# Study on Probability Distribution and Size Effect of **Compressive and Tensile Strength of Concrete**

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コンクリートの圧縮強度と引張強度 の確率分布と寸法効果に関する研究 小 池 狹千朗 • 加 藤 善之助

In the case of calculating the probability distribution of strength of reinforced concrete members by Monte Carlo simulation by the computer, it is very important to sample the probability distribution of mechanical properties of cach materials. This study examined the probability distribution and size effect of compressive strength of three kinds of concrete cylinders and four kinds of concrete prisms and direct tensile strength of four kinds of concrete prisms and splitting tensile strength of three kinds of concrete cylinders, using four kinds of concrete mix proportions having each different maximum sizes of aggregates.

The experimental value of strength shows the probability distribution quite close to the straight line when plotted either on weibull probability paper or on normal ones, but some values are slightly apart from the straight line near the maximum and minimum experimental values. But, experimental values of coefficient of variation CV of strength of concrete show the lower

values than theoretical ones indicated by the formula  $CV = \sqrt{\frac{\Gamma(1+\frac{2}{\beta+1})}{\Gamma^2(1+\frac{1}{\beta+1})}} - 1$ , we re,

 $\beta$  is parameter related to properties of concrete and  $\Gamma$  is gamma function. Therefore, the probability distribution of its strength cannot always be expressed by the weibull distribution.

Compressive strength of concrete decreases with decrease in size of specimen, both in prism and cylinder specimen, and with increase in size of aggregate. On the other hands, tensile strength of concrete reaches the top at specimen size of 10cm both in prism and cylinder specimens, but it rather decreases when specimen size becomes smaller than 10cm.

# 1. INTRODUCTION

Study on valiability of streogth and deformation of reinforced concrete members is particularly important to discuss the structural safety. Recently, papers simulated these variabilities by Monte Carlo method have been reported by many researchers [Ref. 1 -7]. In the case of calculating size effects and the probability distribution of flexural and shear strength of reinforced concrete members by Monte Carlo simulation by the computer, sampling the probability distribution of compressive and tensile strength of concrete being one of the materials such as reinforcing bars and concrete composing reinforced concrete members has a very important meaning.

Tests and theories on size effect of compressive strength of concrete have been examined by many researchers since 1925 [8-18], while no generally accepted theories and experimental equations for predicting size effects exist at present. Generally, it is well known that the probability distribution of concrete strength follows a Weibull distribution when concrete shows a perfectly brittle fracture mode  $\lceil 19, \rangle$ 20,15 and 21], but Tanigawa, Yamada and Yokoyama showed in their experiments that the probability distribution of concrete strength could not always be expressed by a Weibull distribution [Ref.22] . Recently, making allowance for these facts, some of the failure probability models are proposed for the materials which can not be expressed by Weibull distribution [Ref. 23, 21, 18, 24 and 25], and it is expected to investigate the validity of these failure models.

On the other hand, tensible strength of concrete has a significant influence on several important physical properties such as flexural and shear cracking load and creack patterns, shear strength and bond strength of deformed bars in reinforced concrete members [Ref. 18] . Many researchers have pursued their studies on tensile strength of concrete using many kinds of test arrangment [Ref. 26-33, 34-39, 40-45]. But, researches refering to size effect as well as to the probability distribution of tensile strength of concrete in direct or indirect tensile test are not sufficient at present [Ref. 34-39]. It is necessary to pursue the reseaches on these probability distribution in order to simulate the probability distribution of flexural and shear cracking load and ultimate shear strength of reinforced concrete members by Monte Carlo technique.

This study examined size effects and the probability distribution of direct tensile strength of concrete with four kinds of maximum size of aggregate by lazy

Table 1 Outline of experimen.

tongs grips method [Ref. 40] and indirect tensile strength by cylinder splitting test, fabricating four kinds of prism specimens for direct tensile test and three kinds of concrete cylinders for splitting tensile test, and examined those of compressive strength of concrete by prism and cylinder specimens, and offered data to simulate occurence of the probability distribution of concrete strength used.

## 2. EXPERIMENTAL PROCEDURE

The experiment was carried out in accordance with the test program as shown in Table 1.

		prism specimen						cylinder specimen			prism specimen		Cubic specimen	
concrete	w/c	Compressive test		Direct tensi	e test	Compre	ssive test	Spring tensile test Test of modulus of rupture		Compressive test				
		Size	(cm) <sup>-</sup>	No.of spec.	Size (cm)	No.of spec.	Size(cm)	No.of spec.	Size(cm)	No.of spec.	Size(cm)	No.of spec.	Size(cm)	No.of spec.
10Ag.series		4.46×4.4	6×13.4		4.46×4.46×13.4		ø7.5×15		¢7.5×15		$10 \times 10 \times 40$		$10 \times 10 \times 10$	
15Ag.series		7.25×7.2	5×21.8		7.25×7.25×21.8		10,00	V 00 00	ø10 × 20	1×90 00				
20Ag.series	60	9.68×9.6	58×29.0	15	9.68×9.68×29.0		ø10 × 20 	20	φ10 × 20	20		3		6
25Ag.series		15.0×15.	0×45.0		15.0×15.0×45.0		ø15 × 30		ø15 × 30		15 × 15 × 53		15×15×15	

(1) Test Specimen

Prism tensile specimens are plain concrete prisms reduced central parallel section with enlarged ends and without reinforced ends, and prism compressive specimens have its height to lateral dimension (h/D) ratio 3.0. These specimens are shown in Fig. 1. Three



Fig. 1 Outline of prism specimens in compressive and direct tension test.

kinds of concrate cylinders,  $\phi 7.5 \times 15$ ,  $\phi 10 \times 20$  and  $\phi 15 \times 30$  cm were casted for compressive test and splitting tentile test, where  $\phi$  is diameter of cylinder.

The variables in the experiment are as follows: four different sizes of tension prism specimens (d=4. 46, 7.25, 9.68 and 15.0 cm) and three different sizes of splitting and compressive cylinder specimens ( $\phi$  = 7.5, 10.0 and 15.0 cm) were also prepared to obtain the properties of concrete used.

#### (2) Fablication and Curing of Specimen

Ordinary portland cement, Yahagi river sand and Tenryu river gravel were used for concrete. The properties of aggregates used are shown in Table 2. Mix proportions of four kinds of concrete are shown

Table	2	Properties	of	aggregate.
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Kind of	Kind of	Aggregate	Specific	Water	Fineness
concrete	aggregate	size	gravity	absorption	modulus
		(mm)		24hrs.(%)	
	river gravel	10~2.5	2.65	0.99	5.57
10Ag.series	river sand	1.2~	2.58	1.56	2.95
	river gravel	$15 \sim 5$	2.65	0.93	6.25
15Ag.series	river sand	1.2~	2.58	1.56	2.95
	river gravel	$20 \sim 5$	2.66	0.90	6.57
20Ag.series	river sand	2.5~	2.58	1.50	2.95
o= 4	river gravel	$20 \sim 5$	2.66	0.90	7.00
25Ag.series	river sand	2.5~	2.51	1.80	2.58

Kind of	Size of gravel	Water	Cement	Sand	Gravel	s/a	Design		Measured	
concrete	(mm)	$(kg/m^3)$	(kg/m³)	(kg/m³)	(kg/m³)	(°/vl)	·Air(°/vl)	Slamp(cm)	Air(°/vl)	Slamp(cm)
10Ag.series	10~2.5	230	383	659	1015	40	1.0	15	1.25	14.2
15Ag.series	$15 \sim$	220	367	708	1004	42	1.0	15	0.66	16.0
20Ag.series	20~	210	350	759	996	44	1.0	15	0.75	15.4
25Ag.series	25~	210	350	739	996	44	1.0	15	1.80	14.3

Table 3 Mix proportion of concrete.

in Table 3 and water-cement ratio (w/c) of concrete was 60% by weight. Four kins of maximum sizes of aggregate (sieve dimension=10, 15, 20 and 25 mm) were prepared as inclusion, respectively.

Prism specimens for compressive test having steel mold at both ends were cast in wood mold holizontally. Each concrete specimens were fabricated most carefull, so as to place the aggregates as inclusion in concrete molds with equal density. Cylinder specimens stored in a labolatory during 48 hours after casting, then they were remolded and cured in moisture room at a temperature of  $20^{\circ}\pm1^{\circ}$ C and a relative humidity of over 80% until just before the test during six weeks.

## (3) Method of Loading and Measurement

The loadings and supports were accomplished with the same size of plates as specimens both prisms and cylinders and spherical seats molded to the same scale as the test specimen used in comperessive test. Direct tensile test technique was used for specimens with enlarged ends to which load was applied purely by friction using four kinds of lazy tongs grips shown in Fig. 2 [Ref.40—45]. Generaly, it is more suitable for testing a large number of different sizes of specimens. Total of 240 prism specimens were tested in compressive test, 210 cylinders in compressive, 480 prisms in direct tensile and 270 cylinders in splitting, respectively.

Longitudinal strain ( $\varepsilon$ ) was measured by two strain gauge type deformation transformers attached to the specimen (meansured length=1.8D) in compressive test and was measured by wire resistance strain gauges (gauge length=60 mm) in direct tensile test.

## 3. TEST RESULT AND DISCUSSION

Table 4.1 and 4.2 show the actual dimensions of specimen after removing mold and show the test results, where "size of specimen" indicates mean value.

#### (1) Fracture Distribution

Direct tensile test specimens have a hight of three times its depth (d) in central parallel test length. The incidence of fracture was very greater in the top parts of test length in the case of PR-T-15.0 series specimens, and was very greater in the central 2d part in the case of another sizes of specimens. Johnston and



Fig. 2 Test arrangement in direct tensile test using lazy tongs grips.

Sidewell reported that the incidence of fracture, althorgh reasonably uniform, is norticeably greater in the upper part of test length [Ref. 43].

#### (2) Probability Distribution of Strength

The relations between non-failure prabability  $\ln$  (- $\ln(1-P)$ ) and strength  $\ln(F)$  obtained by four kinds of test are shown in Fig.3.1. P (failure probability corresponding to the strength of No. n counted from the smallest one) was calculated by the following formula.

## Table 4.1 Test result (1).

|  | Notation of ]   | No. of  
   
  | Size of<br>specimen  
   
   |  | Rang of<br>stress  
   | Sucingu  | :h  |  | Weibull d  | list.  
  | No   | rmal c   | list.  | Log-r   
  | ormal   | dist   |
|--|---
--
--
--
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--
--|--|--|---|--
--	---	--
---	--	
concrete	specimen	specimen
   
  | Width Depth  
   
   | Length   | (kg/cm²)   
   | M SI   |   |  | LN(·LN(1·P))   | Slope B  
  | r  | μ  | σ  | r   
  | μ   | σ  |
|  | 10-PR-C-4.46  | -   
   
  | (cm) (cm)<br>4.693 4.479   
   
   |  | 249~356  
   | (kg/cm²)(kg<br>294 3   | (/cm²) (%   |  | 9.92X- 56.83   | 0 02 8   
  | 02-0 0   | 277205   | 36 6   | -0.98   
  | 35 68   | 0 1  |
|  | 10-PR-C-7.25  |   
   
  | 7.453 7.252  
   
   |  | 99~276   
   |  | 21.8 8.7  | 790.986  | 11.20X- 62.25  | 11.2010  
  | 20-0.9   | 973249   | )26.6  | 5-0.96  
  | 15.51   | 0.1  |
|  | 10-PR-C-9.68  |   
   
  | 9.749 9.688  
   
   |  | 233~286  
   |  |   |  | 17.91X-100.07  |  
  |  |  |  |   
  |   |  |
|  | 10-PR-C-15.0  |   
   
  | 5.128 15.115   
   
   |  | 264~305  
   |  |   |  | 25.71X-145.89  |  
  |  |  |  |   
  |   |  |
|  | 15-PR-C-4.46  | 15  
   
  | 4.620 4.463  
   
   |  | $56 \sim 283$  
   |  |   |  | 5.91X-32.68  |  
  |  |  |  |   
  |   |  |
|  | 15-PR-C-7.25  | 15  
   
  | 7.411 7.235  
   
   |  | $222 \sim 269$   
   |  |   | 0.950  |  |  
  |  |  |  |   
  |   |  |
|  | 15-PR-C-9.68  |   
   
  | 9.806 9.673  
   
   |  | $202 \sim 238$   
   |  |   |  | 21.67X-117.62  |  
  |  |  |  |   
  |   |  |
|  | 15-PR-C-15.0  |   
   
  | 5.204 15.083   
   
   |  | $226 \sim 324$   
   |  |   |  | 11.47X-64.87   |  
  |  |  |  |   
  |   |  |
|  | 20-PR-C-4.46  |   
   
  | 4.614 4.481  
   
   |  | $177 \sim 252$   
   |  |   |  | 9.98X-53.83<br>20.86X-114.70   |  
  |  |  |  |   
  |   |  |
|  | 20-PR-C-7.25<br>20-PR-C-9.68  |   
   
  | 7.391 7.245  
   
   |  | 2 <u>18~263</u><br>236~261   
   |  |   |  | 36.85X-203.97  |  
  |  |  |  |   
  |   |  |
|  | 20-PR-C-15.0  |   
   
  | 5.172 15.105   
   
   |  | $230 \sim 288$   
   |  |   |  | 18.15X-101.86  |  
  |  |  |  |   
  |   |  |
|  | 25-PR-C-4.46  |   
   
  | 4.702 4.511  
   
   |  | 89~255   
   |  |   |  | 11.10X-60.86   |  
  |  |  |  |   
  |   |  |
|  | 25-PR-C-7.25  |   
   
  | 7.425 7.255  
   
   |  | 94~268   
   |  |   |  | 11.05X-60.37   |  
  |  |  |  |   
  |   |  |
|  | 25-PR-C-9.68  |   
   
  | 9.812 9.693  
   
   |  | 209~271  
   | 242 1  | 8.1 7.4   | 180.986  | 13.75X-75.96   | 13.75 12.  
  | 75-0.9   | 985 242  | 221.5  | 5-0.98  
  | 35.49   | 0.0  |
| ŀ  | 25-PR-C-15.0  | 15 1  
   
  | 5.165 15.105   
   
   | 45.00 2  | $231 \sim 304$   
   | 257 1  | 5.7 6.1   | 10.852   | 15.36X-85.73   | 15.36 14.  
  | 36-0.9   | 961 257  | 721.3  | 3-0.880   
  | 05.55   | 0.0  |
|  |   | 1   
   
  | Size of  
   
   | <u> </u>   | . [  
   | ylinder Co   | mnr   |  |  |  
  | 1  |  |  |   
  |   |  |
| Kind of  | Notation of   | No. of  
   
  | specimer   
   
   | Rang   | 2 01   
   | strength   | mpi.  |  | Weibull dist   | t.   
  | Nor  | mal di   | ist.   | Log-  
  | norma   | ıl di  |
|  |   |   
   
  | Diad Lar   
   
   | - Suit   |  
   | M SD   | CV  | T  | N(IN(AD))  | 21 0   
  |  |  |  |   
  |   |  |
| oncrete  | specimen  | specimer  
   
  | <sup>1</sup> (cm) (cm  
   
   |  |  
   | g/cm²) (kg/cm  | 2) (%)  |  | N(-LN(1-P))  |  
  | r  | μ  | σ  | r   
  | μ   | σ  |
|  | 10-CY-C-\$7.5   | 15  
   
  | 7.491 15.  
   
   |  | ~382   
   | 316 41.1   | 13.00   |  | 7.82X-45.44  |  
  |  |  |  |   
  |   |  |
|  | 10-CY-C-ø10   | 15  
   
  | 9.995 20.  
   
   |  | ~351   
   | 313 29.4   | 9.39  | 0.9801   | 0.60X · 61.35  | 10.60 9.60   
  | 0.96   | 5 313  | 35.6   | -0.955  
  | 5.740   | ).1  |
|  | 10-CY-C-ø15   | 15  
   
  | 14.989 30.   
   
