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Standard Practice for Core Sampling of Raw Wool in Packages for Determination of Percentage of Clean Wool Fiber Present[1]

This standard is issued under the fixed designation D1060; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice for sampling covers a procedure for obtaining samples from lots of grease, pulled, or scoured wool or related animal fibers in bales or bags for the determination of the clean wool fiber present by a procedure similar to that described in Test Method D584.

1.2 This practice provides a description of suitable core sampling equipment, the sampling procedure, and the method for determining the number of packages to be bored and the number of cores to be taken from each sampled package.

1.3 Reliable estimates are given for the standard deviation of the percentage clean wool fiber present between packages and within packages for lots of many types of raw wool.

1.4 The values stated in inch-pound units are to be regarded as the standard. The SI units are in parentheses. The values in each system are not exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in nonconformance with this practice.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

D123 Terminology Relating to Textiles

D584 Test Method for Wool Content of Raw Wool—Laboratory Scale

E105 Practice for Probability Sampling Of Materials

E122 Practice for Calculating Sample Size to Estimate, With Specified Precision, the Average for a Characteristic of a Lot or Process

3. Terminology

3.1 *Definitions:*

3.1.1 *clean wool fiber present*, *n—in raw wool*, the mass of wool base present in the raw wool, adjusted to a moisture content of 12 %, an alcohol-extractable content of 1.5 %, and a mineral matter content of 0.5 %.

3.1.1.1 *Discussion*—The term "clean wool fiber present" is synonymous with the term "absolute clean content" as defined in the Tariff Schedules of the United States of America (see Test Method D584).

3.1.2 *core*, *n—in sampling fiber packages*, the portion of wool or other fiber obtained by using a sampling tube.

3.1.3 *raw wool*, *n*—wool or hair of the sheep in the grease, pulled, or scoured state.

3.2 For definitions of other textile terms used in this practice, refer to Terminology D123.

4. Summary of Practice

4.1 The lot is core sampled in accordance with one of a series of equivalent schedules based on estimates of variability of the percentage clean wool fiber present and on the required level of precision. A set of packages of wool is taken as a lot sample. From each package in the lot sample, a fixed number of cores of wool is drawn to be used as a laboratory sample. Guidance in the selection of the most economical of the equivalent schedules is provided.

5. Significance and Use

5.1 Core sampling is widely accepted, when applicable, for obtaining a laboratory sample representative of the clean wool fiber present in a lot of packaged raw wool.

5.2 If the wool is so loosely packed that a core cannot be cut, or if it is so highly compressed that the sampling tool cannot readily penetrate into the package to the required depth and in the required direction, core sampling is not applicable. The density of wool in most types of commercial packages is suitable for sampling by this method.

[1] This practice is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.13 on Wool and Wool Felt.

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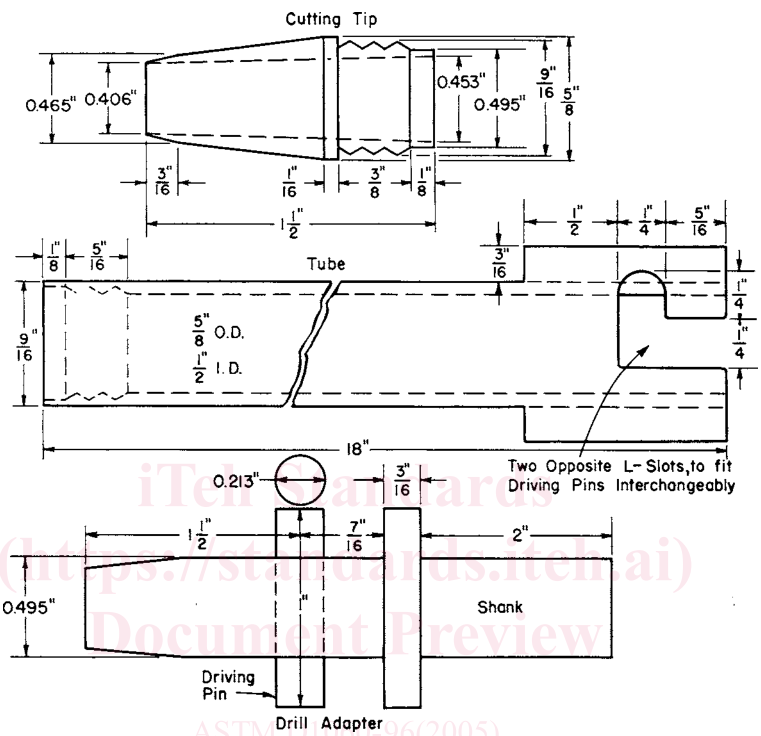
[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

