NOTE: The values shown herein represent normal production practice at the most economic level. Greater accuracy involving extra close work or care in production should be specified only when and where necessary since additional costs may be involved. Conversely, more liberal values should be indicated when acceptable, as these tend to keep costs to a minimum. Any variations in these values shall not be binding on the foundry unless accepted in writing.

A profile is the outline of an object in a given plane. Profiles are formed by projecting a three-dimensional figure onto a plane or by taking cross sections through the figure. The elements of a profile are straight lines, arcs, and other curved lines.

The profile tolerance specifies the width of a uniform zone (one half on each side of the basic profile) within which the elements of the surface must lie.

Where applicable, a general profile tolerance requirement may be specified in a note on the drawing. The general profile tolerance should specify the datum system (usually defined by datum target points—See AA-CS-E20, Page 1-32) from which the basic profile of the toleranced surfaces are located. (Figure 1)

In determining the amount of tolerance to be specified in a general profile tolerance requirement, consideration must be given to a number of factors. The general profile tolerance should be broad enough to reflect the variations caused by expansion and contraction of the mold itself, the metal during solidification, patternmaking tolerances and vibration of the pattern during its removal.

TABLE 1 shows recommended tolerance values which should be attainable between features that are contained within the same mold half. The general profile tolerance should also allow for variance in dimensions which cross the parting line. These dimensions are affected by all of the above factors plus the hydrostatic pressure of the fluid metal which acts similar to hydraulic fluid in a cylinder trying to force the mold halves apart. The amount of additional variation across the parting line, therefore, is related to the "projected area" of the casting at the parting line. For multiple cavity molds the projected area is the area of the mold occupied by the cavities including the area between the cavities.

TABLE 2 shows recommended tolerance values which should be added to those found in TABLE 1 for dimensions crossing the parting line.

TABLE 3 shows recommended tolerance values which should be added to those found in TABLE 1 for dimensions which include areas formed by sand or metal cores.

Specific features which require a more stringent tolerance than the general profile tolerance should be toleranced separately in the appropriate views on the drawing. (Figure 2)

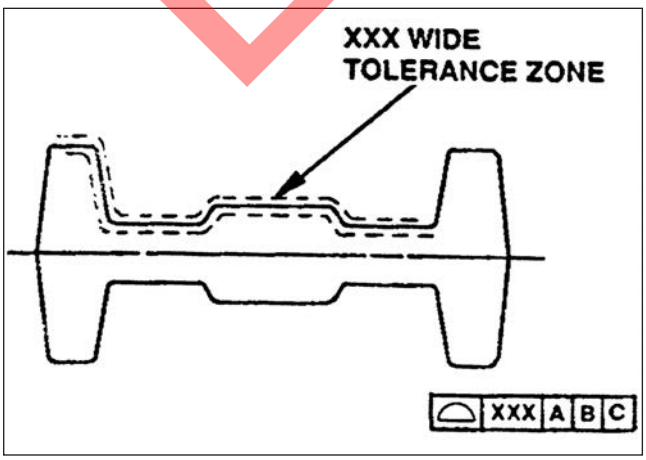


Figure 1

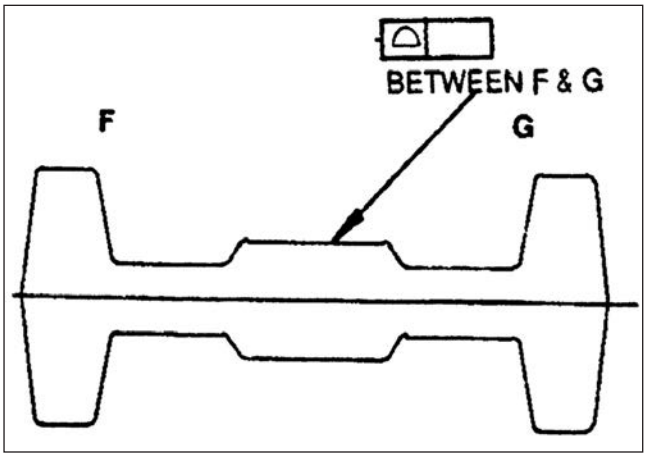


Figure 2

 *Formerly AA-CS-E8-92 in previous editions

CONCENTRICITY TOLERANCES: How to apply this standard. Example below is for permanent mold casting.

