76	50	8	9	3	452	208	1687	45.3	25860	20	33	5	35	21	14	30
15/8/50/26	76	50	8	15	3	452	208	1687	45.3	25860	100	87	39	91	55	87	80

	76	50	8	36	3	452	208	1687	45.3	25860	180	171	147	180	108	231	158
	76	50	8	64	3	452	208	1687	45.3	25860	230	238	252	252	151	320	221
	76	50	8	99	3	452	208	1687	45.3	25860	275	298	343	316	188	376	277
	76	50	8	183	3	452	208	1687	45.3	25860	365	397	473	421	250	434	370
	76	50	8	373	3	452	208	1687	45.3	25860	490	527	606	562	330	475	494
	76	50	8	738	3	452	208	1687	45.3	25860	545	655	706	699	408	496	613
Keeton	89	50	8	15	3	452	208	1687	45.3	25860	90	74	29	78	47	81	69
15/8/50/27	89	50	8	36	3	452	208	1687	45.3	25860	150	147	115	155	93	217	136
	89	50	8	64	3	452	208	1687	45.3	25860	195	206	206	217	130	301	191
	89	50	8	99	3	452	208	1687	45.3	25860	240	259	291	273	163	353	240
	89	50	8	183	3	452	208	1687	45.3	25860	315	348	422	369	219	407	324
	89	50	8	373	3	452	208	1687	45.3	25860	435	470	567	501	295	446	440
	89	50	8	728	3	452	208	1687	45.3	25860	490	596	678	636	372	466	559
Rusch	30	65	7	11	1	336	185	1798	28.4	28700	45	131	87	112	90	62	126
30/B/7/02	30	65	7	18	1	336	185	1798	28.4	28700	95	212	191	182	146	145	205
	30	65	7	28	1	336	185	1798	28.4	28700	150	283	276	245	195	228	276
	30	65	7	44	1	336	185	1798	28.4	28700	205	358	351	311	245	312	350
	30	65	7	70	1	336	185	1798	28.4	28700	250	435	414	381	297	390	428
	30	65	7	120	1	336	185	1798	28.4	28700	310	521	472	457	354	464	514
	30	65	7	180	1	336	185	1798	28.4	28700	350	579	507	506	392	505	569
	30	65	7	280	1	336	185	1798	28.4	28700	390	631	540	546	426	538	615
	30	65	7	440	1	336	185	1798	28.4	28700	440	674	569	573	453	562	645
	30	65	7	700	1	336	185	1798	28.4	28700	460	706	596	587	474	578	661
	30	65	7	1100	1	336	185	1798	28.4	28700	490	728	620	593	488	588	667
Rusch	30	65	7	11	1	344	169	1837	47.9	35600	60	102	68	99	66	63	91
30/C/7/03	30	65	7	18	1	344	169	1837	47.9	35600	130	165	149	161	107	146	148
	30	65	7	28	1	344	169	1837	47.9	35600	205	220	215	215	143	229	198
	30	65	7	44	1	344	169	1837	47.9	35600	260	279	273	272	180	314	251
	30	65	7	70	1	344	169	1837	47.9	35600	315	339	322	330	218	392	305
	30	65	7	120	1	344	169	1837	47.9	35600	370	405	367	393	259	466	362
	30	65	7	180	1	344	169	1837	47.9	35600	415	450	394	431	287	508	398
	30	65	7	280	1	344	169	1837	47.9	35600	450	491	420	462	312	541	427
	30	65	7	440	1	344	169	1837	47.9	35600	470	524	443	481	332	565	444
	30	65	7	700	1	344	169	1837	47.9	35600	480	549	464	491	347	581	453
Rusch	30	65	7	9	3	304	182	1854	38.6	35600	50	87	44	85	50	32	76
30/D/7/04	30	65	7	13	3	304	182	1854	38.6	35600	100	149	120	145	86	87	130
	30	65	7	17	3	304	182	1854	38.6	35600	140	190	175	185	109	132	166
	30	65	7	24	3	304	182	1854	38.6	35600	180	242	242	235	139	194	211
	30	65	7	34	3	304	182	1854	38.6	35600	240	296	303	288	169	259	258
	30	65	7	50	3	304	182	1854	38.6	35600	285	356	361	347	203	328	312
	30	65	7	76	3	304	182	1854	38.6	35600	340	421	414	410	240	395	368
	30	65	7	116	3	304	182	1854	38.6	35600	405	484	457	470	275	450	422
	30	65	7	186	3	304	182	1854	38.6	35600	470	547	498	525	309	497	471
	30	65	7	286	3	304	182	1854	38.6	35600	505	594	529	561	335	528	504
	30	65	7	446	3	304	182	1854	38.6	35600	515	633	557	584	356	551	525
	30	65	7	706	3	304	182	1854	38.6	35600	520	663	583	596	371	566	535
	30	65	7	1106	3	304	182	1854	38.6	35600	520	683	606	601	382	576	539
	30	65	7	1806	3	304	182	1854	38.6	35600	520	698	630	602	390	583	540
Rusch	30	65	1	3	3	350	158	1894	50.6	35600	50	82	54	67	46	41	65
30/E/1/05	30	65	1	7	3	350	158	1894	50.6	35600	135	141	146	114	79	110	112
	30	65	1	11	3	350	158	1894	50.6	35600	175	179	213	146	100	167	143
	30	65	1	18	3	350	158	1894	50.6	35600	220	228	294	187	127	246	182
	30	65	1	28	3	350	158	1894	50.6	35600	260	278	368	229	155	328	224
	30	65	1	44	3	350	158	1894	50.6	35600	300	335	439	277	186	415	271
	30	65	1	70	3	350	158	1894	50.6	35600	340	397	503	330	220	499	323
	30	65	1	110	3	350	158	1894	50.6	35600	375	456	556	381	252	569	372
	30	65	1	180	3	350	158	1894	50.6	35600	405	515	605	430	283	629	420
	30	65	1	280	3	350	158	1894	50.6	35600	440	560	643	464	307	668	453

	30	65	1	440	3	350	158	1894	50.6	35600	460	596	677	486	326	697	475
	30	65	1	700	3	350	158	1894	50.6	35600	470	624	709	499	340	716	487
	30	65	1	1100	3	350	158	1894	50.6	35600	480	644	737	504	350	729	492
Rusch	30	65	7	11	3	401	196	1760	43.9	37000	110	117	81	130	64	65	100
30/G/7/07	30	65	7	18	3	401	196	1760	43.9	37000	220	189	177	210	104	151	163
	30	65	7	28	3	401	196	1760	43.9	37000	320	252	256	282	139	237	218
	30	65	7	44	3	401	196	1760	43.9	37000	410	319	325	356	175	325	275
	30	65	7	70	3	401	196	1760	43.9	37000	470	388	384	433	212	407	334
	30	65	7	120	3	401	196	1760	43.9	37000	530	464	437	515	252	483	397
	30	65	7	180	3	401	196	1760	43.9	37000	560	515	470	565	279	526	436
	30	65	7	280	3	401	196	1760	43.9	37000	600	562	501	605	304	560	468
	30	65	7	440	3	401	196	1760	43.9	37000	620	600	528	631	323	585	487
	30	65	7	700	3	401	196	1760	43.9	37000	630	629	553	643	338	602	497
Rusch&	50	65	7	20	2	337	185	1820	24.5	20620	28	123	100	105	95	140	155
Kordina	50	65	7	27	2	337	185	1820	24.5	20620	44	152	141	130	117	188	190
14/A/1	50	65	7	33	2	337	185	1820	24.5	20620	75	172	171	147	132	221	216
	50	65	7	56	2	337	185	1820	24.5	20620	137	229	250	197	176	302	290
	50	65	7	64	2	337	185	1820	24.5	20620	145	245	270	211	188	321	311
	50	65	7	81	2	337	185	1820	24.5	20620	180	274	304	237	210	352	348
	50	65	7	96	2	337	185	1820	24.5	20620	183	295	328	256	226	372	377
	50	65	7	120	2	337	185	1820	24.5	20620	208	324	357	283	248	395	416
	50	65	7	181	2	337	185	1820	24.5	20620	257	379	405	334	290	431	491
	50	65	7	211	2	337	185	1820	24.5	20620	280	400	421	353	305	442	519
	50	65	7	265	2	337	185	1820	24.5	20620	317	430	443	382	327	456	561
	50	65	7	370	2	337	185	1820	24.5	20620	315	473	472	421	359	472	619
	50	65	7	448	2	337	185	1820	24.5	20620	327	495	488	442	375	480	650
	50	65	7	630	2	337	185	1820	24.5	20620	348	532	512	475	402	490	698
	50	65	7	923	2	337	185	1820	24.5	20620	374	568	536	504	427	499	740
	50	65	7	1038	2	337	185	1820	24.5	20620	360	577	543	510	434	501	750
Rusch&	50	65	7	10	2	337	185	1820	23.4	17860	46	65	27	51	47	41	83
Kordina	50	65	7	14	2	337	185	1820	23.4	17860	69	99	62	78	72	86	126
14/D/04	50	65	7	17	2	337	185	1820	23.4	17860	74	117	86	93	86	115	150
	50	65	7	22	2	337	185	1820	23.4	17860	93	143	122	114	104	155	183
	50	65	7	30	2	337	185	1820	23.4	17860	117	175	169	140	128	205	225
	50	65	7	37	2	337	185	1820	23.4	17860	131	198	203	159	145	239	255
	50	65	7	45	2	337	185	1820	23.4	17860	157	221	235	177	161	270	285
	50	65	7	55	2	337	185	1820	23.4	17860	167	245	268	197	179	299	317
	50	65	7	76	2	337	185	1820	23.4	17860	187	287	319	232	209	344	373
	50	65	7	105	2	337	185	1820	23.4	17860	230	331	367	270	241	382	434
	50	65	7	120	2	337	185	1820	23.4	17860	251	350	385	286	254	395	460
	50	65	7	164	2	337	185	1820	23.4	17860	270	396	426	326	286	423	524
	50	65	7	220	2	337	185	1820	23.4	17860	307	438	460	363	316	445	584
	50	65	7	276	2	337	185	1820	23.4	17860	321	471	483	392	339	458	631
	50	65	7	358	2	337	185	1820	23.4	17860	332	506	508	424	364	471	682
	50	65	7	492	2	337	185	1820	23.4	17860	357	547	534	460	392	483	740
	50	65	7	575	2	337	185	1820	23.4	17860	373	565	546	476	405	488	765
	50	65	7	610	2	337	185	1820	23.4	17860	359	572	551	481	409	489	774
	50	65	7	769	2	337	185	1820	23.4	17860	374	596	567	501	426	495	806
Rusch/	50	65	7	9	2	337	185	1820	25.8	32790	18	37	12	41	31	28	42
Kordina	50	65	7	12	2	337	185	1820	25.8	32790	18	58	31	64	50	65	66
14/B/02	50	65	7	17	2	337	185	1820	25.8	32790	21	81	60	90	70	115	93
	50	65	7	24	2	337	185	1820	25.8	32790	44	105	93	117	90	169	121
	50	65	7	28	2	337	185	1820	25.8	32790	59	116	110	129	99	194	134
	50	65	7	38	2	337	185	1820	25.8	32790	64	139	143	155	119	243	161
	50	65	7	57	2	337	185	1820	25.8	32790	85	173	189	193	148	305	200
	50	65	7	67	2	337	185	1820	25.8	32790	93	187	207	209	160	327	217
	50	65	7	79	2	337	185	1820	25.8	32790	107	202	225	226	173	348	235
	50	65	7	102	2	337	185	1820	25.8	32790	137	226	251	254	193	378	263

	50	65	7	133	2	337	185	1820	25.8	32790	159	253	276	284	215	405	294
	50	65	7	193	2	337	185	1820	25.8	32790	189	290	308	327	246	436	339
	50	65	7	226	2	337	185	1820	25.8	32790	201	306	320	345	259	447	358
	50	65	7	277	2	337	185	1820	25.8	32790	204	326	334	368	276	458	381
	50	65	7	352	2	337	185	1820	25.8	32790	214	349	350	393	294	470	407
	50	65	7	470	2	337	185	1820	25.8	32790	240	374	367	420	315	481	436
	50	65	7	576	2	337	185	1820	25.8	32790	248	391	378	437	329	488	453
	50	65	7	869	2	337	185	1820	25.8	32790	296	420	398	464	352	498	480
	50	65	7	1086	2	337	185	1820	25.8	32790	313	434	408	474	363	502	491
Rusch/	50	65	7	13	2	337	185	1820	26.4	26670	62	72	42	71	61	76	86
Kordina	50	65	7	22	2	337	185	1820	26.4	26670	88	113	96	111	95	155	135
14/C/03	50	65	7	27	2	337	185	1820	26.4	26670	110	129	121	128	109	188	155
	50	65	7	34	2	337	185	1820	26.4	26670	137	149	149	147	125	226	179
	50	65	7	44	2	337	185	1820	26.4	26670	142	172	183	170	144	266	207
	50	65	7	54	2	337	185	1820	26.4	26670	182	192	209	190	161	297	231
	50	65	7	70	2	337	185	1820	26.4	26670	216	218	242	217	182	333	263
	50	65	7	85	2	337	185	1820	26.4	26670	245	239	265	238	199	357	289
	50	65	7	100	2	337	185	1820	26.4	26670	286	256	284	256	214	376	311
	50	65	7	128	2	337	185	1820	26.4	26670	317	284	311	285	237	402	346
	50	65	7	182	2	337	185	1820	26.4	26670	359	324	346	327	269	432	397
	50	65	7	229	2	337	185	1820	26.4	26670	357	351	366	354	291	447	430
	50	65	7	261	2	337	185	1820	26.4	26670	367	365	377	369	303	455	449
	50	65	7	352	2	337	185	1820	26.4	26670	389	398	400	403	329	470	489
	50	65	7	484	2	337	185	1820	26.4	26670	433	430	421	435	354	482	528
	50	65	7	565	2	337	185	1820	26.4	26670	437	445	430	449	366	487	545
	50	65	7	851	2	337	185	1820	26.4	26670	481	478	453	478	392	497	581
	50	65	7	1071	2	337	185	1820	26.4	26670	498	494	465	490	405	501	596
Rusch/	50	65	7	8	2	337	185	1820	27.9	22370	20	32	7	29	26	14	39
Kordina	50	65	7	9	2	337	185	1820	27.9	22370	59	45	15	41	37	28	55
14/E/05	50	65	7	16	2	337	185	1820	27.9	22370	88	95	67	87	77	106	117
	50	65	7	29	2	337	185	1820	27.9	22370	148	147	140	135	119	200	180
	50	65	7	34	2	337	185	1820	27.9	22370	176	162	162	148	130	226	199
	50	65	7	49	2	337	185	1820	27.9	22370	239	198	213	182	160	282	244
	50	65	7	65	2	337	185	1820	27.9	22370	294	228	252	211	184	323	282
	50	65	7	75	2	337	185	1820	27.9	22370	304	244	271	226	197	342	303
	50	65	7	84	2	337	185	1820	27.9	22370	311	257	286	239	207	356	320
	50	65	7	93	2	337	185	1820	27.9	22370	320	269	299	250	216	368	335
	50	65	7	133	2	337	185	1820	27.9	22370	322	313	342	292	251	405	391
	50	65	7	167	2	337	185	1820	27.9	22370	322	341	366	320	273	425	428
	50	65	7	205	2	337	185	1820	27.9	22370	348	366	387	345	293	440	462
	50	65	7	238	2	337	185	1820	27.9	22370	379	385	401	363	307	450	487
	50	65	7	289	2	337	185	1820	27.9	22370	410	408	417	387	326	461	518
	50	65	7	421	2	337	185	1820	27.9	22370	414	451	447	428	359	478	574
	50	65	7	538	2	337	185	1820	27.9	22370	451	477	463	453	378	486	606
	50	65	7	790	2	337	185	1820	27.9	22370	498	513	487	483	405	496	647
	50	65	7	1009	2	337	185	1820	27.9	22370	536	532	501	498	420	500	667
Rusch/	50	65	7	15	2	337	185	1820	28.5	30310	24	75	50	81	65	96	87
Kordina	50	65	7	18	2	337	185	1820	28.5	30310	46	88	67	95	76	124	102
14/F/06	50	65	7	28	2	337	185	1820	28.5	30310	73	120	113	129	103	194	140
	50	65	7	42	2	337	185	1820	28.5	30310	134	152	160	165	131	259	177
	50	65	7	56	2	337	185	1820	28.5	30310	160	177	194	192	152	302	207
	50	65	7	65	2	337	185	1820	28.5	30310	185	191	211	207	164	323	223
	50	65	7	74	2	337	185	1820	28.5	30310	207	203	225	220	174	340	238
	50	65	7	95	2	337	185	1820	28.5	30310	235	227	252	247	195	371	267
	50	65	7	114	2	337	185	1820	28.5	30310	267	246	271	268	210	390	289
	50	65	7	130	2	337	185	1820	28.5	30310	272	259	284	283	222	403	305
	50	65	7	148	2	337	185	1820	28.5	30310	267	273	296	298	233	415	321
	50	65	7	186	2	337	185	1820	28.5	30310	293	296	316	324	253	433	350

	50	65	7	219	2	337	185	1820	28.5	30310	310	313	329	343	267	444	370
	50	65	7	267	2	337	185	1820	28.5	30310	328	334	344	366	284	456	394
	50	65	7	295	2	337	185	1820	28.5	30310	332	344	351	377	292	462	406
	50	65	7	402	2	337	185	1820	28.5	30310	354	373	371	409	317	476	441
	50	65	7	486	2	337	185	1820	28.5	30310	370	391	382	426	330	483	460
Wesche	50	65	3	5	1	336	185	1810	33.3	32200	44	50	19	46	35	32	45
63/A/3/01	50	65	3	7	1	336	185	1810	33.3	32200	60	71	39	65	49	61	64
	50	65	3	8	1	336	185	1810	33.3	32200	64	79	49	73	55	74	72
	50	65	3	10	1	336	185	1810	33.3	32200	80	94	68	86	65	99	85
	50	65	3	14	1	336	185	1810	33.3	32200	95	117	103	107	81	142	106
	50	65	3	17	1	336	185	1810	33.3	32200	125	131	126	120	91	170	119
	50	65	3	24	1	336	185	1810	33.3	32200	155	160	173	146	110	223	144
	50	65	3	31	1	336	185	1810	33.3	32200	184	183	212	168	126	265	165
	50	65	3	49	1	336	185	1810	33.3	32200	240	229	286	211	158	338	208
	50	65	3	63	1	336	185	1810	33.3	32200	275	257	328	238	177	376	235
	50	65	3	78	1	336	185	1810	33.3	32200	300	283	362	262	195	406	258
	50	65	3	98	1	336	185	1810	33.3	32200	335	312	397	289	214	435	285
	50	65	3	126	1	336	185	1810	33.3	32200	381	344	434	321	236	464	316
	50	65	3	183	1	336	185	1810	33.3	32200	412	395	483	369	270	498	364
	50	65	3	280	1	336	185	1810	33.3	32200	432	452	532	424	308	529	418
	50	65	3	371	1	336	185	1810	33.3	32200	438	488	560	458	332	544	452
	50	65	3	464	1	336	185	1810	33.3	32200	439	515	581	483	349	553	476
	50	65	3	556	1	336	185	1810	33.3	32200	442	535	596	501	363	560	494
Wesche	50	65	7	11	1	336	185	1810	33.3	32200	27	71	33	67	49	56	66
63/A/7/02	50	65	7	14	1	336	185	1810	33.3	32200	50	94	57	89	65	91	87
	50	65	7	17	1	336	185	1810	33.3	32200	63	112	80	106	77	121	104
	50	65	7	21	1	336	185	1810	33.3	32200	85	131	106	124	91	156	123
	50	65	7	28	1	336	185	1810	33.3	32200	120	160	146	151	110	204	149
	50	65	7	35	1	336	185	1810	33.3	32200	144	183	179	173	126	242	171
	50	65	7	49	1	336	185	1810	33.3	32200	185	220	230	209	152	297	206
	50	65	7	63	1	336	185	1810	33.3	32200	217	250	267	238	172	335	234
	50	65	7	78	1	336	185	1810	33.3	32200	243	276	298	264	190	365	260
	50	65	7	98	1	336	185	1810	33.3	32200	275	306	330	292	211	393	288
	50	65	7	112	1	336	185	1810	33.3	32200	291	324	347	310	223	408	305
	50	65	7	189	1	336	185	1810	33.3	32200	362	396	409	380	271	457	374
	50	65	7	280	1	336	185	1810	33.3	32200	412	450	447	431	307	483	425
	50	65	7	371	1	336	185	1810	33.3	32200	432	486	472	465	331	497	458
	50	65	7	464	1	336	185	1810	33.3	32200	445	514	489	489	349	506	482
	50	65	7	556	1	336	185	1810	33.3	32200	452	534	502	506	362	512	499
Wesche	50	65	1	3	1	337	185	1818	46.6	37500	40	43	21	44	26	36	35
63/B/1/03	50	65	1	4	1	337	185	1818	46.6	37500	60	52	33	53	32	53	43
	50	65	1	8	1	337	185	1818	46.6	37500	95	79	77	81	49	112	66
	50	65	1	11	1	337	185	1818	46.6	37500	115	94	107	97	59	149	78
	50	65	1	16	1	337	185	1818	46.6	37500	139	115	151	118	71	201	95
	50	65	1	22	1	337	185	1818	46.6	37500	169	135	196	138	84	251	112
	50	65	1	29	1	337	185	1818	46.6	37500	195	154	240	159	96	297	129
	50	65	1	43	1	337	185	1818	46.6	37500	240	186	308	192	115	365	155
	50	65	1	57	1	337	185	1818	46.6	37500	272	211	358	218	131	412	177
	50	65	1	78	1	337	185	1818	46.6	37500	314	242	413	251	149	460	203
	50	65	1	92	1	337	185	1818	46.6	37500	336	259	441	269	160	483	218
	50	65	1	127	1	337	185	1818	46.6	37500	384	294	493	307	181	524	248
	50	65	1	185	1	337	185	1818	46.6	37500	455	336	549	352	206	562	286
	50	65	1	253	1	337	185	1818	46.6	37500	504	371	589	391	227	588	317
	50	65	1	361	1	337	185	1818	46.6	37500	559	410	630	432	250	610	350
	50	65	1	501	1	337	185	1818	46.6	37500	605	442	663	466	270	625	377
	50	65	1	651	1	337	185	1818	46.6	37500	617	466	687	488	283	635	396
	50	65	1	722	1	337	185	1818	46.6	37500	638	475	696	496	288	638	402
Wesche	50	65	3	6	1	337	185	1818	46.6	37500	38	52	25	56	32	47	45

63/B/3/04	50	65	3	8	1	337	185	1818	46.6	37500	64	67	41	72	42	74	58
	50	65	3	10	1	337	185	1818	46.6	37500	87	79	57	85	49	99	69
	50	65	3	12	1	337	185	1818	46.6	37500	109	90	73	96	56	122	78
	50	65	3	17	1	337	185	1818	46.6	37500	139	111	107	119	69	170	96
	50	65	3	22	1	337	185	1818	46.6	37500	160	129	136	138	80	210	112
	50	65	3	30	1	337	185	1818	46.6	37500	190	152	175	163	94	259	132
	50	65	3	44	1	337	185	1818	46.6	37500	232	184	227	197	114	321	160
	50	65	3	58	1	337	185	1818	46.6	37500	268	209	265	225	130	364	182
	50	65	3	79	1	337	185	1818	46.6	37500	304	240	307	259	148	408	210
	50	65	3	93	1	337	185	1818	46.6	37500	326	258	329	278	159	429	225
	50	65	3	121	1	337	185	1818	46.6	37500	361	286	362	309	177	460	251
	50	65	3	186	1	337	185	1818	46.6	37500	426	335	410	363	206	500	294
	50	65	3	278	1	337	185	1818	46.6	37500	496	381	449	411	233	529	333
	50	65	3	364	1	337	185	1818	46.6	37500	539	410	472	442	250	543	358
	50	65	3	554	1	337	185	1818	46.6	37500	596	452	503	482	275	560	391
	50	65	3	723	1	337	185	1818	46.6	37500	626	475	521	502	288	568	407
	50	65	3	768	1	337	185	1818	46.6	37500	629	479	525	506	291	570	410
Wesche	50	65	7	11	1	337	185	1818	46.6	37500	34	60	28	66	37	56	54
63/B/7/05	50	65	7	13	1	337	185	1818	46.6	37500	50	73	42	81	46	80	66
	50	65	7	18	1	337	185	1818	46.6	37500	58	99	73	109	61	130	89
	50	65	7	21	1	337	185	1818	46.6	37500	71	111	90	123	69	156	99
	50	65	7	26	1	337	185	1818	46.6	37500	100	129	115	142	80	192	115
	50	65	7	34	1	337	185	1818	46.6	37500	134	152	148	168	94	237	136
	50	65	7	47	1	337	185	1818	46.6	37500	179	182	189	201	113	291	163
	50	65	7	61	1	337	185	1818	46.6	37500	216	208	222	230	129	331	186
	50	65	7	74	1	337	185	1818	46.6	37500	245	228	245	253	141	358	205
	50	65	7	96	1	337	185	1818	46.6	37500	285	256	276	284	158	391	230
	50	65	7	125	1	337	185	1818	46.6	37500	326	286	305	317	177	420	257
	50	65	7	181	1	337	185	1818	46.6	37500	387	330	341	365	203	454	295
	50	65	7	282	1	337	185	1818	46.6	37500	467	381	378	419	233	483	340
	50	65	7	313	1	337	185	1818	46.6	37500	490	392	386	431	240	489	349
	50	65	7	376	1	337	185	1818	46.6	37500	522	412	399	451	252	498	365
	50	65	7	558	1	337	185	1818	46.6	37500	580	452	424	488	275	512	395
	50	65	7	712	1	337	185	1818	46.6	37500	611	473	438	505	287	519	409
	50	65	7	767	1	337	185	1818	46.6	37500	620	479	442	510	291	521	413
Wesche	50	65	3	6	2	336	185	1810	34.2	27800	34	47	23	48	41	45	52
63/C/3/06	50	65	3	9	2	336	185	1810	34.2	27800	75	66	47	68	57	83	74
	50	65	3	13	2	336	185	1810	34.2	27800	91	85	75	87	74	126	95
	50	65	3	17	2	336	185	1810	34.2	27800	115	100	101	103	87	162	112
	50	65	3	29	2	336	185	1810	34.2	27800	174	134	161	139	116	241	151
	50	65	3	49	2	336	185	1810	34.2	27800	233	174	229	181	150	321	197
	50	65	3	63	2	336	185	1810	34.2	27800	269	195	262	204	169	357	222
	50	65	3	78	2	336	185	1810	34.2	27800	301	215	289	225	185	386	244
	50	65	3	101	2	336	185	1810	34.2	27800	339	240	321	252	206	417	273
	50	65	3	129	2	336	185	1810	34.2	27800	372	264	349	278	227	443	302
	50	65	3	186	2	336	185	1810	34.2	27800	425	301	388	320	259	475	347
	50	65	3	234	2	336	185	1810	34.2	27800	445	325	409	346	278	492	376
	50	65	3	278	2	336	185	1810	34.2	27800	476	342	424	365	293	502	396
	50	65	3	316	2	336	185	1810	34.2	27800	487	355	435	379	303	509	412
	50	65	3	365	2	336	185	1810	34.2	27800	504	369	446	394	315	516	428
	50	65	3	554	2	336	185	1810	34.2	27800	530	406	476	433	345	532	470
	50	65	3	709	2	336	185	1810	34.2	27800	542	425	492	452	361	539	491
	50	65	3	764	2	336	185	1810	34.2	27800	547	431	496	457	365	541	496
Wesche	50	65	7	14	2	336	185	1810	34.2	27800	21	71	45	76	62	86	82
63/C/7/07	50	65	7	25	2	336	185	1810	34.2	27800	54	113	102	120	98	176	131
	50	65	7	33	2	336	185	1810	34.2	27800	77	134	133	143	116	221	156
	50	65	7	49	2	336	185	1810	34.2	27800	120	167	180	179	145	282	195
	50	65	7	70	2	336	185	1810	34.2	27800	171	200	221	215	172	333	233

	50	65	7	131	2	336	185	1810	34.2	27800	272	262	287	284	226	404	308
	50	65	7	192	2	336	185	1810	34.2	27800	333	302	321	328	260	435	357
	50	65	7	284	2	336	185	1810	34.2	27800	387	343	351	373	293	459	405
	50	65	7	375	2	336	185	1810	34.2	27800	419	370	370	402	316	473	437
	50	65	7	468	2	336	185	1810	34.2	27800	435	391	383	423	333	481	460
	50	65	7	566	2	336	185	1810	34.2	27800	449	407	394	440	346	487	478
	50	65	7	646	2	336	185	1810	34.2	27800	458	418	401	450	355	491	489
	50	65	7	734	2	336	185	1810	34.2	27800	464	427	408	458	363	494	498
	50	65	7	793	2	336	185	1810	34.2	27800	467	433	411	463	367	495	503
	50	65	7	824	2	336	185	1810	34.2	27800	470	436	413	465	369	496	506
	50	65	7	856	2	336	185	1810	34.2	27800	474	438	415	467	371	497	508
Wesche	50	65	7	10	2	336	185	1810	33.3	35400	25	41	17	49	34	41	45
63/D/7/08	50	65	7	14	2	336	185	1810	33.3	35400	44	62	39	75	52	86	69
	50	65	7	17	2	336	185	1810	33.3	35400	60	73	54	89	62	115	82
	50	65	7	21	2	336	185	1810	33.3	35400	84	86	72	105	73	148	96
	50	65	7	27	2	336	185	1810	33.3	35400	100	102	96	125	87	188	114
	50	65	7	35	2	336	185	1810	33.3	35400	125	120	121	146	101	230	134
	50	65	7	49	2	336	185	1810	33.3	35400	161	145	156	177	122	282	162
	50	65	7	63	2	336	185	1810	33.3	35400	200	164	181	201	139	318	184
	50	65	7	77	2	336	185	1810	33.3	35400	219	181	201	221	152	345	203
	50	65	7	105	2	336	185	1810	33.3	35400	266	207	229	254	174	381	233
	50	65	7	127	2	336	185	1810	33.3	35400	297	224	246	275	188	401	252
	50	65	7	182	2	336	185	1810	33.3	35400	355	257	274	315	215	431	289
	50	65	7	227	2	336	185	1810	33.3	35400	391	277	290	340	232	447	311
	50	65	7	280	2	336	185	1810	33.3	35400	423	296	303	362	247	459	332
	50	65	7	364	2	336	185	1810	33.3	35400	452	318	318	388	265	471	356
	50	65	7	588	2	336	185	1810	33.3	35400	486	355	343	428	295	488	392
	50	65	7	735	2	336	185	1810	33.3	35400	492	370	353	443	306	494	406
	50	65	7	798	2	336	185	1810	33.3	35400	492	375	356	447	311	496	410
Wesche	50	65	7	10	2	336	185	1810	30.8	28400	30	48	19	50	41	41	55
63/E/7/09	50	65	7	14	2	336	185	1810	30.8	28400	60	72	45	76	62	86	84
	50	65	7	16	2	336	185	1810	30.8	28400	72	82	57	86	70	106	95
	50	65	7	21	2	336	185	1810	30.8	28400	104	101	84	107	87	148	118
	50	65	7	27	2	336	185	1810	30.8	28400	120	120	112	127	103	188	140
	50	65	7	33	2	336	185	1810	30.8	28400	136	136	135	143	117	221	159
	50	65	7	48	2	336	185	1810	30.8	28400	198	168	180	177	144	279	196
	50	65	7	61	2	336	185	1810	30.8	28400	230	189	208	201	163	314	222
	50	65	7	75	2	336	185	1810	30.8	28400	259	209	232	222	179	342	246
	50	65	7	96	2	336	185	1810	30.8	28400	291	234	259	249	200	371	276
	50	65	7	133	2	336	185	1810	30.8	28400	335	268	293	286	229	405	317
	50	65	7	189	2	336	185	1810	30.8	28400	378	305	324	327	260	434	362
	50	65	7	279	2	336	185	1810	30.8	28400	433	346	355	372	294	459	412
	50	65	7	362	2	336	185	1810	30.8	28400	467	372	373	400	316	471	443
	50	65	7	558	2	336	185	1810	30.8	28400	504	412	399	440	348	487	487
	50	65	7	670	2	336	185	1810	30.8	28400	518	426	409	454	360	492	502
	50	65	7	768	2	336	185	1810	30.8	28400	527	437	416	463	368	495	513
	50	65	7	796	2	336	185	1810	30.8	28400	530	439	417	465	370	496	515
Stockl	38	65	7	11	2	358	215	1979	18.1	26500	30	85	51	96	69	59	105
69/A/01	38	65	7	56	2	358	215	1979	18.1	26500	221	272	287	310	217	336	341
	38	65	7	116	2	358	215	1979	18.1	26500	319	366	369	422	290	436	464
	38	65	7	211	2	358	215	1979	18.1	26500	406	439	420	511	347	492	562
	38	65	7	266	2	358	215	1979	18.1	26500	436	465	437	542	367	507	595
	38	65	7	484	2	358	215	1979	18.1	26500	530	521	474	603	409	537	662
	38	65	7	767	2	358	215	1979	18.1	26500	613	554	498	631	434	551	693
Stockl	38	65	7	10	2	247	148	2055	19.3	27100	30	72	37	52	59	42	88
69/B/02	38	65	7	64	2	247	148	2055	19.3	27100	258	281	295	205	227	332	349
	38	65	7	122	2	247	148	2055	19.3	27100	325	362	363	267	291	411	455
	38	65	7	202	2	247	148	2055	19.3	27100	360	422	405	313	339	454	534

	38	65	7	266	2	247	148	2055	19.3	27100	364	452	424	336	362	472	572
	38	65	7	462	2	247	148	2055	19.3	27100	321	503	458	371	401	497	631
	38	65	7	767	2	247	148	2055	19.3	27100	366	539	484	390	428	512	664
Stockl	38	65	7	14	2	353	159	1908	23.9	24090	50	112	84	85	90	96	138
69/C/03	38	65	7	29	2	353	159	1908	23.9	24090	167	192	194	147	155	222	238
	38	65	7	37	2	353	159	1908	23.9	24090	195	221	230	169	177	265	274
	38	65	7	58	2	353	159	1908	23.9	24090	257	276	291	213	221	340	345
	38	65	7	127	2	353	159	1908	23.9	24090	344	377	377	294	300	445	477
	38	65	7	184	2	353	159	1908	23.9	24090	375	422	409	332	336	479	538
	38	65	7	266	2	353	159	1908	23.9	24090	406	464	436	365	368	506	592
	38	65	7	335	2	353	159	1908	23.9	24090	418	488	451	383	386	519	621
	38	65	7	531	2	353	159	1908	23.9	24090	450	528	478	411	416	538	666
	38	65	7	732	2	353	159	1908	23.9	24090	469	550	495	423	433	548	687
Burg	25	50	28	28	1	505	157	1682	45.5	37500	28	23	2	22	14	2	22
93/01	25	50	28	29	1	505	157	1682	45.5	37500	37	50	11	50	32	9	49
	25	50	28	29	1	505	157	1682	45.5	37500	53	67	21	67	43	16	66
	25	50	28	30	1	505	157	1682	45.5	37500	70	95	42	94	61	31	92
	25	50	28	30	1	505	157	1682	45.5	37500	80	105	51	104	67	38	102
	25	50	28	32	1	505	157	1682	45.5	37500	117	138	84	137	88	64	134
	25	50	28	34	1	505	157	1682	45.5	37500	153	171	118	170	109	94	166
	25	50	28	36	1	505	157	1682	45.5	37500	175	192	141	191	123	117	187
	25	50	28	38	1	505	157	1682	45.5	37500	200	209	158	208	134	136	203
	25	50	28	39	1	505	157	1682	45.5	37500	222	227	176	226	145	156	221
	25	50	28	41	1	505	157	1682	45.5	37500	241	243	190	241	155	174	235
	25	50	28	44	1	505	157	1682	45.5	37500	271	265	210	263	169	201	257
	25	50	28	48	1	505	157	1682	45.5	37500	295	289	231	286	185	231	280
	25	50	28	55	1	505	157	1682	45.5	37500	323	326	259	322	207	277	314
	25	50	28	61	1	505	157	1682	45.5	37500	349	353	277	347	224	309	339
	25	50	28	71	1	505	157	1682	45.5	37500	372	386	298	378	245	350	370
	25	50	28	79	1	505	157	1682	45.5	37500	388	411	313	401	260	378	392
	25	50	28	90	1	505	157	1682	45.5	37500	411	435	326	422	275	406	413
	25	50	28	107	1	505	157	1682	45.5	37500	443	467	343	449	294	441	439
	25	50	28	121	1	505	157	1682	45.5	37500	468	488	354	466	307	463	456
	25	50	28	155	1	505	157	1682	45.5	37500	485	524	372	493	329	499	482
	25	50	28	184	1	505	157	1682	45.5	37500	497	546	384	508	342	520	497
	25	50	28	720	1	505	157	1682	45.5	37500	555	648	450	549	403	606	537
Burg	19	50	28	35	1	564	158	1715	78.6	43200	193	190	139	231	65	113	182
85/A/38/01	19	50	28	42	1	564	158	1715	78.6	43200	337	254	192	307	87	193	242
	19	50	28	56	1	564	158	1715	78.6	43200	400	327	238	387	111	300	306
	19	50	28	87	1	564	158	1715	78.6	43200	513	405	279	462	136	424	364
	19	50	28	180	1	564	158	1715	78.6	43200	593	481	318	512	161	549	404
	19	50	28	335	1	564	158	1715	78.6	43200	673	517	342	523	172	606	413
	19	50	28	645	1	564	158	1715	78.6	43200	697	537	364	525	179	639	414
Burg 1	38	50	28	35	1	564	158	1715	78.6	43200	75	99	60	122	34	93	96
85/A/76/06	38	50	28	42	1	564	158	1715	78.6	43200	163	138	104	169	47	159	133
	38	50	28	56	1	564	158	1715	78.6	43200	235	190	160	231	65	247	182
	38	50	28	87	1	564	158	1715	78.6	43200	338	259	222	313	88	349	247
	38	50	28	180	1	564	158	1715	78.6	43200	450	360	288	420	122	452	332
	38	50	28	335	1	564	158	1715	78.6	43200	538	429	325	481	144	499	380
	38	50	28	645	1	564	158	1715	78.6	43200	647	482	355	513	161	526	405

