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Definition och klassificering av tackjärn

Orientering

Denna standard utgörs av den engelska versionen av Europastandarden EN 10 001:1990.

EN 10 001 är en revidering av EURONORM 1-81 och ISO 9147:1987.

De officiella franska och tyska versionerna kan köpas genom SIS.

Definition and classification of pig-irons

Introduction

This standard consists of the English version of the European Standard EN 10 001:1990.

EN 10 001 is a revision of EURONORM 1-81 and ISO 9147:1987.

The official French and German versions can be bought through SIS.

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English version

Definition and classification of pig-irons

Définition et classification des fontes brutes

Begriffsbestimmung und Einteilung von Roheisen

This European Standard was accepted by CEN on 28 July 1990. CEN members are bound to comply with the requirements of CEN/CENELEC Common Rules which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to CEN Central Secretariat has the same status as the official versions.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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EN 10 001 : 1990

Brief history

This European Standard was prepared by the Technical Committee ECISS/TC 5 'Definition, classification and conventional designation of pig iron and ferro-alloys'. The secretariat is held by FES/DIN 'Normenausschuß Eisen und Stahl im DIN, Deutsches Institut für Normung'.

This European Standard replaces the EURONORM EU 1-81 Definition and classification of pig-irons.

This European Standard was adopted by CEN on 28 July 1990.

According to the Common CEN/CENELEC Rules, being part of the Internal Regulations of CEN, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxemburg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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1 Purpose

The purpose of this European Standard is to standardize the definition of pig-irons and to standardize the sub-division of pig-irons into different classes.

2 Definition

A pig-iron is an iron-carbon alloy with more than 2 % C and with contents of other elements equal to or less than the limit values given for them in table 1. It is intended for further processing in the molten condition into steel or cast-iron. Pig-iron is delivered either in the molten state or in the solid state in primary forms such as pigs or similar solid pieces, and granulates.

3 Sub-division of pig-irons

3.1 Pig-iron is sub-divided into the classes indicated in table 2 on the basis of its chemical composition.

3.2 In cases of doubt, the correct classification of the pig-iron into one of the classes indicated in table 2 is to be determined by check analysis. The conditions for sampling including the conditions for the number of tests shall correspond to the conditions usually applied in cases of dispute for deliveries of disputed chemical composition (see annex A).

3.3 The designations used in the different languages for the various classes of pig-iron are given in table 3.

Element	Limit ¹⁾
Manganese	≤ 30.0 %
Silicon	≤ 8.0 %
Phosphorus	≤ 3.0 %
Chromium	≤ 10.0 %
Other alloying elements in total ²⁾	≤ 10.0 %

1) Materials with higher contents are ferro-alloys.
2) In cases of doubt, all *elements for which a minimum content is specified* or whose content exceeds the lower limit given in table 2, footnote 8, paragraph (d), are, in accordance with table 2, footnote 8, paragraphs (c) and (d), regarded as 'Other alloying elements' with the exception of carbon, silicon, manganese, phosphorus and chromium.

Table 2. Classification and designation of pig-iron according to its chemical composition¹⁾

1	2	3	4	5	6	7	8	9		
Pig-iron class			% C total	% Si	% Mn	% P	% S max.	Other		
No.	Designation	Abbreviation								
1.1	Steel-making pig iron	Low phosphorus	Pig-P2	(3,3 to 4,8)	≤ 1,0 ²⁾	0,4 to 6,0 (0,5 to 1,5)	≤ 0,25	0,06	3)	
1.2		High phosphorus	Pig-P20	(0,3 to 4,5)		≤ 1,5	1,5 to 2,5	0,08		
2.1	Foundry pig iron	4)	Pig-P1 Si	(3,3 to 4,5)	1,0 to 4,0 ²⁾ (1,5 to 3,5)	0,4 to 1,5 ²⁾	≤ 0,12	0,06		
2.2			Pig-P3 Si				> 0,12 to 0,5			
2.3			Pig-P6 Si				> 0,5 to 1,0 (> 0,5 to 0,7)			
2.4			Pig-P12 Si				> 1,0 to 1,4			
2.5			Pig-P17 Si				> 1,4 to 2,0			
3.1	Foundry pig iron	Nodular (SG) base	Pig-Nod	(3,5 to 4,6)	≤ 3,0 ²⁾	≤ 0,1	≤ 0,08	0,03		3), 6)
3.2		Nodular (SG) base higher manganese ⁵⁾	Pig-Nod Mn		≤ 4,0 ²⁾	> 0,1 to 0,4 ²⁾				
3.3		Low carbon	Pig-LC	> 2,0 to 3,5	≤ 3,0 ²⁾	> 0,4 to 1,5	≤ 0,30	0,06		3)
4.0		Other unalloyed pig-iron	Pig-SPU			7)				
5.1	Alloyed	Spiegel iron	Pig-Mn	(4,0 to 6,5)	max. 1,5	> 6,0 to 30,0 ²⁾	≤ 0,30 (≤ 0,20)	0,05	3)	
5.2		Other alloyed pig-iron	Pig-SPA			8)				

¹⁾ The unbracketed values are those which determine the classification of the pig-iron. Values given in brackets indicate, for information only, the ranges in which actual contents of the elements concerned normally lie.

²⁾ By sub-dividing this range into various sub-ranges, the class of pig-iron concerned is normally further sub-divided into different grades.

³⁾ No minimum values are specified for other elements. Depending, for example, on the raw materials used, the pig-iron may unintentionally contain elements other than those indicated in columns 4 to 8 and in percentages, for some elements, may reach a value of about 0,5 %. The contents of these indicated elements should not be used in the classification of the pig-iron.

⁴⁾ For these classes of foundry pig-iron, different terms such as low, medium, intermediate and high phosphorus, normal haematite and semi-haematite, Cleveland etc. are used in the various parts of the world and this partly in a very different sense. Consequently, it is recommended to renounce on the international level on such terms and to apply as designations in these cases only the abbreviations given in column 3.

⁵⁾ Normally used for either pearlitic nodular cast-iron or for malleable cast-iron.

⁶⁾ A further characteristic of these pig-iron grades is that the contents of elements prejudicing the formation of nodular graphite and promoting the formation of carbide are low according to the intended use of the grade concerned.

⁷⁾ This class includes pig-iron that cannot be classified either in classes 1.1 to 3.3 or in classes 5.1 and 5.2.

⁸⁾ Other alloyed pig-iron includes:

- a) pig-iron with a silicon content between > 4,0 and 8,0 %;
- b) pig-iron with a manganese content between > 6,0 and 30,0 %, provided that it cannot be classified as Spiegel iron (see class 5.1);
- c) pig-iron for which a minimum content is specified for at least one of the elements not specified in columns 4 to 8;
- d) pig-iron whose content of at least one of the following elements is within the limits indicated below:

Cr	> 0,3 to 10,0 %
Mo	> 0,1
Ni	> 0,3
Ti	> 0,2
V	> 0,1
W	> 0,1

up to the total content of 10,0 % of 'other' elements resulting from table 1.