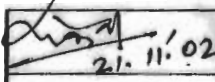
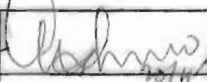
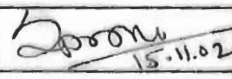
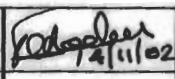


**GOVERNMENT OF INDIA
(Ministry of Railways)**

**SPECIFICATION FOR
HIGH PURITY FERRO SILICON**

Issued by

**MECHANICAL DRAWING OFFICE
WHEEL & AXLE PLANT
YELAHANKA, BANGALORE-560 064
I N D I A**

| | | | |
|---|--|--|---|
|  21.11.02 |  20/11 |  15.11.02 |  14/11/02 |
| CME/W | Dy.CME/WI | Dy.Chief CMT | SSE/D |
| APPROVED | REVIEWED | CHECKED | PREPARED |

Specification for High Purity Ferro Silicon

1.0 Scope:

This specification covers the requirements for Ferro Silicon used in Steel Melt Shop/Wheel and Axle Plant, Yelahanka, Bangalore-560 064.


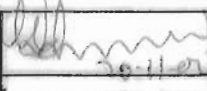
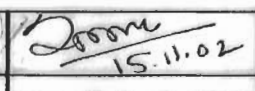
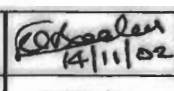
2.0 Usage of Ferro Silicon:

- 2.1 Ferro Silicon is used as a ladle addition to the liquid steel tapped from the Electric Arc Furnace. Final chemistry with respect to Silicon is achieved suitably for casting of Railway steel wheels.
- 2.2 Non-metallic/slag/sand inclusions in the Ferro Silicon results in the formation of slag and therefore, wheels thus cast will tend to have non-metallic inclusions causing rejection or rework. WAP has no facilities for secondary refining or vacuum degassing or Argon purging in the ladle. Therefore, the Ferro Silicon shall be free from slag/non-metallic/sand inclusions.
- 2.3 The manufacture shall cast Ferro Silicon metal in single layer only. Multilayer cast Ferro Silicon is not permitted. The consignment may consists of a number of melts of the same grade referred at 3.0.

3.0 Chemical Composition:

3.1 Chemical Composition will be as indicated below.

| | |
|------------|---|
| Silicon | 70 - 75% |
| Carbon | 0.15% Max. |
| Phosphorus | 0.05% Max. |
| Sulphur | 0.05% Max |
| Aluminium | 1.00% Max. |
| Size | 25 - 100 mm. |
| Fines | Fines below 5 mm is not acceptable. Sizes more than 5 mm and less than 25 mm shall be to a maximum of 5%. |

| | | | |
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3.2 Slag or non-metallic or sand inclusion either on the surface or entrapped in the lump is not permitted.

4.0 **Sampling Norm:**

4.1 The sampling shall be done as per IS:1472/1997 (Method for sampling Ferro Alloys for determination of chemical composition) is a necessary adjunct to this specification.

4.2 Sampling Plan for Cl 3.2 is as under:

The lots shall be offered in bags of each weighing 50kg.

| Sl. 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 |

If any bag contains slag/non-metallic inclusions in any lump(s) or piece(s), a double quantity of bags shall be picked up at random and checked visually. The lots can be accepted if slag/non-metallic inclusions are not present. Otherwise the offered lot is considered as rejected.

5.0 **Method of chemical analysis and testing:**

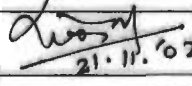
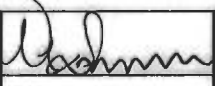
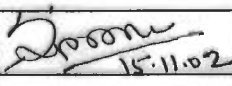
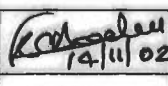
As indicated as a part of the specification contained in latest IS 1559 specification (Part 1 to 7).

6.0 **Test Certificate:**

The supplier shall submit the test certificate pertaining to the lot intended to supply to Wheel and Axle Plant/Bangalore conforming to the requirements.

7.0 **Warranty:**

The supplier shall submit a guarantee certificate for that their product conforms to the specification and to the effect, that in case their product fails to meet the requirement given in the specification, they shall replace the supply free of cost within 21 days after receipt of the complaint. Wheel and Axle Plant, Bangalore is not liable to make the payment for the quantity rejected.

| | | | |
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| APPROVED | REVIEWED | CHECKED | PREPARED |

8.0 **Packing:**

The material shall be packed in double walled eco-friendly bio degradable gunny bags weighing 50 Kgs. each. Each bag shall be marked with Supplier's name and grade of material.

| | | | |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| <i>[Signature]</i> 21.11.02 | <i>[Signature]</i> 20.11.02 | <i>[Signature]</i> 15.11.02 | <i>[Signature]</i> 14/11/02 |
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