Table D.2 RILEM compliance data bank

Series	V/S	h	days			Cem.	Content kg/m^3			Experimental MPa			Compliance $J(t,t_0)$ x10^{-6} 1/MPa						
	mm	%	t_c	t_0	t	Type	c	w	a	E_{cmto}	f_{cm28}	E_{cm28}	EXP	GL	ATL	B3	CEB	ACI	S.B3
Troxell	25	50	28	28	28	I	320	189	1814	20000	17.2	20000	50	50	50	52	50	50	59
5/50/04	25	50	28	28	41	I	320	189	1814	20000	17.2	20000	97	113	113	103	130	83	113
	25	50	28	28	56	I	320	189	1814	20000	17.2	20000	125	129	133	117	151	94	125
	25	50	28	28	118	I	320	189	1814	20000	17.2	20000	151	155	166	150	192	111	153
	25	50	28	28	218	I	320	189	1814	20000	17.2	20000	172	170	185	174	219	122	173
	25	50	28	28	393	I	320	189	1814	20000	17.2	20000	193	181	199	189	241	130	186
	25	50	28	28	758	I	320	189	1814	20000	17.2	20000	211	190	211	199	259	136	195
	25	50	28	28	1853	I	320	189	1814	20000	17.2	20000	228	199	224	206	274	143	204
	25	50	28	28	3678	I	320	189	1814	20000	17.2	20000	235	205	233	211	280	146	210
	25	50	28	28	8525	I	320	189	1814	20000	17.2	20000	240	212	244	217	283	148	217
Troxell	25	70	28	28	28	I	320	189	1814	20000	17.2	20000	50	50	50	52	50	50	59
5/70/03	25	70	28	28	40	I	320	189	1814	20000	17.2	20000	83	101	104	94	110	77	105
	25	70	28	28	56	I	320	189	1814	20000	17.2	20000	99	114	119	103	128	87	114
	25	70	28	28	118	I	320	189	1814	20000	17.2	20000	121	133	143	120	159	103	130
	25	70	28	28	393	I	320	189	1814	20000	17.2	20000	151	153	165	139	197	118	149
	25	70	28	28	758	I	320	189	1814	20000	17.2	20000	166	160	174	145	211	124	156
	25	70	28	28	1853	I	320	189	1814	20000	17.2	20000	176	168	184	152	222	129	164
	25	70	28	28	3678	I	320	189	1814	20000	17.2	20000	182	174	191	157	227	132	169
	25	70	28	28	6952	I	320	189	1814	20000	17.2	20000	194	179	197	161	229	134	175
Troxell	25	99	28	28	28	I	320	189	1814	19300	17.2	20000	52	52	52	51	52	52	58
5/99/2	25	99	28	28	40	I	320	189	1814	19300	17.2	20000	66	81	93	81	72	73	95
	25	99	28	28	56	I	320	189	1814	19300	17.2	20000	75	85	95	85	79	81	101
	25	99	28	28	118	I	320	189	1814	19300	17.2	20000	81	91	97	93	91	93	110
	25	99	28	28	218	I	320	189	1814	19300	17.2	20000	86	94	99	98	102	100	116
	25	99	28	28	388	I	320	189	1814	19300	17.2	20000	88	97	101	103	112	105	122
	25	99	28	28	758	I	320	189	1814	19300	17.2	20000	89	101	103	108	123	110	128
	25	99	28	28	1853	I	320	189	1814	19300	17.2	20000	91	107	106	115	136	114	136
	25	99	28	28	3678	I	320	189	1814	19300	17.2	20000	93	112	108	119	144	116	141
	25	99	28	28	8428	I	320	189	1814	19300	17.2	20000	103	118	111	125	150	118	148
Troxell	25	100	28	28	28	I	320	189	1814	18083	17.2	20000	55	55	55	51	55	55	58
5/100/01	25	100	28	28	41	I	320	189	1814	18083	17.2	20000	76	84	98	79	76	78	94
	25	100	28	28	55	I	320	189	1814	18083	17.2	20000	80	88	99	82	82	86	99
	25	100	28	28	90	I	320	189	1814	18083	17.2	20000	85	91	100	87	90	95	105
	25	100	28	28	613	I	320	189	1814	18083	17.2	20000	99	101	105	103	121	115	123
	25	100	28	28	691	I	320	189	1814	18083	17.2	20000	100	102	105	104	123	116	124
	25	100	28	28	848	I	320	189	1814	18083	17.2	20000	103	103	106	105	126	117	126
	25	100	28	28	1902	I	320	189	1814	18083	17.2	20000	108	109	109	111	138	121	133
	25	100	28	28	2806	I	320	189	1814	18083	17.2	20000	110	111	110	114	142	122	136
	25	100	28	28	4699	I	320	189	1814	18083	17.2	20000	116	115	112	117	147	124	141
	25	100	28	28	7007	I	320	189	1814	18083	17.2	20000	118	118	113	120	150	125	144
Keeton	19	99	8	8	8	3	452	208	1687	21029	45.2	27235	48	48	48	40	48	48	39
15/76/99/01	19	99	8	8	15	3	452	208	1687	21029	45.2	27235	75	75	82	68	57	66	65
	19	99	8	8	22	3	452	208	1687	21029	45.2	27235	80	80	83	72	60	73	70
	19	99	8	8	36	3	452	208	1687	21029	45.2	27235	86	83	85	78	63	80	75
	19	99	8	8	99	3	452	208	1687	21029	45.2	27235	96	88	88	88	70	94	84
	19	99	8	8	183	3	452	208	1687	21029	45.2	27235	102	90	90	93	76	100	89
	19	99	8	8	373	3	452	208	1687	21029	45.2	27235	105	93	92	100	82	107	94
	19	99	8	8	903	3	452	208	1687	21029	45.2	27235	107	97	95	107	90	113	101
Keeton	19	75	8	8	8	3	452	208	1687	21029	46.8	25856	48	48	48	41	48	48	40
15/38/75/02	19	75	8	8	15	3	452	208	1687	21029	46.8	25856	78	89	88	74	76	71	72
	19	75	8	8	22	3	452	208	1687	21029	46.8	25856	86	97	96	80	84	79	78
	19	75	8	8	36	3	452	208	1687	21029	46.8	25856	92	106	104	87	92	89	84
	19	75	8	8	99	3	452	208	1687	21029	46.8	25856	103	119	117	100	110	106	97
	19	75	8	8	183	3	452	208	1687	21029	46.8	25856	107	124	124	107	121	114	103
	19	75	8	8	373	3	452	208	1687	21029	46.8	25856	111	129	130	113	132	123	109
	19	75	8	8	903	3	452	208	1687	21029	46.8	25856	114	135	136	121	141	131	116
Keeton	19	50	8	8	8	3	452	208	1687	21029	47.5	25512	48	48	48	41	48	48	40
15/38/50/03	19	50	8	8	15	3	452	208	1687	21029	47.5	25512	85	98	94	79	89	76	77
	19	50	8	8	22	3	452	208	1687	21029	47.5	25512	94	110	105	87	100	86	86
	19	50	8	8	36	3	452	208	1687	21029	47.5	25512	103	123	118	98	112	98	97
	19	50	8	8	99	3	452	208	1687	21029	47.5	25512	117	141	139	121	138	119	120
	19	50	8	8	183	3	452	208	1687	21029	47.5	25512	126	149	148	132	153	129	130

	19	50	8	8	373	3	452	208	1687	21029	47.5	25512	134	156	157	140	168	139	138
	19	50	8	8	903	3	452	208	1687	21029	47.5	25512	138	163	167	148	182	149	146
Keeton	19	20	8	8	8	3	452	208	1687	21029	46.5	24480	48	48	48	43	48	48	42
15/38/20/04	19	20	8	8	15	3	452	208	1687	21029	46.5	24480	89	106	97	89	107	83	88
	19	20	8	8	22	3	452	208	1687	21029	46.5	24480	100	121	111	105	121	95	104
	19	20	8	8	36	3	452	208	1687	21029	46.5	24480	109	136	127	130	139	109	130
	19	20	8	8	99	3	452	208	1687	21029	46.5	24480	129	159	153	193	176	134	196
	19	20	8	8	183	3	452	208	1687	21029	46.5	24480	137	169	165	225	197	147	229
	19	20	8	8	373	3	452	208	1687	21029	46.5	24480	143	177	176	243	219	159	248
	19	20	8	8	903	3	452	208	1687	21029	46.5	24480	146	184	187	253	238	170	257
Keeton	38	99	8	8	8	3	452	208	1687	21029	45.2	27235	48	48	48	40	48	48	39
15/76/99/05	38	99	8	8	15	3	452	208	1687	21029	45.2	27235	75	76	82	67	57	64	65
	38	99	8	8	22	3	452	208	1687	21029	45.2	27235	81	81	85	72	60	69	69
	38	99	8	8	36	3	452	208	1687	21029	45.2	27235	86	85	87	77	63	76	74
	38	99	8	8	99	3	452	208	1687	21029	45.2	27235	95	89	90	87	70	87	83
	38	99	8	8	183	3	452	208	1687	21029	45.2	27235	100	91	91	93	75	93	89
	38	99	8	8	373	3	452	208	1687	21029	45.2	27235	104	94	93	99	82	99	94
	38	99	8	8	903	3	452	208	1687	21029	45.2	27235	106	98	95	107	90	104	101
Keeton	38	75	8	8	8	3	452	208	1687	21029	46.8	25856	48	48	48	41	48	48	40
15/76/75/06	38	75	8	8	15	3	452	208	1687	21029	46.8	25856	73	83	84	72	72	68	69
	38	75	8	8	22	3	452	208	1687	21029	46.8	25856	81	91	88	77	79	75	75
	38	75	8	8	36	3	452	208	1687	21029	46.8	25856	89	98	95	83	86	83	81
	38	75	8	8	99	3	452	208	1687	21029	46.8	25856	101	110	109	96	102	98	93
	38	75	8	8	183	3	452	208	1687	21029	46.8	25856	107	117	117	104	112	106	100
	38	75	8	8	373	3	452	208	1687	21029	46.8	25856	114	125	125	112	122	113	108
	38	75	8	8	903	3	452	208	1687	21029	46.8	25856	117	132	134	121	131	120	116
Keeton	38	50	8	8	8	3	452	208	1687	21029	47.5	25512	48	48	48	41	48	48	40
15/76/50/07	38	50	8	8	15	3	452	208	1687	21029	47.5	25512	78	88	85	74	82	72	72
	38	50	8	8	22	3	452	208	1687	21029	47.5	25512	86	98	92	80	91	81	78
	38	50	8	8	36	3	452	208	1687	21029	47.5	25512	96	108	101	88	101	91	86
	38	50	8	8	99	3	452	208	1687	21029	47.5	25512	115	126	123	106	123	109	104
	38	50	8	8	183	3	452	208	1687	21029	47.5	25512	125	137	136	119	137	118	116
	38	50	8	8	373	3	452	208	1687	21029	47.5	25512	132	147	150	133	150	127	131
	38	50	8	8	903	3	452	208	1687	21029	47.5	25512	134	158	163	147	163	135	144
Keeton	38	20	8	8	15	3	452	208	1687	21029	46.5	24480	82	93	86	79	95	78	77
15/76/20/08	38	20	8	8	22	3	452	208	1687	21029	46.5	24480	91	103	94	87	107	88	85
	38	20	8	8	36	3	452	208	1687	21029	46.5	24480	101	115	105	99	122	100	97
	38	20	8	8	99	3	452	208	1687	21029	46.5	24480	121	138	132	132	152	122	131
	38	20	8	8	183	3	452	208	1687	21029	46.5	24480	131	151	149	163	171	133	163
	38	20	8	8	373	3	452	208	1687	21029	46.5	24480	139	165	166	206	190	144	207
	38	20	8	8	903	3	452	208	1687	21029	46.5	24480	141	178	182	244	208	154	247
Brooks	19	100	14	14	14	3	374	251	1777	20920	20.7	21419	48	48	48	56	48	48	56
74/B/100/03	19	100	14	14	21	3	374	251	1777	20920	20.7	21419	73	77	84	91	64	65	91
	19	100	14	14	28	3	374	251	1777	20900	20.7	21399	82	82	85	95	68	71	95
	19	100	14	14	42	3	374	251	1777	20900	20.7	21399	90	85	86	100	74	78	100
	19	100	14	14	379	3	374	251	1777	20900	20.7	21399	116	97	92	121	105	102	120
	19	100	14	14	1839	3	374	251	1777	20900	20.7	21399	144	106	97	134	128	111	133
	19	100	14	14	3664	3	374	251	1777	20900	20.7	21399	168	111	99	140	135	113	139
Brooks	19	100	14	14	14	3	379	220	1800	27624	32.7	26254	36	36	36	40	36	36	40
74/C/100/05	19	100	14	14	21	3	379	220	1800	27624	32.7	26254	54	60	64	63	47	49	62
	19	100	14	14	28	3	379	220	1800	27624	32.7	26254	59	64	65	66	49	54	66
	19	100	14	14	42	3	379	220	1800	27624	32.7	26254	63	67	66	71	53	59	70
	19	100	14	14	379	3	379	220	1800	27624	32.7	26254	82	76	71	89	73	77	89
	19	100	14	14	1839	3	379	220	1800	27624	32.7	26254	107	84	75	101	88	84	101
	19	100	14	14	3664	3	379	220	1800	27624	32.7	26254	123	88	77	106	93	86	106
Brooks	19	100	14	14	14	3	382	206	1815	28120	34.7	28826	36	36	36	37	36	36	37
74/D/100/07	19	100	14	14	21	3	382	206	1815	28120	34.7	28826	48	58	64	57	45	48	57
	19	100	14	14	28	3	382	206	1815	28120	34.7	28826	53	62	65	60	47	53	60
	19	100	14	14	42	3	382	206	1815	28120	34.7	28826	57	64	66	64	50	58	64
	19	100	14	14	379	3	382	206	1815	28120	34.7	28826	75	73	72	82	68	76	83
	19	100	14	14	1839	3	382	206	1815	28120	34.7	28826	92	81	76	94	81	82	95
	19	100	14	14	3664	3	382	206	1815	28120	34.7	28826	101	84	78	99	85	84	100
Brooks	19	100	14	14	14	3	384	192	1824	29760	38.9	30513	34	34	34	34	34	34	34
74/E/100/09	19	100	14	14	21	3	384	192	1824	29760	38.9	30513	48	55	60	52	42	46	52
	19	100	14	14	28	3	384	192	1824	29760	38.9	30513	51	58	62	55	44	50	56
	19	100	14	14	42	3	384	192	1824	29760	38.9	30513	55	61	63	59	47	54	60
	19	100	14	14	379	3	384	192	1824	29760	38.9	30513	68	69	68	76	62	72	78
	19	100	14	14	1839	3	384	192	1824	29760	38.9	30513	79	76	72	88	74	78	90
	19	100	14	14	3664	3	384	192	1824	29760	38.9	30513	84	80	74	93	77	79	96

Brooks	19	100	14	14	14	3	380	213	1805	14870	29.3	15196	67	67	67	56	67	67	59
74/H/100/15	19	100	14	14	21	3	380	213	1805	14870	29.3	15196	95	97	104	88	84	91	94
	19	100	14	14	28	3	380	213	1805	14870	29.3	15196	100	102	105	92	88	99	99
	19	100	14	14	42	3	380	213	1805	14870	29.3	15196	112	105	106	97	93	109	104
	19	100	14	14	379	3	380	213	1805	14870	29.3	15196	141	117	112	117	124	144	125
	19	100	14	14	1839	3	380	213	1805	14870	29.3	15196	164	127	117	130	147	156	138
	19	100	14	14	3664	3	380	213	1805	14870	29.3	15196	179	131	119	135	154	159	143
Brooks	19	100	14	14	14	3	385	185	1829	17440	31.6	17840	57	57	57	49	57	57	52
74/I/100/17	19	100	14	14	21	3	385	185	1829	17440	31.6	17840	76	85	92	77	72	78	82
	19	100	14	14	28	3	385	185	1829	17440	31.6	17840	81	90	93	81	76	85	86
	19	100	14	14	42	3	385	185	1829	17440	31.6	17840	88	93	94	85	80	93	90
	19	100	14	14	379	3	385	185	1829	17440	31.6	17840	112	104	100	104	108	122	110
	19	100	14	14	1839	3	385	185	1829	17440	31.6	17840	127	113	104	116	128	133	123
	19	100	14	14	3664	3	385	185	1829	17440	31.6	17840	134	117	107	121	135	136	128
Brooks	19	100	14	14	14	3	390	156	1853	17890	38.7	18303	56	56	56	44	56	56	45
74/J/100/19	19	100	14	14	21	3	390	156	1853	17890	38.7	18303	78	82	88	68	68	76	71
	19	100	14	14	28	3	390	156	1853	17890	38.7	18303	85	86	89	71	72	83	75
	19	100	14	14	42	3	390	156	1853	17890	38.7	18303	91	89	91	76	76	91	79
	19	100	14	14	379	3	390	156	1853	17890	38.7	18303	113	99	96	94	99	119	98
	19	100	14	14	1839	3	390	156	1853	17890	38.7	18303	123	108	101	105	117	130	110
	19	100	14	14	3664	3	390	156	1853	17890	38.7	18303	126	112	103	110	122	132	116
Brooks	19	60	14	14	14	3	374	251	1777	20920	20.7	21419	48	48	48	57	48	48	57
74/B/60/04	19	60	14	14	21	3	374	251	1777	20920	20.7	21419	85	103	101	103	108	72	103
	19	60	14	14	28	3	374	251	1777	20900	20.7	21399	107	117	114	112	123	81	112
	19	60	14	14	42	3	374	251	1777	20900	20.7	21399	146	131	130	122	141	91	122
	19	60	14	14	379	3	374	251	1777	20900	20.7	21399	265	170	177	161	222	126	161
	19	60	14	14	1839	3	374	251	1777	20900	20.7	21399	295	183	196	174	251	139	174
	19	60	14	14	3664	3	374	251	1777	20900	20.7	21399	310	188	203	180	256	142	179
Brooks	19	60	14	14	14	3	379	220	1800	25620	32.7	26254	39	39	39	41	39	39	41
74/C/60/06	19	60	14	14	21	3	379	220	1800	25620	32.7	26254	71	85	80	73	78	59	73
	19	60	14	14	28	3	379	220	1800	25620	32.7	26254	89	96	89	80	88	66	80
	19	60	14	14	42	3	379	220	1800	25620	32.7	26254	115	107	100	88	100	74	89
	19	60	14	14	379	3	379	220	1800	25620	32.7	26254	207	139	132	120	152	103	121
	19	60	14	14	1839	3	379	220	1800	25620	32.7	26254	226	150	145	132	170	113	133
	19	60	14	14	3664	3	379	220	1800	25620	32.7	26254	236	154	151	137	174	116	139
Brooks	19	60	14	14	14	3	382	206	1815	28120	34.7	28826	36	36	36	37	36	36	37
74/D/60/08	19	60	14	14	21	3	382	206	1815	28120	34.7	28826	62	79	74	66	70	54	67
	19	60	14	14	28	3	382	206	1815	28120	34.7	28826	80	89	82	73	78	60	74
	19	60	14	14	42	3	382	206	1815	28120	34.7	28826	101	100	91	81	88	68	82
	19	60	14	14	379	3	382	206	1815	28120	34.7	28826	174	130	120	111	134	94	113
	19	60	14	14	1839	3	382	206	1815	28120	34.7	28826	192	140	132	123	151	103	126
	19	60	14	14	3664	3	382	206	1815	28120	34.7	28826	198	144	137	128	153	106	131
Brooks	19	60	14	14	14	3	384	192	1824	29760	38.9	30513	34	34	34	34	34	34	35
74/E/60/10	19	60	14	14	21	3	384	192	1824	29760	38.9	30513	54	74	69	61	64	51	62
	19	60	14	14	28	3	384	192	1824	29760	38.9	30513	62	84	77	67	71	57	68
	19	60	14	14	42	3	384	192	1824	29760	38.9	30513	77	94	85	75	81	64	77
	19	60	14	14	379	3	384	192	1824	29760	38.9	30513	120	123	111	104	121	89	107
	19	60	14	14	1839	3	384	192	1824	29760	38.9	30513	131	133	123	116	136	98	120
	19	60	14	14	3664	3	384	192	1824	29760	38.9	30513	135	136	127	121	138	100	125
Brooks	19	60	14	14	14	3	380	213	1805	14870	29.3	15196	67	67	67	56	67	67	59
74/H/60/16	19	60	14	14	21	3	380	213	1805	14870	29.3	15196	108	124	122	103	127	102	107
	19	60	14	14	28	3	380	213	1805	14870	29.3	15196	123	137	135	112	143	114	116
	19	60	14	14	42	3	380	213	1805	14870	29.3	15196	141	151	151	123	161	128	126
	19	60	14	14	379	3	380	213	1805	14870	29.3	15196	189	191	199	165	242	178	166
	19	60	14	14	1839	3	380	213	1805	14870	29.3	15196	211	205	219	178	270	196	179
	19	60	14	14	3664	3	380	213	1805	14870	29.3	15196	220	210	227	183	275	200	185
Brooks	19	60	14	14	14	3	385	185	1829	17440	31.6	17840	57	57	57	50	57	57	52
74/I/60/18	19	60	14	14	21	3	385	185	1829	17440	31.6	17840	86	110	107	92	111	87	94
	19	60	14	14	28	3	385	185	1829	17440	31.6	17840	94	123	119	101	124	97	102
	19	60	14	14	42	3	385	185	1829	17440	31.6	17840	109	136	133	112	140	109	112
	19	60	14	14	379	3	385	185	1829	17440	31.6	17840	132	173	176	152	212	151	148
	19	60	14	14	1839	3	385	185	1829	17440	31.6	17840	143	186	193	164	237	167	161
	19	60	14	14	3664	3	385	185	1829	17440	31.6	17840	148	191	200	169	242	171	166
Brooks	19	60	14	14	14	3	390	156	1853	17890	38.7	18303	56	56	56	45	56	56	46
74/J/60/20	19	60	14	14	21	3	390	156	1853	17890	38.7	18303	85	105	101	83	102	85	82
	19	60	14	14	28	3	390	156	1853	17890	38.7	18303	93	117	112	91	113	95	90
	19	60	14	14	42	3	390	156	1853	17890	38.7	18303	100	129	124	102	127	106	99
	19	60	14	14	379	3	390	156	1853	17890	38.7	18303	121	164	161	140	189	148	134
	19	60	14	14	1839	3	390	156	1853	17890	38.7	18303	132	176	177	152	211	162	146

	19	60	14	14	3664	3	390	156	1853	17890	38.7	18303	136	180	183	157	215	166	151
Wischers	38	65	5	5	5	1	325	156	1905	29200	50.1	35700	34	34	34	35	34	34	37
61/A/4.5/01	38	65	5	5	33	1	325	156	1905	29200	50.1	35700	67	89	87	73	68	66	82
	38	65	5	5	187	1	325	156	1905	29200	50.1	35700	87	110	117	93	91	87	105
	38	65	5	5	371	1	325	156	1905	29200	50.1	35700	92	118	128	100	99	93	114
	38	65	5	5	735	1	325	156	1905	29200	50.1	35700	96	124	136	107	106	98	121
	38	65	5	5	2195	1	325	156	1905	29200	50.1	35700	101	131	147	114	112	103	130
Wischers	38	65	8	8	8	1	325	156	1905	30400	50.1	35700	33	33	33	30	33	33	32
61/A/8/02	38	65	8	8	36	1	325	156	1905	30400	50.1	35700	60	80	78	62	63	62	69
	38	65	8	8	99	1	325	156	1905	30400	50.1	35700	71	93	93	74	76	74	82
	38	65	8	8	190	1	325	156	1905	30400	50.1	35700	79	100	103	82	84	80	91
	38	65	8	8	373	1	325	156	1905	30400	50.1	35700	84	107	112	89	91	85	100
	38	65	8	8	738	1	325	156	1905	30400	50.1	35700	88	113	119	95	97	90	107
	38	65	8	8	2198	1	325	156	1905	30400	50.1	35700	93	121	128	102	103	95	116
Wischers	38	65	28	28	28	1	325	156	1905	35700	50.1	35700	28	28	28	25	28	28	26
61/A/28/03	38	65	28	28	56	1	325	156	1905	35700	50.1	35700	46	63	60	46	52	49	49
	38	65	28	28	119	1	325	156	1905	35700	50.1	35700	52	76	70	56	62	58	60
	38	65	28	28	210	1	325	156	1905	35700	50.1	35700	59	83	76	63	68	63	68
	38	65	28	28	393	1	325	156	1905	35700	50.1	35700	65	90	82	70	74	67	76
	38	65	28	28	758	1	325	156	1905	35700	50.1	35700	70	96	86	76	79	70	83
	38	65	28	28	2218	1	325	156	1905	35700	50.1	35700	76	103	93	83	83	73	92
Wischers	38	65	5	5	5	1	410	197	1738	25800	45.7	33500	39	39	39	39	39	39	39
61/B/5/04	38	65	5	5	33	1	410	197	1738	25800	45.7	33500	79	95	99	83	76	75	84
	38	65	5	5	96	1	410	197	1738	25800	45.7	33500	96	109	120	96	92	89	98
	38	65	5	5	187	1	410	197	1738	25800	45.7	33500	109	117	134	105	102	97	107
	38	65	5	5	370	1	410	197	1738	25800	45.7	33500	118	125	146	113	111	104	116
	38	65	5	5	735	1	410	197	1738	25800	45.7	33500	124	131	156	120	118	110	124
	38	65	5	5	2195	1	410	197	1738	25800	45.7	33500	134	139	169	130	125	116	133
Wischers	38	65	10	10	10	1	410	197	1738	30800	45.7	33500	33	32	32	33	32	32	33
61/B/10/05	38	65	10	10	38	1	410	197	1738	30800	45.7	33500	65	79	75	67	66	60	69
	38	65	10	10	100	1	410	197	1738	30800	45.7	33500	83	92	89	80	79	71	82
	38	65	10	10	192	1	410	197	1738	30800	45.7	33500	97	101	98	89	88	78	91
	38	65	10	10	375	1	410	197	1738	30800	45.7	33500	105	108	106	97	96	83	99
	38	65	10	10	740	1	410	197	1738	30800	45.7	33500	112	114	113	104	102	87	107
	38	65	10	10	2200	1	410	197	1738	30800	45.7	33500	122	122	122	113	108	92	116
Wischers	38	65	28	28	28	1	410	197	1738	33500	45.7	33500	30	30	30	27	30	30	27
61/B/28/06	38	65	28	28	56	1	410	197	1738	33500	45.7	33500	53	67	64	51	57	52	52
	38	65	28	28	119	1	410	197	1738	33500	45.7	33500	64	80	75	62	68	62	64
	38	65	28	28	210	1	410	197	1738	33500	45.7	33500	74	88	82	70	75	67	72
	38	65	28	28	393	1	410	197	1738	33500	45.7	33500	83	95	88	78	82	71	80
	38	65	28	28	758	1	410	197	1738	33500	45.7	33500	88	102	93	85	87	74	87
	38	65	28	28	2218	1	410	197	1738	33500	45.7	33500	92	109	100	93	92	78	96
Wischers	38	65	3	3	3	3	325	156	1905	33200	48.8	38200	30	30	30	36	30	30	40
61/C/3/08	38	65	3	3	31	3	325	156	1905	33200	48.8	38200	59	90	73	79	64	60	90
	38	65	3	3	93	3	325	156	1905	33200	48.8	38200	67	104	86	90	77	72	103
	38	65	3	3	185	3	325	156	1905	33200	48.8	38200	72	112	95	98	86	79	112
	38	65	3	3	368	3	325	156	1905	33200	48.8	38200	76	119	103	105	94	84	120
	38	65	3	3	733	3	325	156	1905	33200	48.8	38200	79	124	110	111	101	89	128
	38	65	3	3	2193	3	325	156	1905	33200	48.8	38200	84	132	118	118	107	94	137
Wischers	38	65	28	28	28	3	325	156	1905	38200	48.8	38200	26	26	26	24	26	26	25
61/C/28/09	38	65	28	28	56	3	325	156	1905	38200	48.8	38200	44	61	57	44	48	46	47
	38	65	28	28	119	3	325	156	1905	38200	48.8	38200	55	72	66	53	57	54	58
	38	65	28	28	210	3	325	156	1905	38200	48.8	38200	60	80	72	60	63	59	66
	38	65	28	28	393	3	325	156	1905	38200	48.8	38200	70	86	77	66	68	62	73
	38	65	28	28	758	3	325	156	1905	38200	48.8	38200	72	92	82	72	73	65	80
	38	65	28	28	2218	3	325	156	1905	38200	48.8	38200	72	99	88	79	77	69	89
Wischers	38	65	2	2	2	3	410	197	1738	29200	44.1	31300	34	34	34	58	34	34	59
61/D/1.5/10	38	65	2	2	30	3	410	197	1738	29200	44.1	31300	87	120	85	128	86	71	130
	38	65	2	2	93	3	410	197	1738	29200	44.1	31300	101	137	102	142	108	86	144
	38	65	2	2	184	3	410	197	1738	29200	44.1	31300	110	146	113	151	121	94	153
	38	65	2	2	367	3	410	197	1738	29200	44.1	31300	115	154	123	159	134	101	162
	38	65	2	2	732	3	410	197	1738	29200	44.1	31300	120	161	132	167	144	106	170
	38	65	2	2	2192	3	410	197	1738	29200	44.1	31300	128	169	142	176	153	113	179
Wischers	38	65	3	23	23	3	410	197	1738	30000	44.1	31300	33	33	33	30	33	33	29
61/D/2.9/11	38	65	3	23	51	3	410	197	1738	30000	44.1	31300	71	67	65	55	65	59	55
	38	65	3	23	113	3	410	197	1738	30000	44.1	31300	83	78	76	66	77	70	67
	38	65	3	23	205	3	410	197	1738	30000	44.1	31300	92	86	82	74	86	75	75
	38	65	3	23	388	3	410	197	1738	30000	44.1	31300	99	92	88	83	93	80	84
	38	65	3	23	753	3	410	197	1738	30000	44.1	31300	103	98	93	90	99	84	91

	38	65	3	23	2213	3	410	197	1738	30000	44.1	31300	110	104	100	99	105	89	100
Wischers	38	65	28	28	28	3	410	197	1738	31300	44.1	31300	32	32	32	29	32	32	29
61/D/28/12	38	65	28	28	56	3	410	197	1738	31300	44.1	31300	59	71	68	54	62	56	54
	38	65	28	28	119	3	410	197	1738	31300	44.1	31300	70	84	80	65	74	66	66
	38	65	28	28	210	3	410	197	1738	31300	44.1	31300	77	93	87	73	82	71	74
	38	65	28	28	393	3	410	197	1738	31300	44.1	31300	83	100	93	81	90	76	82
	38	65	28	28	758	3	410	197	1738	31300	44.1	31300	88	107	99	88	95	80	89
	38	65	28	28	2218	3	410	197	1738	31300	44.1	31300	95	115	106	97	101	84	98
Wischers	38	65	2	2	2	3	400	160	1813	35500	54.6	39809	28	28	28	43	28	28	45
61/E/1.6/14	38	65	2	2	30	3	400	160	1813	35500	54.6	39809	71	99	70	98	62	58	104
	38	65	2	2	93	3	400	160	1813	35500	54.6	39809	83	113	84	110	76	70	118
	38	65	2	2	184	3	400	160	1813	35500	54.6	39809	92	121	92	118	85	77	126
	38	65	2	2	367	3	400	160	1813	35500	54.6	39809	99	128	100	126	93	83	135
	38	65	2	2	732	3	400	160	1813	35500	54.6	39809	103	133	106	132	100	87	142
	38	65	2	2	2192	3	400	160	1813	35500	54.6	39809	110	140	114	141	106	92	152
Wischers	38	65	28	28	28	3	400	160	1813	39800	54.6	39809	25	25	25	23	25	25	23
61/E/28/15	38	65	28	28	56	3	400	160	1813	39800	54.6	39809	59	58	55	43	45	44	44
	38	65	28	28	119	3	400	160	1813	39800	54.6	39809	70	69	63	52	53	52	55
	38	65	28	28	210	3	400	160	1813	39800	54.6	39809	77	76	68	60	58	56	63
	38	65	28	28	393	3	400	160	1813	39800	54.6	39809	83	83	73	67	63	60	70
	38	65	28	28	758	3	400	160	1813	39800	54.6	39809	88	88	77	73	67	63	77
	38	65	28	28	2218	3	400	160	1813	39800	54.6	39809	95	95	83	81	71	66	86
Hummel I	50	65	3	3	3	2	334	184	1802	21704	26.9	26300	46	46	46	61	46	46	64
11/A/3/99/1	50	65	3	3	6	2	334	184	1802	21704	26.9	26300	100	90	97	105	78	62	111
	50	65	3	3	10	2	334	184	1802	21704	26.9	26300	102	103	104	113	88	71	119
	50	65	3	3	17	2	334	184	1802	21704	26.9	26300	116	114	112	120	98	79	126
	50	65	3	3	31	2	334	184	1802	21704	26.9	26300	128	125	124	127	111	89	134
	50	65	3	3	94	2	334	184	1802	21704	26.9	26300	149	142	156	142	138	107	149
	50	65	3	3	183	2	334	184	1802	21704	26.9	26300	161	153	179	152	155	116	158
	50	65	3	3	363	2	334	184	1802	21704	26.9	26300	175	163	203	162	172	124	169
	50	65	3	3	723	2	334	184	1802	21704	26.9	26300	177	173	223	172	185	131	179
	50	65	3	3	1227	2	334	184	1802	21704	26.9	26300	177	179	237	179	193	135	185
Hummel I	50	65	7	28	28	2	334	184	1802	26536	26.9	26300	38	38	38	37	38	38	38
11/A/7/28/65/2	50	65	7	28	31	2	334	184	1802	26536	26.9	26300	73	57	63	54	58	48	55
	50	65	7	28	35	2	334	184	1802	26536	26.9	26300	81	63	66	57	65	53	59
	50	65	7	28	42	2	334	184	1802	26536	26.9	26300	83	69	70	61	72	58	63
	50	65	7	28	56	2	334	184	1802	26536	26.9	26300	94	76	75	67	80	65	68
	50	65	7	28	118	2	334	184	1802	26536	26.9	26300	107	88	87	79	98	76	81
	50	65	7	28	208	2	334	184	1802	26536	26.9	26300	131	97	96	88	109	82	90
	50	65	7	28	388	2	334	184	1802	26536	26.9	26300	144	106	106	99	120	87	100
	50	65	7	28	721	2	334	184	1802	26536	26.9	26300	145	114	114	108	129	91	109
	50	65	7	28	1613	2	334	184	1802	26536	26.9	26300	154	122	122	118	136	94	119
Hummel I	50	65	7	90	90	2	334	184	1802	26202	26.9	26300	38	38	38	32	38	38	32
11/A/7/90/65/03	50	65	7	90	94	2	334	184	1802	26202	26.9	26300	76	53	58	43	56	49	44
	50	65	7	90	97	2	334	184	1802	26202	26.9	26300	82	56	60	45	60	52	46
	50	65	7	90	104	2	334	184	1802	26202	26.9	26300	90	60	63	48	66	57	49
	50	65	7	90	118	2	334	184	1802	26202	26.9	26300	101	65	66	52	72	62	53
	50	65	7	90	271	2	334	184	1802	26202	26.9	26300	133	83	83	70	96	77	70
	50	65	7	90	388	2	334	184	1802	26202	26.9	26300	141	89	88	76	102	80	76
	50	65	7	90	450	2	334	184	1802	26202	26.9	26300	143	91	89	79	104	81	79
	50	65	7	90	997	2	334	184	1802	26202	26.9	26300	153	100	97	91	113	86	91
	50	65	7	90	1227	2	334	184	1802	26202	26.9	26300	157	102	99	93	115	87	93
Hummel II	50	65	3	3	3	1	334	184	1802	24521	41.9	30900	41	41	41	46	41	41	48
11/B/3/3/65/4	50	65	3	3	6	1	334	184	1802	24521	41.9	30900	72	77	83	79	62	55	84
	50	65	3	3	10	1	334	184	1802	24521	41.9	30900	82	89	89	85	69	63	91
	50	65	3	3	17	1	334	184	1802	24521	41.9	30900	90	98	96	91	76	70	98
	50	65	3	3	31	1	334	184	1802	24521	41.9	30900	101	107	104	97	85	79	105
	50	65	3	3	93	1	334	184	1802	24521	41.9	30900	114	121	127	109	103	94	118
	50	65	3	3	184	1	334	184	1802	24521	41.9	30900	127	130	144	117	115	103	127
	50	65	3	3	363	1	334	184	1802	24521	41.9	30900	138	139	161	125	126	110	136
	50	65	3	3	719	1	334	184	1802	24521	41.9	30900	144	147	176	133	135	116	145
	50	65	3	3	1309	1	334	184	1802	24521	41.9	30900	153	153	187	139	141	120	152
Hummel II	50	65	7	28	28	1	334	184	1802	30700	41.9	30900	33	33	33	29	33	33	29
11/B/7/28/65/5	50	65	7	28	31	1	334	184	1802	30700	41.9	30900	50	49	54	41	47	41	42
	50	65	7	28	35	1	334	184	1802	30700	41.9	30900	52	54	57	44	51	46	45
	50	65	7	28	42	1	334	184	1802	30700	41.9	30900	58	59	59	47	56	51	48
	50	65	7	28	56	1	334	184	1802	30700	41.9	30900	68	64	63	51	62	56	53
	50	65	7	28	118	1	334	184	1802	30700	41.9	30900	81	75	72	61	74	65	63
	50	65	7	28	298	1	334	184	1802	30700	41.9	30900	101	87	83	73	86	73	77