   |  | ~373   
   | 329 19.9   | 6.03  | 0.9441   | 6.80X-97.86  | 16.80 15.80  
  | 0.97   | 1 330  | 23.9   | -0.977  
  | 5.800   | ).0  |
|  | 15-CY-C-ø7.5  | 15  
   
  | 7.489 15.  
   
   |  | ~330   
   | 280 20.3   |   |  | 4.07X-79.74  |  
  |  |  |  |   
  |   |  |
| orios  | 15-CY-Cø10  | 15  
   
  | 9.985 20.  
   
   |  | ~336   
   | 285 22.0   |   |  | 3.15X-74.79  |  
  |  |  |  |   
  |   |  |
|  | <u>15-CY-C-ø15</u><br>20-CY-C-ø7.5  | 15  
   
  | 14.970 30.   
   
   |  | ~367<br>~257   
   | 330 18.9<br>239 11.0   |   |  | 8.06X-105.26<br>3.38X-128.55   |  
  |  |  |  |   
  |   |  |
|  | 20-CY-C-\$10  | 20  
   
  | 7.502 15.<br>9.997 20.   
   
   |  | $\sim 300$   
   | 265 20.8   |   |  | 3.62X-76.44  |  
  |  |  |  |   
  |   |  |
|  | 20-CY-C- <i>ø</i> 15  | 20  
   
  | 14.974 30.   
   
   |  | ~352   
   | 315 21.2   |   |  | 5.65X 90.52  |  
  |  |  |  |   
  |   |  |
|  | 25-CY-C-\$7.5   | 20  
   
  | 7.508 15.  
   
   |  | ~296   
   | 254 24.8   |   |  | 0.75X-59.99  |  
  |  |  |  |   
  |   |  |
| 5 Ag.  | 25-CY-C-ø10   | 19  
   
  | 9.992 20.  
   
   |  | ~331   
   | 285 19.7   |   |  | 5.15X-86.14  |  
  |  |  |  |   
  |   |  |
|  | 25-CY-C-ø15   | 20  
   
  | 15.008 30.   
   
   |  | ~293   
   | 268 13.2   | 2 4.91  | 0.9702   | 21.62X-121.36  | 21.62 20.60  
  | 0-0.98   | 2 268  | 15.3   | -0.985  
  | 5.590   | ).05   |
| Kind of  | Notation of   | No. of  
   
  | Size of<br>specimer  
   
   | Rang   |  
   | Prism ten<br>strength  | sile  |  | Weibull dist.  |  
  | Non  | nal dis  | st.  | Log-n   
  | omal  | dist.  |
| ,  |   |   
   
  | Width Der  
   
   | th Sures   | 1 7  
   | M SD   | CV  | T  |  | 1  
  |  |  |  |   
  |   |  |
| oncrete  | specimen  | specime   
   
  | n (cm) (c  
   
   | n) (kg/c   | (Kg  
   | g/cm²)(kg/cm   |   |  | N(·LN(1·P)) S  |  
  | r  | μ  | σ  | r   
  | μ   | σ  |
|  | 10-PR-T-4.4   | 6 26  
   
  |  
   
   | 458 16.0~  |  
   |  |   |  | 6.05X-19.79  |  
  |  |  |  |   
  |   |  |
| 0 Ag.  | 10-PR-T-7.2   |   
   
  | 7 450 7  
   
   | 234 21.3~  |  
   | 24.5   1.96  | 5 7.98  | 0 97511  | 3.48X-43.61 1  | 2 10 19 10   
  |  |  |  |   
  | 2 200   | 00   |
| eries  | . DD (0)  | 5 26  
   
  |  
   
   |  |  
   |  |   |  |  |  
  |  |  |  |   
  |   |  |
| CI 100   | 10-PR-T-9.6   | 8 28  
   
  | 9.930 9.   
   
   |  |  
   | 24.2 1.80  | 7.83  | 0.98514  | 4.06X-45.291   | 4.06 13.06   
  | -0.994   | 423.32   | 2.13   | -0.993  
  | 3.190   | . 08   |
|  | 10-PR-T-15.0  | 8 28<br>0 28  
   
  | 9.930 9.<br>15.310 15.   
   
   | 060 15.6~  | -22.9 1  
   | 8.7 1.61   | 7.83<br>8.61  | 0.98514<br>0.97512   | 2.79X-37.92 1  | 4.06 13.06<br>2.79 11.79   
  | -0.994<br>-0.985   | 423.32<br>518.71   | 2.13<br>1.82   | -0.993<br>-0.989  
  | 3.190<br>2.930  | . 08<br>. 09   |
|  | 10-PR-T-15.0<br>15-PR-T-4.40  | 8 28<br>0 28<br>6 23  
   
  | 9.930 9.<br>15.310 15.<br>4.658 4.   
   
   | 060 15.6∼<br>438 15.3∼   | -22.9 1<br>-29.2 2   
   | .8.7 1.61<br>21.1 3.57   | ) 7.83<br>8.61<br>16.90   | 0.985 14<br>0.975 12<br>0.981 6  | 2.79X-37.921<br>6.35X-19.81  | 4.06 13.06<br>2.79 11.79<br>6.35 5.35  
  | -0.994<br>-0.985<br>-0.987   | 423.32<br>518.71<br>721.24   | 2.13<br>1.82<br>4.09   | -0.993<br>-0.989<br>-0.989  
  | 3.190<br>2.930<br>3.040   | . 08<br>. 09<br>. 19   |
| 5 Ag.  | 10-PR-T-15.0<br>15-PR-T-4.40<br>15-PR-T-7.2   | 8 28<br>0 28<br>6 23<br>5 22  
   
  | 9.930 9.<br>15.310 15.<br>4.658 4.<br>7.481 7.   
   
   | 060 15.6~<br>438 15.3~<br>176 20.9~  | -22.9 1<br>-29.2 2<br>-29.3 2  
   | .8.7 1.61<br>21.1 3.57<br>25.3 2.59  | 7.83<br>8.61<br>16.90<br>10.21  | 0.98514<br>0.97512<br>0.9816<br>0.98310  | 2.79X-37.92 1<br>6.35X-19.81<br>0.46X-34.28 1  | 4.06 13.06<br>2.79 11.79<br>6.35 5.35<br>0.46 9.46   
  | -0.994<br>-0.985<br>-0.987<br>-0.987   | 423.32<br>518.71<br>721.24<br>025.42   | 2.13<br>1.82<br>4.09<br>2.96   | -0.993<br>-0.989<br>-0.989<br>-0.987  
  | 3.190<br>2.930<br>3.040<br>3.230  | .08<br>.09<br>.19<br>.11   |
| 5 Ag.  | 10-PR-T-15.0<br>15-PR-T-4.40<br>15-PR-T-7.2<br>15-PR-T-9.60   | 8 28<br>0 28<br>6 23<br>5 22<br>8 26  
   
  | 9.930 9.<br>15.310 15.<br>4.658 4.<br>7.481 7.<br>9.857 9.   
   
   | 060 15.6~<br>438 15.3~<br>176 20.9~<br>560 18.7~   | -22.9 1<br>-29.2 2<br>-29.3 2<br>-28.1 2   
   | 8.7         1.61           21.1         3.57           25.3         2.59           24.0         2.50   | 7.83       8.61       16.90       10.21       10.41   | 0.98514<br>0.97512<br>0.9816<br>0.98310<br>0.99410   | 2.79X-37.92 1<br>6.35X-19.81<br>0.46X-34.28 1<br>0.36X-33.40 1   | 4.06 13.06<br>2.79 11.79<br>6.35 5.35<br>0.46 9.46<br>0.36 9.36  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.990   | 423.32<br>518.71<br>721.24<br>025.42<br>924.02   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.983  
  | 3.190<br>2.930<br>3.040<br>3.230<br>3.170   | .08<br>.09<br>.19<br>.11   |
| 5 Ag.  | 10-PR-T-15.0<br>15-PR-T-4.44<br>15-PR-T-7.25<br>15-PR-T-9.66<br>15-PR-T-15.0  | 8         28           0         28           6         23           5         22           8         26           0         27   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.  
   
   | 060 15.6~<br>438 15.3~<br>176 20.9~<br>560 18.7~<br>987 15.8~  | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1  
   | .8.7         1.61           21.1         3.57           25.3         2.59           24.0         2.50           .8.9         1.52  | 7.83         8.61         16.90         10.21         10.41         8.05  | 0.985 14<br>0.975 12<br>0.981 (<br>0.983 10<br>0.994 10<br>0.996 13  | 2.79X-37.92 1<br>6.35X-19.81<br>0.46X-34.28 1<br>0.36X-33.40 1<br>3.56X-40.33 1  | $\begin{array}{c} 4.06 \\ 2.79 \\ 11.79 \\ 6.35 \\ 5.35 \\ 0.46 \\ 9.46 \\ 0.36 \\ 9.36 \\ 3.56 \\ 12.56 \end{array}$  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.990<br>-0.989   | 423.32<br>518.71<br>721.24<br>025.42<br>924.02<br>018.91   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.987<br>-0.983<br>-0.987  
  | 3.190<br>2.930<br>3.040<br>3.230<br>3.170<br>2.940  | .08<br>.09<br>.19<br>.11<br>.12<br>.09   |
| 5 Ag.<br>eries   | 10-PR-T-15.0<br>15-PR-T-4.40<br>15-PR-T-7.2<br>15-PR-T-9.60   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   
   
  | 9.930 9.<br>15.310 15.<br>4.658 4.<br>7.481 7.<br>9.857 9.   
   
   | 060 15.6~<br>438 15.3~<br>176 20.9~<br>560 18.7~<br>987 15.8~<br>493 11.5~   | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1  
   | 8.7         1.61           21.1         3.57           25.3         2.59           24.0         2.50           8.9         1.52           7.7         3.73   | 7.83         8.61         16.90         10.21         10.41         8.05         21.10  | 0.985 14<br>0.975 12<br>0.981 (<br>0.983 10<br>0.983 10<br>0.994 10<br>0.986 12<br>0.976 4   | 2.79X-37.92 1<br>6.35X-19.81<br>0.46X-34.28 1<br>0.36X-33.40 1   | $\begin{array}{c} 4.06 \\ 2.79 \\ 11.79 \\ 6.35 \\ 5.35 \\ 0.46 \\ 9.46 \\ 0.36 \\ 9.36 \\ 3.56 \\ 12.56 \\ 4.72 \\ 3.72 \end{array}$  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.989<br>-0.990<br>-0.980   | 423.32<br>518.71<br>721.24<br>025.42<br>924.02<br>018.91<br>017.74   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.983<br>-0.987<br>-0.987<br>-0.972  
  | $ \frac{3.190}{2.930}\\ \frac{3.040}{3.230}\\ \frac{3.170}{2.940}\\ \frac{2.940}{2.850} $   | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26  |
| 5 Ag.<br>eries<br>0 Ag.  | 10-PR-T-15.0<br>15-PR-T-4.44<br>15-PR-T-7.22<br>15-PR-T-9.63<br>15-PR-T-15.0<br>20-PR-T-4.46  | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.   
   
   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ \end{array}$   | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2  
   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 7.83         8.61         16.90         010.21         010.41         28.05         321.10         710.69   | 0.985 14<br>0.975 13<br>0.981 (<br>0.983 10<br>0.994 10<br>0.996 13<br>0.976 4<br>0.996 10   | 2.79X-37.92 1<br>6.35X-19.81<br>0.46X-34.28 1<br>0.36X-33.40 1<br>3.56X-40.33 1<br>4.72X-13.97   | $\begin{array}{c} 4.06 \\ 2.79 \\ 11.79 \\ 6.35 \\ 5.35 \\ 0.46 \\ 9.46 \\ 0.36 \\ 9.36 \\ 3.56 \\ 12.56 \\ 4.72 \\ 3.72 \\ 0.09 \\ 9.09 \end{array}$  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.989<br>-0.990<br>-0.980<br>-0.993   | 423.32<br>518.71<br>721.24<br>025.42<br>924.02<br>018.91<br>017.74<br>321.22   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.983<br>-0.987<br>-0.987<br>-0.972<br>-0.986  
  | 3.190<br>2.930<br>3.040<br>3.230<br>3.170<br>2.940<br>2.850<br>3.050  | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12   |
| 5 Ag.<br>eries<br>0 Ag.  | 10-PR-T-15.(<br>15-PR-T-4.44<br>15-PR-T-7.22<br>15-PR-T-9.6(<br>15-PR-T-15.(<br>20-PR-T-4.44<br>20-PR-T-7.22<br>20-PR-T-9.6(<br>20-PR-T-9.6)  | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           8         25           0         27   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.           7.265         7.           9.913         9.           15.373         14.  
   
   | $\begin{array}{c} 060 & 15.6 \\ \hline 438 & 15.3 \\ \hline 176 & 20.9 \\ \hline 560 & 18.7 \\ \hline 987 & 15.8 \\ \hline 493 & 11.5 \\ \hline 551 & 16.4 \\ \hline 533 & 14.9 \\ \hline 977 & 14.5 \\ \end{array}$   | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1  
   | $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | 7.83         8.61         7       16.90         9       10.21         9       10.41         2       8.05         3       21.10         7       10.69         2       13.44         7       9.68   | $\begin{array}{c c} 0.985 & 1.\\ 0.975 & 1.\\ 0.981 & 0\\ 0.983 & 10\\ 0.993 & 10\\ 0.994 & 10\\ 0.986 & 1.\\ 0.976 & 2\\ 0.996 & 10\\ 0.980 & 8\\ 0.990 & 1\end{array}$   | 2.79X-37.92 1<br>6.35X-19.81<br>0.46X-34.28 1<br>0.36X-33.40 1<br>3.56X-40.33 1<br>4.72X-13.97<br>0.09X-31.29 1<br>8.02X-24.88<br>1.30X-33.32 1  | $\begin{array}{c} 4.06 \\ 2.79 \\ 11.79 \\ 6.35 \\ 5.35 \\ 0.46 \\ 9.46 \\ 0.36 \\ 9.36 \\ 12.56 \\ 4.72 \\ 3.72 \\ 0.09 \\ 9.09 \\ 8.02 \\ 7.02 \\ 1.30 \\ 10.30 \end{array}$   
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.990<br>-0.980<br>-0.987<br>-0.987<br>-0.987   | 423.32<br>518.71<br>721.24<br>025.42<br>924.02<br>018.91<br>017.74<br>321.22<br>721.13<br>218.32   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.983<br>-0.987<br>-0.987<br>-0.986<br>-0.986<br>-0.986<br>-0.990  
  | 3.190<br>2.930<br>3.040<br>3.230<br>3.170<br>2.940<br>2.850<br>3.050<br>3.040<br>2.900  | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11   |
| 5 Ag.<br>eries<br>0 Ag.<br>eries   | 10-PR-T-15.(<br>15-PR-T-4.44<br>15-PR-T-7.22<br>15-PR-T-9.6(<br>20-PR-T-4.44<br>20-PR-T-7.22<br>20-PR-T-9.6(<br>20-PR-T-9.6(<br>20-PR-T-15.(<br>25-PR-T-4.44)   | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           8         25           8         25           0         27           6         17           5         25           8         25           0         27           6         22   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.           7.265         7.           9.913         9.           15.373         14.           4.467         4.   
   