1. Basic Tolerances—Surfaces in fixed mold relationship:

   Cylindrical surfaces A and B are formed by the same mold section. If diameter A is 7 in. (175 mm) and diameter B is 4 in. (100 mm), diameter A will be concentric with diameter B within .031 in. T.I.R. (8 mm F.I.M.) (e.g., .025 in. + (2 × .003) = .031 in. [.6 mm for the first 125 mm + (2 × .080)]).

2. Surfaces formed by opposite mold sections:

   Diameters A and B are formed by opposite mold halves. If the projected area C of the casting is 10 × 15 in. or 150 sq. in. (1000 cm^2), cylindrical surface A is 8 in. (200 mm) in diameter and cylindrical surface B is 6 in. (150 mm) in diameter, diameter A will be concentric with diameter B within .069 in. T.I.R. (1.7 mm F.I.M.).

   Projected area allowance .035 in. + basic tolerance [.025 in. + (3 × .003)] = .069 in.
   Projected area allowance .9 mm + basic tolerance [.6 mm + (3 × .080)] = 1.70 mm

3. Surfaces formed by two moving mold members:

   Diameters A and B are formed by moving mold members. If diameter A is 5 in. (125 mm) and diameter B is 2 in. (50 mm), projected area of member C is 25 sq. in. (160 cm^2) and projected area of mold member D is 12 sq. in. (75 cm^2), diameter A will be concentric with diameter B within .075 in. T.I.R. (1.9 mm F.I.M.).

Basic tolerance for 5 in. (125 mm) diameter – .025.....	.025 in.	0.60 mm
Projected area allowance for member C (25 in^2 or 160 cm^2).....	.030 in.	0.80 mm
Projected area allowance for member D (12 in^2 or 75 cm^2).....	.020 in.	0.50 mm
Total.....	.075 in.	1.90 mm

NOTE: The values shown herein represent normal production practices. Fine detail may involve additional costs.

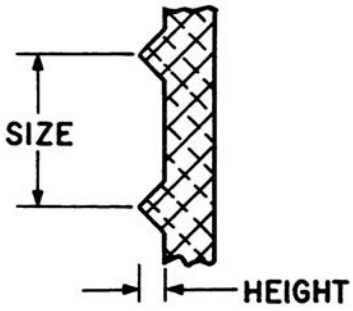
Lettering, trademarks, and identification symbols may be reproduced on the surfaces of sand castings. This lettering can be added to the pattern by means of metal or plastic ribbons, spiked or glued letters, engraved inserts, by casting or stamping the information integrally to the pattern or by the use of inserted plugs that can be replaced if a change is required.

RAISED LETTERS: This is the preferred method of casting lettering on a surface.

RAISED LETTERS IN A RECESS: A satisfactory alternative if raised letters on the cast surface are objectionable.

DEPRESSED LETTERS: Depressed letters are more difficult to cast legibly and are not recommended for wood patterns.

Sharp face letters will be used unless otherwise specified as this type makes a good impression in the sand and reproduces well on the casting. When lettering is to be highlighted, specify a flat face letter. Lettering should be placed on a flat surface, parallel to the parting line, with adequate space allowed (see below) and should not run into fillets or radii. Readability is reduced when placed on a curved surface or in a core.



The above illustration indicates the spacing required for 1/2 in. (12 mm) and 1/4 in. (6 mm) letters. The table below indicates the minimum width required for standard letters, in inches and millimeters.

	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
*Size	0.125	3	0.188	5	0.25	6	0.31	8	0.38	10	0.50	12
Min. Width 10 Letters	1.44	36	1.94	50	2.38	60	2.88	75	3.38	85	4.25	110
Height	0.031	0.8	0.047	1.2	0.047	1.2	0.047	1.2	0.063	1.6	0.078	2.0

All dimensions in inches and millimeters.
*Minimum sizes: Raised—1/8 in. (3 mm) minimum with 1/4 in. (6 mm) preferred.
Depressed—3/16 in. (5 mm) minimum with 5/16 in. (8 mm) preferred.