	50	65	7	28	717	1	334	184	1802	30700	41.9	30900	110	96	92	84	94	78	88
	50	65	7	28	1306	1	334	184	1802	30700	41.9	30900	117	102	96	90	98	81	95
Hummel II	50	65	7	90	90	1	334	184	1802	31464	41.9	30900	32	32	32	25	32	32	25
11/B/7/90/65/06	50	65	7	90	93	1	334	184	1802	31464	41.9	30900	50	43	48	33	43	39	33
	50	65	7	90	97	1	334	184	1802	31464	41.9	30900	55	47	50	35	47	43	35
	50	65	7	90	104	1	334	184	1802	31464	41.9	30900	60	50	52	37	50	47	37
	50	65	7	90	118	1	334	184	1802	31464	41.9	30900	66	54	55	40	55	52	40
	50	65	7	90	269	1	334	184	1802	31464	41.9	30900	94	69	66	53	71	64	54
	50	65	7	90	450	1	334	184	1802	31464	41.9	30900	101	76	71	60	77	68	62
	50	65	7	90	993	1	334	184	1802	31464	41.9	30900	109	84	77	70	83	72	72
	50	65	7	90	1201	1	334	184	1802	31464	41.9	30900	110	85	78	71	84	72	74
Hummel 4	50	65	7	28	28	2	350	133	1889	31796	43.2	31800	31	31	31	27	31	31	28
11/C/7/28/65/07	50	65	7	28	31	2	350	133	1889	31796	43.2	31800	47	47	52	39	45	40	41
	50	65	7	28	35	2	350	133	1889	31796	43.2	31800	49	53	55	42	49	44	44
	50	65	7	28	42	2	350	133	1889	31796	43.2	31800	52	57	58	45	54	49	47
	50	65	7	28	56	2	350	133	1889	31796	43.2	31800	57	63	61	50	59	54	52
	50	65	7	28	209	2	350	133	1889	31796	43.2	31800	72	80	77	69	78	68	71
	50	65	7	28	388	2	350	133	1889	31796	43.2	31800	76	88	83	78	85	72	81
	50	65	7	28	755	2	350	133	1889	31796	43.2	31800	77	94	89	87	91	76	89
	50	65	7	28	1281	2	350	133	1889	31796	43.2	31800	84	99	93	93	94	78	95
Hummel 5	50	65	7	28	28	2	345	155	1862	32690	35.4	32300	31	31	31	29	31	31	30
11/D/7/28/65/8	50	65	7	28	31	2	345	155	1862	32690	35.4	32300	49	47	52	41	45	39	43
	50	65	7	28	35	2	345	155	1862	32690	35.4	32300	57	52	54	44	49	43	46
	50	65	7	28	42	2	345	155	1862	32690	35.4	32300	60	57	57	48	54	47	49
	50	65	7	28	56	2	345	155	1862	32690	35.4	32300	65	63	61	52	60	52	54
	50	65	7	28	209	2	345	155	1862	32690	35.4	32300	84	81	77	71	80	66	74
	50	65	7	28	388	2	345	155	1862	32690	35.4	32300	89	89	84	80	87	70	83
	50	65	7	28	762	2	345	155	1862	32690	35.4	32300	92	96	90	89	93	74	93
	50	65	7	28	1288	2	345	155	1862	32690	35.4	32300	102	100	94	95	97	76	98
Hummel6	50	65	7	28	28	2	328	213	1770	16667	19.0	22260	60	60	60	48	60	60	50
11/E/7/28/65/9	50	65	7	28	31	2	328	213	1770	16667	19.0	22260	87	83	99	72	89	76	76
	50	65	7	28	35	2	328	213	1770	16667	19.0	22260	96	90	105	76	99	85	80
	50	65	7	28	42	2	328	213	1770	16667	19.0	22260	101	97	112	81	109	93	85
	50	65	7	28	56	2	328	213	1770	16667	19.0	22260	112	105	121	88	121	103	92
	50	65	7	28	118	2	328	213	1770	16667	19.0	22260	135	119	146	102	145	120	105
	50	65	7	28	209	2	328	213	1770	16667	19.0	22260	157	130	165	113	162	130	116
	50	65	7	28	388	2	328	213	1770	16667	19.0	22260	170	140	183	125	177	138	127
	50	65	7	28	994	2	328	213	1770	16667	19.0	22260	187	153	206	141	194	147	143
	50	65	7	28	1196	2	328	213	1770	16667	19.0	22260	186	155	210	143	196	148	145
HansenE	152	50	8	8	8	3	303	215	1818	25137	40.5	26463	40	40	40	42	40	40	42
	152	50	8	8	50	3	303	215	1818	25137	40.5	26463	70	89	79	83	82	69	85
	152	50	8	8	100	3	303	215	1818	25137	40.5	26463	75	96	84	89	93	76	93
	152	50	8	8	200	3	303	215	1818	25137	40.5	26463	81	104	90	96	105	82	101
	152	50	8	8	400	3	303	215	1818	25137	40.5	26463	86	113	100	104	117	87	109
	152	50	8	8	800	3	303	215	1818	25137	40.5	26463	95	123	113	112	128	91	119
	152	50	8	8	1367	3	303	215	1818	25137	40.5	26463	107	132	124	120	135	93	127
Hansen	102	50	8	8	8	3	303	215	1818	27939	38.1	29461	36	36	36	40	36	36	40
	102	50	8	8	50	3	303	215	1818	27939	38.1	29461	68	87	75	80	80	65	83
	102	50	8	8	100	3	303	215	1818	27939	38.1	29461	78	95	82	88	91	73	92
	102	50	8	8	200	3	303	215	1818	27939	38.1	29461	83	104	91	95	103	79	100
	102	50	8	8	400	3	303	215	1818	27939	38.1	29461	98	115	103	104	115	84	110
	102	50	8	8	800	3	303	215	1818	27939	38.1	29461	97	126	117	115	125	88	122
	102	50	8	8	1367	3	303	215	1818	27939	38.1	29461	101	135	127	124	131	90	133
Hansen	51	50	8	8	8	3	303	215	1818	24324	42.3	25655	41	41	41	42	41	41	42
	51	50	8	8	50	3	303	215	1818	24324	42.3	25655	93	104	91	89	101	82	92
	51	50	8	8	100	3	303	215	1818	24324	42.3	25655	103	115	103	98	116	92	102
	51	50	8	8	200	3	303	215	1818	24324	42.3	25655	116	127	118	110	131	100	115
	51	50	8	8	400	3	303	215	1818	24324	42.3	25655	126	139	131	122	144	107	129
	51	50	8	8	800	3	303	215	1818	24324	42.3	25655	133	150	143	135	155	112	143
	51	50	8	8	1300	3	303	215	1818	24324	42.3	25655	136	156	149	141	161	115	150
Hansen	25	50	8	8	8	3	303	215	1818	25751	41.9	27123	39	39	39	41	39	39	41
	25	50	8	8	50	3	303	215	1818	25751	41.9	27123	84	115	102	95	107	84	100
	25	50	8	8	100	3	303	215	1818	25751	41.9	27123	97	128	116	109	124	94	115
	25	50	8	8	200	3	303	215	1818	25751	41.9	27123	102	138	127	121	140	104	129
	25	50	8	8	400	3	303	215	1818	25751	41.9	27123	107	147	136	131	154	111	139
	25	50	8	8	800	3	303	215	1818	25751	41.9	27123	108	153	143	137	165	117	146
	25	50	8	8	1150	3	303	215	1818	25751	41.9	27123	109	156	146	139	169	120	149
HansenS	102	50	8	8	8	3	303	215	1818	14466	35.9	12537	69	69	69	60	69	69	62
	102	50	8	8	100	3	303	215	1818	14466	35.9	12537	138	147	128	130	164	140	134

	102	50	8	8	200	3	303	215	1818	14466	35.9	12537	147	158	142	140	184	152	144
	102	50	8	8	400	3	303	215	1818	14466	35.9	12537	151	172	161	151	204	162	156
	102	50	8	8	800	3	303	215	1818	14466	35.9	12537	156	187	182	165	221	169	169
	102	50	8	8	1236	3	303	215	1818	14466	35.9	12537	155	196	195	176	229	173	179
HansenS	51	50	8	8	8	3	303	215	1818	10554	31.5	12537	95	95	95	65	95	95	68
	51	50	8	8	100	3	303	215	1818	10554	31.5	12537	185	193	192	151	223	211	157
	51	50	8	8	200	3	303	215	1818	10554	31.5	12537	206	209	218	167	249	231	172
	51	50	8	8	400	3	303	215	1818	10554	31.5	12537	213	225	243	185	272	246	189
	51	50	8	8	800	3	303	215	1818	10554	31.5	12537	221	238	264	204	291	259	207
	51	50	8	8	1256	3	303	215	1818	10554	31.5	12537	226	246	275	214	299	265	216
HansenS	25	50	8	8	8	3	303	215	1818	12412	29.2	12537	81	81	81	69	81	81	73
	25	50	8	8	100	3	303	215	1818	12412	29.2	12537	178	204	209	181	244	196	185
	25	50	8	8	200	3	303	215	1818	12412	29.2	12537	187	219	230	202	275	215	204
	25	50	8	8	400	3	303	215	1818	12412	29.2	12537	198	230	246	217	301	231	219
	25	50	8	8	800	3	303	215	1818	12412	29.2	12537	203	239	259	227	321	243	228
	25	50	8	8	1261	3	303	215	1818	12412	29.2	12537	206	244	267	231	331	249	233
79/8/60/13	25	60	8	14	14	1	390	183	1985	28000	50.1	29726	36	36	36	32	36	36	32
	25	60	8	14	17	1	390	183	1985	28000	50.1	29726	59	58	61	49	55	48	50
	25	60	8	14	21	1	390	183	1985	28000	50.1	29726	67	66	66	54	62	54	55
	25	60	8	14	28	1	390	183	1985	28000	50.1	29726	79	74	72	59	68	60	61
	25	60	8	14	84	1	390	183	1985	28000	50.1	29726	127	92	90	78	89	77	81
	25	60	8	14	182	1	390	183	1985	28000	50.1	29726	153	101	99	89	102	86	93
	25	60	8	14	392	1	390	183	1985	28000	50.1	29726	168	108	106	97	112	94	102
	25	60	8	14	695	1	390	183	1985	28000	50.1	29726	177	112	111	102	118	98	107
	25	60	8	14	1943	1	390	183	1985	28000	50.1	29726	189	118	117	109	125	103	115
	25	60	8	14	3500	1	390	183	1985	28000	50.1	29726	192	120	121	113	127	105	120
Bryant	38	60	8	14	14	1	390	183	1985	27888	50.1	29726	36	36	36	32	36	36	32
79/14/60/02	38	60	8	14	17	1	390	183	1985	27888	50.1	29726	53	57	62	48	54	47	49
	38	60	8	14	21	1	390	183	1985	27888	50.1	29726	61	64	65	52	59	52	53
	38	60	8	14	28	1	390	183	1985	27888	50.1	29726	70	71	70	57	65	58	58
	38	60	8	14	84	1	390	183	1985	27888	50.1	29726	107	89	87	73	84	74	76
	38	60	8	14	182	1	390	183	1985	27888	50.1	29726	136	99	98	84	96	83	88
	38	60	8	14	392	1	390	183	1985	27888	50.1	29726	157	108	107	95	106	89	100
	38	60	8	14	695	1	390	183	1985	27888	50.1	29726	168	113	113	101	112	93	106
	38	60	8	14	1943	1	390	183	1985	27888	50.1	29726	179	121	121	109	119	98	116
	38	60	8	14	3500	1	390	183	1985	27888	50.1	29726	183	124	126	113	121	99	120
Bryant	50	60	8	14	14	1	390	183	1985	27132	50.1	29726	37	37	37	31	37	37	32
79/8/60/14	50	60	8	14	17	1	390	183	1985	27132	50.1	29726	54	57	63	48	53	48	48
	50	60	8	14	21	1	390	183	1985	27132	50.1	29726	60	64	67	51	59	53	53
	50	60	8	14	28	1	390	183	1985	27132	50.1	29726	69	70	71	56	64	58	57
	50	60	8	14	84	1	390	183	1985	27132	50.1	29726	97	86	85	70	81	74	73
	50	60	8	14	182	1	390	183	1985	27132	50.1	29726	119	97	97	80	93	82	84
	50	60	8	14	392	1	390	183	1985	27132	50.1	29726	140	106	109	91	103	88	96
	50	60	8	14	695	1	390	183	1985	27132	50.1	29726	151	113	116	99	109	92	104
	50	60	8	14	1943	1	390	183	1985	27132	50.1	29726	164	122	126	109	116	96	116
	50	60	8	14	3500	1	390	183	1985	27132	50.1	29726	169	126	131	114	118	98	120
Bryant	75	60	8	14	14	1	390	183	1985	28112	50.1	29726	36	36	36	31	36	36	32
79/8/60/15	75	60	8	14	17	1	390	183	1985	28112	50.1	29726	51	55	61	47	50	45	48
	75	60	8	14	21	1	390	183	1985	28112	50.1	29726	56	62	64	51	55	50	52
	75	60	8	14	28	1	390	183	1985	28112	50.1	29726	64	67	67	54	60	54	56
	75	60	8	14	84	1	390	183	1985	28112	50.1	29726	86	81	78	67	76	68	70
	75	60	8	14	182	1	390	183	1985	28112	50.1	29726	103	90	88	76	86	75	80
	75	60	8	14	392	1	390	183	1985	28112	50.1	29726	120	100	99	86	96	80	90
	75	60	8	14	695	1	390	183	1985	28112	50.1	29726	132	107	107	94	102	83	99
	75	60	8	14	1943	1	390	183	1985	28112	50.1	29726	147	119	120	107	109	87	113
	75	60	8	14	3500	1	390	183	1985	28112	50.1	29726	154	125	126	113	111	89	120
Bryant	100	60	8	14	14	1	390	183	1985	28807	50.1	29726	35	35	35	31	35	35	32
79/8/60/16	100	60	8	14	17	1	390	183	1985	28807	50.1	29726	51	54	60	47	48	43	48
	100	60	8	14	21	1	390	183	1985	28807	50.1	29726	57	60	63	50	52	47	51
	100	60	8	14	28	1	390	183	1985	28807	50.1	29726	57	65	65	54	57	52	55
	100	60	8	14	84	1	390	183	1985	28807	50.1	29726	78	77	74	66	71	64	68
	100	60	8	14	182	1	390	183	1985	28807	50.1	29726	92	86	81	74	82	70	77
	100	60	8	14	392	1	390	183	1985	28807	50.1	29726	105	95	91	83	91	75	87
	100	60	8	14	695	1	390	183	1985	28807	50.1	29726	117	102	100	90	97	78	95
	100	60	8	14	1943	1	390	183	1985	28807	50.1	29726	133	116	114	104	105	82	110
	100	60	8	14	3500	1	390	183	1985	28807	50.1	29726	141	122	121	111	107	83	118
Bryant	50	60	8	14	14	1	390	183	1985	28807	50.1	29726	35	35	35	31	35	35	32
	50	60	8	14	17	1	390	183	1985	28807	50.1	29726	55	55	60	48	51	45	48
	50	60	8	14	21	1	390	183	1985	28807	50.1	29726	63	62	63	51	56	50	53

	50	60	8	14	28	/	390	183	1985	28807	50.1	29726	72	68	67	56	62	55	57
	50	60	8	14	84	/	390	183	1985	28807	50.1	29726	110	84	80	70	79	70	73
	50	60	8	14	182	/	390	183	1985	28807	50.1	29726	139	94	91	80	91	77	84
	50	60	8	14	392	/	390	183	1985	28807	50.1	29726	158	104	102	91	101	83	96
	50	60	8	14	695	/	390	183	1985	28807	50.1	29726	168	111	108	99	107	86	104
	50	60	8	14	1943	/	390	183	1985	28807	50.1	29726	180	120	118	109	114	91	116
	50	60	8	14	3500	/	390	183	1985	28807	50.1	29726	181	124	123	114	116	92	120
Bryant	75	60	8	14	14	/	390	183	1985	29046	50.1	29726	34	34	34	31	34	34	32
	75	60	8	14	17	/	390	183	1985	29046	50.1	29726	49	54	60	47	49	43	48
	75	60	8	14	21	/	390	183	1985	29046	50.1	29726	55	60	62	51	54	48	52
	75	60	8	14	28	/	390	183	1985	29046	50.1	29726	61	66	65	54	59	53	56
	75	60	8	14	84	/	390	183	1985	29046	50.1	29726	85	79	75	67	74	66	70
	75	60	8	14	182	/	390	183	1985	29046	50.1	29726	105	89	85	76	85	72	80
	75	60	8	14	392	/	390	183	1985	29046	50.1	29726	126	99	95	86	95	78	90
	75	60	8	14	695	/	390	183	1985	29046	50.1	29726	139	106	104	94	101	81	99
	75	60	8	14	1943	/	390	183	1985	29046	50.1	29726	152	118	116	107	108	85	113
	75	60	8	14	3500	/	390	183	1985	29046	50.1	29726	154	124	121	113	110	86	120
Bryant	100	60	8	14	14	/	390	183	1985	28689	50.1	29726	35	35	35	31	35	35	32
	100	60	8	14	17	/	390	183	1985	28689	50.1	29726	50	54	60	47	48	43	48
	100	60	8	14	21	/	390	183	1985	28689	50.1	29726	53	60	63	50	53	48	51
	100	60	8	14	28	/	390	183	1985	28689	50.1	29726	58	65	66	54	57	52	55
	100	60	8	14	84	/	390	183	1985	28689	50.1	29726	80	77	74	66	72	64	68
	100	60	8	14	182	/	390	183	1985	28689	50.1	29726	97	86	82	74	82	70	77
	100	60	8	14	392	/	390	183	1985	28689	50.1	29726	115	95	92	83	91	75	87
	100	60	8	14	695	/	390	183	1985	28689	50.1	29726	128	102	100	90	97	78	95
	100	60	8	14	1943	/	390	183	1985	28689	50.1	29726	148	116	115	104	105	82	110
	100	60	8	14	3500	/	390	183	1985	28689	50.1	29726	149	122	121	111	107	83	118
Bryant	150	60	8	14	14	/	390	183	1985	30973	50.1	29726	32	32	32	31	32	32	32
	150	60	8	14	17	/	390	183	1985	30973	50.1	29726	46	51	56	46	44	39	47
	150	60	8	14	21	/	390	183	1985	30973	50.1	29726	50	57	58	50	48	43	51
	150	60	8	14	28	/	390	183	1985	30973	50.1	29726	58	61	61	53	52	46	54
	150	60	8	14	84	/	390	183	1985	30973	50.1	29726	73	72	67	64	65	56	67
	150	60	8	14	182	/	390	183	1985	30973	50.1	29726	85	79	72	72	74	61	75
	150	60	8	14	392	/	390	183	1985	30973	50.1	29726	97	87	78	79	83	66	84
	150	60	8	14	695	/	390	183	1985	30973	50.1	29726	107	94	85	86	89	68	91
	150	60	8	14	1943	/	390	183	1985	30973	50.1	29726	122	107	99	99	97	71	105
Bryant	200	60	8	14	14	/	390	183	1985	30172	50.1	29726	33	33	33	31	33	33	32
	200	60	8	14	17	/	390	183	1985	30172	50.1	29726	46	52	57	46	44	40	47
	200	60	8	14	21	/	390	183	1985	30172	50.1	29726	48	57	60	49	47	43	50
	200	60	8	14	28	/	390	183	1985	30172	50.1	29726	55	62	62	53	51	46	54
	200	60	8	14	84	/	390	183	1985	30172	50.1	29726	71	72	68	63	63	55	66
	200	60	8	14	182	/	390	183	1985	30172	50.1	29726	78	78	72	70	71	60	74
	200	60	8	14	392	/	390	183	1985	30172	50.1	29726	89	85	77	78	80	64	82
	200	60	8	14	695	/	390	183	1985	30172	50.1	29726	95	91	83	84	86	66	88
	200	60	8	14	1943	/	390	183	1985	30172	50.1	29726	110	103	96	95	95	69	101
	200	60	8	14	3500	/	390	183	1985	30172	50.1	29726	118	111	105	103	98	70	109
Bryant	38	96	14	14	14	/	390	183	1985	30303	50.1	27700	33	33	33	33	33	33	33
	38	96	14	14	17	/	390	183	1985	30303	50.1	27700	44	51	56	48	40	40	49
	38	96	14	14	21	/	390	183	1985	30303	50.1	27700	48	56	59	51	42	44	52
	38	96	14	14	28	/	390	183	1985	30303	50.1	27700	51	60	61	55	44	48	56
	38	96	14	14	84	/	390	183	1985	30303	50.1	27700	64	68	65	65	52	59	67
	38	96	14	14	182	/	390	183	1985	30303	50.1	27700	71	71	68	71	58	64	74
	38	96	14	14	392	/	390	183	1985	30303	50.1	27700	76	75	70	77	64	68	80
	38	96	14	14	695	/	390	183	1985	30303	50.1	27700	85	77	72	81	69	71	85
Bryant	38	60	8	8	8	/	390	183	1985	26616	50.1	29726	38	38	38	36	38	38	36
	38	60	8	8	14	/	390	183	1985	26616	50.1	29726	65	72	73	62	62	55	63
	38	60	8	8	28	/	390	183	1985	26616	50.1	29726	86	86	83	71	74	66	74
	38	60	8	8	84	/	390	183	1985	26616	50.1	29726	119	103	102	86	92	81	89
	38	60	8	8	182	/	390	183	1985	26616	50.1	29726	147	114	116	97	105	90	102
	38	60	8	8	392	/	390	183	1985	26616	50.1	29726	167	124	127	107	116	97	113
	38	60	8	8	695	/	390	183	1985	26616	50.1	29726	179	130	134	113	123	101	120
	38	60	8	8	1943	/	390	183	1985	26616	50.1	29726	189	138	145	122	130	107	129
	38	60	8	8	3500	/	390	183	1985	26616	50.1	29726	191	142	150	126	132	109	134
Bryant	38	60	8	21	21	/	390	183	1985	28112	50.1	29726	36	36	36	29	36	36	30
	38	60	8	21	28	/	390	183	1985	28112	50.1	29726	61	60	62	47	57	51	48
	38	60	8	21	42	/	390	183	1985	28112	50.1	29726	74	70	69	54	67	60	55
	38	60	8	21	84	/	390	183	1985	28112	50.1	29726	100	81	79	64	79	71	67
	38	60	8	21	182	/	390	183	1985	28112	50.1	29726	129	92	90	76	91	79	79
	38	60	8	21	392	/	390	183	1985	28112	50.1	29726	151	101	98	87	101	86	91

	38	60	8	21	695	/	390	183	1985	28112	50.1	29726	163	106	103	93	106	89	98
	38	60	8	21	1943	/	390	183	1985	28112	50.1	29726	175	113	110	102	113	94	107
	38	60	8	21	3500	/	390	183	1985	28112	50.1	29726	175	116	114	106	114	96	112
Bryant	38	60	8	28	28	/	390	183	1985	28571	50.1	29726	35	35	35	28	35	35	28
	38	60	8	28	42	/	390	183	1985	28571	50.1	29726	63	63	62	47	61	55	48
	38	60	8	28	63	/	390	183	1985	28571	50.1	29726	80	71	69	54	69	63	56
	38	60	8	28	84	/	390	183	1985	28571	50.1	29726	90	76	73	59	74	67	61
	38	60	8	28	182	/	390	183	1985	28571	50.1	29726	119	87	83	71	87	76	74
	38	60	8	28	392	/	390	183	1985	28571	50.1	29726	139	95	91	82	96	83	85
	38	60	8	28	695	/	390	183	1985	28571	50.1	29726	151	101	96	88	102	86	92
	38	60	8	28	1943	/	390	183	1985	28571	50.1	29726	163	108	102	96	108	91	102
	38	60	8	28	3500	/	390	183	1985	28571	50.1	29726	166	111	106	101	110	92	106
Bryant	38	60	8	84	84	/	390	183	1985	30300	50.1	29726	33	33	33	24	33	33	24
	38	60	8	84	112	/	390	183	1985	30300	50.1	29726	70	57	56	41	59	55	42
	38	60	8	84	182	/	390	183	1985	30300	50.1	29726	92	67	64	51	70	64	52
	38	60	8	84	392	/	390	183	1985	30300	50.1	29726	116	77	71	63	81	72	65
	38	60	8	84	695	/	390	183	1985	30300	50.1	29726	129	82	75	70	87	75	73
	38	60	8	84	1943	/	390	183	1985	30300	50.1	29726	141	89	80	78	92	79	82
	38	60	8	84	3500	/	390	183	1985	30300	50.1	29726	140	91	82	83	94	80	87
Bryant	38	60	8	182	182	/	390	183	1985	30300	50.1	29726	33	33	33	23	33	33	23
	38	60	8	182	212	/	390	183	1985	30300	50.1	29726	59	52	52	36	56	53	36
	38	60	8	182	252	/	390	183	1985	30300	50.1	29726	67	57	57	40	62	59	41
	38	60	8	182	303	/	390	183	1985	30300	50.1	29726	75	61	60	44	67	63	45
	38	60	8	182	392	/	390	183	1985	30300	50.1	29726	85	65	63	49	72	66	50
	38	60	8	182	695	/	390	183	1985	30300	50.1	29726	98	71	67	57	78	71	58
	38	60	8	182	1943	/	390	183	1985	31700	50.1	29726	113	75	69	65	82	71	68
	38	60	8	182	3500	/	390	183	1985	31700	50.1	29726	110	78	70	70	84	73	73
Bryant	38	96	8	8	8	/	390	183	1985	27200	50.1	29726	37	37	37	35	37	37	36
	38	96	8	8	14	/	390	183	1985	27200	50.1	29726	53	63	68	58	45	49	59
	38	96	8	8	28	/	390	183	1985	27200	50.1	29726	63	71	73	65	50	57	67
	38	96	8	8	84	/	390	183	1985	27200	50.1	29726	73	78	77	74	57	68	78
	38	96	8	8	182	/	390	183	1985	27200	50.1	29726	81	81	80	80	63	74	85
	38	96	8	8	392	/	390	183	1985	27200	50.1	29726	85	84	83	86	69	79	91
	38	96	8	8	695	/	390	183	1985	27200	50.1	29726	89	87	85	90	74	82	96
Bryant	38	96	21	21	21	/	390	183	1985	31300	50.1	26615	32	32	32	31	32	32	31
	38	96	21	21	28	/	390	183	1985	31300	50.1	26615	44	53	55	47	40	42	48
	38	96	21	21	42	/	390	183	1985	31300	50.1	26615	50	58	58	52	44	48	53
	38	96	21	21	84	/	390	183	1985	31300	50.1	26615	59	63	61	58	49	55	60
	38	96	21	21	182	/	390	183	1985	31300	50.1	26615	66	67	63	64	55	60	67
	38	96	21	21	392	/	390	183	1985	31300	50.1	26615	76	70	66	70	62	65	73
	38	96	21	21	695	/	390	183	1985	31300	50.1	26615	86	73	67	74	66	67	78
Bryant	38	96	28	28	28	/	390	183	1985	32300	50.1	26000	31	31	31	30	31	31	30
	38	96	28	28	42	/	390	183	1985	32300	50.1	26000	42	53	55	47	41	44	47
	38	96	28	28	63	/	390	183	1985	32300	50.1	26000	47	57	57	51	45	49	52
	38	96	28	28	84	/	390	183	1985	32300	50.1	26000	50	59	58	53	47	52	55
	38	96	28	28	182	/	390	183	1985	32300	50.1	26000	58	63	60	60	53	57	62
	38	96	28	28	392	/	390	183	1985	32300	50.1	26000	63	67	62	66	59	61	68
	38	96	28	28	695	/	390	183	1985	32300	50.1	26000	74	69	64	70	64	64	73
Bryant	38	96	84	84	84	/	390	183	1985	35900	50.1	24498	28	28	28	27	28	28	27
	38	96	84	84	112	/	390	183	1985	35900	50.1	24498	41	48	49	39	39	41	40
	38	96	84	84	182	/	390	183	1985	35900	50.1	24498	46	52	51	44	44	47	45
	38	96	84	84	392	/	390	183	1985	35900	50.1	24498	55	57	53	51	51	51	52
	38	96	84	84	695	/	390	183	1985	35900	50.1	24498	67	60	55	55	55	53	57
Bryant	38	96	182	182	182	/	390	183	1985	38300	50.1	23955	26	26	26	25	26	26	25
	38	96	182	182	212	/	390	183	1985	38300	50.1	23955	36	43	45	35	36	38	35
	38	96	182	182	252	/	390	183	1985	38300	50.1	23955	39	46	46	37	39	41	37
	38	96	182	182	303	/	390	183	1985	38300	50.1	23955	42	48	47	39	41	43	39
	38	96	182	182	392	/	390	183	1985	38300	50.1	23955	44	50	48	41	44	45	42
	38	96	182	182	695	/	390	183	1985	38300	50.1	23955	56	54	50	46	49	48	47
WTC7500	38	50	7	28	28	1	432	187	1745	31568	52.4	31580	32	32	32	27	32	32	27
	38	50	7	28	31	1	432	187	1745	31568	52.4	31580	45	49	51	40	48	41	40
	38	50	7	28	42	1	432	187	1745	31568	52.4	31580	56	60	57	47	58	51	48
	38	50	7	28	56	1	432	187	1745	31568	52.4	31580	63	67	62	53	65	57	54
	38	50	7	28	102	1	432	187	1745	31568	52.4	31580	76	77	71	65	75	65	66
	38	50	7	28	212	1	432	187	1745	31568	52.4	31580	92	88	80	80	87	73	81
	38	50	7	28	445	1	432	187	1745	31568	52.4	31580	101	97	88	93	96	78	96
	38	50	7	28	927	1	432	187	1745	31568	52.4	31580	105	104	93	103	102	82	106
	38	50	7	28	1480	1	432	187	1745	31568	52.4	31580	109	107	96	108	105	84	111
	38	50	7	28	3830	1	432	187	1745	31568	52.4	31580	117	112	102	116	109	86	118

	38	50	7	28	6349	1	432	187	1745	31568	52.4	31580	116	115	104	120	109	87	122
WTC9000	38	50	7	28	28	1	502	196	1677	36215	63.1	36270	28	28	28	24	28	28	23
	38	50	7	28	56	1	502	196	1677	36215	63.1	36270	55	59	54	47	53	49	47
	38	50	7	28	83	1	502	196	1677	36215	63.1	36270	62	66	59	55	59	54	55
	38	50	7	28	197	1	502	196	1677	36215	63.1	36270	76	77	68	71	70	62	72
	38	50	7	28	384	1	502	196	1677	36215	63.1	36270	85	85	74	82	77	67	84
	38	50	7	28	792	1	502	196	1677	36215	63.1	36270	91	91	79	93	82	70	94
	38	50	7	28	1576	1	502	196	1677	36215	63.1	36270	97	95	83	100	85	73	101
	38	50	7	28	4277	1	502	196	1677	36215	63.1	36270	103	100	87	109	88	75	109
	38	50	7	28	6796	1	502	196	1677	36215	63.1	36270	103	102	89	113	88	76	113
WTC7500	38	96	28	28	31	1	432	187	1745	31580	52.4	31580	43	45	54	38	37	38	37
	38	96	28	28	42	1	432	187	1745	31580	52.4	31580	50	52	58	42	40	45	42
	38	96	28	28	56	1	432	187	1745	31580	52.4	31580	54	55	60	45	42	48	45
	38	96	28	28	102	1	432	187	1745	31580	52.4	31580	59	58	62	51	46	54	51
	38	96	28	28	212	1	432	187	1745	31580	52.4	31580	63	62	65	58	51	59	58
	38	96	28	28	550	1	432	187	1745	31580	52.4	31580	68	66	67	66	57	64	66
	38	96	28	28	750	1	432	187	1745	31580	52.4	31580	69	67	68	69	59	65	68
	38	96	28	28	1480	1	432	187	1745	31580	52.4	31580	73	70	70	74	63	67	73
	38	96	28	28	3830	1	432	187	1745	31580	52.4	31580	76	74	72	82	67	68	81
	38	96	28	28	6349	1	432	187	1745	31580	52.4	31580	80	77	74	86	69	69	85
WTC9000	38	96	28	28	31	1	502	196	1677	37270	63.1	36270	37	39	46	33	31	32	32
	38	96	28	28	35	1	502	196	1677	37270	63.1	36270	41	43	48	35	32	35	34
	38	96	28	28	42	1	502	196	1677	37270	63.1	36270	44	45	50	38	33	38	36
	38	96	28	28	56	1	502	196	1677	37270	63.1	36270	49	48	51	41	35	41	40
	38	96	28	28	83	1	502	196	1677	37270	63.1	36270	54	50	53	45	37	44	43
	38	96	28	28	197	1	502	196	1677	37270	63.1	36270	63	54	55	54	41	49	51
	38	96	28	28	384	1	502	196	1677	37270	63.1	36270	72	56	57	60	45	52	57
	38	96	28	28	792	1	502	196	1677	37270	63.1	36270	76	59	59	67	48	55	63
	38	96	28	28	1576	1	502	196	1677	37270	63.1	36270	90	62	60	73	52	56	69
	38	96	28	28	4277	1	502	196	1677	37270	63.1	36270	97	66	63	82	55	58	76
	38	96	28	28	6796	1	502	196	1677	37270	63.1	36270	101	67	64	86	56	58	80
WTC7500	38	50	7	182	182	1	432	187	1745	28704	52.4	31580	35	35	35	22	35	35	22
	38	50	7	182	185	1	432	187	1745	28704	52.4	31580	42	44	48	29	46	43	29
	38	50	7	182	190	1	432	187	1745	28704	52.4	31580	47	47	51	31	50	48	31
	38	50	7	182	212	1	432	187	1745	28704	52.4	31580	56	55	56	37	58	57	38
	38	50	7	182	252	1	432	187	1745	28704	52.4	31580	63	61	61	43	65	64	44
	38	50	7	182	445	1	432	187	1745	28704	52.4	31580	77	71	71	57	76	73	59
	38	50	7	182	550	1	432	187	1745	28704	52.4	31580	79	74	73	61	79	75	63
	38	50	7	182	927	1	432	187	1745	28704	52.4	31580	85	78	76	69	83	78	71
	38	50	7	182	1480	1	432	187	1745	28704	52.4	31580	89	81	79	74	86	80	76
	38	50	7	182	3830	1	432	187	1745	28704	52.4	31580	98	85	83	82	88	83	84
	38	50	7	182	6349	1	432	187	1745	28704	52.4	31580	98	87	84	86	89	84	88
WTC9000	38	50	7	181	181	1	502	196	1677	37170	63.1	36270	27	27	27	19	27	27	19
	38	50	7	181	184	1	502	196	1677	37170	63.1	36270	34	35	38	25	36	33	25
	38	50	7	181	188	1	502	196	1677	37170	63.1	36270	36	38	39	27	38	36	27
	38	50	7	181	195	1	502	196	1677	37170	63.1	36270	41	41	41	29	41	40	29
	38	50	7	181	234	1	502	196	1677	37170	63.1	36270	42	48	46	36	49	47	37
	38	50	7	181	384	1	502	196	1677	37170	63.1	36270	52	58	53	47	58	55	50
	38	50	7	181	570	1	502	196	1677	37170	63.1	36270	65	62	56	54	62	58	57
	38	50	7	181	997	1	502	196	1677	37170	63.1	36270	77	66	58	62	65	60	64
	38	50	7	181	1576	1	502	196	1677	37170	63.1	36270	82	68	60	67	67	62	69
	38	50	7	181	4277	1	502	196	1677	37170	63.1	36270	88	72	63	76	69	64	77
	38	50	7	181	5623	1	502	196	1677	37170	63.1	36270	89	73	64	78	69	64	79
WTC7500	38	50	7	361	361	1	432	187	1745	31580	52.4	31580	33	32	32	21	32	32	21
	38	50	7	361	378	1	432	187	1745	31580	52.4	31580	44	44	46	30	49	47	30
	38	50	7	361	410	1	432	187	1745	31580	52.4	31580	49	50	51	34	55	54	35
	38	50	7	361	445	1	432	187	1745	31580	52.4	31580	53	53	54	37	59	57	38
	38	50	7	361	550	1	432	187	1745	31580	52.4	31580	58	58	58	43	66	62	44
	38	50	7	361	750	1	432	187	1745	31580	52.4	31580	65	62	62	50	71	66	51
	38	50	7	361	927	1	432	187	1745	31580	52.4	31580	68	64	63	53	73	67	54
	38	50	7	361	1480	1	432	187	1745	31580	52.4	31580	73	67	66	58	76	69	60
	38	50	7	361	3830	1	432	187	1745	31580	52.4	31580	84	71	69	66	79	72	68
	38	50	7	361	6349	1	432	187	1745	31580	52.4	31580	85	72	71	70	79	73	72
WTC9000	38	50	7	730	730	1	502	196	1677	36817	63.1	36270	27	27	27	18	27	27	18
	38	50	7	730	734	1	502	196	1677	36817	63.1	36270	32	32	36	21	34	33	20
	38	50	7	730	737	1	502	196	1677	36817	63.1	36270	33	33	37	21	36	35	21
	38	50	7	730	745	1	502	196	1677	36817	63.1	36270	35	35	38	22	38	39	22
	38	50	7	730	792	1	502	196	1677	36817	63.1	36270	41	40	42	25	45	45	25
	38	50	7	730	997	1	502	196	1677	36817	63.1	36270	47	46	48	30	52	52	31