   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 76 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 620 & 15.5 \\ \end{array}$  | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1           -26.6         2  
   | $\begin{array}{c} 8.7 & 1.61 \\ 21.1 & 3.57 \\ 25.3 & 2.59 \\ 24.0 & 2.50 \\ 8.9 & 1.52 \\ 7.7 & 3.73 \\ 21.2 & 2.27 \\ 21.0 & 2.82 \\ 8.3 & 1.77 \\ 20.8 & 3.57 \end{array}$  | 7.83         8.61         7       16.90         0       10.21         0       10.41         2       8.05         3       21.10         7       10.69         2       13.44         7       9.68         7       17.15   | 0.985 1.<br>0.975 12<br>0.981 0<br>0.983 10<br>0.994 10<br>0.996 12<br>0.996 10<br>0.996 10<br>0.990 1<br>0.997 0  | $\begin{array}{c} 2.79X\cdot 37.92 \\ 6.35X\cdot 19.81 \\ 0.46X\cdot 34.281 \\ 0.36X\cdot 33.40 \\ 1 \\ 3.56X\cdot 40.33 \\ 1 \\ 4.72X\cdot 13.97 \\ 0.09X\cdot 31.291 \\ 8.02X\cdot 24.88 \\ 1.30X\cdot 33.32 \\ 1 \\ 6.23X\cdot 19.35 \end{array}$   | $\begin{array}{c} 4.06\\ 13.06\\ 2.79\\ 11.79\\ 6.35\\ 5.35\\ 0.46\\ 9.46\\ 9.36\\ 9.36\\ 3.56\\ 12.56\\ 4.72\\ 3.72\\ 0.09\\ 9.09\\ 8.02\\ 7.02\\ 1.30\\ 10.30\\ 6.23\\ 5.23\end{array}$  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.980<br>-0.980<br>-0.980<br>-0.987<br>-0.987<br>-0.982<br>-0.982   | 423.32<br>518.71<br>721.24<br>025.42<br>025.42<br>018.91<br>017.74<br>821.22<br>721.13<br>218.32<br>220.84   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00<br>4.12   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.983<br>-0.987<br>-0.972<br>-0.986<br>-0.986<br>-0.990<br>-0.988  
  | 3.190<br>2.930<br>3.040<br>3.230<br>3.170<br>2.940<br>2.850<br>3.050<br>3.040<br>2.900<br>3.020   | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.12<br>.15<br>.11  |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.  | 10-PR-T-15.1<br>15-PR-T-4.44<br>15-PR-T-7.22<br>15-PR-T-9.64<br>15-PR-T-15.0<br>20-PR-T-4.44<br>20-PR-T-7.22<br>20-PR-T-9.66<br>20-PR-T-9.66<br>20-PR-T-15.0<br>25-PR-T-4.44<br>25-PR-T-7.22  | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           8         26           0         27           6         17           5         25           8         25           0         27           6         25           25         25           26         22           5         25   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.           7.265         7.           9.913         9.           15.373         14.           4.467         4.           7.458         7.  
   
   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 76 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 987 & 15.8 \\ 551 & 16.4 \\ 553 & 14.9 \\ 977 & 14.5 \\ 620 & 15.5 \\ 177 & 14.9 \\ \end{array}$  | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1           -26.6         2           -25.8         1  
   | $\begin{array}{cccccccccccccccccccccccccccccccccccc$   | 7.83         8.61         7.6.90         10.21         10.41         2.8.05         3.21.10         7.10.69         2.13.44         7.9.68         7.17.15         14.66  | 0.985 1.<br>0.975 12<br>0.981 (<br>0.983 1(<br>0.994 10<br>0.996 12<br>0.996 10<br>0.996 10<br>0.980 8<br>0.990 1<br>0.996 7<br>0.996 7<br>0.997 (<br>0.997   | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.28 \\ 1\\ 0.36X\cdot33.40 \\ 1\\ 3.56X\cdot40.33 \\ 1\\ 4.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 8.02X\cdot24.88 \\ 8.02X\cdot24.88 \\ 1.30X\cdot33.32 \\ 1\\ 5.23X\cdot19.35 \\ 7.39X\cdot22.37 \end{array}$   | $\begin{array}{cccccccccccccccccccccccccccccccccccc$  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.990<br>-0.980<br>-0.993<br>-0.993<br>-0.987<br>-0.982<br>-0.982<br>-0.975  
  | $\begin{array}{c} 4 \\ 23.32 \\ \overline{5} \\ 18.7 \\ 721.24 \\ 025.42 \\ 025.42 \\ 024.02 \\ 018.9 \\ 017.7 \\ 321.22 \\ 721.15 \\ 218.32 \\ 220.84 \\ 519.45 \end{array}$  | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00<br>4.12<br>3.28   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.983<br>-0.987<br>-0.972<br>-0.986<br>-0.986<br>-0.990<br>-0.988<br>-0.988<br>-0.988   | $\begin{array}{c} 3.190 \\ 2.930 \\ 3.040 \\ 3.230 \\ 3.170 \\ 2.940 \\ 2.850 \\ 3.050 \\ 3.050 \\ 3.040 \\ 2.900 \\ 3.020 \\ 2.960 \end{array}$  
   | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16   |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.  | 10-PR.T-15.<br>15-PR.T-4.41<br>15-PR.T-7.22<br>15-PR.T-9.66<br>20-PR.T-15.0<br>20-PR.T-15.0<br>20-PR.T-15.0<br>20-PR.T-15.0<br>20-PR.T-15.0<br>25-PR.T-4.44<br>25-PR.T-7.22<br>25-PR.T-9.66   | 8         28           0         28           6         23           5         22           8         26           0         27           6         25           8         25           0         27           6         22           5         25           8         26   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.           7.265         7.           9.913         9.           15.373         14.           4.467         4.           7.458         7.           9.891         9.   
   
   | $\begin{array}{c} 060 \\ 15.6 \\ 438 \\ 15.3 \\ 176 \\ 20.9 \\ 560 \\ 18.7 \\ 987 \\ 15.8 \\ 493 \\ 11.5 \\ 551 \\ 16.4 \\ 533 \\ 14.9 \\ 977 \\ 14.5 \\ 620 \\ 15.5 \\ 177 \\ 14.9 \\ 526 \\ 16.3 \\ \end{array}$   | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1           -26.6         2           -25.8         1           -26.3         2  
   | $\begin{array}{c} 8.7 & 1.61 \\ 21.1 & 3.57 \\ 25.3 & 2.59 \\ 24.0 & 2.50 \\ 8.9 & 1.52 \\ 7.7 & 3.73 \\ 21.2 & 2.27 \\ 21.0 & 2.82 \\ 8.3 & 1.77 \\ 9.4 & 2.84 \\ 22.2 & 2.57 \end{array}$  | 7.83           8.61           16.90           10.21           10.41           8.05           21.10           10.69           13.44           9.68           17.15           14.66           11.60   | 0.985 14<br>0.975 12<br>0.981 6<br>0.983 10<br>0.994 10<br>0.996 12<br>0.996 10<br>0.996 10<br>0.980 8<br>0.990 1<br>0.980 7<br>0.990 1<br>0.997 6<br>0.970 7  | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 10.36X\cdot33.401 \\ 0.36X\cdot33.401 \\ 3.56X\cdot40.331 \\ 4.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 8.02X\cdot24.88 \\ 1.30X\cdot33.321 \\ 6.23X\cdot19.35 \\ 7.39X\cdot22.37 \\ 3.26X\cdot29.17 \end{array}$  | $\begin{array}{c} 4.06 \\ 13.06 \\ 2.79 \\ 11.79 \\ 6.35 \\ 5.35 \\ 0.46 \\ 9.46 \\ 9.36 \\ 9.36 \\ 1.56 \\ 12.56 \\ 4.72 \\ 3.72 \\ 0.09 \\ 9.09 \\ 9.09 \\ 8.02 \\ 7.09 \\ 8.02 \\ 7.09 \\ 6.23 \\ 5.23 \\ 7.39 \\ 6.39 \\ 9.26 \\ 8.26 \end{array}$   
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.990<br>-0.980<br>-0.993<br>-0.987<br>-0.982<br>-0.982<br>-0.975<br>-0.985   | $\begin{array}{c} 4 \\ 23.32 \\ 5 \\ 18.7 \\ 172 \\ 1.24 \\ 025.42 \\ 025.42 \\ 024.02 \\ 018.9 \\ 017.7 \\ 321.22 \\ 721.13 \\ 218.32 \\ 220.84 \\ 519.43 \\ 022.22 \end{array}$  | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00<br>4.12<br>3.28<br>2.91   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.987<br>-0.983<br>-0.987<br>-0.986<br>-0.986<br>-0.990<br>-0.988<br>-0.988<br>-0.988<br>-0.983  
  | $\begin{array}{r} 3.190 \\ 2.930 \\ 3.040 \\ 3.230 \\ 3.170 \\ 2.940 \\ 2.850 \\ 3.050 \\ 3.050 \\ 3.040 \\ 2.900 \\ 3.020 \\ 2.960 \\ 3.090 \end{array}$   | .08<br>.09<br>.11<br>.12<br>.09<br>.26<br>.12<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13  |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.  | 10-PR-T-15.1<br>15-PR-T-4.44<br>15-PR-T-7.22<br>15-PR-T-9.64<br>15-PR-T-15.0<br>20-PR-T-4.44<br>20-PR-T-7.22<br>20-PR-T-9.66<br>20-PR-T-9.66<br>20-PR-T-15.0<br>25-PR-T-4.44<br>25-PR-T-7.22  | 8         28           0         28           6         23           5         22           8         26           0         27           6         25           8         25           0         27           6         22           5         25           8         26   
   
  | $\begin{array}{c} 9.930 \ 9.\\ 15.310 \ 15.\\ 4.658 \ 4.\\ 7.481 \ 7.\\ 9.857 \ 9.\\ 15.284 \ 14.\\ 4.713 \ 4.\\ 7.265 \ 7.\\ 9.913 \ 9.\\ 15.373 \ 14.\\ 4.467 \ 4.\\ 7.458 \ 7.\\ 9.891 \ 9.\\ 15.353 \ 15.\\ \end{array}$   
   
   | $\begin{array}{c} 060 \\ 15.6 \\ 438 \\ 15.3 \\ 176 \\ 20.9 \\ 560 \\ 18.7 \\ 987 \\ 15.8 \\ 493 \\ 11.5 \\ 551 \\ 16.4 \\ 533 \\ 14.9 \\ 977 \\ 14.5 \\ 620 \\ 15.5 \\ 177 \\ 14.9 \\ 526 \\ 16.3 \\ \end{array}$   | $\begin{array}{c} -22.9 & 1 \\ -29.2 & 2 \\ -29.3 & 2 \\ -29.3 & 2 \\ -28.1 & 2 \\ -21.5 & 1 \\ -23.6 & 1 \\ -24.9 & 2 \\ -26.6 & 2 \\ -22.0 & 1 \\ -26.6 & 2 \\ -25.8 & 1 \\ -26.3 & 2 \\ -24.1 & 1 \end{array}$  
   | $\begin{array}{c} 8.7 & 1.61 \\ 21.1 & 3.57 \\ 55.3 & 2.59 \\ 44.0 & 2.50 \\ 8.9 & 1.52 \\ 7.7 & 3.73 \\ 21.2 & 2.27 \\ 11.0 & 2.82 \\ 8.3 & 1.77 \\ 20.8 & 3.57 \\ 9.4 & 2.84 \\ 22.2 & 2.57 \\ 9.0 & 1.86 \\ \end{array}$  | 7.83         8.61         16.90         10.21         10.41         8.05         21.10         10.69         21.10         10.69         13.44         9.68         17.15         14.66         11.60         9.75  | 0.985 14<br>0.975 12<br>0.981 6<br>0.983 10<br>0.994 10<br>0.996 12<br>0.996 10<br>0.996 10<br>0.980 8<br>0.990 1<br>0.980 7<br>0.990 1<br>0.997 6<br>0.970 7  | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.28 \\ 1\\ 0.36X\cdot33.40 \\ 1\\ 3.56X\cdot40.33 \\ 1\\ 4.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 8.02X\cdot24.88 \\ 8.02X\cdot24.88 \\ 1.30X\cdot33.32 \\ 1\\ 5.23X\cdot19.35 \\ 7.39X\cdot22.37 \end{array}$   | $\begin{array}{c} 4.06 \\ 13.06 \\ 2.79 \\ 11.79 \\ 6.35 \\ 5.35 \\ 0.46 \\ 9.46 \\ 9.36 \\ 9.36 \\ 1.56 \\ 12.56 \\ 4.72 \\ 3.72 \\ 0.09 \\ 9.09 \\ 9.09 \\ 8.02 \\ 7.09 \\ 8.02 \\ 7.09 \\ 6.23 \\ 5.23 \\ 7.39 \\ 6.39 \\ 9.26 \\ 8.26 \end{array}$   
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.990<br>-0.980<br>-0.993<br>-0.987<br>-0.982<br>-0.982<br>-0.975<br>-0.985   | $\begin{array}{c} 4 \\ 23.32 \\ 5 \\ 18.7 \\ 172 \\ 1.24 \\ 025.42 \\ 025.42 \\ 024.02 \\ 018.9 \\ 017.7 \\ 321.22 \\ 721.13 \\ 218.32 \\ 220.84 \\ 519.43 \\ 022.22 \end{array}$  | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00<br>4.12<br>3.28<br>2.91   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.987<br>-0.983<br>-0.987<br>-0.986<br>-0.986<br>-0.990<br>-0.988<br>-0.988<br>-0.988<br>-0.983  
  | $\begin{array}{r} 3.190 \\ 2.930 \\ 3.040 \\ 3.230 \\ 3.170 \\ 2.940 \\ 2.850 \\ 3.050 \\ 3.050 \\ 3.040 \\ 2.900 \\ 3.020 \\ 2.960 \\ 3.090 \end{array}$   | .08<br>.09<br>.11<br>.12<br>.09<br>.26<br>.12<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13  |
| 5 Ag.<br>eries<br>10 Ag.<br>eries<br>15 Ag.<br>eries   | 10-PR-T-15.0<br>15-PR-T-4.44<br>15-PR-T-7.22<br>15-PR-T-9.60<br>20-PR-T-15.0<br>20-PR-T-9.60<br>20-PR-T-15.0<br>20-PR-T-15.0<br>25-PR-T-9.60<br>25-PR-T-9.60<br>25-PR-T-9.60  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.           7.265         7.           9.913         9.           15.373         14.           4.467         4.           4.467         4.           9.891         9.           15.353         15.           Size of         Size of  
   
   | 060 15.6<br>438 15.3<br>176 20.9<br>560 18.7<br>987 15.8<br>493 11.5<br>551 16.4<br>533 14.9<br>977 14.5<br>620 15.5<br>177 14.9<br>526 16.3<br>067 14.6<br>Rang   | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1           -26.6         2           -25.8         1           -26.3         2           -24.1         1  
   | $\begin{array}{c} 8.7 & 1.61 \\ 1.1 & 3.57 \\ 5.3 & 2.59 \\ 24.0 & 2.50 \\ 8.9 & 1.52 \\ 7.7 & 3.73 \\ 21.2 & 2.27 \\ 1.0 & 2.82 \\ 8.3 & 1.77 \\ 9.0 & 8.35 \\ 7.9.4 & 2.84 \\ 22.2 & 2.57 \\ 9.0 & 1.86 \\ \hline \end{array}$   | 7.83           8.61           16.90           10.21           10.41           2.805           2.10           2.110           10.41           2.10           11.41           2.110           11.44           9.68           17.15           14.66           11.60           9.75   | 0.985 14<br>0.975 12<br>0.981 6<br>0.983 10<br>0.994 10<br>0.996 12<br>0.996 10<br>0.996 10<br>0.980 8<br>0.990 1<br>0.980 7<br>0.990 1<br>0.997 6<br>0.970 7  | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 10.36X\cdot33.401 \\ 0.36X\cdot33.401 \\ 3.56X\cdot40.331 \\ 4.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 8.02X\cdot24.88 \\ 1.30X\cdot33.321 \\ 6.23X\cdot19.35 \\ 7.39X\cdot22.37 \\ 3.26X\cdot29.17 \end{array}$  | $\begin{array}{c} 4.06 & [13.06 \\ 2.79 & [11.79 \\ 6.35 & 5.35 \\ 0.46 & 9.46 \\ 0.36 & 9.36 \\ 3.56 & [12.56 \\ 2.70 \\ 9.90 \\ 9.09 \\ 9.09 \\ 8.02 \\ 7.02 \\ 1.30 & [10.30 \\ 6.23 \\ 5.23 \\ 7.39 \\ 6.39 \\ 9.26 \\ 8.26 \\ 0.97 \\ 9.97 \\ 9.97 \\ \end{array}$  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.990<br>-0.980<br>-0.993<br>-0.982<br>-0.975<br>-0.985<br>-0.964   | $\begin{array}{c} 4 \\ 23.32 \\ 5 \\ 18.7 \\ 172 \\ 1.24 \\ 025.42 \\ 025.42 \\ 024.02 \\ 018.9 \\ 017.7 \\ 321.22 \\ 721.13 \\ 218.32 \\ 220.84 \\ 519.43 \\ 022.22 \end{array}$  | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00<br>4.12<br>3.28<br>2.91<br>2.17   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.986<br>-0.986<br>-0.986<br>-0.990<br>-0.988<br>-0.982<br>-0.982<br>-0.983<br>-0.966  
  | $\begin{array}{r} 3.190 \\ 2.930 \\ 3.040 \\ 3.230 \\ 3.170 \\ 2.940 \\ 2.850 \\ 3.050 \\ 3.050 \\ 3.040 \\ 2.900 \\ 3.020 \\ 2.960 \\ 3.090 \end{array}$   | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11   |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.<br>eries   | 10-PR.T-15.<br>15-PR.T-4.41<br>15-PR.T-7.22<br>15-PR.T-9.66<br>20-PR.T-15.0<br>20-PR.T-15.0<br>20-PR.T-15.0<br>20-PR.T-15.0<br>20-PR.T-15.0<br>25-PR.T-4.44<br>25-PR.T-7.22<br>25-PR.T-9.66   | 8         28           0         28           6         23           5         22           8         26           0         27           6         25           8         25           0         27           6         22           5         25           8         26   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.           4.713         4.           7.265         7.           9.913         9.           15.373         14.           4.467         4.           9.858         9.891           15.353         15.           Size of Specime   
   
