





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

**SPECIFICATION FOR
GRAPHITE POWDER
PL No.81981922**

Issued by

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

 CWEM	 AED/M&C	 Dy CME/Mfg	 SSE/D
APPROVED	REVIEWED	VERIFIED	PREPARED

SPECIFICATION FOR GRAPHITE POWDER

1.0 SCOPE

The Specification covers manufacture and supply of Graphite Powder for usage during the steel melting for raising the carbon percentage in the Electric Arc Furnace.

2.0 GENERAL DESCRIPTION

Graphite powder is used for steel melting in Electric Arc Furnace. The Graphite powder shall be free from moisture, oil, visible impurities namely mica, pyrites and shall be free from other contamination.

3.0 JOB REQUIREMENTS

In the Electric Arc Furnace at RWF, steel scrap is melted for casting of railway wheels. During the course of melting, graphite powder is added to maintain the carbon content in the steel.

4.0 MANUFACTURING FACILITIES, TESTING FACILITIES AND QUALITY ASSURANCE PROGRAMME (QAP)

The Manufacturer shall submit documentary evidence for compliance of clause 4.1 to 4.4 along with their offer.

4.1 RAW MATERIAL SELECTION

The Raw material used shall be graphite products with a minimum 98.0% fixed carbon, free from harmful impurities, which may affect the steel quality.


4.2 MANUFACTURING FACILITY

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

4.3 TESTING FACILITIES

The manufacturer shall have all testing facilities and instruments to carry out tests as required for clause 5.0

4.4 The manufacturer shall submit their QAP that will be followed in the manufacturing of graphite powder to achieve the performance requirement described in clause 5.0. The QAP shall consider the following requirement.


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- a) Details on the grade, source, specification and acceptance criteria of Raw material Graphite
- b) In-process parameter of crushing and sieving
- c) Finished product testing
- d) After sales service
- e) Other details like M&P, Technical Manpower, Testing facilities (in-process & Product inspection), ISO or any other certification of Quality Management system as per tender document.
- f) Manufacturer has to produce internal test certificate to inspecting authority at the time of inspection of material.

5.0 TECHNICAL REQUIREMENT

5.1 CHEMICAL REQUIREMENT

Sl No	Constituent	Specified Limit	Test Method
a	Carbon content	98% min.	IS-14852-2000
b	Ash	2% max.	IS-14852-2000
c	Sulphur	0.05% max.	IS-14852-2000
d	Phosphorus	Traces	-----
e	Moisture	0.2% max	IS-14852-2000
f	Size Range	not greater than 6mm	Sieve by 6mm sieve

The particles of coarse powder and granules must be thoroughly mixed before packing.

5.2 PHYSICAL REQUIREMENT


The Graphite powder shall be free from moisture, oil, visible impurities namely mica, pyrites and shall be free from other contamination.

6.0 SAMPLING NORM

The number of bags for sampling shall be selected at random as per table below.

Lot weight	No. of bags selected for sampling
*Upto 1 MT	02
*Over 1 and less than/ equal to 4 MT	04
*Over 4 and including 25 MT	10

- 6.1 From each lot as indicated in the above table, with the help of suitable sampling instrument about 0.25 kg of material shall be taken. This material shall be taken from the top, centre and bottom of each selected bag (containers). Samples

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drawn from each selected bag shall be mixed to form a composite sample. By successive coning and quartering division method, the composite sample shall be reduced and given a final test sample of 150 grams for the chemical analysis and size range as indicated under clause 4.0.

7.0 TEST CERTIFICATE

The Supplier shall submit the test certificate pertaining to the lot supplied to RWF while conforming to the requirement.

8.0 PACKING


The graphite powder shall be supplied in multi-walled paper sacks bags weighing **20 kg** each. The sacks should so rugged to withstand severs condition of burst, tear etc. during handling, transit and storage.

9.0 QUALITY ASSURANCE PLAN (QAP)

The supplier shall submit their Quality Assurance Plan (QAP) along with their bid for approval by RWF, which will be followed in the processing of graphite powder to satisfy the technical requirement as required under this specification. Supplier shall get their QAP approved from RWF in advance, unless a waiver is given to this effect.