*Formerly AA-CS-E16-2000 in previous editions

CHEMICAL COMPOSITION LIMITS FOR COMMONLY USED SAND AND PERMANENT MOLD CASTING ALLOYS ⓐ ⓑ

Alloy	Product ⓒ	Silicon	Iron	Copper	Manganese	Magnesium	Chromium	Nickel	Zinc	Titanium	Others	
											Each	Total ⓚ
201.0	S	0.10	0.15	4.0–5.2	0.20–0.50	0.15–0.55	—	—	—	0.15–0.35	0.05 ⓗ	0.10
204.0	S&P	0.20	0.35	4.2–5.0	0.10	0.15–0.35	—	0.05	0.10	0.15–0.30	0.05 ⓘ	0.15
206.0	S&P	0.10	0.15	4.2–5.0	0.20–0.50	0.15–0.35	—	0.05	0.10	0.15–0.30	0.05 ⓘ	0.15
A206.0	S&P	0.05	0.10	4.2–5.0	0.20–0.50	0.15–0.35	—	0.05	0.10	0.15–0.30	0.05 ⓘ	0.15
208.0	S&P	2.5–3.5	1.2	3.5–4.5	0.50	0.10	—	0.35	1.0	0.25	—	0.50
222.0	S&P	2.0	1.5	9.2–10.7	0.50	0.15–0.35	—	0.50	0.8	0.25	—	0.35
242.0	S&P	0.7	1.0	3.5–4.5	0.35	1.2–1.8	0.25	1.7–2.3	0.35	0.25	0.05	0.15
295.0	S	0.7–1.5	1.0	4.0–5.0	0.35	0.03	—	—	0.35	0.25	0.05	0.15
296.0	P	2.0–3.0	1.2	4.0–5.0	0.35	0.05	—	0.35	0.50	0.25	—	0.35
308.0	P	5.0–6.0	1.0	4.0–5.0	0.50	0.10	—	—	1.0	0.25	—	0.50
319.0	S&P	5.5–6.5	1.0	3.0–4.0	0.50	0.10	—	0.35	1.0	0.25	—	0.50
328.0	S	7.5–8.5	1.0	1.0–2.0	0.20–0.6	0.20–0.6	0.35	0.25	1.5	0.25	—	0.50
332.0	P	8.5–10.5	1.2	2.0–4.0	0.50	0.50–1.5	—	0.50	1.0	0.25	—	0.50
333.0	P	8.0–10.0	1.0	3.0–4.0	0.50	0.05–0.50	—	0.50	1.0	0.25	—	0.50
336.0	P	11.0–13.0	1.2	0.50–1.5	0.35	0.7–1.3	—	2.0–3.0	0.35	0.25	0.05	—
354.0	S&P	8.6–9.4	0.20	1.6–2.0	0.10	0.40–0.6	—	—	0.10	0.20	0.05	0.15
355.0	S&P	4.5–5.5	0.6 ⓓ	1.0–1.5	0.50 ⓓ	0.40–0.6	0.25	—	0.35	0.25	0.05	0.15
C355.0	S&P	4.5–5.5	0.20	1.0–1.5	0.10	0.40–0.6	—	—	0.10	0.20	0.05	0.15
356.0	S&P	6.5–7.5	0.6 ⓓ	0.25	0.35 ⓓ	0.20–0.45	—	—	0.35	0.25	0.05	0.15
A356.0	S&P	6.5–7.5	0.20	0.20	0.10	0.25–0.45	—	—	0.10	0.20	0.05	0.15
B356.0	S&P	6.5–7.5	0.09	0.05	0.05	0.25–0.45	—	—	0.05	0.04–0.20	0.05	0.15
357.0	S&P	6.5–7.5	0.15	0.05	0.03	0.45–0.6	—	—	0.05	0.20	0.05	0.15
A357.0	S&P	6.5–7.5	0.20	0.20	0.10	0.40–0.7	—	—	0.10	0.04–0.20	0.05 ⓔ	0.15
359.0	S&P	8.5–9.5	0.20	0.20	0.10	0.50–0.7	—	—	0.10	0.20	0.05	0.15
443.0	S&P	4.5–6.0	0.8	0.6	0.50	0.05	0.25	—	0.50	0.25	—	0.35
B443.0	S&P	4.5–6.0	0.8	0.15	0.35	0.05	—	—	0.35	0.25	0.05	0.15
A444.0	P	6.5–7.5	0.20	0.10	0.10	0.05	—	—	0.10	0.20	0.05	0.15
512.0	S	1.4–2.2	0.6	0.35	0.8	3.5–4.5	0.25	—	0.35	0.25	0.05	0.15
513.0	P	0.30	0.40	0.10	0.30	3.5–4.5	—	—	1.4–2.2	0.20	0.05	0.15
514.0	S	0.35	0.50	0.15	0.35	3.5–4.5	—	—	0.15	0.25	0.05	0.15
520.0	S	0.25	0.30	0.25	0.15	9.5–10.6	—	—	0.15	0.25	0.05	0.15
535.0	S&P	0.15	0.15	0.05	0.10–0.25	6.2–7.5	—	—	—	0.10–0.25	0.05 ⓕ	0.15
705.0	S&P	0.20	0.8	0.20	0.40–0.6	1.4–1.8	0.20–0.40	—	2.7–3.3	0.25	0.05	0.15
707.0	S&P	0.20	0.8	0.20	0.40–0.6	1.8–2.4	0.20–0.40	—	4.0–4.5	0.25	0.05	0.15
710.0	S	0.15	0.50	0.35–0.65	0.05	0.6–0.8	—	—	6.0–7.0	0.25	0.05	0.15
711.0	P	0.30	0.7–1.4	0.35–0.65	0.05	0.25–0.45	—	—	6.0–7.0	0.20	0.05	0.15
712.0	S	0.30	0.50	0.25	0.10	0.50–0.65	0.40–0.6	—	5.0–6.5	0.15–0.25	0.05	0.20
713.0	S&P	0.25	1.1	0.40–1.0	0.6	0.20–0.50	0.35	0.15	7.0–8.0	0.25	0.10	0.25
771.0	S	0.15	0.15	0.10	0.10	0.8–1.0	0.06–0.20	—	6.5–7.5	0.10–0.20	0.05	0.15
850.0	S&P	0.7	0.7	0.7–1.3	0.10	0.10	—	0.7–1.3	—	0.20	— ⓖ	0.30
851.0	S&P	2.0–3.0	0.7	0.7–1.3	0.10	0.10	—	0.30–0.7	—	0.20	— ⓖ	0.30
852.0	S&P	0.40	0.7	1.7–2.3	0.10	0.6–0.9	—	0.9–1.5	—	0.20	— ⓖ	0.30