   | 060 15.6<br>438 15.3<br>176 20.9<br>560 18.7<br>987 15.8<br>493 11.5<br>551 16.4<br>551 16.4<br>551 16.4<br>553 14.9<br>977 14.5<br>620 15.5<br>177 14.9<br>526 16.3<br>067 14.6<br>Rang<br>stree  | -22.9         1           -29.2         2           -29.3         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1           -26.6         2           -25.8         1           -26.3         2           -24.1         1           g of         Ss  
   | 8.7         1.61           11.1         3.57           25.3         2.59           24.0         2.50           8.9         1.52           7.7         3.73           21.2         2.27           11.0         2.82           8.3         1.77           0.8         3.57           9.4         2.84           22.2         2.57           9.0         1.86           Cylinder sp         strengt   | 7.83           8.61           16.90           10.21           10.41           28.05           21.10           10.41           28.05           21.10           10.41           28.05           21.10           10.41           28.05           21.10           13.44           9.68           17.15           14.66           11.60           9.75           litting   | 0.985 14<br>0.975 12<br>0.981 (0<br>0.983 10<br>0.994 10<br>0.986 12<br>0.976 4<br>0.996 10<br>0.996 10<br>0.990 1<br>0.990 1<br>0.997 (0<br>0.991 0<br>0.991 0<br>0.993 10  | 2.79X.37.92 1<br>6.35X.19.81<br>0.46X.34.281<br>0.36X.33.40 1<br>3.56X.40.33 1<br>4.72X.13.97<br>0.09X.31.29 1<br>8.02X.24.88<br>1.30X.24.88<br>7.39X.22.37<br>9.26X.29.17<br>0.97X.32.81 1<br>Weibull dis   | 4.06 13.06<br>2.79 11.79<br>6.35 5.35<br>0.46 9.46<br>0.36 9.36<br>3.56 12.56<br>4.72 3.72<br>0.09 9.09<br>8.02 7.02<br>1.30 10.30<br>6.23 5.23<br>7.39 6.39<br>9.26 8.26<br>0.97 9.97<br>st.  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.990<br>-0.980<br>-0.993<br>-0.982<br>-0.975<br>-0.985<br>-0.964   | 423.32<br>518.71<br>721.24<br>025.42<br>924.02<br>018.91<br>017.74<br>321.22<br>721.13<br>218.32<br>220.84<br>519.43<br>922.22<br>419.12   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00<br>4.12<br>3.28<br>2.91<br>2.17   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.986<br>-0.986<br>-0.986<br>-0.990<br>-0.988<br>-0.982<br>-0.982<br>-0.983<br>-0.966  
  | 3.190<br>2.930<br>3.040<br>3.230<br>3.170<br>2.940<br>2.850<br>3.050<br>3.050<br>3.020<br>2.900<br>3.020<br>2.960<br>3.020<br>2.960<br>3.090<br>2.940   | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11   |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.<br>eries<br>Xind of  | 10-PR-T-15.0<br>15-PR-T-4.44<br>15-PR-T-7.22<br>15-PR-T-9.60<br>20-PR-T-15.0<br>20-PR-T-9.60<br>20-PR-T-15.0<br>20-PR-T-15.0<br>25-PR-T-9.60<br>25-PR-T-9.60<br>25-PR-T-9.60  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   
   
  | 9.930 9.<br>15.310 15.<br>4.658 4.<br>7.481 7.<br>9.857 9.<br>15.284 14.<br>4.713 4.<br>7.265 7.<br>9.913 9.<br>15.373 14.<br>4.467 4.<br>7.458 7.<br>9.891 9.<br>15.353 15.<br>Size of<br>Specime<br>Diaø Len   
   
   | 060 15.6<br>438 15.3<br>176 20.9<br>560 18.7<br>987 15.8<br>493 11.5<br>551 16.4<br>553 14.9<br>977 14.5<br>620 15.5<br>177 14.9<br>526 16.3<br>067 14.6<br>8<br>8<br>8<br>8<br>9<br>9<br>17 14.6<br>8<br>19<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10<br>10   | -22.9         1           -29.2         2           -29.3         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -26.3         2           -26.3         2           -24.1         1           -26.3         2           -24.1         1           -26.3         2           -24.1         1           -26.3         2           -24.1         1           -26.3         2           -24.1         1  
   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 7.83           8.61           16.90           10.21           10.121           10.41           8.05           21.10           10.69           13.44           9.68           17.15           14.66           9.75           litting           h           CV  | 0.985 14<br>0.975 12<br>0.981 (0<br>0.983 10<br>0.994 10<br>0.986 12<br>0.976 4<br>0.996 10<br>0.996 10<br>0.990 1<br>0.990 1<br>0.997 (0<br>0.991 0<br>0.991 0<br>0.993 10  | 2.79X.37.92 1<br>6.35X.19.81<br>0.46X.34.281<br>0.36X.33.40 1<br>3.56X.40.33 1<br>4.72X.13.97<br>0.09X.31.29 1<br>8.02X.24.88<br>1.30X.24.88<br>7.39X.22.37<br>9.26X.29.17<br>0.97X.32.81 1<br>Weibull dis   | 4.06 13.06<br>2.79 11.79<br>6.35 5.35<br>0.46 9.46<br>0.36 9.36<br>3.56 12.56<br>4.72 3.72<br>0.09 9.09<br>8.02 7.02<br>1.30 10.30<br>6.23 5.23<br>7.39 6.39<br>9.26 8.26<br>0.97 9.97<br>st.  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.989<br>-0.990<br>-0.980<br>-0.993<br>-0.982<br>-0.975<br>-0.985<br>-0.964   | 423.32<br>518.71<br>721.24<br>025.42<br>924.02<br>018.91<br>017.74<br>321.22<br>721.13<br>218.32<br>220.84<br>519.43<br>922.22<br>419.12   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00<br>4.12<br>3.28<br>2.91<br>2.17   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.986<br>-0.986<br>-0.986<br>-0.990<br>-0.988<br>-0.982<br>-0.982<br>-0.983<br>-0.966  
  | 3.190<br>2.930<br>3.040<br>3.230<br>3.170<br>2.940<br>2.850<br>3.050<br>3.050<br>3.020<br>2.900<br>3.020<br>2.960<br>3.020<br>2.960<br>3.090<br>2.940   | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11   |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.<br>eries<br>Xind of<br>concrete  | 10-PR.T.15.(<br>15-PR.T.4.44<br>15-PR.T.7.21<br>15-PR.T.9.61<br>20-PR.T.4.44<br>20-PR.T.7.22<br>20-PR.T.4.44<br>20-PR.T.7.22<br>20-PR.T.15.(<br>25-PR.T.4.44<br>25-PR.T.9.61<br>25-PR.T.9.61<br>25-PR.T.9.61<br>25-PR.T.15.(<br>Notation of<br>specimen   | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           8         25           0         27           6         22           5         25           0         27           6         22           5         25           0         25           No. of         specimer   
   
  | 9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.           7.265         7.           9.913         9.           15.373         14.           4.467         4.           7.458         7.           9.891         9.           15.353         15.           Size of         Specime           Dia\$         Len           10.352         Len           11.333         Len  
   
   | 0600 15.6~<br>438 15.3~<br>176 20.9~<br>560 18.7~<br>987 15.8~<br>987 15.8~<br>1987 15.8~<br>1987 15.8~<br>1987 15.8~<br>1987 15.8~<br>1987 15.8~<br>1987 15.8~<br>10.4~<br>553 14.9~<br>977 14.5~<br>526 16.3~<br>067 14.6~<br>stret<br>gth<br>m) (kg,  | -22.9         1           -29.2         2           -29.3         2           -29.3         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1           -26.6         2           -22.0         1           -26.6         2           -26.3         2           -24.1         1           g of         S           S         N           /(rur <sup>2</sup> )         N  
   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 7.83           8.61           16.90           0.10.21           10.41           2.8.05           3.21.10           10.69           2.13.44           9.68           17.15           14.66           11.60           9.75           litting           h           CV           (%)   | 0.985 14<br>0.975 12<br>0.981 (0<br>0.983 10<br>0.994 10<br>0.996 12<br>0.976 4<br>0.996 10<br>0.986 12<br>0.976 4<br>0.996 10<br>0.980 12<br>0.990 12<br>0.990 12<br>0.990 12<br>0.991 5<br>0.991 5<br>0.991 5<br>0.991 5<br>0.993 10<br>0.991 5<br>0.993 10<br>0.993 10<br>0.991 5<br>0.991 5<br>0.9915<br>0.991 5<br>0.991 5      | 2.79X.37.92 1<br>6.35X.19.81<br>0.46X.34.28 1<br>0.36X.33.40 1<br>3.56X.40.33 1<br>4.72X.13.97<br>0.09X.31.29 1<br>8.02X.24.88<br>7.39X.22.37<br>9.26X.29.17<br>0.97X.32.81 1<br>Weibull dis<br>LN(-LN(1-P))   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.992<br>-0.987<br>-0.982<br>-0.985<br>-0.985<br>-0.985<br>-0.986<br>-0.964<br>Norr   
   | $\begin{array}{c} 423.32\\ \hline 18.7\\ \hline 721.2\\ \hline 925.4\\ \hline 921.1\\ \hline 921.1\\ \hline 921.2\\ \hline 921.1\\ \hline 921.2\\ \hline 921.1\\ \hline 922.2\\ \hline 922.2$ | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 3.28\\ 2.91\\ 2.17\\ \text{st.} \end{array}$  | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.987<br>-0.987<br>-0.986<br>-0.986<br>-0.990<br>-0.988<br>-0.988<br>-0.982<br>-0.983<br>-0.983<br>-0.966<br>Log-n<br>r   | 3. 190           2. 930           3. 040           3. 040           3. 230           3. 170           2. 940           2. 940           2. 940           2. 940           2. 940           3. 050           3. 050           3. 040           2. 900           3. 020           2. 960           3. 090           0.900           0000  | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.15<br>.11<br>.13<br>.11<br>dist   |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.<br>eries<br>Xind of<br>concrete<br>10 Ag.  | 10-PR.T.15.(<br>15-PR.T.4.44<br>15-PR.T.7.22<br>15-PR.T.9.6i<br>20-PR.T.9.6i<br>20-PR.T.9.6i<br>20-PR.T.9.6i<br>20-PR.T.9.6i<br>25-PR.T.4.44<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           0         27           6         22           5         25           0         27           6         22           5         25           0         27           6         22           5         25           8         26           0         25           No. of         speciment           25         25   
   
  | 9.930 9.<br>15.310 15.<br>4.658 4.<br>7.481 7.<br>9.857 9.<br>15.284 14.<br>4.713 4.<br>7.265 7.<br>9.913 9.<br>15.373 14.<br>4.467 4.<br>7.458 7.<br>9.891 9.<br>15.353 15.<br>Size of<br>Specime<br>Diaø Len<br>(cm) (c<br>7.50 15   
   
   | 060 15.6<br>438 15.3<br>176 20.9<br>560 18.7<br>987 15.8<br>493 11.5<br>551 16.4<br>551 16.4<br>551 16.4<br>551 16.4<br>551 16.4<br>552 16.3<br>067 14.6<br>14.9<br>977 14.9<br>526 16.3<br>067 14.6<br>14.9<br>14.9<br>14.9<br>14.9<br>14.9<br>14.9<br>14.9<br>14.9   | -22.9         1           -29.2         2           -29.3         2           -29.3         2           -28.1         2           -28.1         2           -28.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1           -26.6         2           -25.8         1           -26.6         2           -24.1         1           g of         5           Ss         N           /cm²)         (k           ~38.1         2   
   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 7.83           8.61           16.90           0.10.21           0.10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.69           11.60           17.15           14.66           11.60           9.75           litting           h           CV           (%)           4           15.89   | 0.985 14<br>0.975 12<br>0.981 (0.983 10<br>0.983 10<br>0.994 10<br>0.986 12<br>0.996 10<br>0.976 4<br>0.996 10<br>0.980 10<br>0.976 (0.990 1<br>0.967 (0.991 2<br>0.963 10<br>r I<br>0.954   | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 1\\ 3.56X\cdot40.331 \\ 4.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 3.62X\cdot24.88 \\ 1\\ 3.02X\cdot24.88 \\ 1\\ 3.02X\cdot24.88 \\ 1\\ 3.02X\cdot24.88 \\ 1\\ 3.02X\cdot24.88 \\ 1\\ 3.02X\cdot24.81 \\ 1\\ 3.02X\cdot24$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | -0.994<br>-0.985<br>-0.986<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.992<br>-0.985<br>-0.992<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.986<br>-0.986<br>-0.966   
   | $\begin{array}{c} \begin{array}{c} 123.3(2)\\ \hline 18.7)\\ \hline 18.7)\\ \hline 21.2(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 221.8(2)\\ \hline 2$   | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 3.28\\ 2.91\\ 2.17\\ \text{st.}\\ \sigma\\ 4.96\end{array}$   | -0.993<br>-0.989<br>-0.989<br>-0.987<br>-0.987<br>-0.987<br>-0.986<br>-0.986<br>-0.998<br>-0.988<br>-0.988<br>-0.982<br>-0.983<br>-0.966<br>Log-n<br>r<br>-0.981   | 3.190           2.930           3.040           3.040           3.230           3.170           3.230           3.170           2.940           2.940           2.940           2.940           2.940           2.940           2.940           2.900           3.020           2.960           3.090           2.960           3.090           00mal           .9900           .9900           3.090           .9900           3.090           .9900           3.090           .9900<  | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11<br>dist   |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.<br>eries<br>Kind of<br>concrete  | 10-PR.T.15.(<br>15-PR.T.4.44<br>15-PR.T.7.21<br>15-PR.T.9.61<br>20-PR.T.4.44<br>20-PR.T.7.22<br>20-PR.T.4.44<br>20-PR.T.7.22<br>20-PR.T.15.(<br>25-PR.T.4.44<br>25-PR.T.9.61<br>25-PR.T.9.61<br>25-PR.T.9.61<br>25-PR.T.15.(<br>Notation of<br>specimen   | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           8         25           0         27           6         22           5         25           0         27           6         22           5         25           0         25           No. of         specimer   
   
  | 9.930 9.<br>15.310 15.<br>4.658 4.<br>7.481 7.<br>9.857 9.<br>15.284 14.<br>4.713 4.<br>7.265 7.<br>9.913 9.<br>15.373 14.<br>4.467 4.<br>7.458 7.<br>9.891 9.<br>15.353 15.<br>Size of<br>Specime<br>Diaø Len<br>(cm) (c<br>7.50 15   
   