5.3 The procedure described in this practice is adapted to the application of statistical methods for estimating the size of sample required to achieve a required level of sample precision at minimum cost.

NOTE 1—The basic sampling equipment, operating procedure, and statistical approach used in this practice have been adapted for sampling lots of wool for the determination of other properties that are not affected by boring, such as average fiber diameter, and for sampling lots of other bulk fibers in packages.

6.1.4 Drills of ½ hp (375 w) rotating at 200 to 550 rpm (3.3 to 10 rps), have been found to be satisfactory.

6.1.5 A toothed cutting edge on a rotating tube of small diameter, instead of the smooth edge illustrated in Fig. 1, is acceptable provided that for any specific design it has been shown that a bias is not introduced thereby. The absence of bias in samples obtained with a rotating 2-in. (50 mm) diameter tube with a toothed cutting edge has been demonstrated.



(Metric equivalents may be calculated by multiplying inches by 25.4 to obtain equivalent dimensions in millimetres.)

FIG. 1 Small Diameter Wool Sampling Tool (United States Customs Service)

6. Apparatus

6.1 *Sampling Tool*[3]—A tube equipped with a cutting edge, together with a drill, hammer, press, or similar device, and accessories. The tube must be capable of penetrating the required distance (see 7.2) into a package of wool and cutting a core therefrom, which core must be retained substantially unchanged within the tube during its withdrawal from a package.

6.1.1 Fig. 1 illustrates the design of a recommended type of rotatable small-diameter wool sampling tube.

6.1.2 Sampling tubes in common use range from approximately ½ to 2 in. (13 to 50 mm) in diameter, and from 10 to 40 in. (250 to 1000 mm) in length.

6.1.3 Some types of sampling tubes are equipped with receptacles at the rear of the tube.

6.2 *Sample Container*—A container with closure of such material and so constructed that a sample stored therein will not show a material change in its moisture content during the interval between sampling and weighing the sample for test.

7. Sampling Procedure

7.1 *Time of Sampling*—Take the sample at or about the time the lot is weighed.

7.2 *Depth of Penetration*—Penetrate a bale of wool with the sampling tube to a depth such that substantially all parts of the package can be reached. Maintain the same depth of penetration for each core taken from a given lot.

7.3 *Location of Borings*:

7.3.1 Consider a package as composed of eight sections approximately equal in volume, defined by top or bottom, front or back, left or right.

7.3.2 Alternate the location of boring in such a fashion that the total composite sample will consist of approximately the same number of cores from each section of the packages.

7.3.3 If the packages have been compressed in a baling press, enter a package through a compression surface and in a direction normal to that surface.

[3] The sole source of supply of the apparatus known to the committee at this time is Yocom-McColl Testing Laboratories, Inc., 540 Elk Place, Denver, CO 80216. If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,[1] which you may attend.

7.4 Whenever there is danger that loose sand or other material may drop out of the tube during or after boring, so position the package that the direction of boring will be horizontal.

7.5 Just before entering a sampling tube into a package of wool, cut the covering in such a way that none of the covering material fibers become mixed with the core or with the wool in the package.