ⓐ The alloys listed are those which have been included in Federal Specifications QQ-A-596d, ALUMINUM ALLOYS PERMANENT AND SEMI-PERMANENT MOLD CASTINGS, QQ-A-601E, ALUMINUM ALLOY SAND CASTINGS, and Military Specification MIL-A-21180c, ALUMINUM ALLOY CASTINGS, HIGH STRENGTH. Other alloys are registered with The Aluminum Association and are available. Information on these should be requested from individual foundries or ingot suppliers.

ⓑ Except for "Aluminum" and "Others," analysis normally is made for elements for which specific limits are shown. For purposes of determining conformance to these limits, an observed value or calculated value obtained from analysis is rounded off to the nearest unit in the last right hand place of figures used in expressing the specified limit, in accordance with the following:

When the figure next beyond the last figure or place to be retained is less than 5, the figure in the last place retained should be kept unchanged.

When the figure next beyond the last figure or place to be retained is greater than 5, the figure in the last place retained should be increased by 1.

When the figure next beyond the last figure or place to be retained is 5 and

(1) there are no figures or only zeros, beyond this 5, if the figure in the last place to be retained is odd, it should be increased by 1; if even, it should be kept unchanged.

(2) if the 5 next beyond the figure in the last place to be retained is followed by any figures other than zero, the figure in the last place retained should be increased by 1; whether odd or even.

ⓒ S = Sand Cast P = Permanent Mold Cast

ⓓ If iron exceeds 0.45 percent, manganese content shall not be less than one-half the iron content.

ⓔ Also contains 0.04–0.07 percent beryllium.

ⓕ Also contains 0.003–0.007 percent beryllium, boron 0.005 percent maximum.