	38	50	7	730	1576	1	502	196	1677	36817	63.1	36270	55	50	51	36	56	56	37
	38	50	7	730	4277	1	502	196	1677	36817	63.1	36270	65	53	55	46	59	59	46
	38	50	7	730	6796	1	502	196	1677	36817	63.1	36270	65	54	56	50	60	59	50
Rusch&	50	65	7	27	27	2	337	185	1819	16287	26.4	26670	61	61	61	37	61	61	38
Kordina	50	65	7	27	30	2	337	185	1819	16287	26.4	26670	86	81	101	54	82	78	56
14/C/27/03	50	65	7	27	34	2	337	185	1819	16287	26.4	26670	97	87	106	58	89	87	59
	50	65	7	27	41	2	337	185	1819	16287	26.4	26670	104	93	112	62	96	95	63
	50	65	7	27	47	2	337	185	1819	16287	26.4	26670	107	96	116	64	100	100	66
	50	65	7	27	63	2	337	185	1819	16287	26.4	26670	117	102	125	69	107	109	71
	50	65	7	27	85	2	337	185	1819	16287	26.4	26670	125	107	134	74	115	117	76
	50	65	7	27	100	2	337	185	1819	16287	26.4	26670	128	110	139	77	118	120	79
	50	65	7	27	128	2	337	185	1819	16287	26.4	26670	133	114	147	81	123	125	83
	50	65	7	27	190	2	337	185	1819	16287	26.4	26670	137	120	159	87	131	132	89
	50	65	7	27	302	2	337	185	1819	16287	26.4	26670	142	127	172	95	140	139	97
	50	65	7	27	418	2	337	185	1819	16287	26.4	26670	146	131	180	100	145	143	102
	50	65	7	27	599	2	337	185	1819	16287	26.4	26670	149	136	189	106	150	146	107
Rusch&	50	65	7	28	28	2	337	185	1883	16287	23.4	17860	61	61	61	49	61	61	54
Kordina	50	65	7	28	30	2	337	185	1883	16287	23.4	17860	86	82	93	71	89	75	81
14/D/28/04	50	65	7	28	35	2	337	185	1883	16287	23.4	17860	97	93	99	78	103	87	88
	50	65	7	28	42	2	337	185	1883	16287	23.4	17860	104	100	105	83	114	95	94
	50	65	7	28	49	2	337	185	1883	16287	23.4	17860	107	104	109	87	121	101	97
	50	65	7	28	71	2	337	185	1883	16287	23.4	17860	117	113	119	95	136	112	105
	50	65	7	28	93	2	337	185	1883	16287	23.4	17860	125	119	126	100	145	118	110
	50	65	7	28	122	2	337	185	1883	16287	23.4	17860	128	124	133	106	154	124	115
	50	65	7	28	150	2	337	185	1883	16287	23.4	17860	133	128	139	110	161	128	119
	50	65	7	28	183	2	337	185	1883	16287	23.4	17860	137	132	144	114	167	131	123
	50	65	7	28	290	2	337	185	1883	16287	23.4	17860	142	140	156	124	180	138	132
	50	65	7	28	343	2	337	185	1883	16287	23.4	17860	146	143	160	128	185	140	135
	50	65	7	28	427	2	337	185	1883	16287	23.4	17860	149	146	165	132	190	143	139
	50	65	7	28	608	2	337	185	1883	16287	23.4	17860	152	152	172	139	197	146	146
Rusch&	50	65	7	28	28	2	337	185	1855	18868	27.8	22370	53	53	53	40	53	53	42
Kordina	50	65	7	28	31	2	337	185	1855	18868	27.8	22370	75	74	84	59	77	67	62
14/E/28/05	50	65	7	28	37	2	337	185	1855	18868	27.8	22370	84	83	90	65	88	77	68
	50	65	7	28	44	2	337	185	1855	18868	27.8	22370	87	88	95	69	95	84	72
	50	65	7	28	51	2	337	185	1855	18868	27.8	22370	94	92	98	72	100	88	75
	50	65	7	28	79	2	337	185	1855	18868	27.8	22370	103	100	108	80	113	99	83
	50	65	7	28	93	2	337	185	1855	18868	27.8	22370	107	103	112	82	117	102	85
	50	65	7	28	114	2	337	185	1855	18868	27.8	22370	113	107	117	86	122	106	89
	50	65	7	28	141	2	337	185	1855	18868	27.8	22370	118	110	122	90	128	109	92
	50	65	7	28	190	2	337	185	1855	18868	27.8	22370	121	115	128	95	135	114	97
	50	65	7	28	239	2	337	185	1855	18868	27.8	22370	124	119	134	99	140	117	101
	50	65	7	28	314	2	337	185	1855	18868	27.8	22370	132	123	139	104	145	120	106
	50	65	7	28	420	2	337	185	1855	18868	27.8	22370	133	127	145	109	151	123	111
	50	65	7	28	537	2	337	185	1855	18868	27.8	22370	136	131	150	113	155	125	115
Rusch&	50	65	7	28	28	2	337	185	2110	32051	28.4	30310	31	31	31	33	31	31	33
Kordina	50	65	7	28	30	2	337	185	2110	32051	28.4	30310	45	46	52	46	46	38	47
14/F/28/06	50	65	7	28	35	2	337	185	2110	32051	28.4	30310	52	55	56	50	53	44	51
	50	65	7	28	42	2	337	185	2110	32051	28.4	30310	56	60	59	54	59	48	55
	50	65	7	28	53	2	337	185	2110	32051	28.4	30310	62	65	62	58	65	53	59
	50	65	7	28	74	2	337	185	2110	32051	28.4	30310	67	71	66	63	72	57	65
	50	65	7	28	92	2	337	185	2110	32051	28.4	30310	70	74	69	66	76	60	68
	50	65	7	28	108	2	337	185	2110	32051	28.4	30310	74	76	71	68	79	62	71
	50	65	7	28	147	2	337	185	2110	32051	28.4	30310	77	81	75	72	84	65	75
	50	65	7	28	186	2	337	185	2110	32051	28.4	30310	78	84	78	76	88	67	79
	50	65	7	28	220	2	337	185	2110	32051	28.4	30310	81	86	80	78	90	68	82
	50	65	7	28	337	2	337	185	2110	32051	28.4	30310	86	92	85	84	96	71	88
	50	65	7	28	486	2	337	185	2110	32051	28.4	30310	88	97	89	89	101	73	94
	50	65	7	28	623	2	337	185	2110	32051	28.4	30310	90	99	92	93	104	74	97
Rusch&	30	65	8	466	466	3	350	158	1892	42553	48.5	33446	24	24	24	20	24	24	20
Sell	30	65	8	466	468	3	350	158	1892	42553	48.5	33446	28	27	31	23	30	27	23
30/B/8/466	30	65	8	466	476	3	350	158	1892	42553	48.5	33446	31	31	34	24	35	32	24
	30	65	8	466	487	3	350	158	1892	42553	48.5	33446	33	33	35	25	39	35	25
	30	65	8	466	509	3	350	158	1892	42553	48.5	33446	35	35	37	26	42	38	27
	30	65	8	466	558	3	350	158	1892	42553	48.5	33446	38	38	39	28	47	41	28
	30	65	8	466	678	3	350	158	1892	42553	48.5	33446	42	41	42	31	52	45	31
	30	65	8	466	868	3	350	158	1892	42553	48.5	33446	47	43	43	33	55	47	34
	30	65	8	466	977	3	350	158	1892	42553	48.5	33446	46	44	44	34	56	48	35
Rostasy	50	65	7	28	28	1	275	154	1952	36400	41.5	36400	30	27	27	25	27	27	26
43/A/65/01	50	65	7	28	31	1	275	154	1952	36400	41.5	36400	41	42	47	35	39	35	37

	50	65	7	28	35	1	275	154	1952	36400	41.5	36400	44	47	49	37	42	39	40
	50	65	7	28	42	1	275	154	1952	36400	41.5	36400	48	52	52	40	46	42	43
	50	65	7	28	49	1	275	154	1952	36400	41.5	36400	50	55	54	42	49	45	45
	50	65	7	28	70	1	275	154	1952	36400	41.5	36400	55	60	57	46	54	50	51
	50	65	7	28	98	1	275	154	1952	36400	41.5	36400	59	64	61	50	58	53	55
	50	65	7	28	119	1	275	154	1952	36400	41.5	36400	61	67	63	53	60	55	58
	50	65	7	28	147	1	275	154	1952	36400	41.5	36400	63	69	65	55	63	56	61
	50	65	7	28	203	1	275	154	1952	36400	41.5	36400	67	73	68	59	66	59	65
	50	65	7	28	388	1	275	154	1952	36400	41.5	36400	72	80	74	66	72	63	74
	50	65	7	28	570	1	275	154	1952	36400	41.5	36400	75	84	78	70	75	64	79
	50	65	7	28	752	1	275	154	1952	36400	41.5	36400	77	86	80	73	77	66	83
	50	65	7	28	1129	1	275	154	1952	36400	41.5	36400	79	90	82	77	80	67	87
	50	65	7	28	1343	1	275	154	1952	36400	41.5	36400	80	91	83	78	80	68	89
Rostasy	50	65	7	28	28	1	332	136	1855	37100	36.1	37100	29	27	27	26	27	27	27
43/B/65/02	50	65	7	28	30	1	332	136	1855	37100	36.1	37100	38	40	46	35	37	32	37
	50	65	7	28	35	1	332	136	1855	37100	36.1	37100	42	47	49	39	42	37	41
	50	65	7	28	42	1	332	136	1855	37100	36.1	37100	45	52	52	42	46	41	44
	50	65	7	28	49	1	332	136	1855	37100	36.1	37100	47	54	53	44	48	43	46
	50	65	7	28	70	1	332	136	1855	37100	36.1	37100	51	60	57	49	54	47	51
	50	65	7	28	119	1	332	136	1855	37100	36.1	37100	56	67	63	56	60	52	59
	50	65	7	28	203	1	332	136	1855	37100	36.1	37100	61	73	69	63	66	56	66
	50	65	7	28	301	1	332	136	1855	37100	36.1	37100	64	77	73	68	70	58	72
	50	65	7	28	388	1	332	136	1855	37100	36.1	37100	65	80	75	71	72	59	75
	50	65	7	28	500	1	332	136	1855	37100	36.1	37100	67	83	77	74	75	60	79
	50	65	7	28	752	1	332	136	1855	37100	36.1	37100	69	87	80	79	77	62	84
	50	65	7	28	951	1	332	136	1855	37100	36.1	37100	70	89	82	81	79	63	86
	50	65	7	28	1129	1	332	136	1855	37100	36.1	37100	71	90	83	83	80	63	88
	50	65	7	28	1343	1	332	136	1855	37100	36.1	37100	72	91	84	84	80	64	90
Rostasy	50	96	28	28	28	1	332	136	1855	37500	37.9	37500	29	27	27	25	27	27	26
43/B/99/03	50	96	28	28	30	1	332	136	1855	37500	37.9	37500	34	38	47	34	31	31	35
	50	96	28	28	35	1	332	136	1855	37500	37.9	37500	36	44	50	36	33	34	38
	50	96	28	28	42	1	332	136	1855	37500	37.9	37500	38	47	52	38	34	37	41
	50	96	28	28	49	1	332	136	1855	37500	37.9	37500	40	48	53	40	35	39	42
	50	96	28	28	70	1	332	136	1855	37500	37.9	37500	42	51	55	43	37	42	46
	50	96	28	28	119	1	332	136	1855	37500	37.9	37500	45	54	57	47	40	45	51
	50	96	28	28	203	1	332	136	1855	37500	37.9	37500	49	56	59	51	43	48	56
	50	96	28	28	301	1	332	136	1855	37500	37.9	37500	52	58	60	54	45	50	59
	50	96	28	28	388	1	332	136	1855	37500	37.9	37500	53	59	60	56	47	51	62
	50	96	28	28	500	1	332	136	1855	37500	37.9	37500	54	60	61	57	48	52	64
	50	96	28	28	752	1	332	136	1855	37500	37.9	37500	57	61	62	60	51	53	67
	50	96	28	28	951	1	332	136	1855	37500	37.9	37500	59	62	63	62	52	53	69
	50	96	28	28	1129	1	332	136	1855	37500	37.9	37500	60	63	63	63	53	54	70
	50	96	28	28	1343	1	332	136	1855	37500	37.9	37500	61	64	64	64	54	54	72
Lambotte	38	60	1	28	28	1	300	150	1890	27027	29.2	N/A	37	37	37	35	37	37	38
58/A/75/1/01	38	60	1	28	29	1	300	150	1890	27027	29.2	N/A	52	50	56	48	52	43	52
	38	60	1	28	30	1	300	150	1890	27027	29.2	N/A	56	54	58	50	56	45	54
	38	60	1	28	31	1	300	150	1890	27027	29.2	N/A	58	56	60	52	59	47	55
	38	60	1	28	35	1	300	150	1890	27027	29.2	N/A	64	63	64	56	65	52	59
	38	60	1	28	42	1	300	150	1890	27027	29.2	N/A	71	69	68	60	73	58	64
	38	60	1	28	56	1	300	150	1890	27027	29.2	N/A	78	76	74	67	81	64	70
	38	60	1	28	84	1	300	150	1890	27027	29.2	N/A	90	84	81	74	92	70	77
	38	60	1	28	118	1	300	150	1890	27027	29.2	N/A	98	90	87	81	99	75	83
	38	60	1	28	208	1	300	150	1890	27027	29.2	N/A	107	99	96	92	111	81	94
	38	60	1	28	388	1	300	150	1890	27027	29.2	N/A	116	107	104	104	122	86	105
	38	60	1	28	748	1	300	150	1890	27027	29.2	N/A	124	114	110	114	130	90	114
Lambotte	38	60	1	15	15	1	360	158	1896	28571	42.0	N/A	35	35	35	32	35	35	33
58/B/75/1/02	38	60	1	15	16	1	360	158	1896	28571	42.0	N/A	44	48	56	44	47	41	46
	38	60	1	15	17	1	360	158	1896	28571	42.0	N/A	48	52	58	46	51	43	48
	38	60	1	15	18	1	360	158	1896	28571	42.0	N/A	50	55	60	48	53	45	50
	38	60	1	15	22	1	360	158	1896	28571	42.0	N/A	54	62	64	52	59	51	54
	38	60	1	15	29	1	360	158	1896	28571	42.0	N/A	59	68	68	57	65	56	59
	38	60	1	15	43	1	360	158	1896	28571	42.0	N/A	67	75	74	63	72	62	65
	38	60	1	15	71	1	360	158	1896	28571	42.0	N/A	77	83	82	70	80	69	73
	38	60	1	15	105	1	360	158	1896	28571	42.0	N/A	85	88	88	76	87	73	79
	38	60	1	15	195	1	360	158	1896	28571	42.0	N/A	98	96	97	86	96	79	89
	38	60	1	15	375	1	360	158	1896	28571	42.0	N/A	106	103	105	96	105	85	99
	38	60	1	15	735	1	360	158	1896	28571	42.0	N/A	114	110	112	104	112	89	108
	38	60	1	15	1095	1	360	158	1896	28571	42.0	N/A	116	113	115	108	116	91	112
	38	60	1	15	1455	1	360	158	1896	28571	42.0	N/A	118	115	117	110	117	92	115

	38	60	1	15	1815	1	360	158	1896	28571	42.0	N/A	120	116	119	112	119	93	116
Lambotte	38	60	1	7	7	1	360	158	1896	25641	37.9	N/A	39	39	39	40	39	39	41
58/C/75/1/03	38	60	1	7	8	1	360	158	1896	25641	37.9	N/A	50	57	67	59	55	46	62
	38	60	1	7	9	1	360	158	1896	25641	37.9	N/A	54	63	70	62	59	49	65
	38	60	1	7	10	1	360	158	1896	25641	37.9	N/A	56	67	72	65	62	52	67
	38	60	1	7	14	1	360	158	1896	25641	37.9	N/A	63	76	78	70	69	58	73
	38	60	1	7	21	1	360	158	1896	25641	37.9	N/A	69	84	84	76	76	65	80
	38	60	1	7	35	1	360	158	1896	25641	37.9	N/A	79	92	93	83	85	72	87
	38	60	1	7	63	1	360	158	1896	25641	37.9	N/A	88	101	105	92	96	80	95
	38	60	1	7	97	1	360	158	1896	25641	37.9	N/A	95	107	114	98	104	86	102
	38	60	1	7	187	1	360	158	1896	25641	37.9	N/A	104	116	127	109	116	93	113
	38	60	1	7	367	1	360	158	1896	25641	37.9	N/A	113	124	139	119	127	99	123
	38	60	1	7	727	1	360	158	1896	25641	37.9	N/A	121	131	149	128	136	104	132
	38	60	1	7	1087	1	360	158	1896	25641	37.9	N/A	124	134	154	132	140	107	137
	38	60	1	7	1447	1	360	158	1896	25641	37.9	N/A	127	136	157	135	143	108	139
	38	60	1	7	1807	1	360	158	1896	25641	37.9	N/A	128	138	159	137	144	109	141
Lambotte	38	60	1	17	17	1	375	176	1962	27778	39.1	N/A	36	36	36	33	36	36	33
58/D/75/1/04	38	60	1	17	18	1	375	176	1962	27778	39.1	N/A	49	49	57	46	49	42	47
	38	60	1	17	19	1	375	176	1962	27778	39.1	N/A	54	53	59	48	52	45	49
	38	60	1	17	20	1	375	176	1962	27778	39.1	N/A	58	56	61	50	55	46	51
	38	60	1	17	24	1	375	176	1962	27778	39.1	N/A	65	63	65	54	61	52	55
	38	60	1	17	31	1	375	176	1962	27778	39.1	N/A	72	69	69	58	67	57	59
	38	60	1	17	45	1	375	176	1962	27778	39.1	N/A	81	76	75	64	74	63	66
	38	60	1	17	73	1	375	176	1962	27778	39.1	N/A	94	84	83	71	83	70	73
	38	60	1	17	107	1	375	176	1962	27778	39.1	N/A	103	89	90	77	90	75	79
	38	60	1	17	197	1	375	176	1962	27778	39.1	N/A	116	97	99	87	100	81	89
	38	60	1	17	377	1	375	176	1962	27778	39.1	N/A	126	105	107	97	109	86	100
	38	60	1	17	737	1	375	176	1962	27778	39.1	N/A	135	111	114	105	116	90	109
	38	60	1	17	1097	1	375	176	1962	27778	39.1	N/A	140	114	117	109	120	92	113
	38	60	1	17	1457	1	375	176	1962	27778	39.1	N/A	141	116	119	111	121	93	115
Lambotte	25	95	35	35	35	1	362	170	1895	40000	N/A	40000	25	25	25	20	25	25	21
58/E/50/35/05	25	95	35	35	36	1	362	170	1895	40000	N/A	40000	29	32	41	26	27	28	26
	25	95	35	35	37	1	362	170	1895	40000	N/A	40000	31	34	42	27	28	29	27
	25	95	35	35	38	1	362	170	1895	40000	N/A	40000	32	36	43	27	28	30	28
	25	95	35	35	42	1	362	170	1895	40000	N/A	40000	36	39	45	29	29	33	30
	25	95	35	35	49	1	362	170	1895	40000	N/A	40000	40	41	47	30	31	36	32
	25	95	35	35	63	1	362	170	1895	40000	N/A	40000	45	44	48	33	32	39	35
	25	95	35	35	91	1	362	170	1895	40000	N/A	40000	51	46	50	36	34	42	38
	25	95	35	35	125	1	362	170	1895	40000	N/A	40000	55	47	51	38	35	44	41
	25	95	35	35	215	1	362	170	1895	40000	N/A	40000	61	50	53	42	37	48	46
Lambotte	25	60	1	60	60	1	350	182	1950	33333	30.9	N/A	30	30	30	32	30	30	32
58/F/50/1/06	25	60	1	60	61	1	350	182	1950	33333	30.9	N/A	37	39	42	42	44	35	43
	25	60	1	60	62	1	350	182	1950	33333	30.9	N/A	40	42	43	44	47	37	45
	25	60	1	60	63	1	350	182	1950	33333	30.9	N/A	43	44	44	45	50	38	46
	25	60	1	60	67	1	350	182	1950	33333	30.9	N/A	47	50	47	49	56	42	50
	25	60	1	60	74	1	350	182	1950	33333	30.9	N/A	53	55	50	53	63	47	54
	25	60	1	60	88	1	350	182	1950	33333	30.9	N/A	61	61	54	59	71	51	59
	25	60	1	60	116	1	350	182	1950	33333	30.9	N/A	71	67	59	66	80	57	66
	25	60	1	60	150	1	350	182	1950	33333	30.9	N/A	78	71	62	72	87	60	72
	25	60	1	60	240	1	350	182	1950	33333	30.9	N/A	89	77	66	80	97	65	80
	25	60	1	60	420	1	350	182	1950	33333	30.9	N/A	97	81	69	88	106	69	88
	25	60	1	60	780	1	350	182	1950	33333	30.9	N/A	103	85	72	94	113	72	95
Lambotte	38	60	1	7	7	1	375	176	1962	21739	39.5	N/A	46	46	46	39	46	46	40
58/I/75/1/09	38	60	1	7	8	1	375	176	1962	21739	39.5	N/A	72	64	79	58	61	54	60
	38	60	1	7	9	1	375	176	1962	21739	39.5	N/A	77	69	83	61	65	58	63
	38	60	1	7	10	1	375	176	1962	21739	39.5	N/A	81	73	85	64	68	61	65
	38	60	1	7	14	1	375	176	1962	21739	39.5	N/A	90	82	92	69	75	69	71
	38	60	1	7	21	1	375	176	1962	21739	39.5	N/A	98	90	100	75	82	76	77
	38	60	1	7	35	1	375	176	1962	21739	39.5	N/A	108	98	111	82	91	85	85
	38	60	1	7	63	1	375	176	1962	21739	39.5	N/A	121	107	125	90	101	95	93
	38	60	1	7	97	1	375	176	1962	21739	39.5	N/A	132	113	136	96	109	102	100
	38	60	1	7	187	1	375	176	1962	21739	39.5	N/A	146	121	153	106	121	110	110
	38	60	1	7	367	1	375	176	1962	21739	39.5	N/A	157	129	168	116	131	118	121
	38	60	1	7	727	1	375	176	1962	21739	39.5	N/A	166	136	180	124	140	124	130
	38	60	1	7	1087	1	375	176	1962	21739	39.5	N/A	171	139	186	128	144	127	134
	38	60	1	7	1447	1	375	176	1962	21739	39.5	N/A	174	142	190	131	146	128	137
	38	60	1	7	1807	1	375	176	1962	21739	39.5	N/A	176	143	193	132	147	130	138
Lambotte	38	60	1	7	7	1	400	230	1934	25641	46.3	N/A	39	39	39	37	39	39	36
58/K/75/1/11	38	60	1	7	8	1	400	230	1934	25641	46.3	N/A	53	55	67	54	52	46	54

	38	60	1	7	9	1	400	230	1934	25641	46.3	N/A	56	61	70	57	56	49	57
	38	60	1	7	10	1	400	230	1934	25641	46.3	N/A	58	64	72	59	58	52	59
	38	60	1	7	14	1	400	230	1934	25641	46.3	N/A	66	73	78	64	64	58	64
	38	60	1	7	21	1	400	230	1934	25641	46.3	N/A	74	80	84	69	71	65	70
	38	60	1	7	35	1	400	230	1934	25641	46.3	N/A	85	88	92	76	78	72	77
	38	60	1	7	63	1	400	230	1934	25641	46.3	N/A	96	95	104	83	87	80	86
	38	60	1	7	97	1	400	230	1934	25641	46.3	N/A	103	101	112	88	94	86	92
	38	60	1	7	187	1	400	230	1934	25641	46.3	N/A	112	109	125	97	104	93	102
	38	60	1	7	367	1	400	230	1934	25641	46.3	N/A	120	117	136	106	114	100	112
	38	60	1	7	727	1	400	230	1934	25641	46.3	N/A	127	123	146	113	121	105	121
Lambotte	25	95	42	42	42	1	350	168	1950	42735	37.7	N/A	23	23	23	29	23	23	30
58/N/50/42/14	25	95	42	42	43	1	350	168	1950	42735	37.7	N/A	27	33	37	38	28	26	39
	25	95	42	42	44	1	350	168	1950	42735	37.7	N/A	30	35	38	39	29	27	40
	25	95	42	42	45	1	350	168	1950	42735	37.7	N/A	32	37	39	40	30	28	41
	25	95	42	42	49	1	350	168	1950	42735	37.7	N/A	39	41	40	42	32	31	43
	25	95	42	42	56	1	350	168	1950	42735	37.7	N/A	46	44	42	44	34	33	45
	25	95	42	42	70	1	350	168	1950	42735	37.7	N/A	53	47	43	47	37	36	48
	25	95	42	42	98	1	350	168	1950	42735	37.7	N/A	62	50	44	50	40	39	52
	25	95	42	42	132	1	350	168	1950	42735	37.7	N/A	68	52	45	52	43	41	55
	25	95	42	42	222	1	350	168	1950	42735	37.7	N/A	78	55	47	56	47	44	59
	25	95	42	42	402	1	350	168	1950	42735	37.7	N/A	88	58	48	61	52	47	64
	25	95	42	42	762	1	350	168	1950	42735	37.7	N/A	98	61	49	65	57	48	69
Lambotte	25	95	49	49	49	1	350	172	1855	40000	42.9	N/A	25	25	25	27	25	25	27
58/O/50/49/15	25	95	49	49	50	1	350	172	1855	40000	42.9	N/A	28	34	40	34	29	28	34
	25	95	49	49	51	1	350	172	1855	40000	42.9	N/A	29	36	41	35	30	29	36
	25	95	49	49	52	1	350	172	1855	40000	42.9	N/A	29	38	42	36	31	30	36
	25	95	49	49	56	1	350	172	1855	40000	42.9	N/A	30	41	44	37	32	33	38
	25	95	49	49	63	1	350	172	1855	40000	42.9	N/A	35	44	45	39	34	35	40
	25	95	49	49	77	1	350	172	1855	40000	42.9	N/A	41	47	47	42	37	38	43
	25	95	49	49	105	1	350	172	1855	40000	42.9	N/A	49	49	48	45	40	42	46
	25	95	49	49	139	1	350	172	1855	40000	42.9	N/A	54	51	49	47	42	44	49
	25	95	49	49	229	1	350	172	1855	40000	42.9	N/A	63	54	51	51	46	47	53
	25	95	49	49	409	1	350	172	1855	40000	42.9	N/A	70	57	52	55	50	49	58
	25	95	49	49	769	1	350	172	1855	40000	42.9	N/A	77	60	54	59	55	51	63
Lambotte	25	95	17	17	17	1	350	182	1950	37037	31.5	N/A	27	27	27	38	27	27	39
58/P/50/17/16	25	95	17	17	18	1	350	182	1950	37037	31.5	N/A	29	40	44	53	33	30	55
	25	95	17	17	19	1	350	182	1950	37037	31.5	N/A	30	44	45	55	35	32	57
	25	95	17	17	20	1	350	182	1950	37037	31.5	N/A	32	47	46	56	36	33	58
	25	95	17	17	24	1	350	182	1950	37037	31.5	N/A	39	52	48	60	39	36	62
	25	95	17	17	31	1	350	182	1950	37037	31.5	N/A	46	56	50	63	42	40	65
	25	95	17	17	45	1	350	182	1950	37037	31.5	N/A	55	60	51	67	46	43	70
	25	95	17	17	73	1	350	182	1950	37037	31.5	N/A	66	64	53	72	50	47	75
	25	95	17	17	107	1	350	182	1950	37037	31.5	N/A	73	66	54	75	54	50	78
	25	95	17	17	197	1	350	182	1950	37037	31.5	N/A	85	70	56	80	60	54	84
	25	95	17	17	377	1	350	182	1950	37037	31.5	N/A	98	73	58	85	67	57	89
	25	95	17	17	737	1	350	182	1950	37037	31.5	N/A	111	76	59	89	74	59	94
Dutron	25	48	1	60	60	1	289	162	1867	29070	28.4	N/A	34	34	34	33	34	34	34
1/1/47.5/1	25	48	1	60	100	1	289	162	1867	29070	28.4	N/A	57	74	70	78	91	66	76
	25	48	1	60	221	1	289	162	1867	29070	28.4	N/A	83	89	82	106	116	79	101
	25	48	1	60	301	1	289	162	1867	29070	28.4	N/A	92	92	85	114	123	83	108
	25	48	1	60	360	1	289	162	1867	29070	28.4	N/A	96	94	87	118	126	84	112
	25	48	1	60	760	1	289	162	1867	29070	28.4	N/A	111	99	92	128	138	90	122
	25	48	1	60	960	1	289	162	1867	29070	28.4	N/A	112	101	94	130	140	91	124
Dutron	25	48	1	60	60	1	289	162	1867	25840	28.4	N/A	39	39	39	33	39	39	34
1/1/47.5/02	25	48	1	60	100	1	289	162	1867	25840	28.4	N/A	60	78	80	78	95	74	76
	25	48	1	60	160	1	289	162	1867	25840	28.4	N/A	78	88	90	96	111	84	92
	25	48	1	60	221	1	289	162	1867	25840	28.4	N/A	93	93	95	106	120	89	101
	25	48	1	60	301	1	289	162	1867	25840	28.4	N/A	102	96	99	114	127	93	108
	25	48	1	60	360	1	289	162	1867	25840	28.4	N/A	105	98	101	118	131	95	112
	25	48	1	60	460	1	289	162	1867	25840	28.4	N/A	112	100	103	122	135	97	116
	25	48	1	60	610	1	289	162	1867	25840	28.4	N/A	115	102	105	126	139	99	120
	25	48	1	60	760	1	289	162	1867	25840	28.4	N/A	120	104	107	128	142	101	122
	25	48	1	60	960	1	289	162	1867	25840	28.4	N/A	124	105	108	130	145	102	124
Dutron	25	100	60	60	60	1	289	162	1867	34246	28.4	N/A	29	29	29	33	29	29	34
1/1/100/03	25	100	60	60	100	1	289	162	1867	34246	28.4	N/A	39	50	53	48	44	46	52
	25	100	60	60	160	1	289	162	1867	34246	28.4	N/A	47	53	54	52	48	51	57
	25	100	60	60	302	1	289	162	1867	34246	28.4	N/A	51	56	55	56	54	55	62
	25	100	60	60	460	1	289	162	1867	34246	28.4	N/A	52	57	56	59	58	57	65
	25	100	60	60	609	1	289	162	1867	34246	28.4	N/A	53	59	57	61	60	58	67

	25	100	60	60	760	1	289	162	1867	34246	28.4	N/A	53	60	57	62	62	59	69
	25	100	60	60	960	1	289	162	1867	34246	28.4	N/A	53	61	58	63	64	59	71
Dutron	25	100	60	60	60	1	289	162	1867	33450	28.4	N/A	30	30	30	33	30	30	34
1/1/100/04	25	100	60	60	100	1	289	162	1867	33450	28.4	N/A	40	51	54	48	44	47	52
	25	100	60	60	160	1	289	162	1867	33450	28.4	N/A	43	53	55	52	49	52	57
	25	100	60	60	220	1	289	162	1867	33450	28.4	N/A	46	55	56	54	52	54	59
	25	100	60	60	302	1	289	162	1867	33450	28.4	N/A	50	56	57	56	55	56	62
	25	100	60	60	382	1	289	162	1867	33450	28.4	N/A	50	57	57	58	57	57	64
	25	100	60	60	460	1	289	162	1867	33450	28.4	N/A	51	58	58	59	59	58	65
	25	100	60	60	609	1	289	162	1867	33450	28.4	N/A	52	60	58	61	61	59	67
	25	100	60	60	760	1	289	162	1867	33450	28.4	N/A	52	61	59	62	63	60	69
	25	100	60	60	960	1	289	162	1867	33450	28.4	N/A	54	62	59	63	65	61	71
Dutron	25	68	1	60	60	1	289	162	1867	30303	28.4	N/A	33	33	33	33	33	33	34
1/1/67.5/05	25	68	1	60	100	1	289	162	1867	30303	28.4	N/A	44	65	62	61	77	59	63
	25	68	1	60	142	1	289	162	1867	30303	28.4	N/A	55	71	66	68	86	65	69
	25	68	1	60	160	1	289	162	1867	30303	28.4	N/A	58	72	68	70	89	66	71
	25	68	1	60	220	1	289	162	1867	30303	28.4	N/A	64	76	70	75	96	70	76
	25	68	1	60	460	1	289	162	1867	30303	28.4	N/A	78	81	75	84	108	76	85
	25	68	1	60	612	1	289	162	1867	30303	28.4	N/A	83	83	76	86	111	77	88
	25	68	1	60	760	1	289	162	1867	30303	28.4	N/A	85	84	77	88	113	78	90
	25	68	1	60	960	1	289	162	1867	30303	28.4	N/A	87	85	78	90	115	80	92
Dutron	25	48	60	60	60	1	289	162	1867	35088	28.4	N/A	29	29	29	34	29	29	35
1/60/100/06	25	48	60	60	83	1	289	162	1867	35088	28.4	N/A	50	83	63	74	76	50	72
	25	48	60	60	100	1	289	162	1867	35088	28.4	N/A	64	93	69	84	85	55	81
	25	48	60	60	142	1	289	162	1867	35088	28.4	N/A	85	106	77	101	97	60	96
	25	48	60	60	160	1	289	162	1867	35088	28.4	N/A	101	109	79	106	101	62	100
	25	48	60	60	220	1	289	162	1867	35088	28.4	N/A	113	117	83	118	110	66	110
	25	48	60	60	300	1	289	162	1867	35088	28.4	N/A	120	122	87	126	117	68	118
	25	48	60	60	380	1	289	162	1867	35088	28.4	N/A	125	126	89	130	122	70	122
	25	48	60	60	460	1	289	162	1867	35088	28.4	N/A	129	128	90	133	125	71	125
	25	48	60	60	608	1	289	162	1867	35088	28.4	N/A	135	132	92	136	129	73	128
	25	48	60	60	760	1	289	162	1867	35088	28.4	N/A	140	134	94	138	132	74	130
	25	48	60	60	960	1	289	162	1867	35088	28.4	N/A	142	136	96	140	135	75	132
Wesche	50	65	3	3	3	1	336	185	1810	17575	33.3	32200	57	57	57	48	57	57	51
63/A/3/01	50	65	3	3	4	1	336	185	1810	17575	33.3	32200	76	81	113	75	72	68	80
	50	65	3	3	5	1	336	185	1810	17575	33.3	32200	80	89	119	80	76	73	85
	50	65	3	3	7	1	336	185	1810	17575	33.3	32200	88	98	126	84	81	80	90
	50	65	3	3	10	1	336	185	1810	17575	33.3	32200	94	106	132	89	86	87	95
	50	65	3	3	17	1	336	185	1810	17575	33.3	32200	102	115	143	95	94	98	101
	50	65	3	3	24	1	336	185	1810	17575	33.3	32200	108	121	152	98	99	105	106
	50	65	3	3	31	1	336	185	1810	17575	33.3	32200	111	124	159	101	103	110	109
	50	65	3	3	56	1	336	185	1810	17575	33.3	32200	118	132	179	108	112	122	116
	50	65	3	3	70	1	336	185	1810	17575	33.3	32200	122	135	188	110	116	126	118
	50	65	3	3	105	1	336	185	1810	17575	33.3	32200	133	141	206	115	124	134	124
	50	65	3	3	126	1	336	185	1810	17575	33.3	32200	137	143	215	117	127	137	126
	50	65	3	3	168	1	336	185	1810	17575	33.3	32200	143	147	229	121	132	142	130
	50	65	3	3	245	1	336	185	1810	17575	33.3	32200	154	152	247	125	139	148	135
	50	65	3	3	336	1	336	185	1810	17575	33.3	32200	161	156	262	129	144	152	139
	50	65	3	3	371	1	336	185	1810	17575	33.3	32200	163	158	266	131	146	153	141
	50	65	3	3	495	1	336	185	1810	17575	33.3	32200	169	161	278	134	150	157	144
	50	65	3	3	556	1	336	185	1810	17575	33.3	32200	174	163	283	135	152	158	146
Wesche	50	65	7	7	7	1	336	185	1810	21598	33.3	32200	46	46	46	39	46	46	40
63/A/7/02	50	65	7	7	8	1	336	185	1810	21598	33.3	32200	66	65	85	58	59	55	61
	50	65	7	7	9	1	336	185	1810	21598	33.3	32200	72	70	89	61	63	58	64
	50	65	7	7	10	1	336	185	1810	21598	33.3	32200	77	74	91	63	65	61	66
	50	65	7	7	14	1	336	185	1810	21598	33.3	32200	85	83	97	68	71	69	71
	50	65	7	7	17	1	336	185	1810	21598	33.3	32200	89	87	101	70	74	72	74
	50	65	7	7	21	1	336	185	1810	21598	33.3	32200	92	91	104	73	78	76	77
	50	65	7	7	28	1	336	185	1810	21598	33.3	32200	97	95	109	76	82	81	80
	50	65	7	7	35	1	336	185	1810	21598	33.3	32200	97	98	114	79	85	85	83
	50	65	7	7	49	1	336	185	1810	21598	33.3	32200	103	103	121	82	90	91	87
	50	65	7	7	63	1	336	185	1810	21598	33.3	32200	106	106	127	85	94	95	90
	50	65	7	7	91	1	336	185	1810	21598	33.3	32200	113	111	137	90	100	100	95
	50	65	7	7	105	1	336	185	1810	21598	33.3	32200	115	113	141	91	103	102	97
	50	65	7	7	112	1	336	185	1810	21598	33.3	32200	116	114	142	92	104	103	98
	50	65	7	7	172	1	336	185	1810	21598	33.3	32200	126	120	155	97	111	109	104
	50	65	7	7	189	1	336	185	1810	21598	33.3	32200	127	121	157	99	112	110	105
	50	65	7	7	203	1	336	185	1810	21598	33.3	32200	128	122	160	99	113	111	106
	50	65	7	7	217	1	336	185	1810	21598	33.3	32200	129	123	161	100	114	112	107