   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 5620 & 15.5 \\ 16.4 \\ 717 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 14.5$     | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -26.6         2           -24.1         1           -26.3         2           -24.1         1           g of         5           -38.1         2           -33.4         2   
   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | 0.985 14<br>0.975 12<br>0.981 (<br>0.983 1(<br>0.983 1(<br>0.984 1(<br>0.986 12)<br>0.976 4<br>0.996 1(<br>0.986 12)<br>0.976 (<br>0.990 1<br>0.967 (<br>0.991 2)<br>0.963 1(<br>r I<br>0.954 (<br>0.988 1   | 2.79X.37.92 1<br>6.35X.19.81<br>0.46X.34.28 1<br>0.36X.33.40 1<br>3.56X.40.33 1<br>4.72X.13.97<br>0.09X.31.29 1<br>8.02X.24.88<br>7.39X.22.37<br>9.26X.29.17<br>0.97X.32.81 1<br>Weibull dis<br>LN(-LN(1-P))   | $\begin{array}{c} 4.06 & 13.06 \\ 2.79 & 11.79 \\ 6.35 & 5.35 \\ 0.46 & 9.46 \\ 0.36 & 9.36 \\ 3.56 & 12.56 \\ 4.72 & 3.72 \\ 0.09 & 9.09 \\ 8.02 & 7.02 \\ 1.30 & 10.30 \\ 6.23 & 5.23 \\ 7.39 & 6.39 \\ 9.26 & 8.26 \\ 0.97 & 9.97 \\ \text{st.} \end{array}$  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.993<br>-0.986<br>-0.997<br>-0.977<br>-0.977<br>-0.976<br>-0.976<br>-0.977<br>-0.966<br>-0.977   | $\begin{array}{c} \begin{array}{c} \begin{array}{c} 123.3(2)\\ \hline 18.7]\\ \hline 18.7]\\ \hline 21.2(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 225.4(2)\\ \hline 221.1(2)\\ \hline 221.1(2)1.1(2)\\ \hline 221.1(2)\\ \hline 221.1(2)1.1(2)\\ \hline 221.1(2)1.1(2)\\ \hline 22$   | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 3.28\\ 2.91\\ 2.17\\ \text{st.}\\ \sigma\\ \\ \sigma\\ 4.96\\ 3.00 \end{array}$   | 0.993<br>0.989<br>0.989<br>0.987<br>0.987<br>0.983<br>0.987<br>0.986<br>0.986<br>0.986<br>0.986<br>0.982<br>0.986<br>0.982<br>0.988<br>0.982<br>0.988<br>0.982<br>0.988<br>0.982<br>0.988<br>0.982<br>0.988<br>0.982<br>0.988<br>0.982<br>0.988<br>0.982<br>0.988<br>0.982<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.9888<br>0.988<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9880<br>0.9                      | 3. 190         2. 930         3. 040         2. 930         3. 040         3. 230         3. 170         2. 940         2. 850         3. 050         2. 940         2. 850         3. 050         2. 940         2. 960         3. 020         2. 960         3. 020         0. 940         0.
940         0. 940         0. 940         0. 940         0. 940         0. 94  | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11<br>.09<br>.16<br>.13<br>.11<br>.11<br>  |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.<br>eries<br>Xind of<br>concrete<br>10 Ag.<br>series  | 10-PR.T.15.<br>15-PR.T.4.4<br>15-PR.T.7.2<br>15-PR.T.7.2<br>20-PR.T.4.4<br>20-PR.T.7.2<br>20-PR.T.9.6<br>20-PR.T.9.6<br>20-PR.T.9.6<br>25-PR.T.4.<br>25-PR.T.9.6<br>25-PR.T.9.6<br>25-PR.T.9.6<br>25-PR.T.9.6<br>25-PR.T.9.6<br>10-CY-SP-47.5<br>10-CY-SP-47.5  | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           0         27           6         22           5         25           8         26           0         25           8         26           0         25           8         26           0         25           8         26           0         25  
   
  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  
   
   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 5620 & 15.5 \\ 16.4 \\ 717 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 14.5$     | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  
   | 8.7         1.61           11.1         3.57           25.3         2.59           24.0         2.60           8.9         1.52           7.7         3.73           1.2         2.27           1.0         2.82           8.3         1.77           0.0         3.57           9.0         1.86           Cylinder sp<br>strengt           M         SD           g/cm/)(kg/cm           6.7         4.24           2.57   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | 0.985 14<br>0.975 13<br>0.981 (0.983 10<br>0.994 11<br>0.986 13<br>0.996 14<br>0.996 14<br>0.996 10<br>0.990 10<br>0.997 (0.990 10<br>0.967 (0.991 0)<br>0.967 (0.991 0)<br>0.963 10<br>r I<br>0.958 1<br>0.988 1<br>0.988 1   | 2.79X-37.92 1<br>6.35X-19.81<br>0.46X-34.281<br>1.356X-40.33 1<br>4.72X-13.97<br>0.09X-31.29 1<br>8.02X-24.88<br>1.30X-33.32 1<br>5.23X-19.35<br>6.23X-19.35<br>6.23X-19.35<br>7.39X-22.37<br>9.26X-29.17<br>0.97X-32.81 1<br>Weibull dis<br>C.N(-LN(1-P))<br>6.94X-23.24<br>2.15X-41.71 1   | $\begin{array}{c} 4.06 & 13.06 \\ 2.79 & 11.79 \\ 6.35 & 5.35 \\ 0.46 & 9.46 \\ 0.36 & 9.36 \\ 3.56 & 12.56 \\ 4.72 & 3.72 \\ 0.09 & 9.09 \\ 8.02 & 7.02 \\ 1.30 & 10.30 \\ 6.23 & 5.23 \\ 7.39 & 6.39 \\ 9.26 & 8.26 \\ 0.97 & 9.97 \\ \text{st.} \end{array}$  
  | -0.994<br>-0.985<br>-0.987<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.992<br>-0.987<br>-0.977<br>-0.977<br>-0.976<br>-0.977<br>-0.966<br>-0.977<br>-0.960   | $\begin{array}{c} \begin{array}{c} \begin{array}{c} 123.32\\ \hline 18.7\\ \hline 518.7\\ \hline 721.2\\ \hline 25.42\\ \hline 224.0\\ \hline 225.42\\ \hline 224.0\\ \hline 224.0\\ \hline 225.42\\ \hline 224.0\\ \hline 224.0\\ \hline 221.12\\ \hline 321.22\\ \hline$   | 2.13<br>1.82<br>4.09<br>2.96<br>2.83<br>1.72<br>4.40<br>2.56<br>3.22<br>2.00<br>4.12<br>2.00<br>4.12<br>3.28<br>2.91<br>2.17<br>st.<br>$\sigma$<br>4.96<br>3.00<br>2.79  | 0.993<br>0.989<br>0.989<br>0.989<br>0.987<br>0.987<br>0.987<br>0.986<br>0.986<br>0.986<br>0.986<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.990<br>0.988<br>0.990<br>0.988<br>0.990<br>0.988<br>0.990<br>0.988<br>0.990<br>0.988<br>0.990<br>0.988<br>0.989<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.987<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.999<br>0.998<br>0.998<br>0.998<br>0.999<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.999<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.9988<br>0.9989<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.998<br>0.99 | 3. 190         2. 930         3. 040         2. 930         3. 040         3. 230         3. 170         3. 230         3. 170         2. 940         2. 940         2. 850         3. 050         2. 940         2. 900         3. 020         2. 960         3. 020         2. 960         3. 020         2. 960         3. 090         0rmal         μ         3. 280         3. 390         3. 170   
  | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.15<br>.11<br>.15<br>.11<br>.15<br>.11<br>.16<br>.13<br>.11<br>dist  |
| 5 Ag.<br>eries<br>0 Ag.<br>eries<br>5 Ag.<br>eries<br>Xind of<br>concrete<br>10 Ag.<br>series<br>15 Ag.  | 10-PR.T.15.(<br>15-PR.T.4.44<br>15-PR.T.7.22<br>15-PR.T.9.63<br>15-PR.T.9.63<br>20-PR.T.4.44<br>20-PR.T.7.22<br>20-PR.T.15.(<br>25-PR.T.4.44<br>25-PR.T.4.44<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.63<br>25-PR.T.9.75<br>25-PR.T.9.63<br>25-PR.T.9.75<br>25-PR.T.9.63<br>25-PR.T.9.75<br>25-PR.T.9.63<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.63<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25-PR.T.9.75<br>25  | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           0         27           6         22           5         25           8         26           0         25           8         26           0         25           8         26           0         25           8         26           0         25  
   
  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  
   
   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 560 & 15.5 \\ 177 & 14.9 \\ 777 & 14.9 \\ 526 & 16.3 \\ 067 & 14.6 \\ 81 \\ 81 \\ 14.6 \\$ | -22.9         1           -29.2         2           -29.3         2           -29.3         2           -29.3         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -22.0         1           -26.6         2           -26.6         2           -26.3         2           -26.3         2           -24.1         1           g of         5           S         N           \scale         -           -38.1         2           -28.0         2           -35.9         2  
   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | 0.985 11<br>0.975 12<br>0.981 0<br>0.983 10<br>0.983 11<br>0.984 11<br>0.984 11<br>0.994 11<br>0.996 11<br>0.996 10<br>0.996 10<br>0.996 10<br>0.996 10<br>0.997 1<br>0.996 10<br>0.997 1<br>0.996 10<br>0.997 1<br>0.996 10<br>0.997 1<br>0.983 10<br>0.983 10<br>0.983 10<br>0.988 11<br>0.988 11<br>0.987 11<br>0.988 11  | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 5.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 0.36X\cdot33.40 \\ 1\\ 3.56X\cdot40.331 \\ 4.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 1\\ 8.02X\cdot24.88 \\ 1.30X\cdot33.32 \\ 1\\ 5.23X\cdot19.35 \\ 1.30X\cdot33.32 \\ 1\\ 5.23X\cdot19.35 \\ 1.30X\cdot22.37 \\ 3.26X\cdot29.17 \\ 0.97X\cdot32.81 \\ 1\\ 0.97X\cdot32.81 \\ 1\\ 0.97X\cdot32.81 \\ 1\\ 0.4X\cdot23.24 \\ 2.15X\cdot41.71 \\ 1\\ 0.44X\cdot23.26 \\ 5.56X\cdot18.62 \\ 5.56X\cdot18.62 \\ 8.38X\cdot28.95 \\ \end{array}$  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   |
-0.994<br>-0.985<br>-0.987<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.992<br>-0.992<br>-0.985<br>-0.997<br>-0.985<br>-0.962<br>-0.964<br>Norrr<br>r<br>-0.966<br>-0.977<br>-0.966<br>-0.977<br>-0.966<br>-0.977<br>-0.966<br>-0.977<br>-0.967<br>-0.977<br>-0.969<br>-0.977<br>-0.969<br>-0.977<br>-0.969<br>-0.977<br>-0.969<br>-0.977<br>-0.969<br>-0.977<br>-0.969<br>-0.977<br>-0.969<br>-0.977<br>-0.965<br>-0.977<br>-0.965<br>-0.977<br>-0.965<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.9777<br>-0.9777<br>-0.9777<br>-0.9777<br>-0.9777<br>-0.97777<br>-0.9777777777777777777777777777777777777  | $\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} $   | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 3.28\\ 2.91\\ 2.17\\ \text{st.}\\ \sigma\\ \hline \\ \sigma\\ 4.96\\ 3.00\\ 2.79\\ 5.84\\ 4.38\\ \end{array}$   | 0.993<br>0.989<br>0.989<br>0.989<br>0.987<br>0.983<br>0.987<br>0.983<br>0.986<br>0.982<br>0.986<br>0.980<br>0.983<br>0.986<br>0.982<br>0.983<br>0.986<br>r<br>r<br>-0.981<br>-0.961<br>-0.952<br>-0.992<br>0.995  
  | 3.190           2.930           3.040           3.290           3.230           3.170           2.940           2.940           2.950           3.050           3.050           3.040           2.850           3.050           3.050           3.020           2.990           2.990           3.020           2.990           3.020           2.990           3.020           2.990           3.090           3.170           3.250           3.2400  | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11<br>dist<br>σ<br>.17<br>.10<br>.12<br>.22<br>.14   |
| 5 Ag.<br>eries<br>20 Ag.<br>eries<br>25 Ag.<br>eries<br>Xind of<br>concrete<br>10 Ag.<br>series<br>15 Ag.<br>series  | 10-PR.T.15.(<br>15-PR.T.4.44<br>15-PR.T.7.22<br>15-PR.T.9.6i<br>20-PR.T.9.6i<br>20-PR.T.9.6i<br>20-PR.T.9.6i<br>20-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>25-PR.T.9.6i<br>10-CY-SP-\$/15.0i<br>15-CY-SP.\$/10<br>15-CY-SP.\$/15   | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           3         25           0         27           6         22           5         25           8         26           0         25           8         26           0         25           speciment         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25  
   
  | 9.930 9.<br>15.310 15.<br>4.658 4.<br>7.481 7.<br>9.857 9.<br>15.284 14.<br>4.713 4.<br>7.265 7.<br>9.913 9.<br>15.373 14.<br>4.467 4.<br>7.458 7.<br>9.891 9.<br>15.353 15.<br>Size of<br>Specime<br>Diaø Len<br>(cm) (cc<br>7.50 15<br>9.99 24<br>14.98 30<br>7.50 15<br>9.99 20<br>15.03 30   
   
