

**GOVERNMENT OF INDIA  
(Ministry of Railways)**

**SPECIFICATION FOR  
SILICO MANGANESE  
(PL No.9121 0069)**

**Issued by**

**MECHANICAL DRAWING OFFICE  
RAIL WHEEL FACTORY  
YELAHANKA, BANGALORE-560 064  
INDIA**

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CME <i>20/8</i>	CWE/W	Dy. CME/Mfg	SSE/D
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## SPECIFICATION FOR SILICO MANGANESE

### 1.0 SCOPE

This specification covers the requirements for Silico Manganese used in Steel Melt Shop/Rail Wheel Factory (Formerly Wheel and Axle Plant), Yelahanka, Bangalore-560064.

### 2.0 USAGE OF SILICO MANGANESE

- 2.1 Silico Manganese is used as a ladle addition to the liquid steel manufactured in Electric Arc Furnace steel making practice. Final chemistry with respect to Manganese and partly Silicon is achieved suitably for casting of Railway steel wheels. Non-metallic/slag/sand inclusions in the Silico Manganese results in the formation of slag and therefore, wheels thus cast will tend to have non-metallic inclusions causing rejection or rework. RWF has no facilities for secondary refining or vacuum degassing or Argon purging in the ladle.

### 3.0 MANUFACTURE AND QUALITY ASSURANCE PLAN (QAP)

#### 3.1 CHARACTERISTICS OF RAW MATERIALS USED

The manufacturer/supplier has to disclose the details of the grade, source, specification and acceptance criteria of all raw materials used for manufacturing Silico Manganese to satisfy uses of the material as mentioned above.

#### 3.2 MANUFACTURING FACILITIES REQUIRED

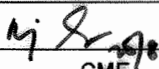
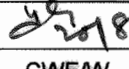
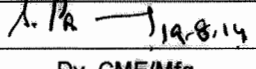

The manufacturer shall have adequate manufacturing facilities such as manufacturing, crushing, sieving and packing.

#### 3.3 TESTING FACILITIES

The manufacturer shall have all facilities to test the properties of Silico Manganese specified in this specification.

#### 3.4 QUALITY ASSURANCE PLAN

The manufacturer shall submit their QAP that will be followed in the manufacturing of Silico Manganese to achieve the performance requirement described in clause 2.0. The QAP shall consider the following requirement.

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- a) Details on grade, source, specification and acceptance criteria of all raw materials
- b) In-process control parameter norms.
- c) Finished product testing
- d) After sales service

Other details like M&P, technical manpower, testing facilities etc shall be given as per the tender document.

#### 4.0 CHEMICAL COMPOSITION

- 4.1 Chemical Composition will be in accordance with grade Si16Mn63 of IS 1470:1990 (Third Revision) as indicated below:

1	Manganese	60 - 65%
2	Silicon	14 - 17%
3	Carbon	2.5% Max.
4	Phosphorus	0.30% Max.
5	Sulphur	0.03% Max
6	As	0.10% Max.
7	Ni, Cr & Mo	0.75% max

#### 4.2 SIZE

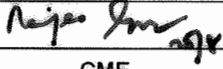
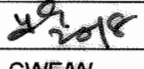
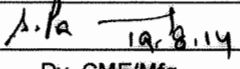

Particle Size : 40 – 150 mm, i.e., size designation 3 of Table 2 of IS 1470 : 1990

Size tolerance will be as per clause 8.1 and Table 2 of IS 1470 : 1990 including over-sizes and under-sizes.

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

#### 5.0 SAMPLING NORM

- 5.1 The sampling shall be done as per IS 1472 : 1977 (Method for sampling Ferro Alloys for determination of chemical composition) is a necessary adjunct to this specification.

			
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## 5.2 SAMPLING PLAN

The lots shall be offered in bags weighing **20 kg** each or as indicated in the purchase order.

SI No	Lot Size	Samples at random
1	<25 MT	8
2	> 25 < 50 MT	16
3	> 50 < 75 MT	24
4	> 75 < 100 MT	32

## 6.0 METHOD OF CHEMICAL ANALYSIS AND TESTING

As indicated in relevant parts of the latest specification IS 1559.

## 7.0 ACCEPTANCE CRITERIA

If the material fails to meet the requirement against clauses 4.1, 4.2 & 4.3 in first sampling, then another sample of double the size of first sample shall be taken for ensuring conformity of the material against clauses 4.1, 4.2 & 4.3. If any one of this sample fails to meet the clauses 4.1, 4.2 & 4.3, the lot stands rejected.



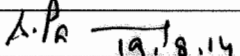

## 8.0 TEST CERTIFICATE

The supplier shall submit the test certificate pertaining to the lot offered for inspection and supply to Rail Wheel Factory, Bangalore conforming to the requirements.

## 9.0 PACKING

The material shall be packed in double walled gunny bags weighing **20 kg** each or as indicated in the purchase order. Each bag shall be marked with Supplier's name and, the name & grade of material.

**Use eco friendly biodegradable packing material.**

			
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