ⓖ Also contains 5.5–7.0 percent tin.

ⓗ Also contains 0.40–1.0 percent silver.

ⓘ Also contains 0.05 max. percent tin.

ⓚ The sum of those "Others" metallic elements 0.010 percent or more each, expressed to the second decimal before determining the sum.

MECHANICAL PROPERTY LIMITS FOR COMMONLY USED ALUMINUM SAND CASTING ALLOYS ①

Alloy	Temper ②	MINIMUM PROPERTIES					Typical Brinell Hardness ④ 500 – kgf load 10 – mm ball
		Tensile Strength				% Elongation in 2 inches or 4 times diameter	
		Ultimate		Yield (0.2% Offset)			
		ksi	(Mpa)	ksi	(Mpa)		
201.0	T7	60.0	(415)	50.0	(345)	3.0	110–140
204.0	T4	45.0	(310)	28.0	(195)	6.0	—
206.0	—	—	—	—	—	—	—
A206.0	—	—	—	—	—	—	—
208.0	F	19.0	(130)	12.0	(85)	1.5	40–70
222.0	0	23.0	(160)	—	—	—	65–95
222.0	T61	30.0	(205)	—	—	—	100–130
242.0	0	23.0	(160)	—	—	—	55–85
242.0	T571	29.0	(200)	—	—	—	70–100
242.0	T61	32.0	(220)	20.0	(140)	—	90–120
242.0	T77	24.0	(165)	13.0	(90)	1.0	60–90
295.0	T4	29.0	(200)	13.0	(90)	6.0	45–75
295.0	T6	32.0	(220)	20.0	(140)	3.0	60–90
295.0	T62	36.0	(250)	28.0	(195)	—	80–110
295.0	T7	29.0	(200)	16.0	(110)	3.0	55–85
319.0	F	23.0	(160)	13.0	(90)	1.5	55–85
319.0	T5	25.0	(170)	—	—	—	65–95
319.0	T6	31.0	(215)	20.0	(140)	1.5	65–95
328.0	F	25.0	(170)	14.0	(95)	1.0	45–75
328.0	T6	34.0	(235)	21.0	(145)	1.0	65–95
355.0	T51	25.0	(170)	18.0	(125)	—	50–80
355.0	T6	32.0	(220)	20.0	(140)	2.0	70–105
355.0	T7	35.0	(240)	—	—	—	70–100
355.0	T71	30.0	(205)	22.0	(150)	—	60–95
C355.0	T6	36.0	(250)	25.0	(170)	2.5	75–105
356.0	F	19.0	(130)	—	—	2.0	40–70
356.0	T51	23.0	(160)	16.0	(110)	—	45–75
356.0	T6	30.0	(205)	20.0	(140)	3.0	55–90
356.0	T7	31.0	(215)	29.0	(200)	—	60–90
356.0	T71	25.0	(170)	18.0	(125)	3.0	45–75
A356.0	T6	34.0	(235)	24.0	(165)	3.5	70–105
B356.0	—	—	—	—	—	—	—
357.0	—	—	—	—	—	—	—
A357.0	—	—	—	—	—	—	—
359.0	—	—	—	—	—	—	—
443.0	F	17.0	(115)	7.0	(50)	3.0	25–55
B433.0	F	17.0	(115)	6.0	(40)	3.0	25–55
512.0	F	17.0	(115)	10.0	(70)	—	35–65
514.0	F	22.0	(150)	9.0	(60)	6.0	35–65
520.0	T4 ⑤	42.0	(290)	22.0	(150)	12.0	60–90
535.0	F or T5	35.0	(240)	18.0	(125)	9.0	60–90
705.0	F or T5	30.0	(205)	17.0	(115)	5.0	50–80
707.0	T5	33.0	(230)	22.0	(150)	2.0	70–100
707.0	T7	37.0	(255)	30.0	(205)	1.0	65–95
710.0	F or T5	32.0	(220)	20.0	(140)	2.0	60–90
712.0	F or T5	34.0	(235)	25.0	(170)	4.0	60–90
713.0	F or T5	32.0	(220)	22.0	(150)	3.0	60–90
771.0	T5	42.0	(290)	38.0	(260)	1.5	85–115
771.0	T51	32.0	(220)	27.0	(185)	3.0	70–100
771.0	T52	36.0	(250)	30.0	(205)	1.5	70–100
771.0	T53	36.0	(250)	27.0	(185)	1.5	—
771.0	T6	42.0	(290)	35.0	(240)	5.0	75–105
771.0	T71	48.0	(330)	45.0	(310)	2.0	105–135
850.0	T5	16.0	(110)	—	—	5.0	30–60
851.0	T5	17.0	(115)	—	—	3.0	30–60
852.0	T5	24.0	(165)	18.0	(125)	—	45–75