7.6 Immediately upon withdrawal of the tube after boring, extrude the core directly into the sample container or the intermediate receptacle (6.1.3) without loss of material or unnecessary exposure to atmospheric conditions that may result in a change in the moisture content of the core.

8. Size of Sample[4]

8.1 *Variance of Sample Mean*—If a sample consists of k cores from each of n packages from a lot of N packages of raw wool, and the $n \times k$ cores are composited into a single sample on which m tests for percent clean wool fiber present are made, then the variance of the mean of the observations is given using Eq 1 (Notes 2 and 3):

$$\sigma_x^2 = \frac{\sigma_b^2}{n} \times \frac{N-n}{N} + \frac{\sigma_w^2}{n \times k} + \frac{\sigma_t^2}{m}$$

$$= \sigma_s^2 + \frac{\sigma_t^2}{m} \quad (1)$$

where:

- σ_x^2 = variance of the mean of the m observations,
- σ_b^2 = variance for percent clean wool fiber present between packages within the lot,
- σ_w^2 = average variance for percent clean wool fiber present of cores within packages of the lot,
- σ_t^2 = variance of observations on a homogeneous sample,
- σ_s^2 = variance for percent clean wool fiber present for the sample, as defined by Eq 1,
- n = number of packages selected at random from the lot from which cores are taken,
- N = number of packages in the lot,
- k = number of cores taken from each of the n packages, and
- m = number of observations made on the composite sample.

NOTE 2—Uniform mass of packages and of cores are assumed. If the departure from uniformity is such that a material error would be introduced by this assumption, proportional compositing must be adhered to.

NOTE 3—The factor $(N\text{-}n)/N$ is the correction for sampling from a finite population. A corresponding correction is generally not necessary for cores and tests.

8.2 *Number of Cores*—Unless otherwise agreed upon, as when specified in an applicable material specification, take a number of cores such that σ_s^2 will be 0.2603.

NOTE 4—0.2603 is the value calculated from $(1.0/1.960)^2$

where:

- 1.0 = allowable variation of the percent clean wool fiber present of the composite sample, and
- 1.960 = value of Student's t for infinite degrees of freedom, two-sided limits, and a 95 % probability level.

8.2.1 *Reliable Estimates of Variances Available*—When reliable estimates of σ_b^2 and σ_w^2 are available, determine the required number of packages based on a specific number of cores per package using Eq 2 or Table 1:

$$n = N(s_w^2 + k\,s_b^2)/[0.2603\,kN + ks_b^2] \quad (2)$$

where:

- n = number of packages to be selected from the lot for coring (rounded upward to a whole number),
- N =
- k = number of cores to be taken from each selected package (Note 5),
- s_w = reliable estimate of the standard deviation for percent clean wool fiber present of cores within packages of a lot of similar packaged raw wool (Note 6),
- s_b = reliable estimate of the standard deviation for percent clean wool fiber present between packages within a lot of similar packaged raw wool (Note 6), and
- 0.2603 = value defined in Note 4.

NOTE 5—Any convenient value of k may be used, but the value of k calculated using Eq 3 and rounding to the nearest whole number will give the most economical sample:

$$k = (s_w^2 \times B/s_b^2 \times C)^{\frac{1}{2}} \quad (3)$$

where:

- B = average cost of selecting and positioning a package for coring, and
- C = average cost of taking and handling a core, and the other terms are defined in the legend for Eq 2.

NOTE 6—Estimates of the variances are best based on data obtained in investigations using analysis of variance techniques for lots of similar packaged raw wool. The estimates listed in Table A1.1 were so obtained. Estimates may also be based on records in the user's laboratory if the plan for sampling and testing described in STP 114[5] has been followed. For testing that does not involve a dispute between the purchaser and the supplier, variances may be estimated as specified in Practice E122.

