



# SilicoManganese Standard

IS 1470: 2013

भारतीय मानक  
सिलिकोमैंगनीज — विशिष्टि  
( चौथा पुनरीक्षण )

*Indian Standard*  
SILICOMANGANESE — SPECIFICATION  
( *Fourth Revision* )

ICS 77.100

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**BUREAU OF INDIAN STANDARDS**  
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## FOREWORD

This Indian Standard (Fourth Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Ferro Alloys Sectional Committee had been approved by the Metallurgical Engineering Division Council.

This standard was first published in 1960 and subsequently revised in 1969, 1979 and 1990. In the light of the experience gained during the years it has been felt necessary to revise this standard.

The following main modifications have been made in this revision:

- a) Two new grades Si23Mn68LS and Si26Mn60LP have been incorporated in view of the international trade practices and the present need of the industry.
- b) Particle size ranges have been modified.
- c) Informations to be given while ordering the material have been incorporated for the benefit of the purchaser.
- d) New clauses have been incorporated to avoid wide segregation of the chemical constituents, thereby safeguarding the small consumers of this product.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*  
**SILICOMANGANESE — SPECIFICATION**  
*( Fourth Revision )*

**1 SCOPE**

This standard covers the requirements and condition of delivery for silicomanganese used by iron and steel industry and foundries.

**2 REFERENCES**

The following standards contain provisions which through reference in the text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreement based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
1387 : 1993	General requirements for the supply of metallurgical materials ( <i>second revision</i> )
1472 : 1977	Methods of sampling ferro alloys for determination of chemical composition ( <i>first revision</i> )
1559 : 1961	Methods of chemical analysis of ferro alloys

**3 TERMINOLOGY**

For the purpose of this standard, the following definitions shall apply.

**3.1 Silicomanganese** — A master alloy of iron, manganese and silicon with a minimum manganese content in the range of 50-75 percent by mass and silicon content in the range of 10-35 percent by mass, obtained by reduction.

**3.2 Cast (Melt)** — The product of any of the following:

- a) One furnace heat; or
- b) One tap of continuous furnace; or
- c) A number of furnace or crucible heats of similar composition mixed in a ladle or holding furnace and used for making a cast.

**3.3 Constitution of Consignment**

**3.3.1 Tapped Lot Method** — A consignment constituted by the tapped lot method consists of silicomanganese mass of one melt (or one part of a continuous tap).

**3.3.2 Graded Lot Method** — A consignment constituted by the graded lot method consists of a number of melts (or parts of continuous taps) of one silicomanganese designation.

The silicomanganese content of the melts (or parts of continuous taps) constituting the consignment shall not differ from each other by more than 3 percent.

**3.3.3 Blended Lot Method** — A consignment constituted by the blended lot method consists of a number of melts (or parts of continuous taps) of one silicomanganese designation, which have been crushed to a particle size less than 50 mm and thoroughly mixed.

The content of the main constituent of the melts (or part of continuous taps) constituting the consignment may vary between the minimum and maximum limits specified for the appropriate silicomanganese designation.

**4 GRADES**

This standard covers 8 grades of silicomanganese, as specified in Table 1.

**5 PARTICULARS TO BE SPECIFIED WHILE ORDERING**

For the benefit of the purchaser, particulars to be specified while ordering for the material to this specification shall be as follows:

- a) Quantity of the material;
- b) Constitution of consignment;
- c) Name of the material;
- d) Grade designation;
- e) Size range; and
- f) Necessary requirements for analysis reports, packing, etc, as appropriate.

**6 SUPPLY OF MATERIALS**

General requirements relating to the supply of the material to this standard shall be as laid down in IS 1387.

**7 REQUIREMENTS****7.1 Constitution of Consignment**

Silicomanganese shall be delivered in consignments constituted by one of the methods defined in 3.3.

## 7.2 Chemical Composition

**7.2.1** Each batch of the material shall conform to the requirements of the chemical composition specified in Table 1 and if so specified by the purchaser at the time of enquiry and order, the manufacturer shall supply a test certificate of chemical analysis for each melt.

**Table 1 Chemical Composition of Silicomanganese**  
(Clauses 4, 7.2.1, 7.2.2 and 7.2.3)

Sl No.	Grade Designation	Constituents, Percent <sup>1)</sup>				
		Mn Max	Si Max	C Max	P	S
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Si18Mn72	70-74	16-20	1.5	0.20	0.03
ii)	Si23Mn68LS	65-70	20-25	1.0	0.30	0.03
iii)	Si23Mn68	65-70	20-25	1.5	0.30	0.05
iv)	Si18Mn68	65-70	16-20	2.0	0.30	0.02
v)	Si19Mn63	60-65	17-20	2.0	0.30	0.03
vi)	Si16Mn63	60-65	15-17	2.5	0.30	0.03
vii)	Si26Mn60LP	60 Min	26 Min	0.2	0.05	0.03
viii)	Si26Mn53	50-55	24-28	0.1	0.30	0.03

<sup>1)</sup> Except where ranges specified.

**7.2.2** If specified by the purchaser at the time of enquiry and order that each lump of the batch should conform to the chemical composition specified in Table 1, this shall be as agreed to between the purchaser and the manufacturer.

NOTE — The material belonging to a melt which is out of specification shall not be blended or mixed with the material of another cast/melt.

**7.2.3** The chemical composition given in Table 1 shows only the main constituent elements and usual impurities. If the purchaser requires closer ranges for the main element contents and different limits for specified elements and/or non-specified elements, this shall be agreed to between the purchaser and the manufacturer.

**7.2.4** The chemical composition of the material shall be determined either by the method specified in IS 1559 or any other established instrumental/chemical method. In case of dispute the procedure given in IS 1559 shall be the referee method. However, where the method is not given in IS 1559, the referee method shall be agreed to between the purchaser and the manufacturer.

**Table 2 Particle Size Range**  
(Clause 8)

Sl No.	Class	Particle Size Range mm	Undersize, Max, Percent by Mass		Oversize, Max, Percent by Mass
			Total (4)	Below 3.15 mm (5)	
(1)	(2)	(3)	(4)	(5)	(6)
i)	1	100-315	15	5 <sup>1)</sup>	10 No of piece to exceed 1.15 × the maximum limit of the size range specified in two or three directions
ii)	2	25-200	15	7 <sup>1)</sup>	
iii)	3	10-100	15	7 <sup>1)</sup>	
iv)	4	3.15-50		7	
v)	5	3.15-25		7	
vi)	6	Up to 3.15		—	

<sup>1)</sup> If not otherwise specified, these values are for information only.

## 8 SIZE DESIGNATION

The material shall be supplied in lumps of as crushed and screened particles in size designations 1 to 3. The particle size ranges and tolerances shall be as given in Table 2. The undersize values shall be valid at the point of delivery to the purchaser.

## 9 EXTRANEEOUS CONTAMINATIONS

The material shall be reasonably free from extraneous contaminations like slag and non-metallic inclusions, etc.

## 10 SAMPLING

Each batch of the material shall be sampled in accordance with IS 1472.

## 11 PACKING

The material shall be packed in suitable containers, in quantities as mutually agreed to between the purchaser and the supplier.

## 12 MARKING

**12.1** The material shall be marked with the following:

- Indication of the source of manufacture;
- Grade designation, cast or lot and size designation;
- Quantity;
- Date of manufacture; and
- Shelf life, if required.

### 12.2 BIS Certification Marking

The material may also be marked with the Standard Mark.

**12.2.1** The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.



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This Indian Standard has been developed from Doc No.: MTD 5 (4803).

### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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