   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 551 & 16.4 \\ 551 & 16.4 \\ 520 & 15.5 \\ 16.4 \\ 977 & 14.9 \\ 977 & 14.9 \\ 14.5 \\ 620 & 15.5 \\ 177 & 14.9 \\ 14.5 \\ 620 & 15.5 \\ 177 & 14.9 \\ 14.5$    | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -26.6         2           -24.1         1           -266.3         2           -24.1         1           -26.3         2           -24.1         1           -26.3         2           -24.1         1           -26.3         2           -24.1         1           -26.3         2           -24.1         1           -26.3         2           -24.1         1           -28.1         -           -33.4         -           -28.0         -           -36.8         -           -33.3         2   
   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | 7.83           8.61           16.90           0.10.21           8.61           10.90           0.10.21           8.65           21.10           10.69           21.10           10.69           21.10           10.69           21.10           10.69           21.10           10.69           11.60           9.75           11.60           9.75           11.60           9.75           11.60           9.75           11.60           9.75           11.15  | 0.985 1<br>0.975 1<br>0.981 (<br>0.983 1<br>0.998 1<br>0.998 1<br>0.998 1<br>0.998 1<br>0.998 1<br>0.998 1<br>0.998 1<br>0.990 1<br>0.997 | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 1\\ 0.36X\cdot33.40 \\ 1\\ 3.56X\cdot40.33 \\ 1\\ 4.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 1\\ 3.02X\cdot33.32 \\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1$  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   |
-0.994<br>-0.983<br>-0.983<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.992<br>-0.986<br>-0.996<br>-0.986<br>-0.996<br>-0.986<br>-0.986<br>-0.966<br>-0.966<br>-0.966<br>-0.966<br>-0.966<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.988<br>-0.996<br>-0.986<br>-0.986<br>-0.986<br>-0.986<br>-0.986<br>-0.986<br>-0.986<br>-0.986<br>-0.986<br>-0.986<br>-0.996<br>-0.986<br>-0.996<br>-0.986<br>-0.996<br>-0.996<br>-0.986<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0.996<br>-0 | $\begin{array}{c} 423.3(2)\\ 518.7(2)\\$   | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 3.28\\ 2.91\\ 2.17\\ \text{st.}\\ \sigma\\ \\ \sigma\\ \\ 4.96\\ 3.00\\ 2.79\\ 5.84\\ 4.38\\ 3.44\\ \end{array}$  | 0.993<br>0.989<br>0.989<br>0.989<br>0.987<br>0.983<br>0.987<br>0.987<br>0.986<br>0.982<br>0.986<br>0.982<br>0.983<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.983<br>0.985<br>0.990<br>0.995<br>0.995<br>0.995<br>0.995  
  | $\begin{array}{c} 3.190\\ 2.930\\ 2.930\\ 3.040\\ 3.230\\ 3.170\\ 2.940\\ 2.950\\ 3.050\\ 3.$ | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12  |
| 5 Ag.<br>eries<br>20 Ag.<br>eries<br>25 Ag.<br>eries<br>25 Ag.<br>eries<br>26 Ag.<br>eries<br>20 Ag.<br>series<br>20 Ag.   | 10-PR.T.15.(<br>15-PR.T.4.4(<br>15-PR.T.7.2:<br>15-PR.T.9.6;<br>20-PR.T.9.6;<br>20-PR.T.9.6;<br>20-PR.T.9.6;<br>20-PR.T.9.6;<br>25-PR.T.4.4(<br>25-PR.T.4.4(<br>25-PR.T.9.6;<br>25-PR.T.9.6;<br>25-PR.T.9.6;<br>25-PR.T.9.6;<br>25-PR.T.9.6;<br>25-PR.T.9.6;<br>25-PR.T.9.6;<br>15-CY.SP.401<br>10-CY.SP.401<br>10-CY.SP.405<br>15-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20-CY.SP.405<br>20  | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           0         27           6         17           5         25           0         0           7         6           22         25           8         26           0         25           No. of         specimen           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25           25         25 </td <td>9.930 9.<br/>15.310 15.<br/>4.658 4.<br/>7.481 7.<br/>9.857 9.<br/>15.284 14.<br/>4.713 4.<br/>7.265 7.<br/>9.913 9.<br/>15.373 14.<br/>4.467 4.<br/>7.458 7.<br/>9.891 9.<br/>15.353 15.<br/>Size of Specime<br/>10 ad Left 15.<br/>9.99 24<br/>14.98 30<br/>7.50 15<br/>9.99 20<br/>15.33 30<br/>7.50 15<br/>9.99 20<br/>15.33 30<br/>15.50 15<br/>9.99 20<br/>15.33 30<br/>15.50 15<br/>9.99 20<br/>15.35 30<br/>15.50 15<br/>15.50 15</td> <td><math display="block">\begin{array}{c} 060 &amp; 15.6 \\ 438 &amp; 15.3 \\ 176 &amp; 20.9 \\ 560 &amp; 18.7 \\ 987 &amp; 15.8 \\ 493 &amp; 11.5 \\ 551 &amp; 16.4 \\ 533 &amp; 14.9 \\ 977 &amp; 14.5 \\ 520 &amp; 15.5 \\ 16.4 \\ 520 &amp; 15.5 \\ 16.4 \\ 520 &amp; 15.5 \\ 177 &amp; 14.9 \\ 526 &amp; 16.3 \\ 14.5 \\ 14</math></td> <td>-22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -21.5         1           -23.6         2           -20.3         2           -26.6         2           -26.6         2           -24.1         1           -26.3         2           -24.1         1           g of         5           -38.1         2           -33.4         2           -36.9         2           -36.8         2           -31.3         2</td> <td>8.7         1.61           11.1         3.57           25.3         2.59           24.0         2.50           24.0         2.50           27.7         3.73           1.2         2.27           1.0         2.82           3.77         3.73           1.2         2.27           1.0         2.82           8.3         1.77           0.8         3.57           9.0   
     1.86           Cylinder sp<br/>strengt           gray         (kg/m)           (kg/m)         (kg/m)           6.7         4.24           9.8         2.59           24.0         5.75           30.0         3.87           27.0         3.01           26.5         5.17           30.0         3.87           27.0         3.01           26.3         2.50</td> <td>7.83           8.61           16.90           0.10.21           0.10.21           0.10.21           10.01           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.46           17.15           14.66           11.60           9.75           1           1           1.1           0           9.97           7           19.52           7           12.88           11.15           9.948</td> <td>0.985 1<br/>0.975 1<br/>0.981 0<br/>0.983 1<br/>0.984 1<br/>0.994 1<br/>0.996 1<br/>0.990 1<br/>0.996 1<br/>0.990 1<br/>0.900 1<br/>0.900 1<br/>0.900 1<br/>0.900 1<br/>0.900 1<br/>0.900 1<br/>0.900 1<br/>0.900 1<br/>0.900 1<br/>0.900</td> <td><math display="block">\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 10.36X\cdot33.40 \\ 1\\ 0.36X\cdot33.40 \\ 1\\ 3.56X\cdot40.33 \\ 1\\ 4.72X\cdot13.97 \\ 1\\ 0.09X\cdot31.29 \\ 1\\ 8.02X\cdot24.88 \\ 1.30X\cdot33.32 \\ 1\\ 1.30X\cdot22.37 \\ 1\\ 9.26X\cdot29.17 \\ 1\\ 0.97X\cdot32.81 \\ 1\\ 1\\ Weibull \ dis \\ 1\\ 0.44X\cdot33.65 \\ 1\\ 5.56X\cdot18.62 \\ 8.38X\cdot28.95 \\ 1.15X\cdot36.94 \\ 1\\ 1\\ 1\\ 5\\ 1\\ 1\\ 1\\ 2\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\</math></td> <td><math display="block">\begin{array}{c} 4.06 &amp; 13.06 \\ 2.79 &amp; 11.79 \\ 6.35 &amp; 5.35 \\ 0.46 &amp; 9.46 \\ 0.36 &amp; 9.36 \\ 3.56 &amp; 12.56 \\ 4.72 &amp; 3.72 \\ 0.09 &amp; 9.09 \\ 8.02 &amp; 7.02 \\ 1.30 &amp; 10.30 \\ 6.23 &amp; 5.23 \\ 7.39 &amp; 6.39 \\ 9.26 &amp; 8.26 \\ 0.97 &amp; 9.97 \\ \text{st.} \end{array}</math></td> <td>-0.994<br/>-0.985<br/>-0.990<br/>-0.986<br/>-0.990<br/>-0.986<br/>-0.990<br/>-0.986<br/>-0.990<br/>-0.986<br/>-0.990<br/>-0.986<br/>-0.995<br/>-0.986<br/>-0.976<br/>-0.986<br/>-0.976<br/>-0.986<br/>-0.977<br/>-0.966<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.977<br/>-0.986<br/>-0.995<br/>-0.987<br/>-0.987<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.985<br/>-0.995<br/>-0.985<br/>-0.995<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.985<br/>-0.995<br/>-0.985<br/>-0.995<br/>-0.985<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0.995<br/>-0</td> <td><math display="block">\begin{array}{c} 423.32\\ 518.7\\ 721.22\\ 721.22\\ 721.22\\ 721.22\\ 721.22\\ 721.12\\ 721.22\\ 721.12\\ </math></td> <td><math display="block">\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 2.17\\ 5.84\\ 4.96\\ 3.00\\ 2.79\\ 5.84\\ 4.38\\ 3.44\\ 2.89\end{array}</math></td>
<td>0.993<br/>0.989<br/>0.987<br/>0.987<br/>0.987<br/>0.987<br/>0.986<br/>0.986<br/>0.986<br/>0.986<br/>0.988<br/>0.982<br/>0.986<br/>r<br/>-0.981<br/>-0.961<br/>-0.961<br/>-0.952<br/>0.982<br/>-0.992<br/>-0.992<br/>-0.982<br/>0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.983<br/>-0.983<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-0.982<br/>-</td> <td><math display="block">\begin{array}{c} 3.190\\ 2.930\\ 3.040\\ 3.230\\ 3.040\\ 3.230\\ 3.070\\ 2.940\\ 2.940\\ 2.940\\ 2.850\\ 3.050\\ 2.940\\ 2.900\\ 3.020\\ 2.940\\ 0\\ 2.940\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0</math></td> <td>.08<br/>.09<br/>.19<br/>.11<br/>.12<br/>.09<br/>.26<br/>.12<br/>.12<br/>.15<br/>.11<br/>.19<br/>.16<br/>.13<br/>.11<br/>.11<br/>.11<br/>.11<br/>.12<br/>.12<br/>.12<br/>.12<br/>.12<br/>.12</td> | 9.930 9.<br>15.310 15.<br>4.658 4.<br>7.481 7.<br>9.857 9.<br>15.284 14.<br>4.713 4.<br>7.265 7.<br>9.913 9.<br>15.373 14.<br>4.467 4.<br>7.458 7.<br>9.891 9.<br>15.353 15.<br>Size of Specime<br>10 ad Left 15.<br>9.99 24<br>14.98 30<br>7.50 15<br>9.99 20<br>15.33 30<br>7.50 15<br>9.99 20<br>15.33 30<br>15.50 15<br>9.99 20<br>15.33 30<br>15.50 15<br>9.99 20<br>15.35 30<br>15.50 15<br>15.50 15   
   
   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 520 & 15.5 \\ 16.4 \\ 520 & 15.5 \\ 16.4 \\ 520 & 15.5 \\ 177 & 14.9 \\ 526 & 16.3 \\ 14.5 \\ 14$  | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -21.5         1           -23.6         2           -20.3         2           -26.6         2           -26.6         2           -24.1         1           -26.3         2           -24.1         1           g of         5           -38.1         2           -33.4         2           -36.9         2           -36.8         2           -31.3         2   | 8.7         1.61           11.1         3.57           25.3         2.59           24.0         2.50           24.0         2.50           27.7         3.73           1.2         2.27           1.0         2.82           3.77         3.73           1.2         2.27           1.0         2.82           8.3         1.77           0.8         3.57           9.0         1.86           Cylinder sp<br>strengt           gray         (kg/m)           (kg/m)         (kg/m)           6.7         4.24           9.8         2.59           24.0         5.75           30.0         3.87           27.0         3.01           26.5         5.17           30.0         3.87           27.0         3.01           26.3         2.50 | 7.83           8.61           16.90           0.10.21           0.10.21           0.10.21           10.01           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.21           10.46           17.15           14.66           11.60           9.75           1           1           1.1           0           9.97           7           19.52           7           12.88           11.15           9.948 | 0.985 1<br>0.975 1<br>0.981 0<br>0.983 1<br>0.984 1<br>0.994 1<br>0.996 1<br>0.990 1<br>0.996 1<br>0.990 1<br>0.900 | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 10.36X\cdot33.40 \\ 1\\ 0.36X\cdot33.40 \\ 1\\ 3.56X\cdot40.33 \\ 1\\ 4.72X\cdot13.97 \\ 1\\ 0.09X\cdot31.29 \\ 1\\ 8.02X\cdot24.88 \\ 1.30X\cdot33.32 \\ 1\\ 1.30X\cdot22.37 \\ 1\\ 9.26X\cdot29.17 \\ 1\\ 0.97X\cdot32.81 \\ 1\\ 1\\ Weibull \ dis \\ 1\\ 0.44X\cdot33.65 \\ 1\\ 5.56X\cdot18.62 \\ 8.38X\cdot28.95 \\ 1.15X\cdot36.94 \\ 1\\ 1\\ 1\\ 5\\ 1\\ 1\\ 1\\ 2\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\ 1\\$   
   | $\begin{array}{c} 4.06 & 13.06 \\ 2.79 & 11.79 \\ 6.35 & 5.35 \\ 0.46 & 9.46 \\ 0.36 & 9.36 \\ 3.56 & 12.56 \\ 4.72 & 3.72 \\ 0.09 & 9.09 \\ 8.02 & 7.02 \\ 1.30 & 10.30 \\ 6.23 & 5.23 \\ 7.39 & 6.39 \\ 9.26 & 8.26 \\ 0.97 & 9.97 \\ \text{st.} \end{array}$   | -0.994<br>-0.985<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.990<br>-0.986<br>-0.995<br>-0.986<br>-0.976<br>-0.986<br>-0.976<br>-0.986<br>-0.977<br>-0.966<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.977<br>-0.986<br>-0.995<br>-0.987<br>-0.987<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.985<br>-0.995<br>-0.985<br>-0.995<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.985<br>-0.995<br>-0.985<br>-0.995<br>-0.985<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0.995<br>-0 | $\begin{array}{c} 423.32\\ 518.7\\ 721.22\\ 721.22\\ 721.22\\ 721.22\\ 721.22\\ 721.12\\ 721.22\\ 721.12\\ $  | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 2.17\\ 5.84\\ 4.96\\ 3.00\\ 2.79\\ 5.84\\ 4.38\\ 3.44\\ 2.89\end{array}$   
  | 0.993<br>0.989<br>0.987<br>0.987<br>0.987<br>0.987<br>0.986<br>0.986<br>0.986<br>0.986<br>0.988<br>0.982<br>0.986<br>r<br>-0.981<br>-0.961<br>-0.961<br>-0.952<br>0.982<br>-0.992<br>-0.992<br>-0.982<br>0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.983<br>-0.983<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-0.982<br>-  | $\begin{array}{c} 3.190\\ 2.930\\ 3.040\\ 3.230\\ 3.040\\ 3.230\\ 3.070\\ 2.940\\ 2.940\\ 2.940\\ 2.850\\ 3.050\\ 2.940\\ 2.900\\ 3.020\\ 2.940\\ 0\\ 2.940\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 0\\ 3.020\\ 0\\ 3.020\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0\\ 0$  | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11<br>.11<br>.11<br>.11<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12   |
| 5 Ag.<br>eries<br>20 Ag.<br>eries<br>25 Ag.<br>eries<br>26 Ag.<br>concrete<br>10 Ag.<br>series<br>15 Ag.<br>series<br>20 Ag.   | 10-PR-T-15.(<br>15-PR-T-4.4(<br>15-PR-T-7.2)<br>15-PR-T-9.6(<br>20-PR-T-4.4(<br>20-PR-T-9.6(<br>20-PR-T-9.6(<br>20-PR-T-9.6(<br>20-PR-T-15.(<br>25-PR-T-4.4(<br>25-PR-T-7.2)<br>25-PR-T-9.6(<br>25-PR-T-9.6(<br>25-PR-T-9.6(<br>25-PR-T-15.(<br>Notation of<br>specimen<br>10-CY-SP-97.5<br>10-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   
   