	50	65	7	7	252	1	336	185	1810	21598	33.3	32200	133	125	166	102	116	113	109
	50	65	7	7	308	1	336	185	1810	21598	33.3	32200	136	127	171	105	119	115	112
	50	65	7	7	336	1	336	185	1810	21598	33.3	32200	139	128	173	106	121	116	113
	50	65	7	7	371	1	336	185	1810	21598	33.3	32200	141	130	176	107	122	117	114
	50	65	7	7	464	1	336	185	1810	21598	33.3	32200	143	133	182	110	125	119	117
	50	65	7	7	495	1	336	185	1810	21598	33.3	32200	146	133	183	111	126	120	118
	50	65	7	7	525	1	336	185	1810	21598	33.3	32200	149	134	185	112	126	120	119
	50	65	7	7	556	1	336	185	1810	21598	33.3	32200	150	135	186	112	127	121	120
Wesche	50	65	7	28	28	1	336	185	1810	24096	33.3	32200	42	42	42	30	42	42	30
63/A/28/03	50	65	7	28	29	1	336	185	1810	24096	33.3	32200	60	52	67	40	52	48	41
	50	65	7	28	31	1	336	185	1810	24096	33.3	32200	67	58	71	43	56	53	43
	50	65	7	28	34	1	336	185	1810	24096	33.3	32200	71	63	74	45	60	57	46
	50	65	7	28	37	1	336	185	1810	24096	33.3	32200	75	65	76	47	62	60	48
	50	65	7	28	40	1	336	185	1810	24096	33.3	32200	78	67	78	48	64	63	49
	50	65	7	28	43	1	336	185	1810	24096	33.3	32200	80	69	80	49	66	65	50
	50	65	7	28	51	1	336	185	1810	24096	33.3	32200	86	73	83	52	70	69	53
	50	65	7	28	58	1	336	185	1810	24096	33.3	32200	90	75	86	54	72	72	55
	50	65	7	28	68	1	336	185	1810	24096	33.3	32200	93	77	89	56	75	75	57
	50	65	7	28	78	1	336	185	1810	24096	33.3	32200	96	79	91	58	77	77	59
	50	65	7	28	98	1	336	185	1810	24096	33.3	32200	100	83	96	61	81	81	63
	50	65	7	28	118	1	336	185	1810	24096	33.3	32200	104	85	100	63	84	83	65
	50	65	7	28	148	1	336	185	1810	24096	33.3	32200	108	88	104	66	87	86	69
	50	65	7	28	168	1	336	185	1810	24096	33.3	32200	110	90	106	68	89	88	71
	50	65	7	28	208	1	336	185	1810	24096	33.3	32200	113	93	111	71	92	90	74
	50	65	7	28	248	1	336	185	1810	24096	33.3	32200	115	95	114	73	94	92	76
	50	65	7	28	288	1	336	185	1810	24096	33.3	32200	118	97	116	75	96	93	78
	50	65	7	28	328	1	336	185	1810	24096	33.3	32200	120	98	119	77	98	94	80
	50	65	7	28	390	1	336	185	1810	24096	33.3	32200	123	100	122	79	100	95	83
	50	65	7	28	453	1	336	185	1810	24096	33.3	32200	127	102	124	81	101	97	85
	50	65	7	28	481	1	336	185	1810	24096	33.3	32200	128	103	125	82	102	97	86
	50	65	7	28	600	1	336	185	1810	24096	33.3	32200	132	105	128	85	104	99	89
	50	65	7	28	670	1	336	185	1810	24096	33.3	32200	133	106	130	86	105	99	90
	50	65	7	28	824	1	336	185	1810	24096	33.3	32200	137	108	132	88	107	101	93
Wesche	50	65	7	2470	2470	1	336	185	1810	28736	33.3	32200	35	35	35	22	35	35	22
63/A/2470/04	50	65	7	2470	2471	1	336	185	1810	28736	33.3	32200	35	37	43	24	39	38	23
	50	65	7	2470	2473	1	336	185	1810	28736	33.3	32200	41	38	44	25	41	40	23
	50	65	7	2470	2477	1	336	185	1810	28736	33.3	32200	42	39	45	25	43	43	24
	50	65	7	2470	2484	1	336	185	1810	28736	33.3	32200	42	40	46	25	45	46	24
	50	65	7	2470	2498	1	336	185	1810	28736	33.3	32200	45	41	48	26	47	49	24
	50	65	7	2470	2526	1	336	185	1810	28736	33.3	32200	47	43	50	26	50	53	25
	50	65	7	2470	2560	1	336	185	1810	28736	33.3	32200	48	44	52	27	53	55	25
	50	65	7	2470	2591	1	336	185	1810	28736	33.3	32200	50	45	53	27	54	57	26
	50	65	7	2470	2647	1	336	185	1810	28736	33.3	32200	51	46	55	28	56	59	26
	50	65	7	2470	2773	1	336	185	1810	28736	33.3	32200	54	48	57	28	58	61	27
	50	65	7	2470	2954	1	336	185	1810	28736	33.3	32200	55	49	59	29	60	62	28
	50	65	7	2470	3231	1	336	185	1810	28736	33.3	32200	59	51	61	30	62	64	29
Wesche	50	65	7	3055	3055	1	336	185	1810	29940	33.3	32200	33	33	33	22	33	33	22
63/A/3055/05	50	65	7	3055	3056	1	336	185	1810	29940	33.3	32200	36	35	41	24	38	37	23
	50	65	7	3055	3058	1	336	185	1810	29940	33.3	32200	36	36	42	24	39	39	23
	50	65	7	3055	3062	1	336	185	1810	29940	33.3	32200	38	37	43	25	41	41	23
	50	65	7	3055	3069	1	336	185	1810	29940	33.3	32200	38	38	44	25	43	44	24
	50	65	7	3055	3083	1	336	185	1810	29940	33.3	32200	38	39	45	25	46	47	24
	50	65	7	3055	3145	1	336	185	1810	29940	33.3	32200	41	42	49	26	50	53	25
	50	65	7	3055	3177	1	336	185	1810	29940	33.3	32200	41	43	50	26	52	54	25
	50	65	7	3055	3248	1	336	185	1810	29940	33.3	32200	43	44	52	27	54	56	25
	50	65	7	3055	3328	1	336	185	1810	29940	33.3	32200	46	45	53	27	56	57	26
	50	65	7	3055	3419	1	336	185	1810	29940	33.3	32200	45	46	54	28	57	58	26
	50	65	7	3055	3601	1	336	185	1810	29940	33.3	32200	46	47	55	28	58	60	27
	50	65	7	3055	3786	1	336	185	1810	29940	33.3	32200	47	48	56	29	59	60	28
Wesche	50	65	7	28	28	1	335	184	1811	28902	33.3	32200	35	35	35	30	35	35	30
63/B/28/06	50	65	7	28	29	1	335	184	1811	28902	33.3	32200	61	46	56	40	45	40	41
	50	65	7	28	40	1	335	184	1811	28902	33.3	32200	80	61	65	48	58	52	49
	50	65	7	28	47	1	335	184	1811	28902	33.3	32200	85	64	68	50	61	56	52
	50	65	7	28	54	1	335	184	1811	28902	33.3	32200	89	67	70	53	64	59	54
	50	65	7	28	68	1	335	184	1811	28902	33.3	32200	94	70	73	56	68	62	57
	50	65	7	28	89	1	335	184	1811	28902	33.3	32200	99	74	77	59	73	66	61
	50	65	7	28	105	1	335	184	1811	28902	33.3	32200	103	77	80	62	75	68	64
	50	65	7	28	117	1	335	184	1811	28902	33.3	32200	106	78	82	63	77	69	65
	50	65	7	28	145	1	335	184	1811	28902	33.3	32200	111	81	85	66	80	72	68

	50	65	7	28	167	1	335	184	1811	28902	33.3	32200	113	83	87	68	82	73	70
	50	65	7	28	194	1	335	184	1811	28902	33.3	32200	116	85	89	70	84	74	73
	50	65	7	28	209	1	335	184	1811	28902	33.3	32200	118	86	90	71	85	75	74
	50	65	7	28	229	1	335	184	1811	28902	33.3	32200	120	87	92	72	86	76	75
	50	65	7	28	243	1	335	184	1811	28902	33.3	32200	122	88	92	73	87	76	76
	50	65	7	28	285	1	335	184	1811	28902	33.3	32200	125	90	95	75	89	77	78
	50	65	7	28	320	1	335	184	1811	28902	33.3	32200	127	91	96	77	91	78	80
	50	65	7	28	341	1	335	184	1811	28902	33.3	32200	129	92	97	77	91	79	81
	50	65	7	28	390	1	335	184	1811	28902	33.3	32200	132	93	99	79	93	80	83
	50	65	7	28	418	1	335	184	1811	28902	33.3	32200	135	94	100	80	94	80	84
	50	65	7	28	446	1	335	184	1811	28902	33.3	32200	137	95	100	81	94	80	85
	50	65	7	28	516	1	335	184	1811	28902	33.3	32200	140	97	102	83	96	81	87
	50	65	7	28	572	1	335	184	1811	28902	33.3	32200	143	98	103	84	97	82	88
	50	65	7	28	607	1	335	184	1811	28902	33.3	32200	145	98	104	85	97	82	89
	50	65	7	28	670	1	335	184	1811	28902	33.3	32200	146	99	105	86	98	83	90
	50	65	7	28	728	1	335	184	1811	28902	33.3	32200	148	100	106	87	99	83	91
	50	65	7	28	759	1	335	184	1811	28902	33.3	32200	149	101	106	87	99	83	92
	50	65	7	28	789	1	335	184	1811	28902	33.3	32200	151	101	107	88	99	84	92
Wesche	50	65	7	2430	2430	1	335	184	1811	28329	33.3	32200	35	35	35	22	35	35	22
63/B/2430/07	50	65	7	2430	2431	1	335	184	1811	28329	33.3	32200	38	37	43	24	40	39	23
	50	65	7	2430	2433	1	335	184	1811	28329	33.3	32200	39	38	45	25	41	41	24
	50	65	7	2430	2437	1	335	184	1811	28329	33.3	32200	41	39	46	25	43	44	24
	50	65	7	2430	2444	1	335	184	1811	28329	33.3	32200	42	40	47	25	45	47	24
	50	65	7	2430	2458	1	335	184	1811	28329	33.3	32200	42	42	49	26	48	50	25
	50	65	7	2430	2520	1	335	184	1811	28329	33.3	32200	45	45	53	27	53	56	25
	50	65	7	2430	2552	1	335	184	1811	28329	33.3	32200	46	46	54	27	55	58	26
	50	65	7	2430	2612	1	335	184	1811	28329	33.3	32200	47	47	56	28	57	60	26
	50	65	7	2430	2703	1	335	184	1811	28329	33.3	32200	51	48	58	28	59	61	27
	50	65	7	2430	2794	1	335	184	1811	28329	33.3	32200	51	49	59	29	60	62	27
	50	65	7	2430	2976	1	335	184	1811	28329	33.3	32200	53	50	60	30	61	64	28
	50	65	7	2430	3161	1	335	184	1811	28329	33.3	32200	53	51	61	30	63	65	29
Wesche	50	65	7	3300	3300	1	335	184	1811	30864	33.3	32200	32	32	32	22	32	32	22
63/B/3300/08	50	65	7	3300	3301	1	335	184	1811	30864	33.3	32200	35	34	39	24	37	36	23
	50	65	7	3300	3303	1	335	184	1811	30864	33.3	32200	36	35	40	24	38	38	23
	50	65	7	3300	3307	1	335	184	1811	30864	33.3	32200	38	36	41	25	40	40	23
	50	65	7	3300	3314	1	335	184	1811	30864	33.3	32200	38	37	42	25	42	43	24
	50	65	7	3300	3328	1	335	184	1811	30864	33.3	32200	38	38	44	25	44	46	24
	50	65	7	3300	3390	1	335	184	1811	30864	33.3	32200	40	40	47	26	49	51	25
	50	65	7	3300	3422	1	335	184	1811	30864	33.3	32200	40	41	48	26	51	52	25
	50	65	7	3300	3482	1	335	184	1811	30864	33.3	32200	41	42	49	27	53	54	25
	50	65	7	3300	3573	1	335	184	1811	30864	33.3	32200	43	44	51	27	54	55	26
	50	65	7	3300	3664	1	335	184	1811	30864	33.3	32200	43	44	52	27	56	56	26
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	50	65	7	3300	4031	1	335	184	1811	30864	33.3	32200	45	46	54	29	58	58	27
Wesche	50	65	1	1	1	3	337	185	1818	17301	47.6	37500	58	58	58	52	58	58	57
63/C/1/09	50	65	1	1	2	3	337	185	1818	17301	47.6	37500	83	90	111	87	71	71	96
	50	65	1	1	3	3	337	185	1818	17301	47.6	37500	87	100	116	92	75	77	102
	50	65	1	1	4	3	337	185	1818	17301	47.6	37500	89	107	120	95	77	81	106
	50	65	1	1	8	3	337	185	1818	17301	47.6	37500	96	122	129	102	83	93	114
	50	65	1	1	11	3	337	185	1818	17301	47.6	37500	99	128	133	105	86	99	118
	50	65	1	1	13	3	337	185	1818	17301	47.6	37500	101	131	136	107	88	102	120
	50	65	1	1	17	3	337	185	1818	17301	47.6	37500	103	136	141	109	91	108	123
	50	65	1	1	22	3	337	185	1818	17301	47.6	37500	106	140	146	112	94	113	126
	50	65	1	1	29	3	337	185	1818	17301	47.6	37500	109	144	152	114	97	119	129
	50	65	1	1	36	3	337	185	1818	17301	47.6	37500	112	147	158	116	100	124	131
	50	65	1	1	50	3	337	185	1818	17301	47.6	37500	116	151	167	119	105	131	135
	50	65	1	1	65	3	337	185	1818	17301	47.6	37500	120	155	176	122	108	137	138
	50	65	1	1	78	3	337	185	1818	17301	47.6	37500	122	157	182	124	111	141	140
	50	65	1	1	92	3	337	185	1818	17301	47.6	37500	126	159	189	125	114	144	142
	50	65	1	1	106	3	337	185	1818	17301	47.6	37500	128	161	194	127	116	147	143
	50	65	1	1	135	3	337	185	1818	17301	47.6	37500	133	164	204	129	120	152	146
	50	65	1	1	178	3	337	185	1818	17301	47.6	37500	136	167	215	132	124	157	150
	50	65	1	1	185	3	337	185	1818	17301	47.6	37500	138	167	217	133	125	158	150
	50	65	1	1	202	3	337	185	1818	17301	47.6	37500	137	168	220	133	126	160	151
	50	65	1	1	219	3	337	185	1818	17301	47.6	37500	139	169	223	134	127	161	152
	50	65	1	1	253	3	337	185	1818	17301	47.6	37500	142	171	229	136	129	163	154
	50	65	1	1	300	3	337	185	1818	17301	47.6	37500	143	173	236	138	132	166	156
	50	65	1	1	361	3	337	185	1818	17301	47.6	37500	145	175	243	140	134	169	159
	50	65	1	1	406	3	337	185	1818	17301	47.6	37500	146	176	247	141	136	171	160

	50	65	1	1	460	3	337	185	1818	17301	47.6	37500	149	178	252	142	137	173	162
	50	65	1	1	501	3	337	185	1818	17301	47.6	37500	149	179	255	143	138	174	163
	50	65	1	1	651	3	337	185	1818	17301	47.6	37500	150	181	264	146	141	177	166
	50	65	1	1	722	3	337	185	1818	17301	47.6	37500	152	182	267	147	143	178	167
Wesche	50	65	3	3	3	3	337	185	1818	22883	47.6	37500	44	44	44	38	44	44	40
63/C/3/10	50	65	3	3	4	3	337	185	1818	22883	47.6	37500	63	65	78	59	55	52	64
	50	65	3	3	5	3	337	185	1818	22883	47.6	37500	67	71	82	62	57	56	68
	50	65	3	3	6	3	337	185	1818	22883	47.6	37500	69	76	84	64	59	59	70
	50	65	3	3	10	3	337	185	1818	22883	47.6	37500	77	86	90	70	64	67	77
	50	65	3	3	18	3	337	185	1818	22883	47.6	37500	83	95	96	76	70	76	84
	50	65	3	3	22	3	337	185	1818	22883	47.6	37500	86	97	98	78	72	79	86
	50	65	3	3	28	3	337	185	1818	22883	47.6	37500	89	100	102	80	75	83	89
	50	65	3	3	37	3	337	185	1818	22883	47.6	37500	93	104	106	83	78	87	92
	50	65	3	3	51	3	337	185	1818	22883	47.6	37500	97	107	111	86	82	92	96
	50	65	3	3	65	3	337	185	1818	22883	47.6	37500	101	110	116	88	85	96	98
	50	65	3	3	79	3	337	185	1818	22883	47.6	37500	103	112	120	90	87	99	101
	50	65	3	3	93	3	337	185	1818	22883	47.6	37500	106	114	123	92	89	101	103
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	50	65	3	3	136	3	337	185	1818	22883	47.6	37500	110	119	131	96	94	106	107
	50	65	3	3	165	3	337	185	1818	22883	47.6	37500	113	121	136	98	97	109	110
	50	65	3	3	193	3	337	185	1818	22883	47.6	37500	114	123	139	100	99	111	112
	50	65	3	3	221	3	337	185	1818	22883	47.6	37500	117	124	142	101	100	112	113
	50	65	3	3	258	3	337	185	1818	22883	47.6	37500	120	126	146	103	102	114	115
	50	65	3	3	298	3	337	185	1818	22883	47.6	37500	123	128	149	104	104	116	117
	50	65	3	3	389	3	337	185	1818	22883	47.6	37500	125	131	155	107	107	118	121
	50	65	3	3	504	3	337	185	1818	22883	47.6	37500	127	133	160	110	110	121	124
	50	65	3	3	589	3	337	185	1818	22883	47.6	37500	129	135	163	111	111	122	126
	50	65	3	3	684	3	337	185	1818	22883	47.6	37500	129	136	165	113	112	123	127
	50	65	3	3	723	3	337	185	1818	22883	47.6	37500	130	137	166	113	113	124	128
	50	65	3	3	768	3	337	185	1818	22883	47.6	37500	130	137	167	114	113	124	129
Wesche	50	65	7	7	7	3	337	185	1818	25000	47.6	37500	40	40	40	31	40	40	32
63/C/7/11	50	65	7	7	8	3	337	185	1818	25000	47.6	37500	53	56	69	45	49	47	48
	50	65	7	7	9	3	337	185	1818	25000	47.6	37500	56	61	72	48	52	50	51
	50	65	7	7	11	3	337	185	1818	25000	47.6	37500	58	66	75	51	55	55	54
	50	65	7	7	15	3	337	185	1818	25000	47.6	37500	64	73	79	54	58	60	58
	50	65	7	7	18	3	337	185	1818	25000	47.6	37500	68	76	81	56	60	63	61
	50	65	7	7	22	3	337	185	1818	25000	47.6	37500	71	79	84	58	63	67	63
	50	65	7	7	26	3	337	185	1818	25000	47.6	37500	73	81	86	60	64	69	65
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	50	65	7	7	40	3	337	185	1818	25000	47.6	37500	78	86	91	64	69	76	70
	50	65	7	7	54	3	337	185	1818	25000	47.6	37500	81	90	96	67	72	80	74
	50	65	7	7	68	3	337	185	1818	25000	47.6	37500	84	92	99	70	75	83	77
	50	65	7	7	83	3	337	185	1818	25000	47.6	37500	87	94	103	72	77	85	79
	50	65	7	7	104	3	337	185	1818	25000	47.6	37500	90	97	107	74	80	88	82
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	50	65	7	7	181	3	337	185	1818	25000	47.6	37500	100	103	117	80	86	94	89
	50	65	7	7	204	3	337	185	1818	25000	47.6	37500	103	105	119	81	87	96	90
	50	65	7	7	238	3	337	185	1818	25000	47.6	37500	106	107	121	83	89	97	92
	50	65	7	7	251	3	337	185	1818	25000	47.6	37500	106	107	122	84	90	98	93
	50	65	7	7	292	3	337	185	1818	25000	47.6	37500	108	109	125	85	91	99	95
	50	65	7	7	376	3	337	185	1818	25000	47.6	37500	110	112	129	88	94	101	98
	50	65	7	7	432	3	337	185	1818	25000	47.6	37500	110	113	132	89	95	103	100
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	50	65	7	7	558	3	337	185	1818	25000	47.6	37500	112	116	136	92	97	105	103
	50	65	7	7	594	3	337	185	1818	25000	47.6	37500	113	116	136	93	98	105	104
	50	65	7	7	648	3	337	185	1818	25000	47.6	37500	113	117	138	94	98	106	105
	50	65	7	7	712	3	337	185	1818	25000	47.6	37500	113	118	139	94	99	106	106
	50	65	7	7	767	3	337	185	1818	25000	47.6	37500	113	119	140	95	100	107	107
Wesche	50	65	7	28	28	3	337	185	1818	26525	47.6	37500	38	38	38	24	38	38	25
63/C/28/12	50	65	7	28	29	3	337	185	1818	26525	47.6	37500	48	47	60	32	45	43	32
	50	65	7	28	30	3	337	185	1818	26525	47.6	37500	51	50	63	33	47	46	34
	50	65	7	28	33	3	337	185	1818	26525	47.6	37500	57	55	66	35	50	51	36
	50	65	7	28	35	3	337	185	1818	26525	47.6	37500	59	57	68	36	51	53	37
	50	65	7	28	40	3	337	185	1818	26525	47.6	37500	62	60	70	38	54	57	40
	50	65	7	28	47	3	337	185	1818	26525	47.6	37500	66	63	73	40	56	61	42
	50	65	7	28	55	3	337	185	1818	26525	47.6	37500	69	65	75	42	59	64	44
	50	65	7	28	62	3	337	185	1818	26525	47.6	37500	72	67	77	44	60	66	46
	50	65	7	28	77	3	337	185	1818	26525	47.6	37500	76	70	81	46	63	70	49

	50	65	7	28	90	3	337	185	1818	26525	47.6	37500	78	72	83	48	65	72	51
	50	65	7	28	119	3	337	185	1818	26525	47.6	37500	84	75	88	51	68	76	55
	50	65	7	28	140	3	337	185	1818	26525	47.6	37500	87	77	90	53	69	78	57
	50	65	7	28	161	3	337	185	1818	26525	47.6	37500	89	79	92	55	71	79	59
	50	65	7	28	183	3	337	185	1818	26525	47.6	37500	93	80	94	56	72	80	61
	50	65	7	28	212	3	337	185	1818	26525	47.6	37500	96	82	97	58	74	82	63
	50	65	7	28	251	3	337	185	1818	26525	47.6	37500	99	84	99	60	75	83	65
	50	65	7	28	312	3	337	185	1818	26525	47.6	37500	103	86	102	62	77	85	68
	50	65	7	28	391	3	337	185	1818	26525	47.6	37500	105	88	105	65	79	87	71
	50	65	7	28	421	3	337	185	1818	26525	47.6	37500	106	89	106	66	79	87	72
	50	65	7	28	520	3	337	185	1818	26525	47.6	37500	107	91	109	68	81	89	74
	50	65	7	28	573	3	337	185	1818	26525	47.6	37500	108	92	110	69	82	89	76
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	50	65	7	28	790	3	337	185	1818	26525	47.6	37500	109	94	113	72	84	91	79
Wesche	50	65	7	2700	2700	3	337	185	1818	33113	47.6	37500	30	30	30	19	30	30	18
63/C/2700/13	50	65	7	2700	2701	3	337	185	1818	33113	47.6	37500	33	32	38	20	33	33	19
	50	65	7	2700	2703	3	337	185	1818	33113	47.6	37500	34	33	38	20	34	35	19
	50	65	7	2700	2707	3	337	185	1818	33113	47.6	37500	35	33	40	21	36	37	19
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	50	65	7	2700	2728	3	337	185	1818	33113	47.6	37500	37	35	42	21	39	43	20
	50	65	7	2700	2790	3	337	185	1818	33113	47.6	37500	39	38	45	22	43	48	20
	50	65	7	2700	2822	3	337	185	1818	33113	47.6	37500	40	39	46	22	44	49	20
	50	65	7	2700	2882	3	337	185	1818	33113	47.6	37500	41	40	48	22	45	51	21
	50	65	7	2700	2973	3	337	185	1818	33113	47.6	37500	43	41	49	23	46	52	21
	50	65	7	2700	3064	3	337	185	1818	33113	47.6	37500	43	41	50	23	47	53	22
	50	65	7	2700	3246	3	337	185	1818	33113	47.6	37500	45	43	52	24	48	54	22
	50	65	7	2700	3431	3	337	185	1818	33113	47.6	37500	45	43	53	24	49	55	23
Wesche	50	65	7	3290	3290	3	337	185	1818	32680	47.6	37500	31	31	31	19	31	31	18
63/C/3290/14	50	65	7	3290	3291	3	337	185	1818	32680	47.6	37500	33	32	38	20	34	34	19
	50	65	7	3290	3293	3	337	185	1818	32680	47.6	37500	33	33	39	20	35	35	19
	50	65	7	3290	3297	3	337	185	1818	32680	47.6	37500	34	33	40	20	36	38	19
	50	65	7	3290	3304	3	337	185	1818	32680	47.6	37500	35	34	41	21	37	40	19
	50	65	7	3290	3318	3	337	185	1818	32680	47.6	37500	36	35	42	21	39	43	19
	50	65	7	3290	3380	3	337	185	1818	32680	47.6	37500	37	38	45	21	43	48	20
	50	65	7	3290	3412	3	337	185	1818	32680	47.6	37500	38	38	46	22	44	49	20
	50	65	7	3290	3472	3	337	185	1818	32680	47.6	37500	38	39	48	22	45	51	20
	50	65	7	3290	3562	3	337	185	1818	32680	47.6	37500	40	40	49	22	46	52	21
	50	65	7	3290	3654	3	337	185	1818	32680	47.6	37500	39	41	50	23	47	53	21
	50	65	7	3290	3836	3	337	185	1818	32680	47.6	37500	40	42	51	23	48	54	22
	50	65	7	3290	4021	3	337	185	1818	32680	47.6	37500	41	42	52	24	49	55	22
Wesche	50	65	3	3	3	1	336	185	1810	15152	35.0	N/A	66	66	66	53	66	66	55
63/H/3/3/15	50	65	3	3	4	1	336	185	1810	15152	35.0	N/A	101	92	124	83	83	78	88
	50	65	3	3	5	1	336	185	1810	15152	35.0	N/A	111	100	130	88	87	84	93
	50	65	3	3	6	1	336	185	1810	15152	35.0	N/A	109	105	134	91	91	88	96
	50	65	3	3	7	1	336	185	1810	15152	35.0	N/A	111	109	137	93	93	91	98
	50	65	3	3	9	1	336	185	1810	15152	35.0	N/A	113	115	142	96	97	97	102
	50	65	3	3	17	1	336	185	1810	15152	35.0	N/A	124	127	156	104	107	111	110
	50	65	3	3	21	1	336	185	1810	15152	35.0	N/A	124	131	161	106	110	115	113
	50	65	3	3	29	1	336	185	1810	15152	35.0	N/A	126	136	171	110	115	122	117
	50	65	3	3	35	1	336	185	1810	15152	35.0	N/A	131	139	177	112	119	126	119
	50	65	3	3	42	1	336	185	1810	15152	35.0	N/A	133	141	183	114	122	130	121
	50	65	3	3	49	1	336	185	1810	15152	35.0	N/A	135	143	189	116	125	134	123
	50	65	3	3	56	1	336	185	1810	15152	35.0	N/A	136	145	195	117	127	137	125
	50	65	3	3	69	1	336	185	1810	15152	35.0	N/A	142	148	204	120	131	141	127
	50	65	3	3	78	1	336	185	1810	15152	35.0	N/A	143	150	209	121	134	144	129
	50	65	3	3	93	1	336	185	1810	15152	35.0	N/A	145	152	218	123	137	147	131
	50	65	3	3	108	1	336	185	1810	15152	35.0	N/A	148	154	225	125	140	150	133
	50	65	3	3	143	1	336	185	1810	15152	35.0	N/A	156	158	240	129	146	156	137
	50	65	3	3	178	1	336	185	1810	15152	35.0	N/A	162	162	251	132	150	160	140
	50	65	3	3	207	1	336	185	1810	15152	35.0	N/A	170	164	259	134	153	162	142
	50	65	3	3	254	1	336	185	1810	15152	35.0	N/A	174	167	269	136	157	166	145
	50	65	3	3	302	1	336	185	1810	15152	35.0	N/A	180	169	278	139	161	168	147
	50	65	3	3	351	1	336	185	1810	15152	35.0	N/A	186	171	285	141	163	171	149
	50	65	3	3	401	1	336	185	1810	15152	35.0	N/A	187	173	292	143	166	173	151
	50	65	3	3	498	1	336	185	1810	15152	35.0	N/A	195	175	301	145	169	175	154
	50	65	3	3	591	1	336	185	1810	15152	35.0	N/A	199	178	309	148	172	178	156
	50	65	3	3	709	1	336	185	1810	15152	35.0	N/A	199	180	316	150	174	180	159
	50	65	3	3	764	1	336	185	1810	15152	35.0	N/A	200	181	319	151	175	180	160
Wesche	50	65	7	7	7	2	336	185	1810	24155	35.0	N/A	41	41	41	43	41	41	44

63/H/7/19	50	65	7	7	8	2	336	185	1810	24155	35.0	N/A	60	61	74	64	56	48	67
	50	65	7	7	10	2	336	185	1810	24155	35.0	N/A	67	71	80	69	62	54	72
	50	65	7	7	14	2	336	185	1810	24155	35.0	N/A	74	80	85	75	69	60	78
	50	65	7	7	20	2	336	185	1810	24155	35.0	N/A	80	87	90	80	75	66	83
	50	65	7	7	35	2	336	185	1810	24155	35.0	N/A	89	96	98	87	85	74	91
	50	65	7	7	49	2	336	185	1810	24155	35.0	N/A	94	101	104	91	90	79	95
	50	65	7	7	77	2	336	185	1810	24155	35.0	N/A	98	107	113	96	98	85	101
	50	65	7	7	113	2	336	185	1810	24155	35.0	N/A	102	112	122	101	105	89	106
	50	65	7	7	212	2	336	185	1810	24155	35.0	N/A	111	121	136	110	116	96	115
	50	65	7	7	308	2	336	185	1810	24155	35.0	N/A	118	126	145	115	122	100	121
	50	65	7	7	525	2	336	185	1810	24155	35.0	N/A	129	133	156	123	130	104	129
	50	65	7	7	798	2	336	185	1810	24155	35.0	N/A	134	138	164	128	135	107	134
Wesche	50	65	7	7	7	2	336	185	1810	21459	35.0	N/A	47	47	47	43	47	47	44
63/H/7/16	50	65	7	7	8	2	336	185	1810	21459	35.0	N/A	63	66	83	64	61	54	67
	50	65	7	7	10	2	336	185	1810	21459	35.0	N/A	70	76	90	69	68	61	72
	50	65	7	7	14	2	336	185	1810	21459	35.0	N/A	77	85	96	75	74	68	78
	50	65	7	7	25	2	336	185	1810	21459	35.0	N/A	88	96	105	82	84	78	86
	50	65	7	7	30	2	336	185	1810	21459	35.0	N/A	93	99	108	85	87	81	89
	50	65	7	7	37	2	336	185	1810	21459	35.0	N/A	97	102	112	87	91	84	91
	50	65	7	7	55	2	336	185	1810	21459	35.0	N/A	103	107	121	92	98	90	97
	50	65	7	7	70	2	336	185	1810	21459	35.0	N/A	112	111	127	95	102	94	100
	50	65	7	7	117	2	336	185	1810	21459	35.0	N/A	126	118	140	102	111	101	107
	50	65	7	7	131	2	336	185	1810	21459	35.0	N/A	130	120	143	103	113	102	108
	50	65	7	7	160	2	336	185	1810	21459	35.0	N/A	136	122	149	106	116	105	111
	50	65	7	7	192	2	336	185	1810	21459	35.0	N/A	141	125	154	109	120	107	114
	50	65	7	7	223	2	336	185	1810	21459	35.0	N/A	146	127	158	111	122	109	116
	50	65	7	7	284	2	336	185	1810	21459	35.0	N/A	152	130	165	114	126	111	120
	50	65	7	7	313	2	336	185	1810	21459	35.0	N/A	155	132	167	116	128	112	121
	50	65	7	7	375	2	336	185	1810	21459	35.0	N/A	157	134	172	118	131	114	124
	50	65	7	7	431	2	336	185	1810	21459	35.0	N/A	162	136	175	120	133	115	126
	50	65	7	7	498	2	336	185	1810	21459	35.0	N/A	165	138	179	122	135	116	128
	50	65	7	7	531	2	336	185	1810	21459	35.0	N/A	167	139	180	123	135	117	129
	50	65	7	7	566	2	336	185	1810	21459	35.0	N/A	168	139	182	124	136	117	130
	50	65	7	7	611	2	336	185	1810	21459	35.0	N/A	169	140	183	125	137	118	131
	50	65	7	7	706	2	336	185	1810	21459	35.0	N/A	172	142	186	127	139	119	133
	50	65	7	7	856	2	336	185	1810	21459	35.0	N/A	175	144	190	129	141	120	135
Wesche	50	65	7	28	28	2	336	185	1810	26810	34.0	N/A	37	37	37	33	37	37	34
63/I/28/20	50	65	7	28	29	2	336	185	1810	26810	34.0	N/A	51	49	58	45	49	43	46
	50	65	7	28	31	2	336	185	1810	26810	34.0	N/A	57	55	62	48	54	47	49
	50	65	7	28	35	2	336	185	1810	26810	34.0	N/A	61	61	65	51	59	52	52
	50	65	7	28	42	2	336	185	1810	26810	34.0	N/A	66	66	69	55	65	57	56
	50	65	7	28	55	2	336	185	1810	26810	34.0	N/A	72	72	73	59	71	62	61
	50	65	7	28	69	2	336	185	1810	26810	34.0	N/A	75	76	77	63	76	66	64
	50	65	7	28	99	2	336	185	1810	26810	34.0	N/A	80	81	82	68	82	71	70
	50	65	7	28	127	2	336	185	1810	26810	34.0	N/A	84	85	86	72	87	73	74
	50	65	7	28	234	2	336	185	1810	26810	34.0	N/A	98	93	95	81	96	79	84
	50	65	7	28	335	2	336	185	1810	26810	34.0	N/A	107	98	100	87	101	82	89
	50	65	7	28	545	2	336	185	1810	26810	34.0	N/A	117	104	107	94	107	85	96
	50	65	7	28	824	2	336	185	1810	26810	34.0	N/A	122	108	111	99	111	87	102
Wesche	50	65	7	28	28	2	336	185	1810	26110	35.0	N/A	38	38	38	33	38	38	33
63/H/28/17	50	65	7	28	29	2	336	185	1810	26110	35.0	N/A	57	50	60	44	49	44	45
	50	65	7	28	30	2	336	185	1810	26110	35.0	N/A	61	53	62	46	52	46	46
	50	65	7	28	31	2	336	185	1810	26110	35.0	N/A	64	56	64	47	54	48	48
	50	65	7	28	35	2	336	185	1810	26110	35.0	N/A	70	61	67	50	60	53	51
	50	65	7	28	41	2	336	185	1810	26110	35.0	N/A	77	66	70	53	64	58	54
	50	65	7	28	48	2	336	185	1810	26110	35.0	N/A	83	70	73	56	68	61	57
	50	65	7	28	55	2	336	185	1810	26110	35.0	N/A	87	72	75	58	71	64	60
	50	65	7	28	63	2	336	185	1810	26110	35.0	N/A	91	75	77	60	74	66	62
	50	65	7	28	70	2	336	185	1810	26110	35.0	N/A	94	76	79	62	76	68	63
	50	65	7	28	76	2	336	185	1810	26110	35.0	N/A	97	78	80	63	78	69	65
	50	65	7	28	83	2	336	185	1810	26110	35.0	N/A	99	79	82	64	79	70	66
	50	65	7	28	95	2	336	185	1810	26110	35.0	N/A	103	81	84	66	82	72	68
	50	65	7	28	111	2	336	185	1810	26110	35.0	N/A	106	83	86	69	84	74	71
	50	65	7	28	125	2	336	185	1810	26110	35.0	N/A	109	85	88	71	86	75	72
	50	65	7	28	153	2	336	185	1810	26110	35.0	N/A	114	88	91	74	89	77	76
	50	65	7	28	196	2	336	185	1810	26110	35.0	N/A	121	91	95	77	93	80	79
	50	65	7	28	230	2	336	185	1810	26110	35.0	N/A	126	93	98	80	96	81	82
	50	65	7	28	287	2	336	185	1810	26110	35.0	N/A	135	96	101	83	99	83	85
	50	65	7	28	334	2	336	185	1810	26110	35.0	N/A	140	98	103	85	101	84	88

	50	65	7	28	391	2	336	185	1810	26110	35.0	N/A	146	100	105	88	103	85	90
	50	65	7	28	453	2	336	185	1810	26110	35.0	N/A	149	102	107	90	105	86	92
	50	65	7	28	572	2	336	185	1810	26110	35.0	N/A	155	104	110	93	107	88	96
	50	65	7	28	670	2	336	185	1810	26110	35.0	N/A	159	106	112	95	109	89	98
	50	65	7	28	726	2	336	185	1810	26110	35.0	N/A	160	107	113	96	109	89	99
	50	65	7	28	790	2	336	185	1810	26110	35.0	N/A	159	108	114	97	110	89	100
	50	65	7	28	845	2	336	185	1810	26110	35.0	N/A	160	108	114	98	111	90	101
Wesche	50	65	7	3300	3300	2	336	185	1810	34130	34.0	N/A	29	29	29	24	29	29	24
63/I/3300/21	50	65	7	3300	3301	2	336	185	1810	34130	34.0	N/A	31	31	35	26	34	32	26
	50	65	7	3300	3303	2	336	185	1810	34130	34.0	N/A	32	32	36	27	36	34	26
	50	65	7	3300	3307	2	336	185	1810	34130	34.0	N/A	33	33	36	27	38	36	26
	50	65	7	3300	3314	2	336	185	1810	34130	34.0	N/A	33	34	37	27	40	38	27
	50	65	7	3300	3328	2	336	185	1810	34130	34.0	N/A	34	35	38	28	43	41	27
	50	65	7	3300	3356	2	336	185	1810	34130	34.0	N/A	35	37	40	28	46	43	27
	50	65	7	3300	3390	2	336	185	1810	34130	34.0	N/A	36	38	41	29	48	45	28
	50	65	7	3300	3482	2	336	185	1810	34130	34.0	N/A	38	40	43	29	52	48	29
	50	65	7	3300	3573	2	336	185	1810	34130	34.0	N/A	40	41	44	30	54	49	29
	50	65	7	3300	3664	2	336	185	1810	34130	34.0	N/A	39	42	45	30	56	50	29
	50	65	7	3300	3846	2	336	185	1810	34130	34.0	N/A	40	43	46	31	57	51	30
	50	65	7	3300	4031	2	336	185	1810	34130	34.0	N/A	41	44	46	32	58	51	31
Wesche	50	65	7	2737	2737	2	336	185	1810	28490	35.0	N/A	35	35	35	24	35	35	23
63/H/2737/18	50	65	7	2737	2737	2	336	185	1810	28490	35.0	N/A	37	36	40	25	38	36	25
	50	65	7	2737	2738	2	336	185	1810	28490	35.0	N/A	38	37	42	26	40	38	25
	50	65	7	2737	2739	2	336	185	1810	28490	35.0	N/A	39	38	43	26	41	39	25
	50	65	7	2737	2740	2	336	185	1810	28490	35.0	N/A	39	38	43	26	42	40	26
	50	65	7	2737	2744	2	336	185	1810	28490	35.0	N/A	41	39	44	27	44	43	26
	50	65	7	2737	2751	2	336	185	1810	28490	35.0	N/A	42	40	45	27	46	46	26
	50	65	7	2737	2758	2	336	185	1810	28490	35.0	N/A	42	41	46	27	48	47	27
	50	65	7	2737	2765	2	336	185	1810	28490	35.0	N/A	43	41	46	28	49	49	27
	50	65	7	2737	2793	2	336	185	1810	28490	35.0	N/A	43	43	48	28	52	52	27
	50	65	7	2737	2827	2	336	185	1810	28490	35.0	N/A	45	44	50	29	54	54	28
	50	65	7	2737	2859	2	336	185	1810	28490	35.0	N/A	46	45	51	29	56	56	28
	50	65	7	2737	2883	2	336	185	1810	28490	35.0	N/A	47	46	52	29	57	57	28
	50	65	7	2737	2919	2	336	185	1810	28490	35.0	N/A	48	47	52	30	58	58	29
	50	65	7	2737	3010	2	336	185	1810	28490	35.0	N/A	50	48	54	30	60	59	29
	50	65	7	2737	3101	2	336	185	1810	28490	35.0	N/A	49	49	55	31	62	60	30
	50	65	7	2737	3191	2	336	185	1810	28490	35.0	N/A	51	50	56	31	63	61	30
	50	65	7	2737	3283	2	336	185	1810	28490	35.0	N/A	52	50	56	32	63	61	31
	50	65	7	2737	3373	2	336	185	1810	28490	35.0	N/A	52	51	57	32	64	62	31
	50	65	7	2737	3468	2	336	185	1810	28490	35.0	N/A	53	51	57	32	65	62	31
Wesche	50	65	7	7	7	1	336	185	1810	19048	31.5	N/A	53	53	53	46	53	53	48
63/J/7/22	50	65	7	7	8	1	336	185	1810	19048	31.5	N/A	80	73	92	69	68	61	72
	50	65	7	7	10	1	336	185	1810	19048	31.5	N/A	88	83	99	75	75	68	78
	50	65	7	7	14	1	336	185	1810	19048	31.5	N/A	97	93	106	80	83	76	84
	50	65	7	7	23	1	336	185	1810	19048	31.5	N/A	106	103	115	87	92	86	91
	50	65	7	7	33	1	336	185	1810	19048	31.5	N/A	113	109	122	91	99	93	95
	50	65	7	7	48	1	336	185	1810	19048	31.5	N/A	119	114	131	96	106	100	100
	50	65	7	7	68	1	336	185	1810	19048	31.5	N/A	122	119	140	100	112	105	105
	50	65	7	7	118	1	336	185	1810	19048	31.5	N/A	128	127	157	108	123	114	112
	50	65	7	7	189	1	336	185	1810	19048	31.5	N/A	138	134	172	114	132	120	119
	50	65	7	7	341	1	336	185	1810	19048	31.5	N/A	150	143	190	123	143	127	128
	50	65	7	7	487	1	336	185	1810	19048	31.5	N/A	157	148	200	128	148	131	133
	50	65	7	7	796	1	336	185	1810	19048	31.5	N/A	167	154	212	134	155	135	139
Wesche	50	65	7	28	28	1	336	185	1810	25840	31.5	27800	39	39	39	34	39	39	34
63/J/28/23	50	65	7	28	29	1	336	185	1810	25840	31.5	27800	62	51	61	45	51	44	46
	50	65	7	28	30	1	336	185	1810	25840	31.5	27800	65	54	63	47	55	47	48
	50	65	7	28	31	1	336	185	1810	25840	31.5	27800	67	57	64	49	57	49	50
	50	65	7	28	35	1	336	185	1810	25840	31.5	27800	72	63	68	52	63	54	53
	50	65	7	28	42	1	336	185	1810	25840	31.5	27800	76	68	72	55	69	59	57
	50	65	7	28	49	1	336	185	1810	25840	31.5	27800	81	72	74	58	73	62	59
	50	65	7	28	56	1	336	185	1810	25840	31.5	27800	84	74	76	60	76	65	62
	50	65	7	28	77	1	336	185	1810	25840	31.5	27800	92	80	82	65	83	70	67
	50	65	7	28	84	1	336	185	1810	25840	31.5	27800	94	81	83	66	85	71	68
	50	65	7	28	91	1	336	185	1810	25840	31.5	27800	95	83	85	67	86	72	69
	50	65	7	28	98	1	336	185	1810	25840	31.5	27800	99	84	86	68	88	73	70
	50	65	7	28	112	1	336	185	1810	25840	31.5	27800	104	86	88	70	90	75	72
	50	65	7	28	126	1	336	185	1810	25840	31.5	27800	107	87	90	72	93	76	74
	50	65	7	28	154	1	336	185	1810	25840	31.5	27800	112	90	93	75	96	78	77
	50	65	7	28	189	1	336	185	1810	25840	31.5	27800	116	93	97	78	100	80	80

