Designation: ~~B296 – 03 (Reapproved 2014)~~ B296 – 20

Standard Practice for Temper Designations of Magnesium Alloys, Cast and Wrought[1]

This standard is issued under the fixed designation B296; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This practice covers a system for designating the tempers of magnesium alloys, cast and wrought. The designations used in ASTM specifications under the jurisdiction of Committee B07 for magnesium alloy castings and wrought products conform to this practice.[2]

1.2 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Basis of Codification

2.1 The designations for temper are used for all forms of magnesium and magnesium-alloy products except ingots and are based on the sequence of basic treatments used to produce the various tempers.

2.2 The temper designation follows the alloy designation, the two being separated by a dash.

2.3 Basic temper designations consist of letters. Subdivisions of the basic tempers, where required, are indicated by a digit or digits following the letter. These designate specific sequences of basic treatments, but only operations recognized as significantly influencing the characteristics of the product are indicated. Should some other variation of the same sequence of basic operations be applied to the same alloy, resulting in different characteristics, then additional digits are added to the designation.

NOTE 1—In material specifications containing reference to two or more tempers of the same alloy which result in identical mechanical properties, the distinction between the tempers should be covered in suitable explanatory notes.

2.4 The temper designations and the subdivisions are fully defined and explained in Table 1. A brief outline for quick reference is given in Table 2.

3. Referenced Documents

3.1 *ANSI Standard:*[3]

ANSI H35.1/H35.1M American National Standard Alloy and Temper Designation Systems for Aluminum

4. Keywords

4.1 cast and wrought alloys; magnesium alloys; temper designations

[1] This practice is under the jurisdiction of the ASTM Committee B07 on Light Metals and Alloys and is the direct responsibility of Subcommittee B07.04 on Magnesium Alloy Cast and Wrought Products.

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[2] The designations used in ASTM Committee B07 specifications for aluminum-alloy wrought and cast products conform to the American National Standard ~~H 35.1~~H35.1/H35.1M~~/H 35.1(M).~~

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

TABLE 1 Temper Designations

Temper Designation and Subdivision (if any)	Description
F	*As Fabricate* treatment.
O	*Annealed, R*
H	*Strain Harde* treatments to

~~Subdivisions of the "H" Temper:~~

H1	*Strain Harde* number follo
H2	*Strain Harde* desired final The num
H3	*Strain Harde* and increase The num stabilized.

~~The number following this designation indicates the degree of strain hardening remaining after the product has been strain hardened a specific amount and then stabilized.~~

~~Subdivisions of the "H1," "H2," and "H3" Tempers:~~

Subdivisions of H1, H2, and H3	~~The digit following the designations "H1," "H2," and "H3" indicates the final degree of strain hardening. Tempers between 0 (annealed) and 8 (full hard)~~ The digit following the designations "H1," "H2," and "H3" indicates the final degree of strain hardening. Tempers between 0 (annealed) and 8 (full hard) are designated by numerals 1 through 7. Material having a strength about midway between that of the 0 temper and that of the 8 temper is designated by the numeral 4 (half hard); between 0 and 4 by the numeral 2 (quarter hard); between 4 and 8 by the numeral 6 (three-quarter hard); and so forth. The third digit, when used, indicates a variation of a two-digit H temper. It is used when the degree of control of temper or the mechanical properties are different from but close to those for the two-digit H temper to which it is added. Numerals 1 through 9 may be arbitrarily assigned for an alloy and product to indicate a specific degree of control of temper or specified mechanical property limits.

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~~W~~	~~*Solution Hea* specific only~~
W	*Solution Hea* specific only
~~T~~	~~*Thermally Tr* to produce s follows:~~
T	*Thermally Tr* to produce s shown below

~~Subdivisions of the "T" Tempers:~~

T1	*Cooled From* from an eleva
T3	*Solution Hea* straightening
T4	*Solution Hea* the effect of
~~T5~~	~~*Cooled From* process, sue~~
T5	*Cooled From* process, suc
T6	*Solution Hea* flattening or
T7	*Solution Hea* special chara
T8	*Solution Hea* flattening or
T9	*Solution Hea*
~~T10~~	~~*Cooled From* elevated tem A period of n it is metallurg Additional dig~~

T10

Cooled From
elevated tem
A period
when it is me
Additiona

TABLE 2 Basic Temper Designations and Subdivisions

F As fabricated.	
O Annealed, recrystallized (wrought products only).	
H Strain hardened.	
Subdivisions of the" H" Temper:	
H1, plus one or more digits... .Strain hardened only.	
H2, plus one or more digits... .Strain hardened and then partially annealed.	
H3, plus one or more digits... .Strain hardened and then stabilized.	
W Solution heat treated. Unstable temper.	
T Thermally treated to produce stable tempers other than F, O, or H.	
Subdivisions of the "T" Temper:	
T1 Cooled and naturally aged.	
T3 Solution heat treated and then cold worked.	
T4 Solution heat treated.	
T5 Cooled and artificially aged.	
T6 Solution heat treated and artificially aged.	
T7 Solution heat treated and stabilized.	
T8 Solution heat treated, cold worked, and artificially aged.	
T9 Solution heat treated, artificially aged, and cold worked.	
T10 Cooled, artificially aged, and cold worked.	

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W	Solution heat treated. Unstable temper.	
T	Thermally treated to produce stable tempers other than F, O, or H.	
T1	Cooled and naturally aged.	
T3	Solution heat treated and then cold worked.	
T4	Solution heat treated and naturally aged.	
T5	Cooled and artificially aged.	
T6	Solution heat treated and artificially aged.	
T7	Solution heat treated and stabilized.	
T8	Solution heat treated, cold worked, and artificially aged.	
T9	Solution heat treated, artificially aged, and cold worked.	
T10	Cooled, artificially aged, and cold worked.	