8.2.2 *No Reliable Estimates of Variances Available*—When no reliable estimates of σ_b^2 and σ_w^2 are available, determine the required number of packages based on a specific number of cores per package using Eq 2 or Table 1 and $s_w = s_b = 5.0$ percentage points. These estimates of variability are somewhat larger than the variability usually found in practice and will usually require a larger number of cores than when reliable estimates of variability are available.

9. Sampling Schedules

9.1 For convenience, Table 1 gives the values of n calculated by Eq 2 for selected pairs of values of s_w and s_b and for selected lot sizes, N, and numbers of cores per package, k, for

[4] For background information, see the paper by Louis Tanner and W. Edwards Deming, "Some Problems in the Sampling of Bulk Materials," *Proceedings,* ASTM, Vol 49, 1949, p. 1181 and ASTM Practice E105.

[5] *Symposium on Bulk Sampling, ASTM STP 114*, ASTM, 1952.

an allowable variation of ±1.0 % clean wool fiber present at a probability level of 95 %.

10. Keywords

10.1 sampling; wool content

TABLE 1 Values of *n* for an Allowable Variation of ± 1.0 % Clean Wool Fiber Present (0.86 % Wool Base) at a Probability Level of 95 %[A], for Selected Values of s_w, s_b, and *k*

s_w	s_b	Number of Cores per Sampled Package, *k*	Number of Packages in Lot, *N*									
			25	50	75	100	150	200	300	500	750	1000
			Number of Packages to Be Sampled, *n*									
1.0	1.0	1	7	8	8	8	8	8	8	8	8	8
1.0	1.5	1	10	11	12	12	12	12	13	13	13	13
1.0	2.0	1	12	15	17	17	18	18	19	19	19	19
1.0	2.5	1	15	19	22	23	24	25	26	27	27	28
1.0	3.0	1	17	23	27	29	32	33	35	36	37	38
1.0	3.5	1	18	27	32	35	39	43	44	47	48	49
1.0	4.0	1	19	30	36	41	47	50	55	59	61	62
1.0	4.5	1	20	32	40	46	54	59	65	71	74	76
1.0	5.0	1	21	35	44	51	61	68	76	84	89	92
1.5	1.0	1	11	12	12	13	13	13	13	13	13	13
1.5	1.5	1	13	15	16	16	17	17	17	17	18	18