	50	65	7	28	238	1	336	185	1810	25840	31.5	27800	121	97	100	82	104	82	84
	50	65	7	28	294	1	336	185	1810	25840	31.5	27800	126	99	104	85	107	84	87
	50	65	7	28	329	1	336	185	1810	25840	31.5	27800	128	101	105	86	109	85	88
	50	65	7	28	364	1	336	185	1810	25840	31.5	27800	130	102	107	88	110	86	90
	50	65	7	28	422	1	336	185	1810	25840	31.5	27800	133	104	109	90	112	87	92
	50	65	7	28	514	1	336	185	1810	25840	31.5	27800	139	106	111	93	115	88	95
Wesche	50	65	7	2707	2707	1	336	185	1810	22422	31.5	27800	45	45	45	25	45	45	24
63/1/2707/24	50	65	7	2707	2707	1	336	185	1810	22422	31.5	27800	48	46	51	26	48	46	26
	50	65	7	2707	2708	1	336	185	1810	22422	31.5	27800	49	47	54	27	50	49	26
	50	65	7	2707	2709	1	336	185	1810	22422	31.5	27800	50	47	54	27	51	50	27
	50	65	7	2707	2710	1	336	185	1810	22422	31.5	27800	51	48	55	27	52	51	27
	50	65	7	2707	2714	1	336	185	1810	22422	31.5	27800	53	49	56	28	54	55	27
	50	65	7	2707	2721	1	336	185	1810	22422	31.5	27800	54	50	58	28	57	58	28
	50	65	7	2707	2728	1	336	185	1810	22422	31.5	27800	54	51	59	28	59	60	28
	50	65	7	2707	2735	1	336	185	1810	22422	31.5	27800	55	51	59	29	60	62	28
	50	65	7	2707	2763	1	336	185	1810	22422	31.5	27800	56	53	62	29	64	66	29
	50	65	7	2707	2797	1	336	185	1810	22422	31.5	27800	58	54	64	30	66	69	29
	50	65	7	2707	2829	1	336	185	1810	22422	31.5	27800	60	55	66	30	68	71	29
	50	65	7	2707	2854	1	336	185	1810	22422	31.5	27800	61	56	67	30	69	72	30
	50	65	7	2707	2889	1	336	185	1810	22422	31.5	27800	62	57	68	31	71	73	30
	50	65	7	2707	2980	1	336	185	1810	22422	31.5	27800	65	58	70	31	73	75	31
	50	65	7	2707	3071	1	336	185	1810	22422	31.5	27800	65	59	72	32	74	76	31
	50	65	7	2707	3161	1	336	185	1810	22422	31.5	27800	67	60	73	32	76	77	32
	50	65	7	2707	3253	1	336	185	1810	22422	31.5	27800	69	60	74	33	76	78	32
	50	65	7	2707	3343	1	336	185	1810	22422	31.5	27800	70	61	74	33	77	79	32
	50	65	7	2707	3438	1	336	185	1810	22422	31.5	27800	71	61	75	33	78	79	33
Wesche	50	65	7	28	28	1	332	171	1797	25707	36.0	27800	39	39	39	32	39	39	33
63/D/28/25	50	65	7	28	29	1	332	171	1797	25707	36.0	27800	52	51	60	43	51	44	44
	50	65	7	28	31	1	332	171	1797	25707	36.0	27800	57	57	64	46	56	49	47
	50	65	7	28	34	1	332	171	1797	25707	36.0	27800	62	61	67	48	60	53	50
	50	65	7	28	37	1	332	171	1797	25707	36.0	27800	65	64	68	50	63	56	52
	50	65	7	28	40	1	332	171	1797	25707	36.0	27800	68	66	70	52	66	58	53
	50	65	7	28	43	1	332	171	1797	25707	36.0	27800	70	68	71	53	68	60	55
	50	65	7	28	51	1	332	171	1797	25707	36.0	27800	75	72	74	56	72	63	57
	50	65	7	28	58	1	332	171	1797	25707	36.0	27800	78	74	76	58	75	66	59
	50	65	7	28	68	1	332	171	1797	25707	36.0	27800	81	77	78	60	78	68	62
	50	65	7	28	78	1	332	171	1797	25707	36.0	27800	85	79	81	62	81	70	64
	50	65	7	28	88	1	332	171	1797	25707	36.0	27800	87	81	82	64	83	72	66
	50	65	7	28	98	1	332	171	1797	25707	36.0	27800	89	83	84	65	85	73	67
	50	65	7	28	108	1	332	171	1797	25707	36.0	27800	90	84	86	67	87	75	69
	50	65	7	28	118	1	332	171	1797	25707	36.0	27800	91	85	87	68	89	76	70
	50	65	7	28	128	1	332	171	1797	25707	36.0	27800	93	86	88	69	90	77	71
	50	65	7	28	148	1	332	171	1797	25707	36.0	27800	95	88	91	71	92	78	73
	50	65	7	28	168	1	332	171	1797	25707	36.0	27800	97	90	93	73	95	79	75
	50	65	7	28	208	1	332	171	1797	25707	36.0	27800	100	93	96	76	98	82	79
	50	65	7	28	248	1	332	171	1797	25707	36.0	27800	103	96	99	79	101	83	81
	50	65	7	28	288	1	332	171	1797	25707	36.0	27800	105	98	101	81	103	84	83
	50	65	7	28	328	1	332	171	1797	25707	36.0	27800	106	99	103	83	105	85	85
	50	65	7	28	379	1	332	171	1797	25707	36.0	27800	109	101	105	85	107	86	87
	50	65	7	28	421	1	332	171	1797	25707	36.0	27800	110	102	106	86	108	87	89
	50	65	7	28	484	1	332	171	1797	25707	36.0	27800	111	104	108	88	110	88	91
	50	65	7	28	540	1	332	171	1797	25707	36.0	27800	113	105	109	90	111	89	92
	50	65	7	28	596	1	332	171	1797	25707	36.0	27800	116	106	110	91	112	89	94
	50	65	7	28	694	1	332	171	1797	25707	36.0	27800	117	108	112	93	114	90	96
	50	65	7	28	759	1	332	171	1797	25707	36.0	27800	119	109	113	94	114	91	97
Wesche	50	65	7	28	28	1	312	170	1828	24752	35.7	27800	40	40	40	32	40	40	33
63/E/28/26	50	65	7	28	29	1	312	170	1828	24752	35.7	27800	55	52	63	43	52	46	44
	50	65	7	28	31	1	312	170	1828	24752	35.7	27800	62	58	66	46	58	51	47
	50	65	7	28	34	1	312	170	1828	24752	35.7	27800	67	63	69	48	62	55	50
	50	65	7	28	40	1	312	170	1828	24752	35.7	27800	73	68	72	51	67	60	53
	50	65	7	28	58	1	312	170	1828	24752	35.7	27800	81	76	79	57	76	68	60
	50	65	7	28	68	1	312	170	1828	24752	35.7	27800	84	78	82	60	80	71	62
	50	65	7	28	98	1	312	170	1828	24752	35.7	27800	90	84	88	65	87	76	68
	50	65	7	28	118	1	312	170	1828	24752	35.7	27800	93	87	91	68	90	79	70
	50	65	7	28	148	1	312	170	1828	24752	35.7	27800	97	90	95	71	94	81	74
	50	65	7	28	228	1	312	170	1828	24752	35.7	27800	101	96	102	77	101	86	80
	50	65	7	28	328	1	312	170	1828	24752	35.7	27800	105	101	107	82	106	89	86
	50	65	7	28	492	1	312	170	1828	24752	35.7	27800	108	106	113	88	112	91	91
	50	65	7	28	678	1	312	170	1828	24752	35.7	27800	111	109	116	92	115	93	96

	50	65	7	28	758	1	312	170	1828	24752	35.7	27800	112	111	118	93	116	94	97
Wesche	50	65	7	28	28	1	332	161	1797	25575	40.8	35400	39	39	39	26	39	39	27
63/F/28/27	50	65	7	28	29	1	332	161	1797	25575	40.8	35400	50	49	63	34	47	45	35
	50	65	7	28	31	1	332	161	1797	25575	40.8	35400	55	54	67	36	51	49	38
	50	65	7	28	34	1	332	161	1797	25575	40.8	35400	59	58	70	39	54	53	40
	50	65	7	28	37	1	332	161	1797	25575	40.8	35400	62	61	72	40	56	56	42
	50	65	7	28	40	1	332	161	1797	25575	40.8	35400	64	63	73	41	58	58	43
	50	65	7	28	43	1	332	161	1797	25575	40.8	35400	66	64	75	42	59	60	44
	50	65	7	28	51	1	332	161	1797	25575	40.8	35400	70	67	78	45	62	64	47
	50	65	7	28	58	1	332	161	1797	25575	40.8	35400	72	69	80	47	64	66	49
	50	65	7	28	63	1	332	161	1797	25575	40.8	35400	74	71	81	48	65	67	50
	50	65	7	28	68	1	332	161	1797	25575	40.8	35400	75	72	83	49	66	69	51
	50	65	7	28	78	1	332	161	1797	25575	40.8	35400	77	74	85	50	68	71	53
	50	65	7	28	88	1	332	161	1797	25575	40.8	35400	79	75	87	52	70	72	55
	50	65	7	28	98	1	332	161	1797	25575	40.8	35400	81	77	89	53	71	74	56
	50	65	7	28	108	1	332	161	1797	25575	40.8	35400	82	78	91	55	72	75	58
	50	65	7	28	118	1	332	161	1797	25575	40.8	35400	83	79	92	56	73	76	59
	50	65	7	28	148	1	332	161	1797	25575	40.8	35400	85	82	96	59	76	79	62
	50	65	7	28	188	1	332	161	1797	25575	40.8	35400	88	85	100	62	79	81	66
	50	65	7	28	228	1	332	161	1797	25575	40.8	35400	90	87	103	64	81	83	68
	50	65	7	28	268	1	332	161	1797	25575	40.8	35400	92	89	106	66	83	84	71
	50	65	7	28	308	1	332	161	1797	25575	40.8	35400	93	90	108	68	84	85	73
	50	65	7	28	348	1	332	161	1797	25575	40.8	35400	94	92	110	69	85	86	74
	50	65	7	28	388	1	332	161	1797	25575	40.8	35400	95	93	111	71	86	87	76
	50	65	7	28	447	1	332	161	1797	25575	40.8	35400	96	94	113	73	88	88	78
	50	65	7	28	518	1	332	161	1797	25575	40.8	35400	98	96	115	74	89	89	80
	50	65	7	28	636	1	332	161	1797	25575	40.8	35400	101	98	118	77	90	90	82
	50	65	7	28	699	1	332	161	1797	25575	40.8	35400	102	98	119	78	91	91	83
	50	65	7	28	734	1	332	161	1797	25575	40.8	35400	102	99	120	78	91	91	84
	50	65	7	28	764	1	332	161	1797	25575	40.8	35400	103	99	120	79	91	91	84
Wesche	50	65	7	28	28	1	335	168	1808	25575	40.0	35400	39	39	39	26	39	39	27
63/G/28/28	50	65	7	28	29	1	335	168	1808	25575	40.0	35400	50	49	63	35	47	45	36
	50	65	7	28	31	1	335	168	1808	25575	40.0	35400	55	54	67	37	51	49	38
	50	65	7	28	34	1	335	168	1808	25575	40.0	35400	59	58	70	39	54	53	40
	50	65	7	28	37	1	335	168	1808	25575	40.0	35400	62	61	72	41	56	56	42
	50	65	7	28	40	1	335	168	1808	25575	40.0	35400	65	63	74	42	58	58	43
	50	65	7	28	43	1	335	168	1808	25575	40.0	35400	67	64	75	43	59	60	45
	50	65	7	28	51	1	335	168	1808	25575	40.0	35400	70	67	78	45	62	64	47
	50	65	7	28	58	1	335	168	1808	25575	40.0	35400	73	70	80	47	64	66	49
	50	65	7	28	68	1	335	168	1808	25575	40.0	35400	76	72	83	49	66	69	52
	50	65	7	28	78	1	335	168	1808	25575	40.0	35400	79	74	86	51	68	71	53
	50	65	7	28	88	1	335	168	1808	25575	40.0	35400	81	75	88	52	70	72	55
	50	65	7	28	108	1	335	168	1808	25575	40.0	35400	84	78	91	55	73	75	58
	50	65	7	28	128	1	335	168	1808	25575	40.0	35400	87	80	94	57	75	77	60
	50	65	7	28	148	1	335	168	1808	25575	40.0	35400	89	82	97	59	76	79	62
	50	65	7	28	188	1	335	168	1808	25575	40.0	35400	92	85	101	62	79	81	66
	50	65	7	28	228	1	335	168	1808	25575	40.0	35400	94	87	104	64	81	83	69
	50	65	7	28	268	1	335	168	1808	25575	40.0	35400	96	89	107	66	83	84	71
	50	65	7	28	308	1	335	168	1808	25575	40.0	35400	97	90	109	68	84	85	73
	50	65	7	28	348	1	335	168	1808	25575	40.0	35400	101	92	111	70	86	86	74
	50	65	7	28	392	1	335	168	1808	25575	40.0	35400	103	93	112	71	87	87	76
	50	65	7	28	448	1	335	168	1808	25575	40.0	35400	105	94	114	73	88	88	78
	50	65	7	28	511	1	335	168	1808	25575	40.0	35400	108	96	116	74	89	89	80
	50	65	7	28	574	1	335	168	1808	25575	40.0	35400	110	97	117	76	90	89	81
	50	65	7	28	637	1	335	168	1808	25575	40.0	35400	110	98	119	77	91	90	82
	50	65	7	28	700	1	335	168	1808	25575	40.0	35400	111	99	120	78	91	91	84
	50	65	7	28	730	1	335	168	1808	25575	40.0	35400	112	99	120	78	92	91	84
	50	65	7	28	761	1	335	168	1808	25575	40.0	35400	113	99	121	79	92	91	84
Wesche	50	65	7	2477	2477	1	332	171	1797	30100	35.7	35400	32	33	33	20	33	33	20
63/D/2477/29	50	65	7	2477	2478	1	332	171	1797	30100	35.7	35400	35	35	41	22	37	36	21
	50	65	7	2477	2480	1	332	171	1797	30100	35.7	35400	36	36	42	22	39	38	21
	50	65	7	2477	2484	1	332	171	1797	30100	35.7	35400	36	37	43	22	40	41	22
	50	65	7	2477	2491	1	332	171	1797	30100	35.7	35400	37	38	45	23	42	43	22
	50	65	7	2477	2505	1	332	171	1797	30100	35.7	35400	37	39	46	23	44	46	22
	50	65	7	2477	2567	1	332	171	1797	30100	35.7	35400	39	42	50	24	48	52	23
	50	65	7	2477	2598	1	332	171	1797	30100	35.7	35400	40	43	51	24	50	53	23
	50	65	7	2477	2654	1	332	171	1797	30100	35.7	35400	42	44	53	25	51	55	24
	50	65	7	2477	2871	1	332	171	1797	30100	35.7	35400	44	46	56	26	54	57	25
	50	65	7	2477	3053	1	332	171	1797	30100	35.7	35400	45	47	57	27	55	59	26

	50	65	7	2477	3238	I	332	171	1797	30100	35.7	35400	45	48	58	27	56	59	26
Wesche	50	65	7	2452	2452	I	312	170	1828	31300	35.7	28400	31	32	32	23	32	32	23
63/E/2452/30	50	65	7	2452	2452	I	312	170	1828	31300	35.7	28400	34	33	37	25	35	33	24
	50	65	7	2452	2453	I	312	170	1828	31300	35.7	28400	35	34	39	26	37	35	25
	50	65	7	2452	2454	I	312	170	1828	31300	35.7	28400	35	35	39	26	38	36	25
	50	65	7	2452	2455	I	312	170	1828	31300	35.7	28400	36	35	40	26	39	37	25
	50	65	7	2452	2459	I	312	170	1828	31300	35.7	28400	37	36	40	26	41	39	26
	50	65	7	2452	2466	I	312	170	1828	31300	35.7	28400	38	37	41	27	44	42	26
	50	65	7	2452	2473	I	312	170	1828	31300	35.7	28400	37	38	42	27	45	43	26
	50	65	7	2452	2480	I	312	170	1828	31300	35.7	28400	38	39	43	27	46	45	26
	50	65	7	2452	2508	I	312	170	1828	31300	35.7	28400	39	40	45	28	50	48	27
	50	65	7	2452	2542	I	312	170	1828	31300	35.7	28400	41	42	46	28	52	50	27
	50	65	7	2452	2599	I	312	170	1828	31300	35.7	28400	43	43	48	29	55	52	28
	50	65	7	2452	2634	I	312	170	1828	31300	35.7	28400	42	44	48	29	56	53	28
	50	65	7	2452	2725	I	312	170	1828	31300	35.7	28400	44	45	50	30	59	54	29
	50	65	7	2452	2816	I	312	170	1828	31300	35.7	28400	44	46	51	30	60	55	30
	50	65	7	2452	2906	I	312	170	1828	31300	35.7	28400	45	47	51	31	61	56	30
	50	65	7	2452	2998	I	312	170	1828	31300	35.7	28400	46	48	52	31	62	56	31
	50	65	7	2452	3088	I	312	170	1828	31300	35.7	28400	46	48	52	32	63	57	31
	50	65	7	2452	3183	I	312	170	1828	31300	35.7	28400	46	49	53	32	63	57	31
Wesche	50	65	7	2477	2477	I	332	161	1797	30303	40.8	28400	33	33	33	22	33	33	22
63/F/2477/31	50	65	7	2477	2477	I	332	161	1797	30303	40.8	28400	34	34	38	23	36	34	23
	50	65	7	2477	2478	I	332	161	1797	30303	40.8	28400	35	35	40	24	38	36	24
	50	65	7	2477	2480	I	332	161	1797	30303	40.8	28400	35	36	41	24	40	38	24
	50	65	7	2477	2484	I	332	161	1797	30303	40.8	28400	37	37	42	24	42	41	24
	50	65	7	2477	2491	I	332	161	1797	30303	40.8	28400	37	38	42	25	44	43	25
	50	65	7	2477	2498	I	332	161	1797	30303	40.8	28400	38	39	43	25	45	45	25
	50	65	7	2477	2505	I	332	161	1797	30303	40.8	28400	38	39	44	25	47	46	25
	50	65	7	2477	2533	I	332	161	1797	30303	40.8	28400	39	41	45	26	50	49	26
	50	65	7	2477	2567	I	332	161	1797	30303	40.8	28400	41	42	47	26	52	51	26
	50	65	7	2477	2599	I	332	161	1797	30303	40.8	28400	42	43	48	27	54	53	26
	50	65	7	2477	2624	I	332	161	1797	30303	40.8	28400	42	44	49	27	55	53	27
	50	65	7	2477	2659	I	332	161	1797	30303	40.8	28400	42	45	49	27	56	54	27
	50	65	7	2477	2750	I	332	161	1797	30303	40.8	28400	44	46	51	28	58	56	28
	50	65	7	2477	2841	I	332	161	1797	30303	40.8	28400	44	47	52	28	59	57	28
	50	65	7	2477	2931	I	332	161	1797	30303	40.8	28400	45	48	52	29	60	58	29
	50	65	7	2477	3023	I	332	161	1797	30303	40.8	28400	46	48	53	29	61	58	29
	50	65	7	2477	3113	I	332	161	1797	30303	40.8	28400	46	49	53	29	62	58	29
	50	65	7	2477	3208	I	332	161	1797	30303	40.8	28400	46	49	54	30	62	59	30
Wesche	50	65	7	2446	2446	I	335	168	1808	30200	40.0	28400	29	33	33	22	33	33	22
63/G/2446/32	50	65	7	2446	2447	I	335	168	1808	30200	40.0	28400	31	35	40	24	38	36	24
	50	65	7	2446	2448	I	335	168	1808	30200	40.0	28400	32	36	40	24	39	37	24
	50	65	7	2446	2450	I	335	168	1808	30200	40.0	28400	33	36	41	25	40	39	24
	50	65	7	2446	2454	I	335	168	1808	30200	40.0	28400	33	37	42	25	42	41	25
	50	65	7	2446	2461	I	335	168	1808	30200	40.0	28400	33	38	43	25	44	44	25
	50	65	7	2446	2475	I	335	168	1808	30200	40.0	28400	36	40	44	26	47	46	25
	50	65	7	2446	2503	I	335	168	1808	30200	40.0	28400	38	41	46	26	50	50	26
	50	65	7	2446	2629	I	335	168	1808	30200	40.0	28400	39	45	50	28	56	55	27
	50	65	7	2446	2811	I	335	168	1808	30200	40.0	28400	38	47	52	29	60	57	28
	50	65	7	2446	2993	I	335	168	1808	30200	40.0	28400	40	49	53	30	62	58	29
	50	65	7	2446	3178	I	335	168	1808	30200	40.0	28400	41	49	54	30	63	59	30
Stockl,S	30	65	7	57	57	I	336	185	1799	25000	30.3	23953	40	40	40	34	40	40	35
73/19.71/2	30	65	7	57	57	I	336	185	1799	25000	30.3	23953	52	46	53	42	50	43	44
	30	65	7	57	58	I	336	185	1799	25000	30.3	23953	60	48	55	44	53	45	45
	30	65	7	57	58	I	336	185	1799	25000	30.3	23953	67	50	56	45	55	46	47
	30	65	7	57	59	I	336	185	1799	25000	30.3	23953	73	54	58	47	59	49	49
	30	65	7	57	62	I	336	185	1799	25000	30.3	23953	83	59	61	51	66	54	52
	30	65	7	57	63	I	336	185	1799	25000	30.3	23953	86	60	62	51	67	55	53
	30	65	7	57	65	I	336	185	1799	25000	30.3	23953	94	62	64	53	70	57	54
	30	65	7	57	69	I	336	185	1799	25000	30.3	23953	98	65	65	54	74	60	56
	30	65	7	57	72	I	336	185	1799	25000	30.3	23953	109	67	67	56	77	62	57
	30	65	7	57	78	I	336	185	1799	25000	30.3	23953	115	70	69	58	80	65	60
	30	65	7	57	85	I	336	185	1799	25000	30.3	23953	123	72	72	61	84	68	62
	30	65	7	57	92	I	336	185	1799	25000	30.3	23953	133	74	74	63	87	70	64
	30	65	7	57	105	I	336	185	1799	25000	30.3	23953	140	78	77	66	92	73	67
	30	65	7	57	122	I	336	185	1799	25000	30.3	23953	150	81	80	69	97	76	70
	30	65	7	57	153	I	336	185	1799	25000	30.3	23953	161	85	83	74	103	80	74
	30	65	7	57	177	I	336	185	1799	25000	30.3	23953	171	87	85	76	107	82	77
	30	65	7	57	209	I	336	185	1799	25000	30.3	23953	176	89	87	79	111	84	80

	30	65	7	57	259	1	336	185	1799	25000	30.3	23953	183	92	90	83	115	86	83
	30	65	7	57	297	1	336	185	1799	25000	30.3	23953	189	93	91	85	118	88	85
	30	65	7	57	372	1	336	185	1799	25000	30.3	23953	192	95	93	88	122	90	88
	30	65	7	57	428	1	336	185	1799	25000	30.3	23953	195	97	94	90	124	91	90
	30	65	7	57	521	1	336	185	1799	25000	30.3	23953	197	98	96	92	127	93	92
	30	65	7	57	824	1	336	185	1799	25000	30.3	23953	204	102	99	96	133	95	97
	30	65	7	57	1020	1	336	185	1799	25000	30.3	23953	211	103	100	98	135	97	99
Espion	38	65	1	14	14	1	375	177	1800	25641	36.0	N/A	39	39	39	36	39	39	37
77/15/01	38	65	1	14	15	1	375	177	1800	25641	36.0	N/A	46	53	63	51	52	45	52
	38	65	1	14	17	1	375	177	1800	25641	36.0	N/A	51	61	67	55	58	51	56
	38	65	1	14	21	1	375	177	1800	25641	36.0	N/A	56	68	72	60	65	56	61
	38	65	1	14	27	1	375	177	1800	25641	36.0	N/A	62	74	76	64	70	62	65
	38	65	1	14	35	1	375	177	1800	25641	36.0	N/A	70	78	80	68	75	66	69
	38	65	1	14	42	1	375	177	1800	25641	36.0	N/A	73	81	83	70	79	69	72
	38	65	1	14	45	1	375	177	1800	25641	36.0	N/A	75	82	84	71	80	70	73
	38	65	1	14	49	1	375	177	1800	25641	36.0	N/A	76	84	86	73	82	72	74
	38	65	1	14	52	1	375	177	1800	25641	36.0	N/A	77	84	87	73	83	73	75
	38	65	1	14	56	1	375	177	1800	25641	36.0	N/A	79	86	88	75	84	74	76
	38	65	1	14	63	1	375	177	1800	25641	36.0	N/A	81	87	90	76	86	75	78
	38	65	1	14	70	1	375	177	1800	25641	36.0	N/A	82	89	92	78	88	77	79
	38	65	1	14	77	1	375	177	1800	25641	36.0	N/A	85	90	94	79	90	78	81
	38	65	1	14	84	1	375	177	1800	25641	36.0	N/A	85	91	95	80	91	79	82
	38	65	1	14	91	1	375	177	1800	25641	36.0	N/A	88	92	97	82	93	80	83
	38	65	1	14	98	1	375	177	1800	25641	36.0	N/A	88	93	98	83	94	81	84
	38	65	1	14	112	1	375	177	1800	25641	36.0	N/A	90	95	100	85	96	83	86
	38	65	1	14	126	1	375	177	1800	25641	36.0	N/A	92	97	102	86	98	84	88
	38	65	1	14	140	1	375	177	1800	25641	36.0	N/A	93	98	104	88	100	85	89
	38	65	1	14	154	1	375	177	1800	25641	36.0	N/A	95	99	105	89	102	86	91
	38	65	1	14	170	1	375	177	1800	25641	36.0	N/A	96	100	107	91	103	87	92
	38	65	1	14	188	1	375	177	1800	25641	36.0	N/A	98	102	108	92	105	88	94
	38	65	1	14	211	1	375	177	1800	25641	36.0	N/A	99	103	110	94	107	89	96
	38	65	1	14	224	1	375	177	1800	25641	36.0	N/A	101	104	111	95	108	90	96
	38	65	1	14	238	1	375	177	1800	25641	36.0	N/A	101	104	112	96	109	90	97
	38	65	1	14	252	1	375	177	1800	25641	36.0	N/A	103	105	113	97	109	91	98
	38	65	1	14	266	1	375	177	1800	25641	36.0	N/A	104	106	113	97	110	91	99
	38	65	1	14	280	1	375	177	1800	25641	36.0	N/A	104	106	114	98	111	92	100
	38	65	1	14	308	1	375	177	1800	25641	36.0	N/A	106	107	115	99	112	93	101
	38	65	1	14	322	1	375	177	1800	25641	36.0	N/A	107	108	116	100	113	93	102
	38	65	1	14	336	1	375	177	1800	25641	36.0	N/A	107	108	116	101	114	93	102
	38	65	1	14	351	1	375	177	1800	25641	36.0	N/A	109	109	117	101	114	94	103
	38	65	1	14	373	1	375	177	1800	25641	36.0	N/A	110	109	118	102	115	94	104
	38	65	1	14	392	1	375	177	1800	25641	36.0	N/A	110	110	118	103	116	95	104
	38	65	1	14	422	1	375	177	1800	25641	36.0	N/A	111	110	119	104	117	95	105
	38	65	1	14	448	1	375	177	1800	25641	36.0	N/A	111	111	120	104	117	96	106
	38	65	1	14	477	1	375	177	1800	25641	36.0	N/A	112	112	121	105	118	96	107
	38	65	1	14	518	1	375	177	1800	25641	36.0	N/A	113	112	122	106	119	97	108
	38	65	1	14	576	1	375	177	1800	25641	36.0	N/A	114	113	123	107	120	97	109
	38	65	1	14	598	1	375	177	1800	25641	36.0	N/A	115	114	123	108	121	98	109
	38	65	1	14	616	1	375	177	1800	25641	36.0	N/A	115	114	123	108	121	98	110
	38	65	1	14	643	1	375	177	1800	25641	36.0	N/A	114	114	124	109	121	98	110
	38	65	1	14	679	1	375	177	1800	25641	36.0	N/A	116	115	124	109	122	98	111
	38	65	1	14	737	1	375	177	1800	25641	36.0	N/A	116	116	125	110	123	99	112
	38	65	1	14	904	1	375	177	1800	25641	36.0	N/A	119	117	127	112	125	100	114
	38	65	1	14	999	1	375	177	1800	25641	36.0	N/A	120	118	128	113	125	101	115
	38	65	1	14	1268	1	375	177	1800	25641	36.0	N/A	122	120	130	115	127	102	117
Espion	38	65	1	14	14	1	375	177	1800	23256	36.0	N/A	43	43	43	36	43	43	37
77/10/02	38	65	1	14	15	1	375	177	1800	23256	36.0	N/A	46	57	69	51	56	50	52
	38	65	1	14	16	1	375	177	1800	23256	36.0	N/A	49	62	72	53	60	53	55
	38	65	1	14	20	1	375	177	1800	23256	36.0	N/A	50	70	78	59	67	61	60
	38	65	1	14	23	1	375	177	1800	23256	36.0	N/A	54	74	81	61	71	64	62
	38	65	1	14	27	1	375	177	1800	23256	36.0	N/A	54	78	84	64	74	68	65
	38	65	1	14	37	1	375	177	1800	23256	36.0	N/A	63	83	90	69	80	74	70
	38	65	1	14	41	1	375	177	1800	23256	36.0	N/A	65	85	92	70	82	76	71
	38	65	1	14	62	1	375	177	1800	23256	36.0	N/A	72	91	100	76	90	83	77
	38	65	1	14	69	1	375	177	1800	23256	36.0	N/A	74	93	102	78	92	84	79
	38	65	1	14	76	1	375	177	1800	23256	36.0	N/A	74	94	104	79	94	86	80
	38	65	1	14	83	1	375	177	1800	23256	36.0	N/A	78	95	105	80	95	87	82
	38	65	1	14	90	1	375	177	1800	23256	36.0	N/A	76	96	107	81	96	88	83
	38	65	1	14	97	1	375	177	1800	23256	36.0	N/A	78	97	108	83	98	89	84

	38	65	1	14	104	1	375	177	1800	23256	36.0	N/A	81	98	110	84	99	90	85
	38	65	1	14	118	1	375	177	1800	23256	36.0	N/A	81	100	112	85	101	92	87
	38	65	1	14	132	1	375	177	1800	23256	36.0	N/A	74	101	114	87	103	93	89
	38	65	1	14	146	1	375	177	1800	23256	36.0	N/A	84	102	116	89	105	94	90
	38	65	1	14	160	1	375	177	1800	23256	36.0	N/A	86	104	118	90	106	95	91
	38	65	1	14	176	1	375	177	1800	23256	36.0	N/A	86	105	119	91	108	97	93
	38	65	1	14	194	1	375	177	1800	23256	36.0	N/A	87	106	121	93	109	98	94
	38	65	1	14	217	1	375	177	1800	23256	36.0	N/A	90	107	123	94	111	99	96
	38	65	1	14	230	1	375	177	1800	23256	36.0	N/A	91	108	124	95	112	99	97
	38	65	1	14	244	1	375	177	1800	23256	36.0	N/A	92	109	125	96	113	100	98
	38	65	1	14	258	1	375	177	1800	23256	36.0	N/A	94	109	126	97	114	101	98
	38	65	1	14	272	1	375	177	1800	23256	36.0	N/A	94	110	127	98	115	101	99
	38	65	1	14	286	1	375	177	1800	23256	36.0	N/A	94	110	127	98	115	102	100
	38	65	1	14	314	1	375	177	1800	23256	36.0	N/A	96	111	129	100	117	102	101
	38	65	1	14	328	1	375	177	1800	23256	36.0	N/A	97	112	129	100	117	103	102
	38	65	1	14	342	1	375	177	1800	23256	36.0	N/A	97	112	130	101	118	103	102
	38	65	1	14	357	1	375	177	1800	23256	36.0	N/A	99	113	131	101	118	104	103
	38	65	1	14	379	1	375	177	1800	23256	36.0	N/A	100	113	131	102	119	104	104
	38	65	1	14	398	1	375	177	1800	23256	36.0	N/A	102	114	132	103	120	105	104
	38	65	1	14	428	1	375	177	1800	23256	36.0	N/A	103	115	133	104	121	105	105
	38	65	1	14	454	1	375	177	1800	23256	36.0	N/A	102	115	134	105	122	106	106
	38	65	1	14	483	1	375	177	1800	23256	36.0	N/A	102	116	135	105	122	106	107
	38	65	1	14	524	1	375	177	1800	23256	36.0	N/A	103	117	136	106	123	107	108
	38	65	1	14	582	1	375	177	1800	23256	36.0	N/A	103	118	137	108	124	107	109
	38	65	1	14	622	1	375	177	1800	23256	36.0	N/A	104	118	138	108	125	108	110
	38	65	1	14	685	1	375	177	1800	23256	36.0	N/A	108	119	139	109	126	109	111
	38	65	1	14	806	1	375	177	1800	23256	36.0	N/A	108	120	141	111	128	110	113
	38	65	1	14	943	1	375	177	1800	23256	36.0	N/A	109	121	143	113	129	111	114
	38	65	1	14	1006	1	375	177	1800	23256	36.0	N/A	110	122	143	113	130	111	115
	38	65	1	14	1077	1	375	177	1800	23256	36.0	N/A	113	122	144	114	130	111	116
	38	65	1	14	1275	1	375	177	1800	23256	36.0	N/A	113	124	146	115	131	112	117
	38	65	1	14	1644	1	375	177	1800	23256	36.0	N/A	114	125	148	117	133	113	119
Espion	38	65	1	14	14	1	375	177	1800	26316	36.0	N/A	38	38	38	36	38	38	37
77/5/03	38	65	1	14	15	1	375	177	1800	26316	36.0	N/A	45	52	61	51	51	44	52
	38	65	1	14	17	1	375	177	1800	26316	36.0	N/A	51	60	66	55	57	49	56
	38	65	1	14	21	1	375	177	1800	26316	36.0	N/A	57	67	70	60	64	55	61
	38	65	1	14	29	1	375	177	1800	26316	36.0	N/A	60	74	75	65	71	61	66
	38	65	1	14	35	1	375	177	1800	26316	36.0	N/A	67	77	78	68	74	65	69
	38	65	1	14	42	1	375	177	1800	26316	36.0	N/A	68	80	81	70	78	68	72
	38	65	1	14	49	1	375	177	1800	26316	36.0	N/A	72	83	84	73	81	70	74
	38	65	1	14	57	1	375	177	1800	26316	36.0	N/A	74	85	86	75	83	72	76
	38	65	1	14	64	1	375	177	1800	26316	36.0	N/A	75	86	88	76	85	74	78
	38	65	1	14	70	1	375	177	1800	26316	36.0	N/A	77	88	89	78	87	75	79
	38	65	1	14	105	1	375	177	1800	26316	36.0	N/A	85	93	96	84	94	80	85
	38	65	1	14	122	1	375	177	1800	26316	36.0	N/A	87	95	99	86	97	81	87
	38	65	1	14	175	1	375	177	1800	26316	36.0	N/A	89	100	104	91	103	85	93
	38	65	1	14	204	1	375	177	1800	26316	36.0	N/A	90	102	106	94	105	87	95
	38	65	1	14	234	1	375	177	1800	26316	36.0	N/A	93	103	108	96	107	88	97
	38	65	1	14	274	1	375	177	1800	26316	36.0	N/A	96	105	110	98	110	89	99
	38	65	1	14	322	1	375	177	1800	26316	36.0	N/A	97	107	112	100	112	91	102
	38	65	1	14	392	1	375	177	1800	26316	36.0	N/A	100	109	115	103	115	92	104
	38	65	1	14	456	1	375	177	1800	26316	36.0	N/A	104	110	116	105	117	93	106
	38	65	1	14	588	1	375	177	1800	26316	36.0	N/A	106	113	119	108	120	95	109
	38	65	1	14	738	1	375	177	1800	26316	36.0	N/A	110	115	121	110	122	96	112
	38	65	1	14	843	1	375	177	1800	26316	36.0	N/A	110	116	123	112	123	97	113
	38	65	1	14	942	1	375	177	1800	26316	36.0	N/A	111	116	124	113	124	98	114
	38	65	1	14	1036	1	375	177	1800	26316	36.0	N/A	112	117	125	114	125	98	115
	38	65	1	14	1142	1	375	177	1800	26316	36.0	N/A	113	118	125	114	125	99	116
	38	65	1	14	1214	1	375	177	1800	26316	36.0	N/A	116	118	126	115	126	99	117
	38	65	1	14	1673	1	375	177	1800	26316	36.0	N/A	117	121	129	118	128	100	119
Yue&Taerwe	38	60	1	28	28	1	300	170	1915	27778	36.5	N/A	36	36	36	31	36	36	32
92/B/02	38	60	1	28	30	1	300	170	1915	27778	36.5	N/A	51	51	57	44	52	44	45
	38	60	1	28	35	1	300	170	1915	27778	36.5	N/A	66	60	62	49	60	51	50
	38	60	1	28	40	1	300	170	1915	27778	36.5	N/A	68	64	65	52	64	55	53
	38	60	1	28	45	1	300	170	1915	27778	36.5	N/A	71	67	67	54	67	58	56
	38	60	1	28	50	1	300	170	1915	27778	36.5	N/A	75	69	69	56	70	60	58
	38	60	1	28	60	1	300	170	1915	27778	36.5	N/A	79	73	72	59	74	63	61
	38	60	1	28	70	1	300	170	1915	27778	36.5	N/A	83	76	75	61	78	66	64
	38	60	1	28	80	1	300	170	1915	27778	36.5	N/A	86	78	77	64	80	68	66

