Reaffirmation of H35.3-1997

American National Standard

designation system for aluminum hardeners

Approved November 7, 2013 Secretariat: The Aluminum Association, Inc.

1. Scope

1.1 This standard provides a system for designating aluminum hardeners used primarily for the addition of alloying or grain refining elements or modifiers to aluminum alloy melts.

2. Alloy Designation System①

2.1 This system consists of four digit numerical designations prefixed by the letter H. The first two digits identify the hardener alloy group by major alloying element②③ as shown in Table 1. The last two digits indicate the sequential registration of hardener alloys beginning with the number H2X00 and have no other significance.

TABLE 1
*Designations for Hardener Alloy Groups*④

	Major Alloying Elements	*Designation No.*
Hardener Alloys Grouped by Major Added Elements Other Than Aluminum	Other Elements[a]	H20XX
	Cu	H21XX
	Ti, B	H22XX
	Si	H23XX
	Mn	H24XX
	Ni	H25XX
	Zr, V	H26XX
	Two or more elements, each over 9.5%	H27XX
	Fe	H28XX
	Cr	H29XX

(a) Major elements other than those listed.

① Chemical composition limits and designations conforming to this standard may be registered with the Aluminum Association provided (a) the hardener is offered for sale; (b) the complete chemical composition limits are registered; (c) the composition is significantly different from that of any other hardeners for which a numerical designation already has been assigned, where "significant" is defined as:

(i) A change of the following amounts or more in arithmetic mean of the limits for each individual alloying element:

Arithmetic Mean of Limits for Alloying Elements in Original Alloy	*Minimum Arithmetic Changes Need for New Alloy Issuance**
Up thru 0.30 percent	0.10
Over 0.30 thru 1.0 percent	0.15
Over 1.0 thru 2.0 percent	0.20
Over 2.0 thru 3.0 percent	0.30
Over 3.0 thru 4.0 percent	0.40
Over 4.0 thru 5.0 percent	0.50
Over 5.0 thru 6.0 percent	0.70
Over 6.0	1.00

*Lesser amounts are considered too small to issue new alloy designation.

(ii) Addition or deletion of one or more alloying elements with limits having an arithmetic mean of 0.20 percent or more.

(iii) Change in limits for impurities for which the difference between arithmetic means (existing and proposed) is at least 0.10 percent.

(d) the hardener contains more aluminum than attributable to impurity and the aluminum serves a useful function other than qualifying the hardener for inclusion in the system; and (e) the hardener must be produced specifically for and regularly used as an alloying material in the production of aluminum and aluminum alloys.

② For codification purposes an alloying element is any element which is intentionally added.

③ A major element is that element other than aluminum having the greatest nominal concentration. Should two or more major elements have equal nominal concentrations, that element appearing first in the element limit sequence shall be used to determine designation grouping. When nominal concentration of two or more elements are each greater than 9.5%, such alloys are assigned to the 27XX group.

④ Standard limits for alloying elements and impurities are arranged in the following sequence: Silicon; Iron; Copper; Manganese; Chromium; Nickel; Titanium; Boron; Vanadium; Additional specified elements in alphabetical order of their chemical symbols; Other elements, Each; Other elements, Total; Aluminum (remainder).