1.5	2.0	1	15	19	20	21	22	23	23	24	24	24
1.5	2.5	1	17	23	25	27	29	30	31	32	32	32
1.5	3.0	1	19	26	30	33	36	37	39	41	42	42
1.5	3.5	1	20	29	35	38	43	46	49	51	53	54
1.5	4.0	1	21	32	39	44	50	54	59	63	65	67
1.5	4.5	1	21	34	43	49	57	63	69	75	79	81
1.5	5.0	1	22	36	46	54	64	71	80	88	93	96
2.0	1.0	1	17	18	19	19	19	19	19	20	20	20
		2	10	11	11	12	12	12	12	12	12	12
2.0	1.5	1	18	21	22	23	23	24	24	24	24	24
		2	13	14	15	16	16	16	16	17	17	17
2.0	2.0	1	20	24	26	27	28	29	30	30	31	31
		2	15	18	20	20	21	22	22	23	23	23
2.0	2.5	1	21	27	30	32	34	36	37	38	39	39
		2	17	22	25	26	28	29	30	31	31	31
2.0	3.0	1	21	30	35	38	41	43	45	47	48	49
		2	18	25	29	32	35	37	38	40	41	41
2.0	3.5	1	22	33	39	43	48	51	54	58	59	60
		2	19	29	34	38	42	45	48	51	52	53
2.0	4.0	1	23	35	43	48	55	59	64	69	72	73
		2	20	32	39	43	50	53	58	62	64	66
2.0	4.5	1	23	37	46	53	62	68	74	81	85	87
		2	21	34	42	49	57	62	68	74	78	80
2.0	5.0	1	24	39	49	57	68	76	85	94	99	102
		2	22	36	46	53	64	71	79	88	92	95
2.5	1.0	1	25	26	27	27	28	28	28	28	28	28
		2	14	15	16	16	16	16	16	16	16	16
2.5	1.5	1	25	28	30	31	31	32	32	33	33	33
		2	16	18	19	20	20	20	21	21	21	21
2.5	2.0	1	25	31	33	35	36	37	38	39	39	39
		2	17	21	23	24	25	26	27	27	27	27
2.5	2.5	1	25	33	37	39	42	43	45	46	47	47
		2	19	25	28	30	32		34	35	35	36
2.5	3.0	1	25	35	41	44	48	50	53	55	57	57
		2	20	28	32	35	38	40	42	44	45	46
2.5	3.5	1	25	37	44	49	55	58	62	65	67	68
		2	21	31	37	41	45	48	52	54	56	57
2.5	4.0	1	25	39	47	53	61	66	71	77	80	81
		2	22	33	41	46	53	57	61	66	68	70
2.5	4.5	1	25	40	50	58	67	74	81	89	93	95
		2	22	36	45	51	60	65	72	78	82	84
2.5	5.0	1	25	42	53	62	74	82	91	101	107	110
		2	23	37	48	56	66	73	82	90	96	99
		2	23	37	48	56	66	73	82	90	96	99
3.0	1.0	1	[B]	36	37	37	38	38	38	39	39	39
		2	19	20	21	21	21	21	21	21	22	22
3.0	1.5	1	[B]	37	39	40	41	42	43	43	43	43
		2	20	23	24	24	25	25	26	26	26	26
3.0	2.0	1	[B]	39	42	44	46	47	48	49	49	50
		2	21	25	28	29	30	31	32	32	32	33
3.0	2.5	1	[B]	40	45	48	51	53	55	56	57	58