① Values represent properties obtained from separtely cast lest bars and are derived from ASTM B26/B26M, Standard Specification for Aluminum-Alloy Sand Castings; Federal Specification QQ-A-601e, Aluminum Alloy Sand Castings; and Military Specification MIL-A-21180c, Aluminum Alloy Castings, High Strength. Unless otherwise specified, the tensile strength, yield strength and elongation values of specimens cut from castings shall be not less than 75 percent of the tensile and yield strength values and not less than 25 percent of the elongation values given above. The customer should keep in mind that (1) some foundries may offer additional tempers for the above alloys, and (2) foundries are constantly improving casting techniques and, as a result, some may offer minimum properties in excess of the above.

② F indicates "as cast" condition; refer to AA-CS-M11 for recommended times and temperatures of heat treatment for other tempers to achieve properties specified.

③ Footnote no longer in use.

④ Hardness values are given for information only; not required for acceptance.

⑤ The T4 temper of Alloy 520.0 is unstable; significant room temperature aging occurs within life expectancy of most castings. Elongation may decrease by as much as 80 percent.

*Formerly AA-CS-M3-2000 in previous editions

MECHANICAL PROPERTY LIMITS FOR COMMONLY USED ALUMINUM PERMANENT MOLD CASTING ALLOYS ①

Alloy	Temper ②	MINIMUM PROPERTIES					Typical Brinell Hardness ③ 500 – kgf load 10 – mm ball
		Tensile Strength				% Elongation in 2 inches or 4 times diameter	
		Ultimate		Yield (0.2% Offset)			
		ksi	(Mpa)	ksi	(Mpa)		
204.0	T4	48.0	(330)	29.0	(200)	8.0	—
208.0	T4	33.0	(230)	15.0	(105)	4.5	60–90
208.0	T6	35.0	(240)	22.0	(150)	2.0	75–105
208.0	T7	33.0	(230)	16.0	(110)	3.0	65–95
222.0	T551	30.0	(205)	—	—	—	100–130
222.0	T65	40.0	(275)	—	—	—	125–155
242.0	T571	34.0	(230)	—	—	—	90–120
242.0	T61	40.0	(275)	—	—	—	95–125
296.0	T6	35.0	(240)	—	—	2.0	75–105
308.0	F	24.0	(165)	—	—	2.0	55–85
319.0	F	28.0	(195)	14.0	(95)	1.5	70–100
319.0	T6	34.0	(235)	—	—	2.0	75–105
332.0	T5	31.0	(215)	—	—	—	90–120
333.0	F	28.0	(195)	—	—	—	65–100
333.0	T5	30.0	(205)	—	—	—	70-105
333.0	T6	35.0	(240)	—	—	—	85-115
333.0	T7	31.0	(215)	—	—	—	75–105
336.0	T551	31.0	(215)	—	—	—	90–120
336.0	T65	40.0	(275)	—	—	—	110–140
354.0	T61	48.0	(330)	37.0	(255)	3.0	—
354.0	T62	52.0	(360)	42.0	(290)	2.0	—
355.0	T51	27.0	(185)	—	—	—	60–90
355.0	T6	37.0	(255)	—	—	1.5	75–105
355.0	T62	42.0	(290)	—	—	—	90–120
355.0	T7	36.0	(250)	—	—	—	70–100
355.0	T71	34.0	(235)	27.0	(185)	—	65-95
C355.0	T61	40.0	(275)	30.0	(205)	3.0	75–105
356.0	F	21.0	(145)	—	—	3.0	40–70
356.0	T51	25.0	(170)	—	—	—	55–85
356.0	T6	33.0	(230)	22.0	(150)	3.0	65–95
356.0	T7	25.0	(170)	—	—	3.0	60–90
356.0	T71	25.0	(170)	—	—	3.0	60–90
A356.0	T61	37.0	(255)	26.0	(180)	5.0	70–100
B356.0	T6	37.0	(255)	27.0	(185)	7.0	—
357.0	T6	45.0	(310)	—	—	3.0	75–105
A357.0	T61	45.0	(310)	36.0	(250)	3.0	85–115
359.0	T61	45.0	(310)	34.0	(235)	4.0	75–105
359.0	T62	47.0	(325)	38.0	(260)	3.0	85–115
443.0	F	21.0	(145)	7.0	(50)	2.0	30–60
B443.0	F	21.0	(145)	6.0	(40)	2.5	30–60
A444.0	T4	20.0	(140)	—	—	20.0	—
513.0	F	22.0	(150)	12.0	(85)	2.5	45–75
535.0	F	35.0	(240)	18.0	(125)	8.0	60–90
705.0	T5	37.0	(255)	17.0	(120)	10.0	55–85
707.0	T7	45.0	(310)	35.0	(240)	3.0	80–110
711.0	T1	28.0	(195)	18.0	(125)	7.0	55-85
713.0	T5	32.0	(220)	22.0	(150)	4.0	60–90
850.0	T5	18.0	(125)	—	—	8.0	30–60
851.0	T5	17.0	(115)	—	—	3.0	30–60
851.0	T6	18.0	(125)	—	—	8.0	—
852.0	T5	27.0	(185)	—	—	3.0	55–85