	38	60	1	28	90	1	300	170	1915	27778	36.5	N/A	89	80	79	65	83	69	68
	38	60	1	28	100	1	300	170	1915	27778	36.5	N/A	91	82	81	67	85	71	70
	38	60	1	28	150	1	300	170	1915	27778	36.5	N/A	100	88	87	74	92	75	77
	38	60	1	28	200	1	300	170	1915	27778	36.5	N/A	106	92	91	79	97	78	82
	38	60	1	28	250	1	300	170	1915	27778	36.5	N/A	110	94	94	82	100	80	86
	38	60	1	28	300	1	300	170	1915	27778	36.5	N/A	113	97	96	85	103	82	89
	38	60	1	28	350	1	300	170	1915	27778	36.5	N/A	115	98	98	87	105	83	91
	38	60	1	28	400	1	300	170	1915	27778	36.5	N/A	117	100	99	89	107	84	93
	38	60	1	28	450	1	300	170	1915	27778	36.5	N/A	119	101	100	91	108	85	95
	38	60	1	28	500	1	300	170	1915	27778	36.5	N/A	120	102	101	92	109	85	96
	38	60	1	28	600	1	300	170	1915	27778	36.5	N/A	122	104	103	95	111	86	99
	38	60	1	28	700	1	300	170	1915	27778	36.5	N/A	124	105	104	96	113	87	101
	38	60	1	28	800	1	300	170	1915	27778	36.5	N/A	125	106	105	98	114	88	102
	38	60	1	28	900	1	300	170	1915	27778	36.5	N/A	126	107	106	99	115	88	104
	38	60	1	28	1000	1	300	170	1915	27778	36.5	N/A	127	108	107	100	116	89	105
	38	60	1	28	1500	1	300	170	1915	27778	36.5	N/A	130	111	110	103	118	91	109
Chem	25	50	28	28	28	1	505	157	1682	16750	53.5	16750	62	67	75	46	68	63	44
93/01	25	50	28	28	29	1	505	157	1682	16750	53.5	16750	64	73	81	50	74	67	48
	25	50	28	28	29	1	505	157	1682	16750	53.5	16750	75	78	84	53	78	71	51
	25	50	28	28	29	1	505	157	1682	16750	53.5	16750	82	79	84	53	79	72	51
	25	50	28	28	30	1	505	157	1682	16750	53.5	16750	88	83	86	55	82	75	53
	25	50	28	28	30	1	505	157	1682	16750	53.5	16750	91	85	88	57	84	77	54
	25	50	28	28	31	1	505	157	1682	16750	53.5	16750	98	88	89	58	86	79	55
	25	50	28	28	35	1	505	157	1682	16750	53.5	16750	127	99	96	65	95	90	61
	25	50	28	28	37	1	505	157	1682	16750	53.5	16750	131	102	98	67	98	92	63
	25	50	28	28	41	1	505	157	1682	16750	53.5	16750	147	107	102	70	102	98	66
	25	50	28	28	46	1	505	157	1682	16750	53.5	16750	151	112	107	75	107	103	70
	25	50	28	28	48	1	505	157	1682	16750	53.5	16750	169	114	109	76	109	105	71
	25	50	28	28	53	1	505	157	1682	16750	53.5	16750	178	117	112	80	112	109	74
	25	50	28	28	64	1	505	157	1682	16750	53.5	16750	187	124	118	87	118	115	80
	25	50	28	28	79	1	505	157	1682	16750	53.5	16750	197	129	124	94	125	122	86
	25	50	28	28	89	1	505	157	1682	16750	53.5	16750	204	132	127	98	128	125	89
	25	50	28	28	102	1	505	157	1682	16750	53.5	16750	207	136	130	103	132	128	93
	25	50	28	28	148	1	505	157	1682	16750	53.5	16750	218	143	137	115	141	137	103
	25	50	28	28	184	1	505	157	1682	16750	53.5	16750	225	147	141	121	147	141	108
	25	50	28	28	720	1	505	157	1682	16750	53.5	16750	248	164	158	144	171	160	128
Hilsdorf	50	99	1	1	1	3	337	185	1820	21277	40.4	N/A	47	47	47	67	47	47	71
98/1/1/01	50	99	1	1	2	3	337	185	1820	21277	40.4	N/A	69	81	88	109	54	54	118
	50	99	1	1	3	3	337	185	1820	21277	40.4	N/A	74	92	92	114	56	58	124
	50	99	1	1	4	3	337	185	1820	21277	40.4	N/A	78	99	95	118	57	60	128
	50	99	1	1	8	3	337	185	1820	21277	40.4	N/A	86	114	99	125	60	67	136
	50	99	1	1	15	3	337	185	1820	21277	40.4	N/A	93	125	103	131	64	73	142
	50	99	1	1	29	3	337	185	1820	21277	40.4	N/A	101	133	106	136	68	81	149
	50	99	1	1	57	3	337	185	1820	21277	40.4	N/A	109	139	109	142	73	90	155
	50	99	1	1	91	3	337	185	1820	21277	40.4	N/A	115	141	110	145	78	95	159
	50	99	1	1	181	3	337	185	1820	21277	40.4	N/A	123	145	112	150	85	103	165
	50	99	1	1	366	3	337	185	1820	21277	40.4	N/A	128	148	114	155	93	110	170
	50	99	1	1	731	3	337	185	1820	21277	40.4	N/A	132	150	116	160	102	115	176
	50	99	1	1	791	3	337	185	1820	21277	40.4	N/A	133	151	116	160	103	115	176
Hilsdorf	50	65	1	3	3	3	337	185	1820	24390	40.4	N/A	41	41	41	47	41	41	50
98/1/3/02	50	65	1	3	4	3	337	185	1820	24390	40.4	N/A	58	64	71	73	56	49	78
	50	65	1	3	5	3	337	185	1820	24390	40.4	N/A	60	72	74	78	60	52	83
	50	65	1	3	6	3	337	185	1820	24390	40.4	N/A	62	77	76	80	63	55	86
	50	65	1	3	10	3	337	185	1820	24390	40.4	N/A	68	88	81	87	70	62	93
	50	65	1	3	17	3	337	185	1820	24390	40.4	N/A	73	96	86	93	77	69	99
	50	65	1	3	31	3	337	185	1820	24390	40.4	N/A	81	105	93	99	86	77	106
	50	65	1	3	59	3	337	185	1820	24390	40.4	N/A	88	113	103	106	96	86	114
	50	65	1	3	93	3	337	185	1820	24390	40.4	N/A	95	119	111	111	104	92	120
	50	65	1	3	183	3	337	185	1820	24390	40.4	N/A	104	128	124	119	116	100	128
	50	65	1	3	368	3	337	185	1820	24390	40.4	N/A	111	136	138	127	128	107	138
	50	65	1	3	733	3	337	185	1820	24390	40.4	N/A	116	144	150	136	137	112	147
	50	65	1	3	778	3	337	185	1820	24390	40.4	N/A	116	145	150	136	138	113	147
Hilsdorf	50	65	1	7	7	3	337	185	1820	24390	40.4	N/A	41	41	41	38	41	41	40
98/1/7/03	50	65	1	7	8	3	337	185	1820	24390	40.4	N/A	53	58	68	56	54	48	58
	50	65	1	7	9	3	337	185	1820	24390	40.4	N/A	57	63	71	59	57	51	61
	50	65	1	7	10	3	337	185	1820	24390	40.4	N/A	59	67	73	61	60	53	64
	50	65	1	7	14	3	337	185	1820	24390	40.4	N/A	65	75	77	65	66	60	69
	50	65	1	7	21	3	337	185	1820	24390	40.4	N/A	70	82	81	70	72	66	74
	50	65	1	7	35	3	337	185	1820	24390	40.4	N/A	78	89	87	76	79	74	81

	50	65	1	7	63	3	337	185	1820	24390	40.4	N/A	86	96	95	83	88	82	88
	50	65	1	7	97	3	337	185	1820	24390	40.4	N/A	94	101	102	88	95	87	93
	50	65	1	7	187	3	337	185	1820	24390	40.4	N/A	102	109	114	95	105	94	102
	50	65	1	7	372	3	337	185	1820	24390	40.4	N/A	109	118	126	104	115	101	111
	50	65	1	7	737	3	337	185	1820	24390	40.4	N/A	113	125	136	112	123	106	120
	50	65	1	7	827	3	337	185	1820	24390	40.4	N/A	114	126	137	113	124	106	121
Hilsdorf	50	65	1	28	28	3	337	185	1820	26316	40.4	N/A	38	38	38	30	38	38	30
98/1/28/04	50	65	1	28	29	3	337	185	1820	26316	40.4	N/A	48	49	59	39	48	44	40
	50	65	1	28	30	3	337	185	1820	26316	40.4	N/A	50	52	61	41	51	46	42
	50	65	1	28	31	3	337	185	1820	26316	40.4	N/A	52	54	62	42	52	48	43
	50	65	1	28	35	3	337	185	1820	26316	40.4	N/A	56	59	66	45	57	53	46
	50	65	1	28	42	3	337	185	1820	26316	40.4	N/A	60	64	69	48	62	58	49
	50	65	1	28	56	3	337	185	1820	26316	40.4	N/A	67	70	73	52	68	64	53
	50	65	1	28	84	3	337	185	1820	26316	40.4	N/A	75	76	79	57	74	70	59
	50	65	1	28	118	3	337	185	1820	26316	40.4	N/A	82	80	85	61	80	74	64
	50	65	1	28	208	3	337	185	1820	26316	40.4	N/A	93	87	93	69	88	80	72
	50	65	1	28	393	3	337	185	1820	26316	40.4	N/A	101	95	101	77	95	85	80
	50	65	1	28	798	3	337	185	1820	26316	40.4	N/A	107	102	109	85	102	89	90
Hilsdorf	50	65	1	90	90	3	337	185	1820	28571	40.4	N/A	35	35	35	26	35	35	26
98/1/90/05	50	65	1	90	91	3	337	185	1820	28571	40.4	N/A	44	42	51	32	43	39	32
	50	65	1	90	92	3	337	185	1820	28571	40.4	N/A	47	45	52	33	45	41	33
	50	65	1	90	93	3	337	185	1820	28571	40.4	N/A	48	46	53	34	46	43	34
	50	65	1	90	97	3	337	185	1820	28571	40.4	N/A	52	50	56	36	50	47	35
	50	65	1	90	104	3	337	185	1820	28571	40.4	N/A	57	53	58	38	54	51	37
	50	65	1	90	118	3	337	185	1820	28571	40.4	N/A	63	58	61	40	59	56	40
	50	65	1	90	146	3	337	185	1820	28571	40.4	N/A	69	63	66	44	64	61	44
	50	65	1	90	180	3	337	185	1820	28571	40.4	N/A	75	67	70	47	68	64	48
	50	65	1	90	270	3	337	185	1820	28571	40.4	N/A	85	73	76	53	75	69	54
	50	65	1	90	455	3	337	185	1820	28571	40.4	N/A	93	79	82	61	81	73	62
	50	65	1	90	840	3	337	185	1820	28571	40.4	N/A	99	85	87	68	86	76	70
Hilsdorf	50	99	3	3	3	3	337	185	1820	25000	40.4	N/A	40	40	40	47	40	40	50
98/3/3/06	50	99	3	3	4	3	337	185	1820	25000	40.4	N/A	56	62	70	72	46	45	77
	50	99	3	3	5	3	337	185	1820	25000	40.4	N/A	62	68	72	76	47	48	81
	50	99	3	3	6	3	337	185	1820	25000	40.4	N/A	65	73	74	78	48	50	84
	50	99	3	3	10	3	337	185	1820	25000	40.4	N/A	72	82	77	84	51	55	90
	50	99	3	3	17	3	337	185	1820	25000	40.4	N/A	78	88	80	89	54	60	96
	50	99	3	3	31	3	337	185	1820	25000	40.4	N/A	85	93	82	94	57	66	101
	50	99	3	3	59	3	337	185	1820	25000	40.4	N/A	94	97	84	99	61	72	107
	50	99	3	3	93	3	337	185	1820	25000	40.4	N/A	101	99	86	103	65	76	111
	50	99	3	3	183	3	337	185	1820	25000	40.4	N/A	112	102	87	108	71	82	117
	50	99	3	3	368	3	337	185	1820	25000	40.4	N/A	122	105	89	113	78	87	123
	50	99	3	3	733	3	337	185	1820	25000	40.4	N/A	130	107	91	117	85	91	128
	50	99	3	3	910	3	337	185	1820	25000	40.4	N/A	132	108	91	119	87	92	130
Hilsdorf	50	99	7	7	7	3	337	185	1820	26316	40.4	N/A	38	38	38	38	38	38	40
98/7/7/07	50	99	7	7	8	3	337	185	1820	26316	40.4	N/A	47	54	64	55	43	43	58
	50	99	7	7	9	3	337	185	1820	26316	40.4	N/A	49	58	66	57	44	45	60
	50	99	7	7	10	3	337	185	1820	26316	40.4	N/A	51	61	68	59	45	46	62
	50	99	7	7	14	3	337	185	1820	26316	40.4	N/A	57	68	71	63	47	51	66
	50	99	7	7	21	3	337	185	1820	26316	40.4	N/A	63	72	73	67	50	55	71
	50	99	7	7	35	3	337	185	1820	26316	40.4	N/A	69	76	75	71	53	60	76
	50	99	7	7	63	3	337	185	1820	26316	40.4	N/A	77	79	77	76	56	65	81
	50	99	7	7	97	3	337	185	1820	26316	40.4	N/A	83	81	78	80	59	69	85
	50	99	7	7	187	3	337	185	1820	26316	40.4	N/A	92	83	79	84	64	74	91
	50	99	7	7	372	3	337	185	1820	26316	40.4	N/A	103	86	81	89	70	78	96
	50	99	7	7	737	3	337	185	1820	26316	40.4	N/A	111	88	83	94	76	82	102
	50	99	7	7	885	3	337	185	1820	26316	40.4	N/A	113	89	83	95	78	82	103
Hilsdorf	50	99	28	28	28	3	337	185	1820	27778	40.4	N/A	36	36	36	30	36	36	30
98/28/28/08	50	99	28	28	29	3	337	185	1820	27778	40.4	N/A	41	46	59	39	40	40	39
	50	99	28	28	30	3	337	185	1820	27778	40.4	N/A	42	49	61	40	41	41	41
	50	99	28	28	31	3	337	185	1820	27778	40.4	N/A	44	50	62	41	41	43	41
	50	99	28	28	35	3	337	185	1820	27778	40.4	N/A	48	54	65	43	43	46	44
	50	99	28	28	42	3	337	185	1820	27778	40.4	N/A	54	57	67	45	45	50	46
	50	99	28	28	56	3	337	185	1820	27778	40.4	N/A	60	60	69	48	47	54	49
	50	99	28	28	84	3	337	185	1820	27778	40.4	N/A	69	62	70	51	50	58	53
	50	99	28	28	118	3	337	185	1820	27778	40.4	N/A	76	63	71	54	52	61	56
	50	99	28	28	208	3	337	185	1820	27778	40.4	N/A	87	65	73	58	56	65	61
	50	99	28	28	393	3	337	185	1820	27778	40.4	N/A	98	68	74	63	61	68	66
	50	99	28	28	758	3	337	185	1820	27778	40.4	N/A	107	70	76	67	65	71	71
	50	99	28	28	906	3	337	185	1820	27778	40.4	N/A	109	71	76	68	67	72	73

Hilsdorf	50	99	90	90	90	3	337	185	1820	30400	40.4	N/A	33	33	33	26	33	33	26
98/90/90/09	50	99	90	90	91	3	337	185	1820	30400	40.4	N/A	36	40	53	32	36	36	31
	50	99	90	90	93	3	337	185	1820	30400	40.4	N/A	38	43	56	33	37	38	33
	50	99	90	90	97	3	337	185	1820	30400	40.4	N/A	41	46	59	34	39	41	34
	50	99	90	90	104	3	337	185	1820	30400	40.4	N/A	45	48	60	35	40	44	35
	50	99	90	90	118	3	337	185	1820	30400	40.4	N/A	50	50	62	36	42	47	36
	50	99	90	90	146	3	337	185	1820	30400	40.4	N/A	56	52	64	39	44	50	39
	50	99	90	90	190	3	337	185	1820	30400	40.4	N/A	60	54	65	41	46	53	41
	50	99	90	90	270	3	337	185	1820	30400	40.4	N/A	68	55	66	44	49	56	44
	50	99	90	90	455	3	337	185	1820	30400	40.4	N/A	77	57	67	47	53	59	49
	50	99	90	90	820	3	337	185	1820	30400	40.4	N/A	85	60	68	52	56	61	53
	50	99	90	90	886	3	337	185	1820	30400	40.4	N/A	85	60	69	52	57	61	54
Browne	38	96	7	7	8	1	418	176	1839	27100	42.8	N/A	46	52	65	56	42	42	56
25/7/20/14	38	96	7	7	9	1	418	176	1839	27100	42.8	N/A	59	57	67	58	43	44	59
	38	96	7	7	10	1	418	176	1839	27100	42.8	N/A	64	60	69	60	44	46	60
	38	96	7	7	14	1	418	176	1839	27100	42.8	N/A	71	66	72	65	46	50	65
	38	96	7	7	17	1	418	176	1839	27100	42.8	N/A	74	69	74	67	48	53	67
	38	96	7	7	27	1	418	176	1839	27100	42.8	N/A	79	74	76	72	50	58	72
	38	96	7	7	37	1	418	176	1839	27100	42.8	N/A	83	76	78	75	52	61	75
	38	96	7	7	47	1	418	176	1839	27100	42.8	N/A	86	77	79	77	54	63	78
	38	96	7	7	57	1	418	176	1839	27100	42.8	N/A	88	78	80	79	55	65	79
	38	96	7	7	77	1	418	176	1839	27100	42.8	N/A	90	80	81	82	57	68	82
	38	96	7	7	107	1	418	176	1839	27100	42.8	N/A	93	81	82	84	59	71	85
	38	96	7	7	207	1	418	176	1839	27100	42.8	N/A	93	84	85	90	65	76	91
	38	96	7	7	307	1	418	176	1839	27100	42.8	N/A	98	86	87	93	68	78	94
	38	96	7	7	407	1	418	176	1839	27100	42.8	N/A	90	87	88	96	71	80	97
	38	96	7	7	507	1	418	176	1839	27100	42.8	N/A	93	88	89	97	73	81	98
	38	96	7	7	707	1	418	176	1839	27100	42.8	N/A	99	90	90	100	76	83	101
	38	96	7	7	1007	1	418	176	1839	27100	42.8	N/A	106	91	91	103	79	84	104
Browne	38	96	60	60	61	1	418	176	1839	33200	42.8	N/A	34	38	48	33	33	33	33
25/60/20/16	38	96	60	60	62	1	418	176	1839	33200	42.8	N/A	40	40	50	34	34	35	34
	38	96	60	60	63	1	418	176	1839	33200	42.8	N/A	42	42	51	34	35	36	34
	38	96	60	60	67	1	418	176	1839	33200	42.8	N/A	46	45	53	36	36	39	36
	38	96	60	60	70	1	418	176	1839	33200	42.8	N/A	48	46	54	37	37	40	37
	38	96	60	60	80	1	418	176	1839	33200	42.8	N/A	51	49	56	39	39	43	39
	38	96	60	60	90	1	418	176	1839	33200	42.8	N/A	53	50	57	40	40	45	40
	38	96	60	60	100	1	418	176	1839	33200	42.8	N/A	55	51	57	41	41	47	41
	38	96	60	60	110	1	418	176	1839	33200	42.8	N/A	56	52	58	42	42	48	42
	38	96	60	60	130	1	418	176	1839	33200	42.8	N/A	58	53	59	44	43	50	44
	38	96	60	60	160	1	418	176	1839	33200	42.8	N/A	60	55	60	46	45	51	46
	38	96	60	60	260	1	418	176	1839	33200	42.8	N/A	65	57	61	50	49	55	50
	38	96	60	60	360	1	418	176	1839	33200	42.8	N/A	68	59	62	53	51	56	53
	38	96	60	60	460	1	418	176	1839	33200	42.8	N/A	71	60	63	55	53	57	55
	38	96	60	60	560	1	418	176	1839	33200	42.8	N/A	72	61	64	56	54	58	57
	38	96	60	60	760	1	418	176	1839	33200	42.8	N/A	75	62	65	59	56	59	59
	38	96	60	60	1060	1	418	176	1839	33200	42.8	N/A	79	64	65	61	58	60	62
Browne	38	96	400	400	401	1	418	176	1839	35000	42.8	N/A	32	34	45	26	31	31	26
25/400/20/18	38	96	400	400	403	1	418	176	1839	35000	42.8	N/A	41	37	47	27	32	33	27
	38	96	400	400	407	1	418	176	1839	35000	42.8	N/A	44	39	49	27	33	35	27
	38	96	400	400	410	1	418	176	1839	35000	42.8	N/A	45	40	50	28	33	36	28
	38	96	400	400	420	1	418	176	1839	35000	42.8	N/A	46	42	51	28	35	39	28
	38	96	400	400	430	1	418	176	1839	35000	42.8	N/A	48	43	52	29	36	40	29
	38	96	400	400	440	1	418	176	1839	35000	42.8	N/A	48	44	53	29	36	41	30
	38	96	400	400	450	1	418	176	1839	35000	42.8	N/A	48	44	54	30	37	42	30
	38	96	400	400	470	1	418	176	1839	35000	42.8	N/A	49	45	54	31	38	43	31
	38	96	400	400	500	1	418	176	1839	35000	42.8	N/A	50	47	55	31	39	45	31
	38	96	400	400	600	1	418	176	1839	35000	42.8	N/A	52	49	57	33	41	47	33
	38	96	400	400	700	1	418	176	1839	35000	42.8	N/A	53	51	58	35	43	48	35
	38	96	400	400	800	1	418	176	1839	35000	42.8	N/A	54	52	58	36	44	49	36
	38	96	400	400	900	1	418	176	1839	35000	42.8	N/A	54	53	59	37	45	50	37
	38	96	400	400	1100	1	418	176	1839	35000	42.8	N/A	55	54	59	38	46	51	39
	38	96	400	400	1400	1	418	176	1839	35000	42.8	N/A	56	56	60	40	48	51	40
Hannant	26	96	180	180	180	1	402	189	1809	42735	54.8	N/A	23	23	23	21	23	23	20
26/13.79/27/07	26	96	180	180	188	1	402	189	1809	42735	54.8	N/A	28	34	41	26	28	30	26
	26	96	180	180	197	1	402	189	1809	42735	54.8	N/A	30	36	42	27	29	32	27
	26	96	180	180	206	1	402	189	1809	42735	54.8	N/A	32	37	43	28	30	34	28
	26	96	180	180	222	1	402	189	1809	42735	54.8	N/A	32	39	44	29	31	36	29
	26	96	180	180	248	1	402	189	1809	42735	54.8	N/A	35	40	44	30	33	38	30
	26	96	180	180	274	1	402	189	1809	42735	54.8	N/A	38	41	45	31	34	39	31

	26	96	180	180	328	I	402	189	1809	42735	54.8	N/A	38	43	46	33	35	41	33
	26	96	180	180	460	I	402	189	1809	42735	54.8	N/A	41	45	47	35	37	43	36
	26	96	180	180	635	I	402	189	1809	42735	54.8	N/A	44	46	48	38	39	44	38
	26	96	180	180	916	I	402	189	1809	42735	54.8	N/A	46	48	49	41	41	45	41
Seki&Kawa	38	50	1	96	96	I	402	189	1809	24000	23.7	N/A	41	42	42	35	42	42	37
44/96/50/20/03	38	50	1	96	97	I	402	189	1809	24000	23.7	N/A	50	51	58	46	57	48	50
	38	50	1	96	99	I	402	189	1809	24000	23.7	N/A	57	56	61	50	64	53	54
	38	50	1	96	103	I	402	189	1809	24000	23.7	N/A	64	62	65	54	72	58	58
	38	50	1	96	110	I	402	189	1809	24000	23.7	N/A	69	67	69	59	79	64	62
	38	50	1	96	116	I	402	189	1809	24000	23.7	N/A	71	71	72	62	84	67	65
	38	50	1	96	136	I	402	189	1809	24000	23.7	N/A	78	78	79	70	94	74	71
	38	50	1	96	156	I	402	189	1809	24000	23.7	N/A	84	83	84	75	100	78	77
	38	50	1	96	186	I	402	189	1809	24000	23.7	N/A	92	88	89	82	107	82	83
	38	50	1	96	246	I	402	189	1809	24000	23.7	N/A	96	94	96	92	116	87	91
	38	50	1	96	296	I	402	189	1809	24000	23.7	N/A	99	98	100	99	121	90	97
	38	50	1	96	496	I	402	189	1809	24000	23.7	N/A	109	105	108	114	132	95	111
	38	50	1	96	666	I	402	189	1809	24000	23.7	N/A	112	109	111	122	137	97	118
Seki&Kawa	38	96	1	96	96	I	402	189	1809	35000	23.7	N/A	28	29	29	35	29	29	37
44/96/S/20/04	38	96	1	96	97	I	402	189	1809	35000	23.7	N/A	32	35	39	44	33	31	48
	38	96	1	96	99	I	402	189	1809	35000	23.7	N/A	37	38	41	45	36	34	50
	38	96	1	96	103	I	402	189	1809	35000	23.7	N/A	37	40	42	47	38	36	51
	38	96	1	96	110	I	402	189	1809	35000	23.7	N/A	41	42	43	49	40	39	53
	38	96	1	96	116	I	402	189	1809	35000	23.7	N/A	41	43	43	50	42	40	54
	38	96	1	96	136	I	402	189	1809	35000	23.7	N/A	44	45	44	52	45	44	57
	38	96	1	96	156	I	402	189	1809	35000	23.7	N/A	44	46	45	54	48	45	59
	38	96	1	96	186	I	402	189	1809	35000	23.7	N/A	46	47	45	56	50	47	61
	38	96	1	96	246	I	402	189	1809	35000	23.7	N/A	49	49	46	59	54	50	64
	38	96	1	96	296	I	402	189	1809	35000	23.7	N/A	50	50	46	61	56	51	66
	38	96	1	96	496	I	402	189	1809	35000	23.7	N/A	54	52	47	66	62	53	70
	38	96	1	96	666	I	402	189	1809	35000	23.7	N/A	56	53	48	68	65	54	73
Kawasumi	38	96	96	96	97	I	343	137	1919	30000	44.5	N/A	34	40	53	29	36	37	30
et. al	38	96	96	96	99	I	343	137	1919	30000	44.5	N/A	36	44	56	30	38	39	31
46/S/96/20/03	38	96	96	96	103	I	343	137	1919	30000	44.5	N/A	37	46	58	31	39	42	32
	38	96	96	96	110	I	343	137	1919	30000	44.5	N/A	40	49	60	32	40	45	33
	38	96	96	96	121	I	343	137	1919	30000	44.5	N/A	42	50	62	34	42	48	35
	38	96	96	96	141	I	343	137	1919	30000	44.5	N/A	43	52	63	35	44	51	37
	38	96	96	96	155	I	343	137	1919	30000	44.5	N/A	43	53	64	36	45	53	38
	38	96	96	96	197	I	343	137	1919	30000	44.5	N/A	46	55	65	38	47	56	40
	38	96	96	96	218	I	343	137	1919	30000	44.5	N/A	47	56	66	39	47	57	41
	38	96	96	96	292	I	343	137	1919	30000	44.5	N/A	49	58	67	41	50	59	44
	38	96	96	96	441	I	343	137	1919	30000	44.5	N/A	53	60	69	44	52	61	47
	38	96	96	96	664	I	343	137	1919	30000	44.5	N/A	56	62	70	47	55	63	51
Kawasumi	38	96	96	96	96	I	343	137	1919	23000	44.5	N/A	44	43	43	24	43	43	24
et. al	38	96	96	96	97	I	343	137	1919	23000	44.5	N/A	50	51	67	29	46	48	30
46/S/96/20/03	38	96	96	96	99	I	343	137	1919	23000	44.5	N/A	57	54	71	30	48	51	31
	38	96	96	96	103	I	343	137	1919	23000	44.5	N/A	61	56	74	31	49	55	32
	38	96	96	96	110	I	343	137	1919	23000	44.5	N/A	68	59	76	32	50	59	33
	38	96	96	96	121	I	343	137	1919	23000	44.5	N/A	73	61	78	34	52	63	35
	38	96	96	96	137	I	343	137	1919	23000	44.5	N/A	78	62	80	35	53	66	36
	38	96	96	96	165	I	343	137	1919	23000	44.5	N/A	86	64	81	37	55	70	38
	38	96	96	96	210	I	343	137	1919	23000	44.5	N/A	91	66	83	39	57	74	41
	38	96	96	96	294	I	343	137	1919	23000	44.5	N/A	98	68	85	41	60	77	44
	38	96	96	96	435	I	343	137	1919	23000	44.5	N/A	104	70	87	44	62	80	47
	38	96	96	96	664	I	343	137	1919	23000	44.5	N/A	111	72	88	47	65	82	51
Kommendant	38	96	90	90	90	2	419	160	1818	43000	41.0	N/A	24	23	23	26	23	23	26
et. al	38	96	90	90	91	2	419	160	1818	43000	41.0	N/A	28	31	36	32	26	26	32
54/90/23/B/02	38	96	90	90	95	2	419	160	1818	43000	41.0	N/A	31	36	39	34	29	29	34
	38	96	90	90	98	2	419	160	1818	43000	41.0	N/A	31	37	40	34	30	30	35
	38	96	90	90	105	2	419	160	1818	43000	41.0	N/A	33	40	41	36	31	32	36
	38	96	90	90	117	2	419	160	1818	43000	41.0	N/A	35	42	42	37	33	34	38
	38	96	90	90	132	2	419	160	1818	43000	41.0	N/A	37	43	43	39	34	36	39
	38	96	90	90	163	2	419	160	1818	43000	41.0	N/A	40	45	44	41	36	38	41
	38	96	90	90	217	2	419	160	1818	43000	41.0	N/A	42	47	45	44	39	40	44
	38	96	90	90	323	2	419	160	1818	43000	41.0	N/A	46	49	46	48	42	42	48
	38	96	90	90	479	2	419	160	1818	43000	41.0	N/A	49	51	47	51	45	43	51
	38	96	90	90	636	2	419	160	1818	43000	41.0	N/A	51	53	47	53	47	44	54
	38	96	90	90	797	2	419	160	1818	43000	41.0	N/A	54	54	48	55	48	45	55
Kommendant	38	96	90	90	90	2	419	160	1818	42000	41.0	N/A	24	24	24	26	24	24	26
et. al	38	96	90	90	91	2	419	160	1818	42000	41.0	N/A	28	31	37	32	27	26	32

54/90/23/Y/15	38	96	90	90	96	2	419	160	1818	42000	41.0	N/A	30	37	40	34	30	30	34
	38	96	90	90	101	2	419	160	1818	42000	41.0	N/A	32	39	41	35	31	32	35
	38	96	90	90	126	2	419	160	1818	42000	41.0	N/A	35	43	44	38	34	36	39
	38	96	90	90	146	2	419	160	1818	42000	41.0	N/A	37	45	44	40	36	38	40
	38	96	90	90	181	2	419	160	1818	42000	41.0	N/A	39	46	45	42	38	40	43
	38	96	90	90	237	2	419	160	1818	42000	41.0	N/A	41	48	46	45	40	41	45
	38	96	90	90	335	2	419	160	1818	42000	41.0	N/A	44	50	47	48	43	43	48
	38	96	90	90	516	2	419	160	1818	42000	41.0	N/A	48	52	48	52	46	45	52
	38	96	90	90	740	2	419	160	1818	42000	41.0	N/A	51	54	49	54	48	46	55
Burg 1	38	50	28	70	70	1	562	158	1709	35206	78.6	43200	28	28	28	18	28	28	18
	38	50	28	70	73	1	562	158	1709	35206	78.6	43200	42	39	44	25	36	36	24
	38	50	28	70	76	1	562	158	1709	35206	78.6	43200	46	42	46	26	38	39	26
	38	50	28	70	84	1	562	158	1709	35206	78.6	43200	54	46	48	30	41	44	30
	38	50	28	70	98	1	562	158	1709	35206	78.6	43200	62	51	52	34	44	48	34
	38	50	28	70	133	1	562	158	1709	35206	78.6	43200	72	57	57	41	48	54	41
	38	50	28	70	182	1	562	158	1709	35206	78.6	43200	78	62	61	48	52	58	48
	38	50	28	70	301	1	562	158	1709	35206	78.6	43200	86	68	66	57	56	62	58
	38	50	28	70	497	1	562	158	1709	35206	78.6	43200	90	72	70	65	59	65	65

Table D.3 RILEM shrinkage data bank: rejected data

Series	V/S	h	days		Cem	Content kg/m^3			Exp. MPa		Shrinkage x10^{-6}						
	mm	%	t_c	t	Type	c	w	a	f_{cm28}	E_{cm28}	EXP	GL	ATL	B3	CEB	ACI	S.B3
Yue	38	60	1	14	1	400	129	1950	80.2	53200	170	106	148	108	-32	168	93
92/01	38	60	1	26	1	400	129	1950	80.2	53200	211	146	231	149	-44	265	128
	38	60	1	51	1	400	129	1950	80.2	53200	233	196	319	201	-58	375	172
	38	60	1	76	1	400	129	1950	80.2	53200	253	230	367	235	-68	434	201
	38	60	1	101	1	400	129	1950	80.2	53200	255	254	398	260	-75	472	222
	38	60	1	121	1	400	129	1950	80.2	53200	285	270	416	275	-80	493	235
	38	60	1	141	1	400	129	1950	80.2	53200	300	283	430	288	-84	509	246
	38	60	1	161	1	400	129	1950	80.2	53200	312	295	442	299	-87	522	255
	38	60	1	181	1	400	129	1950	80.2	53200	317	304	452	308	-90	533	263
	38	60	1	211	1	400	129	1950	80.2	53200	335	317	465	320	-93	546	273
	38	60	1	236	1	400	129	1950	80.2	53200	332	326	474	328	-96	554	280
	38	60	1	266	1	400	129	1950	80.2	53200	333	335	483	335	-98	563	286
	38	60	1	301	1	400	129	1950	80.2	53200	347	344	491	343	-101	570	293
	38	60	1	326	1	400	129	1950	80.2	53200	352	349	497	347	-102	575	297
	38	60	1	351	1	400	129	1950	80.2	53200	358	354	502	351	-104	579	300
	38	60	1	391	1	400	129	1950	80.2	53200	362	362	509	356	-106	584	304
	38	60	1	451	1	400	129	1950	80.2	53200	374	370	518	363	-108	591	310
	38	60	1	501	1	400	129	1950	80.2	53200	380	376	525	366	-110	595	313
	38	60	1	576	1	400	129	1950	80.2	53200	390	384	533	371	-112	600	317
	38	60	1	701	1	400	129	1950	80.2	53200	422	393	544	376	-115	606	321
	38	60	1	826	1	400	129	1950	80.2	53200	428	400	553	379	-117	611	324
	38	60	1	941	1	400	129	1950	80.2	53200	427	406	560	381	-118	614	325
	38	60	1	1301	1	400	129	1950	80.2	53200	432	416	576	384	-121	620	328
	38	60	1	1381	1	400	129	1950	80.2	53200	435	418	579	384	-121	621	328
Stockl	38	65	7	11	2	250	200	1940	11.4	20800	26	111	66	89	75	55	145
69/D/04	38	65	7	21	2	250	200	1940	11.4	20800	74	203	189	164	137	153	266
	38	65	7	28	2	250	200	1940	11.4	20800	93	245	246	199	165	201	322
	38	65	7	50	2	250	200	1940	11.4	20800	160	335	354	275	225	296	446
	38	65	7	116	2	250	200	1940	11.4	20800	266	476	480	400	317	406	649
	38	65	7	171	2	250	200	1940	11.4	20800	332	539	525	459	358	442	744
	38	65	7	264	2	250	200	1940	11.4	20800	368	604	567	519	400	472	843
	38	65	7	329	2	250	200	1940	11.4	20800	395	633	586	546	419	484	886
	38	65	7	521	2	250	200	1940	11.4	20800	438	686	622	592	452	503	960
	38	65	7	811	2	250	200	1940	11.4	20800	466	725	651	620	476	514	1006
MaMillan	18	50	1	35	1	350	172	1685	36.0	31340	235	530	699	457	374	517	491
	18	50	1	90	1	350	172	1685	36.0	31340	265	660	821	571	462	753	613
	18	50	1	355	1	350	172	1685	36.0	31340	305	765	953	632	531	955	678
	18	50	1	547	1	350	172	1685	36.0	31340	325	781	988	634	541	986	681
	18	50	1	1000	1	350	172	1685	36.0	31340	400	795	1036	635	550	1014	682
	18	50	1	2500	1	350	172	1685	36.0	31340	450	805	1106	635	557	1035	682
MaMillan	18	50	1	208	1	350	172	1685	36.0	31340	280	735	905	621	512	898	667
	18	50	1	456	1	350	172	1685	36.0	31340	300	775	974	634	537	975	680
	18	50	1	680	1	350	172	1685	36.0	31340	345	787	1006	635	545	998	682
	18	50	1	1000	1	350	172	1685	36.0	31340	400	795	1036	635	550	1014	682
	18	50	1	2500	1	350	172	1685	36.0	31340	450	805	1106	635	557	1035	682
MaMillan	18	50	1	386	1	350	172	1685	36.0	31340	330	768	960	632	533	962	679
	18	50	1	672	1	350	172	1685	36.0	31340	360	786	1005	635	545	998	682
	18	50	1	1000	1	350	172	1685	36.0	31340	400	795	1036	635	550	1014	682
	18	50	1	2500	1	350	172	1685	36.0	31340	450	805	1106	635	557	1035	682
Burg	19	50	28	35	1	475	181	1727	88.5	44500	123	181	133	265	41	108	176
85/B/38/02	19	50	28	42	1	475	181	1727	88.5	44500	220	243	183	351	55	185	233