TABLE 1 *Continued*

s_w	s_b	Number of Cores per Sampled Package, k	Number of Packages in Lot, N									
			25	50	75	100	150	200	300	500	750	1000
			Number of Packages to Be Sampled, n									
		2	22	28	32	34	36	37	39	40	41	41
3.0	3.0	1	[B]	41	48	52	57	59	63	65	67	67
		2	22	31	36	39	43	45	47	49	50	51
3.0	3.5	1	[B]	43	51	56	63	67	71	75	77	78
		2	23	34	40	44	49	53	56	59	61	62
3.0	4.0	1	[B]	44	53	60	69	74	80	86	89	91
		2	23	36	44	49	56	61	66	71	73	75
3.0	4.5	1	[B]	44	56	64	74	81	90	98	102	105
		2	24	38	47	54	63	69	76	83	87	89
3.0	5.0	1	[B]	45	58	67	80	89	99	110	116	120
		2	24	39	50	58	70	77	86	96	101	104
3.5	1.0	1	[B]	48	49	50	50	50	51	51	51	51
		2	24	26	27	27	27	27	28	28	28	28
		3	17	19	19	19	20	20	20	20	20	20
		4	14	15	15	16	16	16	16	16	16	16
3.5	1.5	1	[B]	48	50	52	53	54	55	55	56	56
		2	24	28	29	30	31	31	32	32	32	32
		3	19	21	22	23	24	24	24	24	25	25
		4	16	18	19	19	20	20	20	21	21	21
3.5	2.0	1	[B]	48	52	55	57	58	60	61	62	62
		2	25	30	33	34	36	37	38	38	39	39
		3	20	24	26	27	29	29	30	31	31	31
		4	17	21	23	24	25	26	26	27	27	27
3.5	2.5	1	[B]	49	54	58	62	64	66	68	69	70
		2	25	33	37	39	41	43	45	46	47	47
		3	21	27	31	33	35	36	37	38	39	39
		4	19	25	28	29	31	32	34	35	35	35
3.5	3.0	1	[B]	49	56	61	67	70	74	77	79	79
		2	25	35	40	44	48	50	53	55	56	57
		3	22	30	35	38	41	43	46	48	49	49
		4	20	28	32	35	38	40	42	44	45	45
3.5	3.5	1	[B]	49	58	65	72	77	82	87	89	90
		2	25	37	44	49	54	58	62	65	67	68
		3	22	33	39	43	48	51	55	58	60	60
		4	21	31	37	41	45	48	51	54	56	57
3.5	4.0	1	[B]	49	60	68	77	84	91	97	101	103
		2	25	39	47	53	61	66	71	76	79	81
		3	23	35	43	48	55	60	65	69	72	73
		4	22	33	41	46	52	57	61	66	68	69
3.5	4.5	1	[B]	49	62	71	83	90	100	109	114	116
		2	25	40	50	57	67	73	81	88	92	95
		3	23	37	46	53	62	68	75	81	85	87
		4	22	36	44	51	59	65	72	78	82	84
3.5	5.0	1	[B]	49	63	73	88	97	109	121	127	131
		2	25	41	53	61	73	81	91	101	106	110
		3	24	39	49	57	69	76	85	94	100	102
		4	23	37	48	55	66	73	82	91	96	99
4.0	1.0	1	[B]	[B]	63	63	64	65	65	65	65	66
		2	[B]	33	33	34	34	34	35	35	35	35
		3	22	23	24	24	24	24	25	25	25	25
		4	17	18	19	19	19	19	19	20	20	20
4.0	1.5	1	[B]	[B]	63	65	67	68	69	69	70	70
		2	[B]	34	36	37	38	38	39	39	39	40
		3	22	25	27	27	28	28	29	29	29	29
		4	18	21	22	23	23	24	24	24	24	24
4.0	2.0	1	[B]	[B]	64	67	70	72	74	75	76	76
		2	[B]	36	39	40	42	43	44	45	46	46
		3	23	28	30	32	33	34	35	35	36	36
		4	20	24	26	27	28	29	30	30	31	31
4.0	2.5	1	[B]	[B]	65	69	74	77	80	82	83	84
		2	[B]	37	42	45	48	49	51	53	54	54
		3	23	31	34	36	39	40	42	43	44	44
		4	21	27	30	32	34	36	37	38	39	39
4.0	3.0	1	[B]	[B]	66	72	79	82	87	90	92	93
		2	[B]	39	45	49	54	56	59	62	63	64
		3	24	33	38	41	45	47	50	52	53	54
		4	21	30	35	38	41	43	45	47	48	49
4.0	3.5	1	[B]	[B]	67	74	83	88	94	100	103	104
		2	[B]	41	48	53	60	63	68	72	74	75
		3	24	35	42	46	52	55	59	62	64	65
		4	22	33	39	43	48	51	54	58	59	60

