



Designation: E527 – 23

Standard Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)¹

This standard is issued under the fixed designation E527; 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 (Note 1) covers a unified numbering system (UNS) for metals and alloys that have a “commercial standing” (see Note 2), and covers the procedure by which such numbers are assigned. Section 2 describes the system of alphanumeric designations or “numbers” established for each family of metals and alloys. Section 3 outlines the organization established for administering the system. Section 5 describes the procedure for requesting number assignment to metals and alloys for which UNS numbers have not previously been assigned.

NOTE 1—UNS designations are not to be used for metals and alloys that are not registered under the system described herein, or for any metal or alloy whose composition differs from those registered.

NOTE 2—The terms “commercial standing,” “production usage,” and other similar terms are intended to apply to metals and alloys in active commercial production and use, although the actual amount of such use will depend, among other things, upon the type of metals and alloys involved and their application.

The various standardizing organizations involved with the individual industries apply their own established criteria to define the status of a metal or alloy in terms of when a UNS designation number will be assigned. For instance, ASTM Committee A01 requires details of heat analysis, mechanical properties, and processing requirements for addition of a new grade or alloy to its specifications. The Copper Development Association requires that the material be “in commercial use (without tonnage limits);” the Aluminum Association requires that the alloy be “offered for sale (not necessarily in commercial use);” the SAE Aerospace Materials Division calls for “repetitive procurement by at least two users.”

Thus, while no universal definition for usage criteria is established, the UNS numbers are intended to identify metals and alloys that are generally in regular production and use. A UNS number will not ordinarily be issued

¹ This practice is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.91 on Editorial.

Current edition approved Sept. 1, 2023. Published September 2023. Originally approved in 1974. Last previous edition approved in 2016 as E527 – 16. DOI: 10.1520/E0527-23.

for a material that has just been conceived or that is still in only experimental trial.

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. Description of Numbers (or Codes) Established for Metals and Alloys

2.1 The UNS establishes 19 series of numbers for metals and alloys, as shown in Table 1. Each UNS number consists of a single letter-prefix followed by five digits. In most cases the letter is suggestive of the family of metals identified; for example, A for aluminum, P for precious metals, and S for stainless steels.

2.2 Whereas some of the digits in certain UNS number groups have special assigned meaning, each series is independent of the others in such significance; this practice permits greater flexibility and avoids complicated and lengthy UNS numbers.

NOTE 3—This arrangement of alphanumeric six-character numbers is a compromise between the thinking that identification numbers should indicate many characteristics of the material, and the belief that numbers should be short and uncomplicated to define only the chemical composition and leaving the other properties to the specifications involved.

2.3 Wherever feasible, identification “numbers” from previous systems are incorporated into the UNS numbers. For example: carbon steel, originally identified by “American Iron and Steel Institute (AISI) 1020,” is covered by “UNS G10200,” and free cutting brass, presently identified by “Copper Development Association (CDA) C36000,” is covered by “UNS C36000.” Table 2 shows the secondary division of some primary series of numbers.

*A Summary of Changes section appears at the end of this standard

TABLE 1 Primary Series of Numbers

<i>Nonferrous Metals and Alloys</i>	
A00001–A99999	aluminum and aluminum alloys
B00001–B99999	aluminum and aluminum alloys
C00001–C99999	copper and copper alloys
E00001–E99999	rare earth and rare earth-like metals and alloys (18 items; see Table 2)
L00001–L99999	low melting metals and alloys (15 items; see Table 2)
M00001–M99999	miscellaneous nonferrous metals and alloys (12 items; see Table 2)
N00001–N99999	nickel and nickel alloys
P00001–P99999	precious metals and alloys (8 items; see Table 2)
R00001–R99999	reactive and refractory metals and alloys (14 items; see Table 2)
Z00001–Z99999	zinc and zinc alloys
<i>Ferrous Metals and Alloys</i>	
D00001–D99999	specified mechanical properties steels
F00001–F99999	cast irons
G00001–G99999	carbon and alloy steels
H00001–H99999	H-steels
J00001–J99999	cast steels (except tool steels)
K00001–K99999	miscellaneous steels and ferrous alloys
S00001–S99999	heat and corrosion resistant (stainless) steels
T00001–T99999	tool steels
W00001–W99999	welding filler metals, covered and tubular electrodes, classified by weld deposit composition (see Table 2)

TABLE 2 Secondary Division of Some Series of Numbers

<i>E00001–E99999 Rare Earth and Rare Earth-Like Metals and Alloys</i>	
E00000–E00999	actinium
E01000–E20999	cerium
E21000–E45999	mixed rare earths ^A
E46000–E47999	dysprosium
E48000–E49999	erbium
E50000–E51999	europium
E52000–E55999	gadolinium
E56000–E57999	holmium
E58000–E67999	lanthanum
E68000–E68999	lutetium
E69000–E73999	neodymium
E74000–E77999	praseodymium
E78000–E78999	promethium
E79000–E82999	samarium
E83000–E84999	scandium
E85000–E86999	terbium
E87000–E87999	thulium
E88000–E89999	ytterbium
E90000–E99999	yttrium
<i>L00001–L99999 Low-Melting Metals and Alloys</i>	
L00001–L00999	bismuth
L01001–L01999	cadmium
L02001–L02999	cesium
L03001–L03999	gallium
L04001–L04999	indium
L06001–L06999	lithium
L07001–L07999	mercury
L08001–L08999	potassium
L09001–L09999	rubidium
L10001–L10999	selenium
L11001–L11999	sodium
L12001–L12999	thallium
L13001–L13999	tin
L50001–L59999	lead
<i>M00001–M99999 Miscellaneous Nonferrous Metals and Alloys</i>	
M00001–M00999	antimony
M01001–M01999	arsenic
M02001–M02999	barium
M03001–M03999	calcium
M04001–M04999	germanium
M05001–M05999	plutonium
M06001–M06999	strontium
M07001–M07999	tellurium