BS EN 2032-001:2014

BSI Standards Publication

Aerospace series — Metallic materials

Part 001: Conventional designation

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National foreword

This British Standard is the UK implementation of EN 2032-001:2014. It supersedes BS EN 2032-1:2002 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ACE/61, Metallic materials for aerospace purposes.

A list of organizations represented on this committee can be obtained on request to its secretary.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 2032-001:2014) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2015, and conflicting national standards shall be withdrawn at the latest by January 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 2032-1:2001.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This standard is part of the series of EN metallic materials standards for aerospace applications. The general organization of this series is described in EN 4258.

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1 Scope

This European Standard specifies the rules for establishing the conventional designation of unalloyed, commercially pure and alloyed metallic materials used for aerospace applications.

NOTE Information relating to former ASD-STAN designations for nickel base or cobalt base alloys, steel, commercially pure titanium and titanium base alloys, is contained in Annex (informative).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1780-1, *Aluminium and aluminium alloys — Designation of alloyed aluminium ingots for remelting, master alloys and castings — Part 1: Numerical designation system*

EN 4258, *Aerospace series — Metallic materials — General organization of standardization - Links between types of EN standards and their use*

EN 4500-001, *Aerospace series — Metallic materials — Rules for drafting and presentation of material standards - Part 001: General rules*

EN 10020, *Definition and classification of grades of steel*

EN 10027-1, *Designation systems for steels — Part 1: Steel names*

EN 10027-2, *Designation systems for steels — Part 2: Numerical system*

TR 3900, *Aerospace series — Metallic materials — Relationship between AECMA designation systems 1)*

ISO 80000-9, *Quantities and units — Part 9: Physical chemistry and molecular physics*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
structural material
material used for the manufacture of a specific component of an aerospace system, structure or engine

3.2
alloying element
see EN 4500-001

3.3
unalloyed metal
metal that contains no alloying elements and with a total impurity content less than 0,5 %

For the applications of this standard, a so-called “commercially pure” metal is not considered as unalloyed metal and its designation shall be chosen according to the same rules as those of the relevant metallic alloys

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1) Published as ASD-STAN Technical Report at the date of publication of this standard. http://www.asd-stan.org/

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3.4
cast material
material resulting from the bulk solidification of a previously homogeneous liquid metal

3.5
cast + wrought material
material resulting from further solid state working of cast material

3.6
powder metallurgy material
material divided into solid particles at least in the first step of its solid state processing

3.7
steel
iron base material alloyed with carbon the content of which is generally lower than 2 %

3.8
unalloyed steel
see EN 10020

3.9
low alloy steel
steel alloyed with one or several metallic elements, the mean value of the content of each being less than 5 % and the content of at least one being higher than the carbon content

3.10
high alloy, ferritic or martensitic steel
steel alloyed with one or several metallic elements, the mean value of the content of at least one of which is equal to or higher than 5 % and the crystalline structure of which contains less than 40 % of austenite in its condition of use

3.11
high alloy, austenitic or austenitic-ferritic steel
steel alloyed with one or several metallic elements, the mean value of the content of at least one of which is equal to or higher than 5 % and the crystalline structure of which contains 40 % austenite or more in its condition of use

3.12
joining material
material used for the metallurgical assembly of several parts of an aerospace system

3.13
filler metals for welding
joining material solidus temperature of which is close to or the same as the solidus temperature of the materials to be joined

3.14
filler metals for brazing
joining material solidus temperature of which is significantly lower than the solidus temperature of the materials to be joined

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4 Principle

4.1 General

The conventional designation defines by one series of characters (letters, figures, dashes) all metallic materials having the same basic chemical composition without taking into account:

— any option concerning other elements than alloying elements,

— the method of melting,

— the heat treatment,

— the form.

NOTE The method of melting may induce variations in the mass content of one or several alloying elements. These variations are not considered significant and shall not be taken into consideration.

4.2 ASD-STAN designation

ASD-STAN designation is not applicable to new standard and revision for:

— nickel base or cobalt base alloys (see 5.2, EN 10027-1 and EN 10027-2),

— steels (see 5.4, EN 10027-1 and EN 10027-2),

— commercially pure titanium and titanium base alloys (see 5.5).

The ASD-STAN designation of each material comprises nine characters divided into three groups:

A group of three characters consisting of:

— the symbol of the base metal in accordance with ISO 80000-9, but written entirely in capital letters,

— dash(es) for completion to three characters.

A group of five characters:

— the first three characters indicate the alloying elements (one, two or three) considered significant (with the exception of all aluminium base materials). If the chemical composition is such that there is only one or two alloying elements, the remaining character(s) is (are) a zero.

The use of this group of three characters is defined in each of the relevant following clauses. In addition, one character indicates the method of production for structural materials or the use for joining materials (see 4.3).