TABLE 1 *Continued*

s_w	s_b	Number of Cores per Sampled Package, *k*	Number of Packages in Lot, *N*									
			25	50	75	100	150	200	300	500	750	1000
			Number of Packages to Be Sampled, *n*									
4.0	4.0	1	[B]	[B]	68	77	88	95	103	110	114	116
		2	[B]	42	51	58	66	71	77	83	86	87
		3	24	37	46	61	69	63	69	73	76	78
		4	23	35	43	48	55	59	64	69	72	73
4.0	4.5	1	[B]	[B]	69	79	92	101	111	121	127	130
		2	[B]	43	54	62	72	79	87	94	99	101
		3	24	39	49	56	65	71	79	86	90	92
		4	23	37	46	53	62	68	74	81	85	87
4.0	5.0	1	[B]	[B]	70	81	97	107	120	133	140	144
		2	[B]	44	56	65	78	86	97	107	113	116
		3	25	40	52	60	72	79	89	98	104	107
		4	24	39	49	57	68	76	85	94	99	102
4.5	1.0	1	[B]	[B]	[B]	79	80	81	81	82	82	82
		2	[B]	40	41	42	42	42	43	43	43	43
		3	[B]	28	29	29	30	30	30	30	30	30
		4	21	22	23	23	23	23	23	24	24	24
4.5	1.5	1	[B]	[B]	[B]	80	82	83	85	85	86	86
		2	[B]	41	43	44	45	46	47	47	47	48
		3	[B]	30	32	32	33	34	34	34	35	35
		4	21	24	26	26	27	27	28	28	28	28
4.5	2.0	1	[B]	[B]	[B]	81	85	87	89	91	92	92
		2	[B]	42	46	48	50	51	52	53	54	54
		3	[B]	32	35	36	38	39	40	41	41	41
		4	22	27	29	31	32	33	34	34	35	35
4.5	2.5	1	[B]	[B]	[B]	83	88	91	95	98	99	100
		2	[B]	43	48	51	55	57	59	61	61	62
		3	[B]	34	38	41	44	45	47	48	49	49
		4	23	30	33	36	38	39	41	42	43	43
4.5	3.0	1	[B]	[B]	[B]	84	92	96	101	106	108	109
		2	[B]	44	51	55	60	63	66	69	71	72
		3	[B]	36	42	45	50	52	55	57	58	59
		4	23	32	37	41	44	47	49	41	52	53
4.5	3.5	1	[B]	[B]	[B]	85	96	102	108	115	118	120
		2	[B]	45	53	59	66	70	75	79	81	83
		3	[B]	38	45	50	56	60	64	67	69	70
		4	24	35	41	46	51	54	58	61	63	64
4.5	4.0	1	[B]	[B]	[B]	87	99	107	116	125	129	132
		2	[B]	46	56	63	72	77	84	90	93	95
		3	[B]	40	49	55	62	67	73	78	81	83
		4	24	37	45	51	58	62	68	73	75	77
4.5	4.5	1	[B]	[B]	[B]	88	103	113	124	135	141	145
		2	[B]	46	58	66	77	85	93	101	106	109
		3	[B]	41	51	59	69	75	83	90	94	97
		4	24	39	48	55	65	71	78	85	89	91
4.5	5.0	1	[B]	[B]	[B]	89	106	118	132	146	155	159
		2	[B]	47	60	69	83	92	103	114	120	124
		3	[B]	42	54	63	75	83	93	103	109	112
		4	24	40	51	59	71	79	88	97	103	106
5.0	1.0	1	[B]	[B]	[B]	97	98	98	99	100	100	100
		2	[B]	49	50	50	51	51	52	52	52	52
		3	[B]	34	35	35	35	36	36	36	36	36
		4	25	26	27	27	28	28	28	28	28	28
5.0	1.5	1	[B]	[B]	[B]	97	99	101	102	103	104	104
		2	[B]	49	51	53	54	55	56	56	57	57
		3	[B]	35	37	38	39	39	40	40	51	41
		4	25	28	30	31	31	32	32	33	33	33
5.0	2.0	1	[B]	[B]	[B]	97	102	104	106	109	110	110
		2	[B]	49	53	55	58	59	61	62	63	63
		3	[B]	37	40	42	43	44	46	46	47	47
		4	25	31	33	35	36	37	38	39	39	39
5.0	2.5	1	[B]	[B]	[B]	97	104	108	112	115	117	118
		2	[B]	49	55	59	63	65	67	69	70	71
		3	[B]	38	43	46	49	51	52	54	55	55
		4	25	33	37	39	42	43	45	46	47	47
5.0	3.0	1	[B]	[B]	[B]	98	107	112	118	123	125	127
		2	[B]	49	57	62	68	71	75	78	79	80
		3	[B]	40	46	50	55	57	60	63	64	65
		4	25	35	41	44	48	50	53	55	57	57
5.0	3.5	1	[B]	[B]	[B]	98	109	116	124	131	135	137
		2	[B]	49	59	65	73	77	83	87	90	91
		3	[B]	41	49	54	61	65	69	73	75	76