

Painting, chromating, phosphate coating and chrome plating can be used for decorative finishes. Painting, chromating, anodizing, and iridite coatings can be used as corrosion barriers. Hard chrome plating can be used to improve wear resistance, with the exception of ZA-27.

The bright chrome plating characteristics of the Zamak alloys and ZA-8 make these alloys a prevailing choice for hardware applications.

**A detailed discussion of finishing methods for zinc die castings can be found in Product Design for Die Casting.**

**Table A-3-13 Chemical Composition: Zn Alloys**

*All single values are maximum composition percentages unless otherwise stated.*

	Zamak Die Casting Alloys <sup>Ⓒ</sup> <sup>Ⓓ</sup>				ZA Die Casting Alloys <sup>Ⓒ</sup> <sup>Ⓓ</sup>		
	No. 2	No. 3 AG-40A	No. 5 AG-41A	No. 7 AG-40B	ZA-8	ZA-12	ZA-27
Commercial: ANSI/AA	Al 4.0	Al 4.0	Al 4.0	Al 4.0	Al 8.4	Al 11.0	Al 27.0
Nominal	Mg	Mg 0.035	Mg	Mg 0.013	Mg 0.023	Mg	Mg
Comp:	0.035		0.055	Cu 0.013	Cu 1.0	0.023	0.015
	Cu 3.0		Cu 1.0			Cu 0.88	Cu 2.25
<b>Detailed Composition</b>							
<b>Aluminum</b> Al	3.7-4.3	3.7-4.3	3.7-4.3	3.7-4.3	8.0-8.8	10.5-11.5	25.0-28.0
<b>Magnesium</b> Mg	0.02-0.06	0.02-0.06 <sup>Ⓐ</sup>	0.02-0.06	0.005-0.020	0.010-0.030	0.010-0.030	0.010-0.020
<b>Copper</b> Cu	2.6-3.3*	0.1 max <sup>Ⓑ</sup>	0.70-1.20	0.1 max	0.8-1.3	0.5-1.2	2.0-2.5
<b>Iron</b> Fe (max)	0.05	0.05	0.05	0.005	0.075	0.075	0.075
<b>Lead <sup>Ⓒ</sup></b> Pb (max)	0.005	0.005	0.005	0.003	0.006	0.006	0.006
<b>Cadmium <sup>Ⓒ</sup></b> Cd (max)	0.004	0.004	0.004	0.002	0.006	0.006	0.006
<b>Tin</b> Sn (max)	0.002	0.002	0.002	0.001	0.003	0.003	0.003
<b>Nickel</b> Ni	—	—	—	0.005-0.020	—	—	—
<b>Zinc</b> Zn	Balance	Balance	Balance	Balance	Balance	Balance	Balance

<sup>Ⓐ</sup> The magnesium may be as low as 0.015 percent provided that the lead, cadmium and tin do not exceed 0.003, 0.003 and 0.001 percent, respectively. <sup>Ⓑ</sup> For the majority of commercial applications, a copper content of up to 0.7 percent will not adversely affect the serviceability of die castings and should not serve as a basis for rejection. Sources: ASTM B86 and ASTM B791. <sup>Ⓒ</sup> As specified, the chemical composition of zinc and ZA alloys are in compliance with RoHS (the European Union's Directive on Restriction of Hazardous Substances) If the presence of mercury is suspected, analysis shall be made to determine that the amount does not exceed 0.1 weight percent. Hexavalent chromium does not exist in the alloys and therefore meets the 0.1% limit. <sup>Ⓓ</sup> Registration for REACH (the European Union's Directive on Registration, Evaluation, and Authorization of Chemicals) is not required for die castings, even if coated, since die castings are considered articles. Notification may be required if some contained substances in the die casting or coating exceed the 0.1% total weight of the article level and are listed as SVHC (substances of very high concern).

Note: There are newly developed zinc alloys (a result of through NADCA sponsored research) for elevated temperature creep resistance applications (such as ZCA-9). Contact your alloy producer for more information.