— the last two of this group of five characters (or the last character in the case of cast aluminium base alloys, see 5.3.2) form a serial number starting at 01 (or 1 in the case of cast aluminium base alloys, see 5.3.2). This serial number shall be changed every time the first three and the last five characters already allocated do not fit the new basic chemical composition to be designated.

The conventional designation is unique for one basic chemical composition, except for certain filler metals for brazing (see 6.2.2.2 and 6.2.2.3).

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4.3 Method of production or use

A capital letter from the following series:

Structural material ———-
- C for cast material,
- P for cast + wrought material,
- R for powder metallurgy material.

Joining material ————
- W for welding material,
- B for brazing material.

4.4 Basic chemical composition (base metal excluded)

A group of five digits:

4.4.1 In the case of unalloyed materials, the first three digits indicate information as in 5.1.

4.4.2 In the case of metallic alloys, with the exception of all aluminium base materials (see 5.3), the first three digits indicate the alloying elements (one, two or three) considered significant (see 5.1, 5.2, Annex B, Annex C, Annex D and 5.6 to 6.2). If the chemical composition is such that there is only one or two alloying elements, the remaining digit(s) is (are) a zero.

The use of this group of three digits is defined in each of the relevant following clauses.

4.4.3 The last two of this group of five digits form a serial number starting at 01. This serial number shall be changed every time the first three and the last five digits already allocated do not fit the new basic chemical composition to be designated.

NOTE In consequence of 4.1, 4.2 and 4.3, except for certain brazing materials (see 6.2.2.1 and 6.2.2.2) the first three and the last five digits correspond to one and only one basic chemical composition, whatever the letter used as the fourth digit.

4.5 Mass content of an alloying element

It shall be taken as the arithmetical mean of the limits of its range. If two alloying elements have the same mass content, they shall be written according to the alphabetical order of their international symbol.

5 Structural materials

5.1 Unalloyed metals

With the exception of all aluminium base materials (see 5.3), the group of five digits of the designation comprises from left to right:

— a single capital letter U symbolic of this category,

— a number indicating the percentage of base metal after the decimal point, completed with zero if necessary,

— last two digits as serial numbers (This serial number shall be changed every time the first three and the last five characters already allocated do not fit the new basic chemical composition to be designated).

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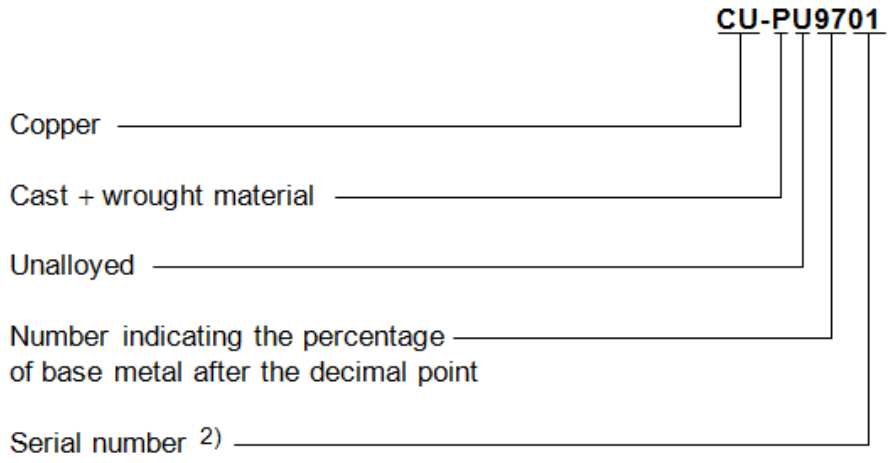
EXAMPLE Cast + wrought copper 99,97 % pure



NOTE In this example, the chemical composition is unique and the serial number can only be 01.

5.2 Nickel base or cobalt base alloys

The names and numbers of the alloys are formed in accordance with EN 10027-1 and EN 10027-2 respectively.

a) name: The preceding chemical symbols indicate the main alloy elements and the figure immediately following indicates the average content of these alloys subsequently followed by the symbol for the other added important alloy elements.

b) material number: The structure is set out according to EN 10027-2 with the number 2 for the material group number. This material group comprises chemically resistant and high temperature or heat resistant nickel and cobalt alloys.

5.3 Aluminium base materials

5.3.1 All materials other than cast materials

The group of five digits in the designation is devoted to the ALUMINIUM ASSOCIATION [2)] designation completed if necessary by a dash. This applies to both commercially pure aluminium and aluminium alloys.

EXAMPLE AL-P1050A
AL-P2024-
AL-P2618A
AL-R5091-
AL-W5183-
AL-B4043-

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2) ALUMINUM ASSOCIATION, Inc., 900 19th Street N.W., Washington, D.C. 20006.

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