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   | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 560 & 15.5 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 14.5 \\$           | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  
   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | 0.985 14<br>0.975 11<br>0.981 (<br>0.983 14<br>0.984 14<br>0.984 14<br>0.994 14<br>0.996 14<br>0.996 14<br>0.996 14<br>0.996 14<br>0.990 14<br>0.99  | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 1\\ 0.36X\cdot34.281 \\ 1\\ 0.36X\cdot33.401 \\ 1\\ 0.36X\cdot33.401 \\ 1\\ 0.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot33.321 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot23.24 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot23.24 \\ 1\\ 1.30X\cdot22.37 \\ 1\\ 3.02X\cdot23.24 \\ 1\\ 1.30X\cdot22.37 \\ 1\\ 3.02X\cdot23.24 \\ 1\\ 1.30X\cdot23.24 \\ 1\\ 1\\ 10.44X\cdot33.65 \\ 1\\ 5.56X\cdot18.62 \\ 8.38X\cdot28.95 \\ 9.73X\cdot32.55 \\ 1.15X\cdot36.941 \\ 9.20X\cdot31.62 \end{array}$   | $\begin{array}{c} 4.06 & 13.06 \\ 2.79 & 11.79 \\ 6.35 & 5.35 \\ 0.46 & 9.46 \\ 0.36 & 9.36 \\ 0.36 & 9.36 \\ 3.56 & 12.56 \\ 4.72 & 3.72 \\ 0.09 & 9.09 \\ 8.02 & 7.02 \\ 1.30 & 10.30 \\ 6.23 & 5.23 \\ 7.39 & 6.39 \\ 9.26 & 8.26 \\ 0.97 & 9.97 \\ 8.28 \\ 5.56 & 4.56 \\ 4.56 \\ 4.56 \\ 4.56 \\ 4.56 \\ 4.56 \\ 3.8 \\ 7.38 \\ 9.73 \\ 8.73 \\ 8.73 \\ 1.15 \\ 10.11 \\ 15 \\ 0.16 \\ 8.26 \\ 8.26 \\ 11.15 \\ 11.15 \\ 10.16 \\ 8.26 \\ 8.26 \\ 11.15 \\ 11.15 \\ 10.16 \\ 8.26 \\ 11.15 \\ 11.15 \\ 10.16 \\ 8.26 \\ 11.15 \\ 11.15 \\ 10.16 \\ 11.15 \\ 11$ | -0.994<br>-0.985<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.987<br>-0.966<br>-0.977<br>-0.966<br>-0.977<br>-0.966<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.988<br>-0.977<br>-0.987<br>-0.987<br>-0.977<br>-0.987<br>-0.977<br>-0.987<br>-0.977<br>-0.987<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.977<br>-0.9777<br>-0.9777<br>-0.9777<br>-0.9777<br>-0.9777<br>-0.97777<br>-0.97777<br>-0.9777777777777777777777777777777777777  
   | $\begin{array}{c} 423.32\\ 518.7\\ 518.7\\ 721.22\\ 518.7\\ 721.22\\ 721.22\\ 721.22\\ 721.32\\ 721.32\\ 721.32\\ 721.32\\ 721.32\\ 721.32\\ 721.32\\ 721.32\\ 721.32\\ 722.32\\ 722.32\\ 722.32\\ 722.32\\ 722.32\\ 722.4$ 722.4\\ 722.4 722.4\\ 722.   | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 3.22\\ 2.01\\ 5.6\\ 4.96\\ 3.00\\ 2.79\\ 5.84\\ 4.38\\ 3.44\\ 2.89\\ 3.97\end{array}$   | 0.993<br>0.989<br>0.989<br>0.987<br>0.987<br>0.987<br>0.987<br>0.986<br>0.986<br>0.986<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.989<br>0.981<br>0.981<br>0.981<br>0.981<br>0.981<br>0.982<br>0.982<br>0.992<br>0.990<br>0.982<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992<br>0.992  | $\begin{array}{c} 3.190\\ 2.930\\ 2.930\\ 3.040\\ 3.230\\ 3.070\\ 2.940\\ 2.940\\ 2.940\\ 2.940\\ 3.050\\
3.050\\ 3.$ | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11<br>.11<br>.13<br>   |
| 5 Ag.<br>eries<br>20 Ag.<br>eries<br>25 Ag.<br>55 Ag.<br>56 Ag.<br>56 Ag.<br>56 Ag.<br>56 Ag.<br>56 Ag.<br>57 Ag.<br>56 Ag.<br>57 Ag | 10-PR.T.15.(<br>15-PR.T.4.4(<br>15-PR.T.7.2:<br>15-PR.T.9.6(<br>15-PR.T.9.6(<br>20-PR.T.4.4(<br>20-PR.T.7.2:<br>20-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25-PR.T.9.6(<br>25  | 8         28           0         28           6         23           5         22           8         26           0         27           6         17           5         25           8         25           5         22           5         25           0         27           6         22           5         25           0         25           No. of         speciment           25         25           25         25           25         25           24         25           25         25           19         19           19         19   
   
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   | $\begin{array}{c} 000 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 560 & 16.5 \\ 777 & 14.9 $   | $\begin{array}{c} -22.9 & 1 \\ -29.2 & 2 \\ -29.3 & 2 \\ -29.3 & 2 \\ -28.1 & 2 \\ -21.5 & 1 \\ -23.6 & 1 \\ -24.9 & 2 \\ -23.6 & 2 \\ -22.0 & 1 \\ -24.9 & 2 \\ -26.6 & 2 \\ -22.0 & 1 \\ -24.9 & 2 \\ -26.6 & 2 \\ -22.0 & 1 \\ -26.6 & 2 \\ -22.0 & 1 \\ -26.6 & 2 \\ -22.0 & 1 \\ -26.6 & 2 \\ -22.0 & 1 \\ -26.6 & 2 \\ -22.0 & 1 \\ -26.6 & 2 \\ -22.0 & 1 \\ -26.6 & 2 \\ -22.0 & 1 \\ -26.6 & 2 \\ -26.3 & 2 \\ -27.6 & 1 \\ -26.6 & 2 \\ -28.0 & 2 \\ -28.0 & 2 \\ -36.8 & 3 \\ -36.8 & 3 \\ -36.3 & 2 \\ -36.3 & 2 \\ -29.9 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\ -20.0 & 2 \\$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | 0.985 1<br>0.975 11<br>0.975 11<br>0.981 10<br>0.981 10<br>0.983 11<br>0.983 11<br>0.986 13<br>0.986 13<br>0.986 13<br>0.986 13<br>0.986 13<br>0.980 1<br>0.980 1<br>0.988 1<br>0  
  | $\begin{array}{c} 2.79X\cdot37.92 \\ 1.279X\cdot37.92 \\ 1.35X\cdot19.81 \\ 0.36X\cdot34.281 \\ 1.0.36X\cdot33.401 \\ 1.0.36X\cdot33.401 \\ 1.0.36X\cdot33.401 \\ 1.356X\cdot40.331 \\ 1.472X\cdot13.97 \\ 1.009X\cdot31.291 \\ 1.30X\cdot33.321 \\ 1.30X\cdot33$  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | 0.994<br>0.985<br>0.985<br>0.990<br>0.990<br>0.990<br>0.986<br>0.990<br>0.985<br>0.990<br>0.985<br>0.992<br>0.985<br>0.992<br>0.985<br>0.992<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.995<br>0.985<br>0.995<br>0.995<br>0.985<br>0.995<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.985<br>0.995<br>0.995<br>0.985<br>0.995<br>0.995<br>0.985<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.   | $\begin{array}{c} 423.32\\ 518.7\\ 721.2\\ 721.2\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 724.0\\ 726.4\\ 7$  | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.56\\ 3.22\\ 2.00\\ 4.12\\ 2.00\\ 4.12\\ 2.00\\ 4.22\\ 0.00\\ 1.22\\ 0.00\\ 1.22\\ 0.00\\ 1.22\\ 0.00\\ 1.22\\ 0.00\\ 1.22\\ 0.00\\ 1.22\\ 0.00\\ 1.22\\ 0.00\\ 1.22\\ 0.00\\
0.00\\ 0.00\\$ | 0.993<br>0.989<br>0.987<br>0.987<br>0.987<br>0.987<br>0.987<br>0.987<br>0.987<br>0.987<br>0.986<br>0.986<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.988<br>0.986<br>0.980<br>0.960<br>0.980<br>0.960<br>0.981<br>0.961<br>0.952<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.990<br>0.993<br>0.991<br>0.993<br>0.991<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993  | $\begin{array}{c} 3.190\\ 2.930\\ 3.040\\ 3.230\\ 3.040\\ 2.940\\ 2.850\\ 3.070\\ 2.940\\ 2.950\\ 3.070\\ 2.940\\ 2.950\\ 3.070\\ 3.070\\ 3.090\\ 2.960\\ 3.090\\ 2.960\\ 3.090\\ 0.090\\ 3.090\\ 0.090\\ 3.090\\ 0.090\\ 3.090\\ 0.090\\ 3.090\\ 0.090\\ 3.090\\ 0.090\\ 3.090\\ 0.090\\ 3.090\\ 0.$ | . 08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11<br>.11<br>.13<br>.11<br>.11<br>.12<br>.15<br>.12<br>.12<br>.15<br>.11<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12<br>.12 |
| 5 Ag.<br>eries<br>20 Ag.<br>eries<br>25 Ag.<br>eries<br>25 Ag.<br>eries<br>26 Ag.<br>series<br>27 Ag.<br>series<br>20 Ag.<br>series<br>20 Ag.  | 10-PR-T-15.(<br>15-PR-T-4.4(<br>15-PR-T-7.2)<br>15-PR-T-9.6(<br>20-PR-T-4.4(<br>20-PR-T-9.6(<br>20-PR-T-9.6(<br>20-PR-T-9.6(<br>20-PR-T-15.(<br>25-PR-T-4.4(<br>25-PR-T-7.2)<br>25-PR-T-9.6(<br>25-PR-T-9.6(<br>25-PR-T-9.6(<br>25-PR-T-15.(<br>Notation of<br>specimen<br>10-CY-SP-97.5<br>10-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-SP-910<br>15-CY-  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   
   
  | 9.930         9.           9.930         9.           15.310         15.           4.658         4.           7.481         7.           9.857         9.           15.284         14.           4.713         4.           7.265         7.           9.9373         14.           4.467         4.           7.458         7.           9.891         9.           15.353         15.           Size of         Specime           Dia & Len         (cm)           (cm)         (cc)           7.50         15           9.99         20           15.03         30           7.50         15           9.99         20           15.03         30           7.50         15           9.99         20           15.03         30           7.50         15           9.99         20           15.03         30           7.50         15           9.99         20           15.03         30           7.50         15 <td><math display="block">\begin{array}{c} 060 &amp; 15.6 \\ 438 &amp; 15.3 \\ 176 &amp; 20.9 \\ 560 &amp; 18.7 \\ 987 &amp; 15.8 \\ 493 &amp; 11.5 \\ 551 &amp; 16.4 \\ 533 &amp; 14.9 \\ 977 &amp; 14.5 \\ 560 &amp; 15.5 \\ 177 &amp; 14.9 \\ 526 &amp; 16.3 \\ 177 &amp; 14.9 \\ 14.5
\\ 14.5 \\ 14.5 \\ 14.5 \\</math></td> <td>-22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -26.6         2           -24.1         1           -266.3         2           -24.1         1           -26.6         2           -27.8         1           -26.6         2           -24.1         1           -26.6         2           -24.1         1           -26.6         2           -38.1         2           -33.4         2           -36.8         3           -36.8         3           -31.3         2           -33.3         2           -33.3         2</td> <td><math display="block">\begin{array}{c ccccccccccccccccccccccccccccccccccc</math></td> <td><math display="block">\begin{array}{c ccccccccccccccccccccccccccccccccccc</math></td> <td>0.985 1<br/>0.975 11<br/>0.975 11<br/>0.981 10<br/>0.981 10<br/>0.983 11<br/>0.984 11<br/>0.984 11<br/>0.986 11<br/>0.986 11<br/>0.996 11<br/>0.988 10<br/>0.988 1</td> <td><math display="block">\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 1\\ 0.36X\cdot34.281 \\ 1\\ 0.36X\cdot33.401 \\ 1\\ 0.36X\cdot33.401 \\ 1\\ 0.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot33.321 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot23.24 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot23.24 \\ 1\\ 1.30X\cdot22.37 \\ 1\\ 3.02X\cdot23.24 \\ 1\\ 1.30X\cdot22.37 \\ 1\\ 3.02X\cdot23.24 \\ 1\\ 1.30X\cdot23.24 \\ 1\\ 1\\ 10.44X\cdot33.65 \\ 1\\ 5.56X\cdot18.62 \\ 8.38X\cdot28.95 \\ 9.73X\cdot32.55 \\ 1.15X\cdot36.941 \\ 9.20X\cdot31.62 \end{array}</math></td> <td><math display="block">\begin{array}{c ccccccccccccccccccccccccccccccccccc</math></td> <td>0.994<br/>0.985<br/>0.985<br/>0.990<br/>0.990<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.990<br/>0.985<br/>0.997<br/>0.985<br/>0.997<br/>0.985<br/>0.997<br/>0.985<br/>0.997<br/>0.985<br/>0.997<br/>0.985<br/>0.997<br/>0.985<br/>0.997<br/>0.987<br/>0.997<br/>0.987<br/>0.997<br/>0.997<br/>0.997<br/>0.985<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.997<br/>0.</td> <td><math display="block">\begin{array}{c} &amp; \mu \\ 423,32\\ 518,77\\ 721,22\\ 525,42\\ 721,22\\ 721,22\\ 721,22\\ 721,22\\ 721,22\\ 721,22\\ 721,22\\ 721,12\\ 7</math></td> <td><math display="block">\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.83\\ 1.72\\ 4.40\\ 2.322\\ 2.00\\ 4.12\\ 3.22\\ 2.00\\ 4.12\\ 3.22\\ 2.00\\ 4.12\\ 3.22\\ 2.00\\ 4.12\\ 3.22</math></td>
<td>0.993<br/>0.989<br/>0.989<br/>0.987<br/>0.987<br/>0.987<br/>0.987<br/>0.987<br/>0.981<br/>0.986<br/>0.980<br/>0.980<br/>0.980<br/>0.980<br/>0.980<br/>0.980<br/>0.980<br/>0.980<br/>0.980<br/>0.981<br/>0.966<br/>0.981<br/>0.966<br/>0.981<br/>0.966<br/>0.983<br/>0.966<br/>0.983<br/>0.966<br/>0.983<br/>0.966<br/>0.983<br/>0.966<br/>0.983<br/>0.990<br/>0.993<br/>0.990<br/>0.993<br/>0.990<br/>0.993<br/>0.990<br/>0.993<br/>0.990<br/>0.993<br/>0.990<br/>0.993<br/>0.993<br/>0.993<br/>0.993<br/>0.993<br/>0.993<br/>0.995<br/>0.993<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995<br/>0.995</td> <td>3. 190           2. 930           3. 040           3. 230           3. 030           3. 030           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           3. 020           2. 960           3. 020           2. 960           3. 020           2. 940           ormal           μ           3. 280           3. 280           3. 302           2. 940           ormal           μ           3. 280           3. 170           3. 280           3. 170           3. 290           3. 290</td> <td>.08<br/>.09<br/>.19<br/>.11<br/>.12<br/>.09<br/>.26<br/>.12<br/>.15<br/>.11<br/>.19<br/>.16<br/>.13<br/>.11<br/>.11<br/>.13<br/>.11<br/>.13<br/>11<br/></td> | $\begin{array}{c} 060 & 15.6 \\ 438 & 15.3 \\ 176 & 20.9 \\ 560 & 18.7 \\ 987 & 15.8 \\ 493 & 11.5 \\ 551 & 16.4 \\ 533 & 14.9 \\ 977 & 14.5 \\ 560 & 15.5 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 526 & 16.3 \\ 177 & 14.9 \\ 14.5 \\$           | -22.9         1           -29.2         2           -29.3         2           -28.1         2           -21.5         1           -23.6         1           -24.9         2           -26.6         2           -26.6         2           -24.1         1           -266.3         2           -24.1         1           -26.6         2           -27.8         1           -26.6         2           -24.1         1           -26.6         2           -24.1         1           -26.6         2           -38.1         2           -33.4         2           -36.8         3           -36.8         3           -31.3         2           -33.3         2           -33.3         2   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$  
| 0.985 1<br>0.975 11<br>0.975 11<br>0.981 10<br>0.981 10<br>0.983 11<br>0.984 11<br>0.984 11<br>0.986 11<br>0.986 11<br>0.996 11<br>0.988 10<br>0.988 1   | $\begin{array}{c} 2.79X\cdot37.92 \\ 1\\ 6.35X\cdot19.81 \\ 0.46X\cdot34.281 \\ 1\\ 0.36X\cdot34.281 \\ 1\\ 0.36X\cdot33.401 \\ 1\\ 0.36X\cdot33.401 \\ 1\\ 0.72X\cdot13.97 \\ 0.09X\cdot31.291 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot33.321 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot23.24 \\ 1\\ 3.02X\cdot24.88 \\ 1.30X\cdot23.24 \\ 1\\ 1.30X\cdot22.37 \\ 1\\ 3.02X\cdot23.24 \\ 1\\ 1.30X\cdot22.37 \\ 1\\ 3.02X\cdot23.24 \\ 1\\ 1.30X\cdot23.24 \\ 1\\ 1\\ 10.44X\cdot33.65 \\ 1\\ 5.56X\cdot18.62 \\ 8.38X\cdot28.95 \\ 9.73X\cdot32.55 \\ 1.15X\cdot36.941 \\ 9.20X\cdot31.62 \end{array}$   | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$   | 0.994<br>0.985<br>0.985<br>0.990<br>0.990<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.990<br>0.985<br>0.997<br>0.985<br>0.997<br>0.985<br>0.997<br>0.985<br>0.997<br>0.985<br>0.997<br>0.985<br>0.997<br>0.985<br>0.997<br>0.987<br>0.997<br>0.987<br>0.997<br>0.997<br>0.997<br>0.985<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.997<br>0.   | $\begin{array}{c} & \mu \\ 423,32\\ 518,77\\ 721,22\\ 525,42\\ 721,22\\ 721,22\\ 721,22\\ 721,22\\ 721,22\\ 721,22\\ 721,22\\ 721,12\\
721,12\\ 7$  | $\begin{array}{c} 2.13\\ 1.82\\ 4.09\\ 2.96\\ 2.83\\ 1.72\\ 4.40\\ 2.83\\ 1.72\\ 4.40\\ 2.322\\ 2.00\\ 4.12\\ 3.22\\ 2.00\\ 4.12\\ 3.22\\ 2.00\\ 4.12\\ 3.22\\ 2.00\\ 4.12\\ 3.22$  | 0.993<br>0.989<br>0.989<br>0.987<br>0.987<br>0.987<br>0.987<br>0.987<br>0.981<br>0.986<br>0.980<br>0.980<br>0.980<br>0.980<br>0.980<br>0.980<br>0.980<br>0.980<br>0.980<br>0.981<br>0.966<br>0.981<br>0.966<br>0.981<br>0.966<br>0.983<br>0.966<br>0.983<br>0.966<br>0.983<br>0.966<br>0.983<br>0.966<br>0.983<br>0.990<br>0.993<br>0.990<br>0.993<br>0.990<br>0.993<br>0.990<br>0.993<br>0.990<br>0.993<br>0.990<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.993<br>0.995<br>0.993<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995<br>0.995  | 3. 190           2. 930           3. 040           3. 230           3. 030           3. 030           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           2. 940           3. 020           2. 960           3. 020           2. 960           3. 020           2. 940           ormal           μ           3. 280           3. 280           3. 302           2. 940           ormal           μ           3. 280           3. 170           3. 280           3. 170           3. 290           3. 290   | .08<br>.09<br>.19<br>.11<br>.12<br>.09<br>.26<br>.12<br>.15<br>.11<br>.19<br>.16<br>.13<br>.11<br>.11<br>.13<br>.11<br>.13<br>11<br>   |