	19	50	28	56	1	475	181	1727	88.5	44500	287	313	228	443	70	288	293
	19	50	28	87	1	475	181	1727	88.5	44500	393	387	266	527	86	406	349
	19	50	28	180	1	475	181	1727	88.5	44500	497	460	304	583	102	526	386
	19	50	28	335	1	475	181	1727	88.5	44500	573	494	327	595	109	581	394
	19	50	28	645	1	475	181	1727	88.5	44500	590	514	348	597	113	613	395
Burg	19	50	28	35	1	487	156	1744	91.9	45500	100	177	130	228	27	110	173
85/C/38/03	19	50	28	42	1	487	156	1744	91.9	45500	177	238	179	302	36	188	229
	19	50	28	56	1	487	156	1744	91.9	45500	240	306	223	380	46	293	288
	19	50	28	87	1	487	156	1744	91.9	45500	327	379	261	451	57	413	342
	19	50	28	180	1	487	156	1744	91.9	45500	430	450	298	499	67	535	379
	19	50	28	335	1	487	156	1744	91.9	45500	503	483	320	508	72	591	386
	19	50	28	645	1	487	156	1744	91.9	45500	543	503	340	510	75	623	387
Burg	19	50	28	35	1	564	144	1661	119	50800	87	157	115	212	-65	109	160
85/D/38/04	19	50	28	42	1	564	144	1661	119	50800	140	210	158	280	-86	186	212
	19	50	28	56	1	564	144	1661	119	50800	203	270	197	350	-111	290	265
	19	50	28	87	1	564	144	1661	119	50800	283	334	230	413	-136	410	313
	19	50	28	180	1	564	144	1661	119	50800	373	398	263	454	-161	531	343
	19	50	28	335	1	564	144	1661	119	50800	443	427	283	461	-172	586	349
	19	50	28	645	1	564	144	1661	119	50800	490	444	301	463	-178	618	350
Burg	19	50	28	35	1	475	151	1661	107	48400	137	165	121	221	-22	103	165
85/E/38/05	19	50	28	42	1	475	151	1661	107	48400	183	221	167	292	-29	177	218
	19	50	28	56	1	475	151	1661	107	48400	233	285	207	366	-38	276	274
	19	50	28	87	1	475	151	1661	107	48400	323	352	243	433	-46	389	324
	19	50	28	180	1	475	151	1661	107	48400	377	419	277	477	-54	504	357
	19	50	28	335	1	475	151	1661	107	48400	457	450	298	486	-58	557	363
	19	50	28	645	1	475	151	1661	107	48400	493	468	317	487	-60	587	364
Burg 2	38	50	28	35	1	475	181	1727	88.5	44500	55	95	58	140	21	89	93
85/B/76/07	38	50	28	42	1	475	181	1727	88.5	44500	120	132	100	194	30	152	129
	38	50	28	56	1	475	181	1727	88.5	44500	158	181	153	265	41	237	176
	38	50	28	87	1	475	181	1727	88.5	44500	218	248	213	358	56	335	237
	38	50	28	180	1	475	181	1727	88.5	44500	322	344	276	481	77	433	318
	38	50	28	335	1	475	181	1727	88.5	44500	407	410	311	548	91	478	363
	38	50	28	645	1	475	181	1727	88.5	44500	508	461	339	584	102	504	387
Burg 3	38	50	28	35	1	487	156	1744	91.9	45500	77	93	56	120	14	90	91
85/C/76/08	38	50	28	42	1	487	156	1744	91.9	45500	118	129	98	167	20	155	127
	38	50	28	56	1	487	156	1744	91.9	45500	155	177	150	228	27	241	173
	38	50	28	87	1	487	156	1744	91.9	45500	195	243	208	307	37	340	233
	38	50	28	180	1	487	156	1744	91.9	45500	292	337	270	412	51	441	313
	38	50	28	335	1	487	156	1744	91.9	45500	410	401	304	469	60	487	356
	38	50	28	645	1	487	156	1744	91.9	45500	543	451	332	499	67	513	379
Burg 4	38	50	28	35	1	564	144	1661	119	50800	68	82	50	112	-34	90	85
85/D/76/09	38	50	28	42	1	564	144	1661	119	50800	115	114	86	156	-47	154	118
	38	50	28	56	1	564	144	1661	119	50800	142	157	132	212	-65	239	160
	38	50	28	87	1	564	144	1661	119	50800	195	214	184	285	-88	337	216
	38	50	28	180	1	564	144	1661	119	50800	257	297	238	379	-122	437	287
	38	50	28	335	1	564	144	1661	119	50800	315	355	269	429	-144	482	325
	38	50	28	645	1	564	144	1661	119	50800	415	399	293	454	-161	508	344
Burg 5	38	50	28	35	1	475	151	1661	107	48400	83	86	53	117	-11	85	87
85/E/76/10	38	50	28	42	1	475	151	1661	107	48400	125	120	91	162	-16	146	121
	38	50	28	56	1	475	151	1661	107	48400	163	165	140	221	-22	227	165
	38	50	28	87	1	475	151	1661	107	48400	218	226	194	297	-30	320	222
	38	50	28	180	1	475	151	1661	107	48400	302	313	251	397	-41	415	296
	38	50	28	335	1	475	151	1661	107	48400	365	374	283	450	-49	458	337
	38	50	28	645	1	475	151	1661	107	48400	463	420	309	477	-55	483	357
Wischers	38	65	0.4	29	3	325	156	1905	54.6	39808.91	228	215	351	183	102	352	165
61/C/0.42/13	38	65	0.4	92	3	325	156	1905	54.6	39808.91	313	344	555	298	163	571	269
	38	65	0.4	183	3	325	156	1905	54.6	39808.91	361	427	649	372	200	663	337
	38	65	0.4	366	3	325	156	1905	54.6	39808.91	401	499	723	435	233	722	393

	38	65	0.4	731	3	325	156	1905	54.6	39808.91	423	552	782	471	257	755	426
	38	65	0.4	2191	3	325	156	1905	54.6	39808.91	441	599	860	488	277	778	441
Wischers	38	65	0.8	2	1	325	156	1905	48.8	38194.37	25	41	19	35	25	22	33
61/A/0.83/07	38	65	0.8	4	1	325	156	1905	48.8	38194.37	42	69	58	59	41	59	56
	38	65	0.8	8	1	325	156	1905	48.8	38194.37	86	103	127	89	62	124	85
	38	65	0.8	28	1	325	156	1905	48.8	38194.37	193	193	325	168	116	322	160
	38	65	0.8	92	1	325	156	1905	48.8	38194.37	248	315	524	277	188	533	265
	38	65	0.8	183	1	325	156	1905	48.8	38194.37	312	390	612	346	231	619	330
	38	65	0.8	366	1	325	156	1905	48.8	38194.37	357	456	681	402	269	673	384
	38	65	0.8	731	1	325	156	1905	48.8	38194.37	380	505	737	435	296	704	415
	38	65	0.8	2191	1	325	156	1905	48.8	38194.37	424	547	811	449	320	726	429

Table D.4 RILEM compliance data bank: rejected data

Series	V/S	h	days			Cem.	Content kg/m^3			Experimental MPa			Compliance $J(t,t_0)$ x10^{-6} 1/MPa						
	mm	%	t_c	t_0	t	Type	c	w	a	E_{cm28}	f_{cm28}	E_{cm28}	EXP	GL	ATL	B3	CEB	ACI	S.B3
Brooks	19.1	100	14	14	14	3	375	251	1778	13460	21.5	13746	74	74	74	71	74	74	78
74/G/100/13	19.1	100	14	14	21	3	375	251	1778	13460	21.5	13746	119	108	115	116	95	101	130
	19.1	100	14	14	28	3	375	251	1778	13460	21.5	13746	127	113	116	121	101	110	136
	19.1	100	14	14	42	3	375	251	1778	13460	21.5	13746	140	117	117	127	108	121	142
	19.1	100	14	14	379	3	375	251	1778	13460	21.5	13746	176	131	123	150	148	159	167
	19.1	100	14	14	1839	3	375	251	1778	13460	21.5	13746	222	142	128	164	178	172	182
	19.1	100	14	14	3664	3	375	251	1778	13460	21.5	13746	242	147	130	169	187	176	189
Brooks	19.1	60	14	14	14	3	375	251	1778	13460	21.5	13746	74	74	74	72	74	74	79
74/G/60/14	19.1	60	14	14	21	3	375	251	1778	13460	21.5	13746	133	138	139	132	152	113	145
	19.1	60	14	14	28	3	375	251	1778	13460	21.5	13746	151	154	156	142	172	126	155
	19.1	60	14	14	42	3	375	251	1778	13460	21.5	13746	184	170	177	154	195	141	167
	19.1	60	14	14	379	3	375	251	1778	13460	21.5	13746	269	214	238	202	300	196	215
	19.1	60	14	14	1839	3	375	251	1778	13460	21.5	13746	300	230	263	216	337	216	231
	19.1	60	14	14	3664	3	375	251	1778	13460	21.5	13746	319	236	272	222	344	221	237
Burg 3	38	50	28	70	70	1	487	156	1744	38133	91.9	45500	26	26	26	16	26	26	16
	38	50	28	70	73	1	487	156	1744	38133	91.9	45500	31	36	40	22	33	33	23
	38	50	28	70	76	1	487	156	1744	38133	91.9	45500	34	39	42	24	35	36	24
	38	50	28	70	84	1	487	156	1744	38133	91.9	45500	39	43	44	27	37	40	28
	38	50	28	70	98	1	487	156	1744	38133	91.9	45500	44	47	47	30	40	45	32
	38	50	28	70	133	1	487	156	1744	38133	91.9	45500	48	53	52	37	44	50	39
	38	50	28	70	182	1	487	156	1744	38133	91.9	45500	52	57	55	43	47	53	45
	38	50	28	70	301	1	487	156	1744	38133	91.9	45500	59	63	59	51	50	58	54
	38	50	28	70	497	1	487	156	1744	38133	91.9	45500	68	67	63	58	53	60	62
Burg 4	38	50	28	70	70	1	564	144	1661	43679	119	50800	23	23	23	14	23	23	14
	38	50	28	70	73	1	564	144	1661	43679	119	50800	27	32	35	20	28	29	20
	38	50	28	70	76	1	564	144	1661	43679	119	50800	29	34	36	21	29	31	21
	38	50	28	70	84	1	564	144	1661	43679	119	50800	32	38	38	24	31	35	24
	38	50	28	70	98	1	564	144	1661	43679	119	50800	35	42	41	27	34	39	28
	38	50	28	70	133	1	564	144	1661	43679	119	50800	39	47	44	33	36	43	34
	38	50	28	70	182	1	564	144	1661	43679	119	50800	41	51	47	39	39	46	40
	38	50	28	70	301	1	564	144	1661	43679	119	50800	44	56	50	48	42	50	48
	38	50	28	70	497	1	564	144	1661	43679	119	50800	46	60	53	55	44	53	55
Burg 5	38	50	28	70	70	1	475	151	1661	38704	107	48400	26	26	26	15	26	26	15
	38	50	28	70	73	1	475	151	1661	38704	107	48400	30	35	39	20	32	33	21
	38	50	28	70	76	1	475	151	1661	38704	107	48400	32	38	41	22	33	35	22
	38	50	28	70	84	1	475	151	1661	38704	107	48400	36	42	43	25	35	40	26
	38	50	28	70	98	1	475	151	1661	38704	107	48400	39	45	46	28	38	44	29
	38	50	28	70	133	1	475	151	1661	38704	107	48400	41	51	50	34	41	49	36
	38	50	28	70	182	1	475	151	1661	38704	107	48400	44	55	53	40	44	52	42
	38	50	28	70	301	1	475	151	1661	38704	107	48400	47	60	57	48	47	56	51
	38	50	28	70	497	1	475	151	1661	38704	107	48400	51	64	60	54	49	59	58
Mamillan	17.5	50	1	7	7	1	350	172	1685	28573	34.0	28573	36	35	35	42	35	35	44
17/50/7/5	17.5	50	1	7	14	1	350	172	1685	28573	34.0	28573	90	80	74	82	81	57	85
	17.5	50	1	7	21	1	350	172	1685	28573	34.0	28573	101	91	83	92	92	65	94
	17.5	50	1	7	35	1	350	172	1685	28573	34.0	28573	109	102	94	105	106	74	106
	17.5	50	1	7	63	1	350	172	1685	28573	34.0	28573	123	111	104	119	123	83	120
	17.5	50	1	7	124	1	350	172	1685	28573	34.0	28573	134	120	114	134	141	93	135
	17.5	50	1	7	218	1	350	172	1685	28573	34.0	28573	141	125	120	143	156	100	143
	17.5	50	1	7	429	1	350	172	1685	28573	34.0	28573	151	130	126	150	171	108	151
	17.5	50	1	7	1007	1	350	172	1685	28573	34.0	28573	157	135	133	157	184	114	158
	17.5	50	1	7	1257	1	350	172	1685	28573	34.0	28573	169	136	135	158	186	116	159
	17.5	50	1	7	1557	1	350	172	1685	28573	34.0	28573	172	137	137	160	188	117	161
Mamillan	17.5	50	1	21	21	1	350	172	1685	30303	34.0	28573	33	33	33	34	33	33	35
17/50/21/6	17.5	50	1	21	24	1	350	172	1685	30303	34.0	28573	46	55	54	56	61	45	57
	17.5	50	1	21	28	1	350	172	1685	30303	34.0	28573	59	63	60	63	70	51	64
	17.5	50	1	21	49	1	350	172	1685	30303	34.0	28573	73	79	73	81	91	65	81
	17.5	50	1	21	116	1	350	172	1685	30303	34.0	28573	85	91	84	103	115	79	102
	17.5	50	1	21	352	1	350	172	1685	30303	34.0	28573	98	100	93	120	139	91	118
	17.5	50	1	21	570	1	350	172	1685	30303	34.0	28573	108	103	95	124	147	95	123
	17.5	50	1	21	941	1	350	172	1685	30303	34.0	28573	113	105	98	128	153	98	127

	17.5	50	1	21	1341	1	350	172	1685	30303	34.0	28573	114	106	100	130	156	100	129
	17.5	50	1	21	1671	1	350	172	1685	30303	34.0	28573	118	107	101	132	158	101	131
	17.5	50	1	21	2001	1	350	172	1685	30303	34.0	28573	123	108	102	133	159	102	132
Mamillan	17.5	50	1	28	28	1	350	172	1685	24390	34.0	28573	41	41	41	32	41	41	33
17/50/28/07	17.5	50	1	28	29	1	350	172	1685	24390	34.0	28573	56	54	60	47	60	49	48
	17.5	50	1	28	35	1	350	172	1685	24390	34.0	28573	67	68	73	59	76	63	59
	17.5	50	1	28	39	1	350	172	1685	24390	34.0	28573	70	73	78	64	82	68	64
	17.5	50	1	28	43	1	350	172	1685	24390	34.0	28573	75	76	82	67	86	72	67
	17.5	50	1	28	56	1	350	172	1685	24390	34.0	28573	85	82	90	76	96	80	76
	17.5	50	1	28	69	1	350	172	1685	24390	34.0	28573	88	86	95	82	103	85	82
	17.5	50	1	28	85	1	350	172	1685	24390	34.0	28573	91	89	99	88	109	89	87
	17.5	50	1	28	105	1	350	172	1685	24390	34.0	28573	97	92	102	93	115	94	92
	17.5	50	1	28	119	1	350	172	1685	24390	34.0	28573	102	94	104	96	118	96	95
	17.5	50	1	28	187	1	350	172	1685	24390	34.0	28573	110	98	109	104	129	103	103
	17.5	50	1	28	213	1	350	172	1685	24390	34.0	28573	112	99	110	106	132	105	105
	17.5	50	1	28	299	1	350	172	1685	24390	34.0	28573	112	101	113	111	138	109	109
	17.5	50	1	28	422	1	350	172	1685	24390	34.0	28573	124	103	116	114	144	113	113
	17.5	50	1	28	604	1	350	172	1685	24390	34.0	28573	129	104	119	117	150	116	116
Mamillan	17.5	50	1	90	90	1	350	172	1685	27027	34.0	28573	37	37	37	28	37	37	28
17/50/90/08	17.5	50	1	90	91	1	350	172	1685	27027	34.0	28573	44	45	51	37	52	44	37
	17.5	50	1	90	120	1	350	172	1685	27027	34.0	28573	58	63	71	56	82	68	56
	17.5	50	1	90	180	1	350	172	1685	27027	34.0	28573	69	70	80	68	98	80	67
	17.5	50	1	90	270	1	350	172	1685	27027	34.0	28573	77	73	84	75	109	87	74
	17.5	50	1	90	410	1	350	172	1685	27027	34.0	28573	84	76	87	80	117	92	79
	17.5	50	1	90	438	1	350	172	1685	27027	34.0	28573	87	76	88	81	118	92	79
	17.5	50	1	90	610	1	350	172	1685	27027	34.0	28573	92	77	90	84	123	95	82
	17.5	50	1	90	682	1	350	172	1685	27027	34.0	28573	94	78	90	84	124	96	83
	17.5	50	1	90	720	1	350	172	1685	27027	34.0	28573	93	78	91	85	125	96	84
	17.5	50	1	90	830	1	350	172	1685	27027	34.0	28573	96	78	92	86	126	97	85
	17.5	50	1	90	970	1	350	172	1685	27027	34.0	28573	98	79	92	87	128	98	86
	17.5	50	1	90	1070	1	350	172	1685	27027	34.0	28573	97	79	93	88	128	99	87
	17.5	50	1	90	1375	1	350	172	1685	27027	34.0	28573	100	80	94	90	130	100	89
	17.5	50	1	90	1630	1	350	172	1685	27027	34.0	28573	103	80	95	91	131	101	90
	17.5	50	1	90	1890	1	350	172	1685	27027	34.0	28573	104	81	95	92	132	102	91
	17.5	50	1	90	2140	1	350	172	1685	27027	34.0	28573	111	81	96	93	133	102	92
Mamillan	17.5	50	1	365	365	1	350	172	1685	31250	34.0	28573	32	32	32	25	32	32	25
17/50/365/09	17.5	50	1	365	366	1	350	172	1685	31250	34.0	28573	38	36	42	29	43	37	29
	17.5	50	1	365	386	1	350	172	1685	31250	34.0	28573	41	44	53	33	63	52	33
	17.5	50	1	365	575	1	350	172	1685	31250	34.0	28573	54	51	64	41	89	69	41
	17.5	50	1	365	672	1	350	172	1685	31250	34.0	28573	56	52	65	43	93	72	43
	17.5	50	1	365	730	1	350	172	1685	31250	34.0	28573	59	53	66	44	94	73	44
	17.5	50	1	365	1000	1	350	172	1685	31250	34.0	28573	62	54	68	47	99	76	47
	17.5	50	1	365	1060	1	350	172	1685	31250	34.0	28573	63	54	68	47	100	76	47
	17.5	50	1	365	1325	1	350	172	1685	31250	34.0	28573	67	54	69	49	102	77	49
	17.5	50	1	365	1505	1	350	172	1685	31250	34.0	28573	68	54	69	50	103	78	50
	17.5	50	1	365	1595	1	350	172	1685	31250	34.0	28573	69	55	69	50	103	78	50
	17.5	50	1	365	1785	1	350	172	1685	31250	34.0	28573	71	55	70	51	104	79	51
	17.5	50	1	365	2130	1	350	172	1685	31250	34.0	28573	77	55	70	52	104	79	53
Mamillan	17.5	50	1	720	720	1	350	172	1685	39216	34.0	28573	26	26	26	24	26	26	24
17/50/720/10	17.5	50	1	720	748	1	350	172	1685	39216	34.0	28573	33	35	40	29	55	42	29
	17.5	50	1	720	800	1	350	172	1685	39216	34.0	28573	39	38	43	31	65	48	31
	17.5	50	1	720	846	1	350	172	1685	39216	34.0	28573	46	38	45	32	70	50	32
	17.5	50	1	720	947	1	350	172	1685	39216	34.0	28573	47	40	46	33	76	53	33
	17.5	50	1	720	1020	1	350	172	1685	39216	34.0	28573	50	40	47	34	79	55	34
	17.5	50	1	720	1280	1	350	172	1685	39216	34.0	28573	55	41	48	36	83	57	36
	17.5	50	1	720	1400	1	350	172	1685	39216	34.0	28573	54	41	48	36	85	58	37
	17.5	50	1	720	1575	1	350	172	1685	39216	34.0	28573	55	41	49	37	86	58	38
	17.5	50	1	720	1880	1	350	172	1685	39216	34.0	28573	56	42	49	39	87	59	39
	17.5	50	1	720	2140	1	350	172	1685	39216	34.0	28573	70	42	50	40	88	60	40
Mamillan	17.5	100	7	7	7	1	350	172	1685	32258	34.0	N/A	31	31	31	43	31	31	45
17/100/7/16	17.5	100	7	7	8	1	350	172	1685	32258	34.0	N/A	42	47	53	62	36	36	65
	17.5	100	7	7	14	1	350	172	1685	32258	34.0	N/A	47	61	58	71	41	44	74
	17.5	100	7	7	21	1	350	172	1685	32258	34.0	N/A	51	65	59	75	44	48	79
	17.5	100	7	7	28	1	350	172	1685	32258	34.0	N/A	53	68	60	78	46	51	82
	17.5	100	7	7	35	1	350	172	1685	32258	34.0	N/A	54	69	60	80	48	53	84
	17.5	100	7	7	63	1	350	172	1685	32258	34.0	N/A	59	72	61	85	52	59	89
	17.5	100	7	7	97	1	350	172	1685	32258	34.0	N/A	58	74	62	88	55	62	93

	17.5	100	7	7	124	1	350	172	1685	32258	34.0	N/A	63	75	63	90	57	64	95
	17.5	100	7	7	157	1	350	172	1685	32258	34.0	N/A	62	76	63	92	59	66	97
	17.5	100	7	7	185	1	350	172	1685	32258	34.0	N/A	61	76	64	93	61	67	98
	17.5	100	7	7	218	1	350	172	1685	32258	34.0	N/A	61	77	64	95	62	68	99
	17.5	100	7	7	250	1	350	172	1685	32258	34.0	N/A	62	78	64	96	64	69	100
	17.5	100	7	7	355	1	350	172	1685	32258	34.0	N/A	64	79	65	98	67	71	103
	17.5	100	7	7	429	1	350	172	1685	32258	34.0	N/A	66	80	66	100	69	72	105
	17.5	100	7	7	547	1	350	172	1685	32258	34.0	N/A	65	81	66	101	71	73	107
	17.5	100	7	7	652	1	350	172	1685	32258	34.0	N/A	67	82	67	103	73	74	108
	17.5	100	7	7	797	1	350	172	1685	32258	34.0	N/A	66	83	67	104	75	75	109
	17.5	100	7	7	1072	1	350	172	1685	32258	34.0	N/A	72	84	68	106	78	76	112
	17.5	100	7	7	1212	1	350	172	1685	32258	34.0	N/A	71	85	68	107	79	77	113
Mamillan	17.5	100	21	21	21	1	350	172	1685	35714	34.0	N/A	28	28	28	34	28	28	35
17/100/21/18	17.5	100	21	21	22	1	350	172	1685	35714	34.0	N/A	31	39	45	46	32	32	47
	17.5	100	21	21	49	1	350	172	1685	35714	34.0	N/A	43	53	51	56	41	46	59
	17.5	100	21	21	111	1	350	172	1685	35714	34.0	N/A	48	56	53	63	48	53	66
	17.5	100	21	21	201	1	350	172	1685	35714	34.0	N/A	51	59	54	68	52	57	71
	17.5	100	21	21	345	1	350	172	1685	35714	34.0	N/A	55	61	55	72	57	60	75
	17.5	100	21	21	430	1	350	172	1685	35714	34.0	N/A	56	62	56	74	59	61	77
	17.5	100	21	21	496	1	350	172	1685	35714	34.0	N/A	55	63	56	75	60	61	78
	17.5	100	21	21	615	1	350	172	1685	35714	34.0	N/A	52	64	56	76	61	62	80
	17.5	100	21	21	754	1	350	172	1685	35714	34.0	N/A	51	65	57	78	63	63	81
	17.5	100	21	21	1061	1	350	172	1685	35714	34.0	N/A	53	66	58	80	66	64	84
	17.5	100	21	21	1196	1	350	172	1685	35714	34.0	N/A	55	67	58	81	67	64	85
	17.5	100	21	21	1316	1	350	172	1685	35714	34.0	N/A	58	67	58	82	67	64	86
	17.5	100	21	21	1631	1	350	172	1685	35714	34.0	N/A	62	68	59	83	69	65	87
	17.5	100	21	21	2001	1	350	172	1685	35714	34.0	N/A	62	69	59	85	70	65	89
Mamillan	17.5	100	28	28	28	1	350	172	1685	40000	34.0	N/A	25	25	25	33	25	25	34
17/100/28/19	17.5	100	28	28	29	1	350	172	1685	40000	34.0	N/A	29	35	39	43	29	28	44
	17.5	100	28	28	35	1	350	172	1685	40000	34.0	N/A	32	43	43	47	33	34	49
	17.5	100	28	28	39	1	350	172	1685	40000	34.0	N/A	33	44	43	48	34	36	50
	17.5	100	28	28	43	1	350	172	1685	40000	34.0	N/A	32	45	44	49	35	37	51
	17.5	100	28	28	56	1	350	172	1685	40000	34.0	N/A	37	47	45	52	38	40	54
	17.5	100	28	28	69	1	350	172	1685	40000	34.0	N/A	38	49	45	54	39	42	56
	17.5	100	28	28	85	1	350	172	1685	40000	34.0	N/A	39	49	46	56	41	44	58
	17.5	100	28	28	105	1	350	172	1685	40000	34.0	N/A	41	50	46	57	43	46	60
	17.5	100	28	28	119	1	350	172	1685	40000	34.0	N/A	42	51	46	58	44	46	61
	17.5	100	28	28	187	1	350	172	1685	40000	34.0	N/A	42	53	47	62	47	49	65
	17.5	100	28	28	213	1	350	172	1685	40000	34.0	N/A	43	53	47	63	48	50	66
	17.5	100	28	28	299	1	350	172	1685	40000	34.0	N/A	44	55	48	65	51	52	68
	17.5	100	28	28	422	1	350	172	1685	40000	34.0	N/A	48	56	49	68	54	53	71
	17.5	100	28	28	604	1	350	172	1685	40000	34.0	N/A	50	58	49	71	56	54	74
	17.5	100	28	28	813	1	350	172	1685	40000	34.0	N/A	46	59	50	73	59	55	76
	17.5	100	28	28	953	1	350	172	1685	40000	34.0	N/A	47	60	50	74	60	56	77
	17.5	100	28	28	1188	1	350	172	1685	40000	34.0	N/A	49	61	50	76	62	56	79
	17.5	100	28	28	1423	1	350	172	1685	40000	34.0	N/A	51	62	51	77	63	57	80
	17.5	100	28	28	1768	1	350	172	1685	40000	34.0	N/A	52	63	51	79	64	57	82
Mamillan	17.5	100	365	365	365	1	350	172	1685	47619	34.0	N/A	21	21	21	25	21	21	26
17/100/365/20	17.5	100	365	365	366	1	350	172	1685	47619	34.0	N/A	24	26	32	29	24	23	29
	17.5	100	365	365	386	1	350	172	1685	47620	34.0	N/A	27	32	35	31	28	29	31
	17.5	100	365	365	393	1	350	172	1685	47620	34.0	N/A	30	32	36	31	29	30	32
	17.5	100	365	365	485	1	350	172	1685	47620	34.0	N/A	31	35	37	33	33	35	34
	17.5	100	365	365	585	1	350	172	1685	47620	34.0	N/A	32	37	38	35	36	37	36
	17.5	100	365	365	672	1	350	172	1685	47620	34.0	N/A	31	39	38	36	37	38	37
	17.5	100	365	365	730	1	350	172	1685	47620	34.0	N/A	33	39	38	37	38	38	38
	17.5	100	365	365	855	1	350	172	1685	47620	34.0	N/A	37	41	39	38	39	39	39
	17.5	100	365	365	970	1	350	172	1685	47620	34.0	N/A	41	42	39	39	40	39	40
	17.5	100	365	365	1285	1	350	172	1685	47620	34.0	N/A	46	43	40	41	42	40	42
	17.5	100	365	365	1425	1	350	172	1685	47620	34.0	N/A	45	44	40	42	43	40	43
	17.5	100	365	365	1565	1	350	172	1685	47620	34.0	N/A	45	45	40	42	43	40	44
	17.5	100	365	365	1775	1	350	172	1685	47620	34.0	N/A	44	45	40	43	44	41	45
	17.5	100	365	365	2145	1	350	172	1685	47620	34.0	N/A	46	47	40	45	45	41	46
Yue&Taerwe	37.5	60	1	28	28	2	400	129	1950	43000	80.5	43000	23	23	23	19	23	23	20
92/A/01	37.5	60	1	28	30	2	400	129	1950	43000	80.5	43000	28	34	37	26	30	28	27
	37.5	60	1	28	35	2	400	129	1950	43000	80.5	43000	30	40	39	29	34	33	31
	37.5	60	1	28	40	2	400	129	1950	43000	80.5	43000	32	43	41	32	36	35	33
	37.5	60	1	28	45	2	400	129	1950	43000	80.5	43000	33	45	42	33	37	37	35

	37.5	60	1	28	50	2	400	129	1950	43000	80.5	43000	33	46	43	35	39	39	37
	37.5	60	1	28	60	2	400	129	1950	43000	80.5	43000	35	49	45	37	41	41	40
	37.5	60	1	28	70	2	400	129	1950	43000	80.5	43000	35	51	46	39	42	42	42
	37.5	60	1	28	80	2	400	129	1950	43000	80.5	43000	36	52	47	41	43	44	44
	37.5	60	1	28	90	2	400	129	1950	43000	80.5	43000	37	54	48	43	44	45	46
	37.5	60	1	28	100	2	400	129	1950	43000	80.5	43000	37	55	49	44	45	46	47
	37.5	60	1	28	150	2	400	129	1950	43000	80.5	43000	40	59	52	50	49	49	54
	37.5	60	1	28	200	2	400	129	1950	43000	80.5	43000	41	62	54	54	51	50	58
	37.5	60	1	28	250	2	400	129	1950	43000	80.5	43000	42	64	55	56	52	52	61
	37.5	60	1	28	300	2	400	129	1950	43000	80.5	43000	43	65	56	59	53	53	64
	37.5	60	1	28	350	2	400	129	1950	43000	80.5	43000	43	66	57	61	54	53	66
	37.5	60	1	28	400	2	400	129	1950	43000	80.5	43000	44	67	57	62	55	54	68
	37.5	60	1	28	450	2	400	129	1950	43000	80.5	43000	44	68	58	63	56	55	69
	37.5	60	1	28	500	2	400	129	1950	43000	80.5	43000	45	69	59	64	56	55	70
	37.5	60	1	28	600	2	400	129	1950	43000	80.5	43000	45	70	59	66	57	56	72
	37.5	60	1	28	700	2	400	129	1950	43000	80.5	43000	46	71	60	68	58	56	74
	37.5	60	1	28	800	2	400	129	1950	43000	80.5	43000	46	72	61	69	58	57	75
	37.5	60	1	28	1000	2	400	129	1950	43000	80.5	43000	47	73	61	71	59	57	78
	37.5	60	1	28	1500	2	400	129	1950	43000	80.5	43000	48	75	63	74	60	58	81
Yue&Taerwe	37.5	60	1	28	28	2	400	129	1950	43000	80.5	43000	24	23	23	19	23	23	20
92/A/02	37.5	60	1	28	30	2	400	129	1950	43000	80.5	43000	30	34	37	26	30	28	27
	37.5	60	1	28	35	2	400	129	1950	43000	80.5	43000	33	40	39	29	34	33	31
	37.5	60	1	28	40	2	400	129	1950	43000	80.5	43000	35	43	41	32	36	35	33
	37.5	60	1	28	45	2	400	129	1950	43000	80.5	43000	36	45	42	33	37	37	35
	37.5	60	1	28	50	2	400	129	1950	43000	80.5	43000	37	46	43	35	39	39	37
	37.5	60	1	28	60	2	400	129	1950	43000	80.5	43000	38	49	45	37	41	41	40
	37.5	60	1	28	70	2	400	129	1950	43000	80.5	43000	39	51	46	39	42	42	42
	37.5	60	1	28	80	2	400	129	1950	43000	80.5	43000	40	52	47	41	43	44	44
	37.5	60	1	28	90	2	400	129	1950	43000	80.5	43000	40	54	48	43	44	45	46
	37.5	60	1	28	100	2	400	129	1950	43000	80.5	43000	41	55	49	44	45	46	47
	37.5	60	1	28	150	2	400	129	1950	43000	80.5	43000	43	59	52	50	49	49	54
	37.5	60	1	28	200	2	400	129	1950	43000	80.5	43000	45	62	54	54	51	50	58
	37.5	60	1	28	250	2	400	129	1950	43000	80.5	43000	46	64	55	56	52	52	61
	37.5	60	1	28	300	2	400	129	1950	43000	80.5	43000	47	65	56	59	53	53	64
	37.5	60	1	28	350	2	400	129	1950	43000	80.5	43000	47	66	57	61	54	53	66
	37.5	60	1	28	400	2	400	129	1950	43000	80.5	43000	48	67	57	62	55	54	68
	37.5	60	1	28	450	2	400	129	1950	43000	80.5	43000	48	68	58	63	56	55	69
	37.5	60	1	28	500	2	400	129	1950	43000	80.5	43000	49	69	59	64	56	55	70
	37.5	60	1	28	600	2	400	129	1950	43000	80.5	43000	49	70	59	66	57	56	72
	37.5	60	1	28	700	2	400	129	1950	43000	80.5	43000	50	71	60	68	58	56	74
	37.5	60	1	28	800	2	400	129	1950	43000	80.5	43000	50	72	61	69	58	57	75
	37.5	60	1	28	900	2	400	129	1950	43000	80.5	43000	51	72	61	70	59	57	77
	37.5	60	1	28	1000	2	400	129	1950	43000	80.5	43000	51	73	61	71	59	57	78
	37.5	60	1	28	1500	2	400	129	1950	43000	80.5	43000	52	75	63	74	60	58	81
Wischers	37.5	65	0.4	0.5	0.5	3	400	160	1813	28200	54.6	39809	35	35	35	63	35	35	67
61/E/05/13	37.5	65	0.4	0.5	28.5	3	400	160	1813	28200	54.6	39809	87	144	106	142	78	79	152
	37.5	65	0.4	0.5	91.5	3	400	160	1813	28200	54.6	39809	101	161	132	155	95	96	166
	37.5	65	0.4	0.5	182.5	3	400	160	1813	28200	54.6	39809	110	170	148	162	106	106	174
	37.5	65	0.4	0.5	365.5	3	400	160	1813	28200	54.6	39809	115	177	163	170	116	114	183
	37.5	65	0.4	0.5	730.5	3	400	160	1813	28200	54.6	39809	120	183	175	177	124	121	190
	37.5	65	0.4	0.5	2190.5	3	400	160	1813	28200	54.6	39809	128	190	190	186	132	128	200
Wischers	37.5	65	0.8	0.9	0.9	3	325	156	1905	30300	48.8	38200	33	33	33	52	33	33	58
61/C/09/07	37.5	65	0.8	0.9	29	3	325	156	1905	30300	48.8	38200	73	123	90	114	75	70	132
	37.5	65	0.8	0.9	92	3	325	156	1905	30300	48.8	38200	88	139	110	126	92	86	146
	37.5	65	0.8	0.9	183	3	325	156	1905	30300	48.8	38200	91	148	122	133	103	94	155
	37.5	65	0.8	0.9	366	3	325	156	1905	30300	48.8	38200	94	155	134	140	113	101	163
	37.5	65	0.8	0.9	731	3	325	156	1905	30300	48.8	38194	97	161	143	146	121	107	171
	37.5	65	0.8	0.9	2191	3	325	156	1905	30300	48.8	38200	98	168	155	154	129	113	180