① Values represent properties obtained from separately cast test bars and are derived from ASTM B-108, Standard Specification for Aluminum-Alloy Permanent Mold Castings; Federal Specification QQ-A-596d, Aluminum Alloy Permanent and Semi-Permanent Mold Castings; and Military Specification MIL-A-21180c, Aluminum Alloy Castings, High Strength. Unless otherwise specified, the average tensile strength, average yield strength and average elongation values of specimens cut from castings shall be not less than 75 percent of the tensile strength and yield values and not less than 25 percent of the elongation values given above. The customer should keep in mind that (1) some foundries may offer additional tempers for the above alloys, and (2) foundries are constantly improving casting techniques and, as a result, some may offer minimum properties in excess of the above.

② F indicates “as cast” condition; refer to AA-CS-M11 for recommended times and temperatures of heat treatment for other tempers to achieve properties specified.

③ Hardness values are given for information only; not required for acceptance.

The purpose of this standard is to establish quality standards for aluminum castings, so that purchasers may specify and expect a product consistent with their needs. TO BE IN EFFECT, THIS STANDARD, M5-08 INCLUDING THE QUALITY AND FREQUENCY LEVELS, MUST BE CALLED OUT ON THE DRAWING.

When using this standard, two factors should be determined by the person responsible for designating the proper level. These are:

1. QUALITY LEVEL: The inherent quality of the casting having the capability of doing the job for which the part was designed.

2. FREQUENCY LEVEL: The amount of inspection necessary to determine compliance, or that number of parts to be inspected that will satisfy the requirement of quality level.

Both of these factors may affect cost and should not be higher than necessary for the application of the part.

Workmanship, tolerances, drafts and other features of castings produced to this standard will be within the limits set forth in the Engineering Series. Special requirements such as sealing surfaces, high stress areas, anodic or chemical finishes and pressure testing, shall be designated on print. Welding, peening, plugging and impregnation are acceptable methods of processing unless specifically prohibited. The foundry will use those controls necessary to produce the casting to the quality level indicated.

Example Drawing Callout (blanks to be filled in to levels described in Tables I and II)

Note:

This casting shall conform to Quality Level_____ Frequency Level_____ per Aluminum Association Standard M5-08

All castings produced to this standard will be visually inspected. No cracks will be permitted. Cold shuts, laps and surface discontinuities of linear nature will be investigated. In most applications, no greater degree of inspection is necessary, but when the function of the casting indicates that it will require some additional degree of examination, frequency levels calling for radiographic and penetrant inspection may be used. Certification of chemical composition and mechanical properties, if required, to be agreed on between the supplier and purchaser.

*Formerly AA-CS-M5-92 in previous editions