Kind of	Notation of	Size of	Bending	Modulus of	Cubic compressive
concrete	specimen	<pre>specimen(cm)</pre>	<pre>span(cm)</pre>	rupture(kg/cm²)	strength(kg/cm²)
10Ag.	10-PR-B-10.0	$10.17 \times 9.97$	30	32.9	315
series	10-PR-B-15.0	$15.12 \times 15.03$	45	35.9	324
15Ag.	15-PR-B-10.0	$10.21 \times 9.96$	30	30.7	303
series	15-PR-B-15.0	15.10×15.03	45	34.1	324
20Ag.	20-PR-B-10.0	$10.18 \times 10.00$	30	33.1	326
series	20-PR-B-15.0	15.15×15.05	45	24.6	303
25Ag.	25-PR-B-10.0	$10.00 \times 10.04$	30	34.0	318
series	25-PR-B-15.0	15.02×15.13	45	31.2	296









Fig. 3-1 Relation between non-failure probability ln(-ln(1-P)) and strength ln(F) (Weibull distribution).





Fig. 3·2 Relation between non-failure probability (1-P) (%) and strength (F) (Normal distribution).

## where, P: failure probability N: the total number of specimens

When a material shows perfectly bittle fracture mode, the probability distribution of strangth follows a Weibull distribution [Ref. 19, 20, 15 and 21], the relation between non-failure probability  $\ln(-\ln(1-P))$  and the strength  $\ln(F)$  is expressed by the straight line expression (Weibull distribution).

$$In(-In(1-P)) = In(A) + (\beta + 1) \cdot In(F) \qquad \dots \dots (2)$$

where, P: failure probability

- β: parameter related to properties of concrete
- A: a constant determined by kind of materials, circumstances, size of specimen, etc.
- F: strength of specimen

The slope of straight line  $(\beta + 1)$  does not reated to the quantity of tdetects. In this study, it was assumed that the experimental errors were small and distributions of that errors were uniform in the large range of D/d. The straight lines obtained by the least square approximation of experimental values are shown in Fig. 3.1 and 3.2, and the expressions of these straight lines and correlation coefficients are shown in Table 4.1.

The results of tests show correlation coefficient of 0.85-0.99 in prism compressive specimens, 0.94-0.99 in cylinder comperssive, 0.96-0.996 in prism direct tensile and 0.94-0.99 in cylinder splitting. In the case of prism direct tensile test, correlation coefficient is nearest to 1. Fig. 3.2 shows the probability distribution of test results protted on Normal probability paper. Fig. 3.1 and 3.2 show that distributions of experimental values are quite close to the straight line, but some values are slightly apart from the straight line near the maximum and minimum values. This matter requires futher examinations to discuss the structural safety. In order to propose the probability distribution for adequate indication of distribution of exerimental values, it is necessary to accumulate more experimental data.

#### 1) Effect of size of specimen

Fig. 4 and Table 4.1 show the relation between material constant ( $\beta$ ) and spacimen size (S).  $\beta$  was calculated by the following formula form "a" (slope of the straight line drawn by the probability distribution of strength calculated by the method of reast squares on the weibull probability paper.

$$\beta = a - 1$$
 .....(3)

Fig. 4 shows the tendency that the value of  $\beta$  increase with increase of S (size of spacimen; prism spec.: S= prism width, cyclinder spec.: S=cylinder diamater).

Nagamatsu stated that the value of  $\beta$  was constant [Ref. 15]. However, Fig. 4 shows that  $\beta$  is greatly

affected by the size of aggregate in concrete or by the size of specimen, and not constant. Hoshino and Tomeji showed that  $\beta$  was 5.25 for the direct tensile strength of mortar [Ref. 38].

## 2) Effect of Size of Aggregates

Fig. 5 shows the relation between material constant  $(\beta)$  and width (diameter) (D) of spacimen to size of aggregate (d) ratio (D/d), in the tensile strength of concrete. In the case of PR-T specimen (prism specimen in direct tensile test), the value of  $\beta$  increases straight up to D/d=10, but after D/d exceeds 10, it shows tendency to decrease.

In the case of CY-SP specimen (cylinder splitting specimen), the value of  $\beta$  has the tendency to increase up to D/d=10 while showing considerable variabiability, but after D/d exceeds 10, it shows the tendency to decrease same as PR-T specimen.

## (3) Coefficient of Variation of Strength

Coefficient of variation of strength (CV) was calculated by the following formula.

where, CV: coefficient of variation

- Fi: measured value of strength
  - $\overline{F}$ : mean value of strength
  - N: total number of specimens

1) Effect of size of specimen

Fig. 6 shows the relation between coefficient of variation of strength (CV : %) and size of specimen (S). The value of CV of compressive strength of prism specimen decreases greatly with increase in prism width S in the range whear S is 4.46cm—7.25cm,but in the rang where S is larger than 7.25cm, the tendency of decrease suddenly becomes small. This tendency coincides well with the result of experiments reported by the auther [Ref. 7].

The value of CV of compressive strength of cylinder specimen in the range where s is  $\phi 7.5 - \phi 15$ decrease continuously with increase in S. The value of CV of the direct tensile strength of prism specimen decreases greatly with increase in S in the rang where the prism width (S) is 4.46-7.25, but after the value of S exceeds 7.25 each series of concrete show very little decrease and show constant value. However, the specimen of which maximum size of aggregates is smaller, shows the smaller values of CV. On the other hand, the value of CV of the spling tensile strength of cylinder specimen decreases greatly with increase in S in the range where cylinder diameter (S) is 7.5cm -10 cm, but after exceeding this rang the value of CV decreases very little and shows almost constant value. Hoshino reported that the variability of direct tensile strength was larger than the variablility of splitting tensile strength [Ref. 37] . However, according to this experimental results, the value of



Fig. 4 Relation between material constant ( $\beta$ ) and size of specimen S.



Fig. 6 Relation between coefficient of variation of strength (CV : %) and size of specimen (S).



Fig. 5 Relation between material constant (β) and width (diameter) of specimen to size of aggregate d ratio D/d.



Fig. 7 Relation between coefficient of variation of strength (CV : %) and the value of D/d.



Fig. 8 Relation between coefficient of variation of strength (CV : %) and material constant ( $\beta$ ).



Fig. 10 Relation between strength (F) and the value of D/d.



Fig. 9 Relation between strength (F) and size of specimen (S).



Fig. 11 Relation between relative concrete strength (ln  $F/F_{\rm 15})$  and relative volume of specimen (ln  $V_{\rm 15}/V).$ 



Fig. 12 Relation between prFt/Fsp and cylinder diameter S, and aggregate size d.



Fig. 13 Cubic compressive strength and modulus of rupture of prism specimen.

CV of direct tensile and splitting showed similar tendency and the variability of splitting strength showed slightly larger value.

#### 2) Effect of Size of Aggregeate

Hoshino, Johnston and sidewell, Sabnis and Mirza, et al reported that the specimen with aggregate of large size showed larger variability of tensile strangth in the splitting tensile test [Ref. 37,43,18,46]. However, the experimental result of this time showed that specimens of 20 Ag. series and 25 Ag. series had smaller variablility than specinens of 15 Ag. series and 10 Ag. series. More researches are needed in this area. Johnston reported that the specimen with aggregate of large size showed larger value of CV of direct tensile strength in the direct tensile test, which concides with the experimental results of this time [Ref. 43].

Fig. 7 shows the relation between values of CV of direct tensile strength and D/d of prism specimen. The value of CV shows tendency to decrease with increase in D/d in the hyperbolic shape, but the relation between CV and D/d can not be indicated in one formula because it is affected by size of aggregate.

#### 3) Effect of Value of $\beta$

Fig. 8 shows the relation between CV and  $\beta$ . The value of cofficient of variation (CV) can be calculated by the following theoretical equation [Ref. 15,21].

where,  $\Gamma$ : gamma function

Nagamatsu reported that coefficient of variation CV of strength was affected only by material constant  $\beta$ , not affected by size of specimen and proporsed eq. 5. However, it is obvious in Fig. 8 that the experimental values are larger than the theoretical value in both prism compressive strength and prism direct tensile strength. Therefore, the probability distribution of its

strength can not always be expected by a Weibull distribution  $\ensuremath{\left[\text{Ref. 22}\right]}$  .

## (4) Mean Value of strength

Fig. 9 shows the relation between strangth (F) and size of specimens (S). Compressive strength of prism specimens decreases straight when size of specimen becomes smaller, and strangth decreases in parallel with increase in size of aggregate in concrete. These tendencies were already confirmed by the auther's previous study [Ref. 7].

The direct tensile strength of prism specimen shows considerable increase with decrease in size of specimens S in the rang where S is 15.0-9.68cm, but this increase of direct tensile strength reaches the top when S is smaller than 9.68 and it rather decreases when S is smaller than 7.25.

These strengths of specimens of aggregate size 20 Ag. series and 25 Ag. series showed tendency to become lower than these strangth of 10 Ag. and 15 Ag. series when the value of S become smaller. On the other hand, as shown in Fig. 9, splitting tensile strangth of cylinder specimen showed a little difference according to the size of aggregate in case of  $\phi$  15cm cylinder-the specimen with aggregate of large size showing slightly low strength, but in case of  $\phi 10$ and  $\phi$ 7.5cm cylinders, any difference of strangth by size of aggregate was not recognized. Besides, the value of splitting tensile strength increases greatly with decrease in the value of diameter S when S is 15 -10 cm, but with S = 10 cm as border, when S decreases from 10cm to 7.5cm strangth rather falls. On the other hand, Subnis and Mariza repored "Mirza [Ref. 46] tested series of cylinders, cast form the same model concrete, ranging from lin.  $\times 2in.$  (25mm $\times 50mm$ ) to  $6in. \times 12in.$  (150mm  $\times$  300mm) in splitting tensile tests. and the mean strength and the standard deviation were found to decrease with an increase in size of specimen [Ref. 20]. This difference will be studied here after.

Fig. 10 shows the relation between strength (F) and the value of D/d. Compressive strength (F) of prism specimen and cylinder specimen shows tendency to increase with increase in D/d and in the case of same value of D/d, the larger the size of specimen is,the slightly larger value concrete shows.

On the other hand, with same D/d value, direct tensile strength of prism specimen showed that the specimens of 20 Ag. and 25 Ag. series had considerably lower value than the specimens of 10 Ag. and 15 Ag. series. The experiment of this time shows that tensile strangth of concrete is not determined only by D/d, but also affected greatly by size of aggregate.

Fig. 11 show the relation between relative concrete strangth (1n  $F/F_{15}$ ) and relative volume of specimen (1n  $V_{15}/V$ ) plotted on the logarithmic graph (both co -ordinates) where  $F_{15}$  and  $v_{15}$  are the strangth and volume of S=15.0cm series of prism specimen, res-

pectively. According to the Weibull's weakest statistical theory and the stochastic theory for the perfectry brittle fracture mode, size effect of strength can be writtlen as follows:

where,  $F_0$  and  $V_0$  are strength and volum of standard specimen.  $\beta$  is material constant .

According to the above formula, relation between  $\ln(F/F_0)$  and  $\ln(V_0/V)$  is indicated on the straight line with the slope  $-1/(\beta+1)$ .

In Fig. 11, relation between compressive strength of prism and volume of specimen is shown nearly by the formula of straihit line regardless of aggregate size except secimen of S=4.46cm, and the above formula is almost affected, but in the case of direct tensile strength, it can not be considered as straight line. The value of direct tensile strength shows tendency to increase on the contrary when the value of specimen size becomes larger than the certain value.

Fig. 12. shows relationship between  $_{\rm Pr}F_t/F_{\rm sp}$  ratio ( $_{\rm Pr}F_t$ =direct tensile strength of prism,  $F_{\rm sp}$ =splitting tensile strength of cylinder) and size of aggregate. In Fig. 12, values of  $_{\rm pr}F_{t7.25}/F_{\rm sp}\phi_{7.5}, _{\rm pr}F_{t9.68}/F_{\rm sp}\phi_{10}$  and  $_{\rm pr}F_{t15.0}/F_{\rm sp}\phi_{15}$  were calculated, supporsing the size of prism S and diameter of cylinder  $\phi$  were equal for convenience' sake. Fig. 13 shows the cubic compressive strength calculated from the mean value of each six specimens and the modulus of rupture calculated from the mean value of each three specimens, for referrence.

## 4. CONCLUSION

The following are the conclution of study on probability distribution and size effect, with tests of compressive strength, direct tensile strength and splitting tensile strength using different sizes of aggregate and specimen which are main factors to determine strength of concrete.

1) The experimental value of strangth shows the probability distribution quite close to the strainght line when plotted either on Weibull probability papers or on Normal ones, but some values are slightly apart from the straight line near the maximum and minimum experimental values.

2) The value of material constant  $\beta$  shows tendency to increase with increase in size of specimen S. The value of  $\beta$  is largely affected by the size of aggregate in concrete and by the size of specimen, and cannot be considered as constant value.

3) Coefficient of variation for strength in compressive test showed gradual increase with decrease of specimen size in the range of 15cm to 10—7cm, but it showed greatly increase when the specimen size becomes smaller than the range of 10—7cm.

4) The value of coefficient of variation (CV) for tensile strength showed same tendency as compressive strength, in both cases of direct tensile test and splitting test.

5) The value of coefficient of variation (CV) for tensile strength of concrete in direct tensile test shows larger values when the size of aggregate in the specimen is larger.

6) Experimental values of coefficient of variation (CV) of strength show the lower values than theoretical ones indicated by the formula (5). Therefore the probability distribution of its strength cannot always be expressed by the Weibull distribution.

7) Compressive strength decreases with decrease in size of specimen, both in prism and cylinder specimens, and with increase in size of aggregates.

8) Tesile strength of concrete reaches the top at specimen size of 10cm both in prism and cylinder specimens, but it rather decreases when specimen size becomes smaller than 10cm.

9) The formula (6) is almost effected in compressive test of prism specimen, but the formula (6) is not effected in direct tensile test.

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