10.0 TRIAL OF THE SUPPLY

The material for trial shall necessarily meet all the requirements mentioned elsewhere in this specification prior to shop floor trial. Only after this, the material will be taken up for shop floor trial by RWF as per trial scheme at Annexure-1 and the corresponding trial report shall be prepared as per Annexure-2.


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TRIAL SCHEME OF GRAPHITE POWDER

1	Trial scheme No.	RWF/M/SPECN-1/048 /1993 alt --- / Trial Scheme PL NO.....
2	Objective of Trial	To establish the suitability of Graphite powder as per Specn No. RWF/M/SPECN-1/048 /1993 alt--
3	Description of Material PO Number & PO date PO Qty. Supplier	GRAPHITE POWDER
4	IDN Number & Date IDN Qty.
5	Authority for conducting Trial	Dy. CME/ Mfg
6	Earlier trial details	First Time Supply/ Second time/ Third time/...../.....
7	Trial Parameters	As mentioned in Trial Scheme
8	Specification	RWF/M/SPECN-1/048/1993 alt ---
9	Pre-trial Testing details	Met. Lab Report & MTC
10	Trial qty	Full IDN Qty/ 5% of the tendered quantity
11	Equipment / Station process	EAF-A,B,C


(..... to be filled by Team Members)

Trial Parameters:

1. Total quantity Graphite powder to be drawn and trial conducted on the entire quantity under the purchase order/5% of the tendered quantity, whichever is less.
2. Inspection & testing by shop and whenever required by laboratory completely in line (not in part) with the specification. Sampling for inspection as per RWF specification.
3. Examination of MTC (Manufacturer's Test Certificate) and comments on its suitability.

Specific Requirements:

Compare carbon pickup in the steel bath in matching number of other established makes by ensuring same process parameter during use and in the same period (or just preceding/succeeding period) and shall be comparable to 90% to established make already in use.


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TRIAL REPORT OF GRAPHITE POWDER

1	Trial No.	RWF/M/SPECN-1/048 /1993 alt --- / Trial Scheme PL NO.....
2	Objective of Trial	To establish the suitability of Graphite powder as per Specn No. RWF/M/SPECN-1/048 /1993 alt-- -
3	Description of Material PO Number & PO date PO Qty. Supplier	GRAPHITE POWDER
4	IDN Number & Date IDN Qty.
5	Authority for conducting Trial	Dy. CME/ Mfg
6	Earlier trial details	First Time Supply/ Second time/ Third time/...../.....
7	Trial Parameters	As mentioned in Trial Scheme
8	Specification	RWF/M/SPECN-1/048/1993 alt ---
9	Pre-trial Testing details	Met. Lab Report & MTC
10	Trial qty	Full IDN Qty/ 5% of the tendered quantity
11	Equipment / Station process	EAF-A,B,C
12	Nominated Officers	ACMT/W & AWM/SMS

(..... to be filled by Team Members)

Application Test: Shop Floor test conducted from date ___ to date ___ & H. No.

Trial Parameters

- 1 Total quantity Graphite powder to be drawn and trial conducted on the entire quantity under the purchase order/5% of the tendered quantity, whichever is less.


Comments:

- 2 Inspection & testing by shop and whenever required by laboratory completely in line (not in part) with the specification. Sampling for inspection as per RWF specification.

Enclosure Details:

- 3 Examination of M Lab report & MTC (Manufacturer's Test Certificate) and comments on its suitability.

Comments with documents:


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Specific Requirements:

Compare carbon pickup in the steel bath in matching number of other established makes by ensuring same process parameter during use and in the same period (or just preceding/succeeding period) and shall be comparable to 90% to established make already in use.

Observations:

AWM/WM

ACMT/W

SSE/SMS

WM/W


Remarks of Dy CME/Mfg.

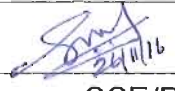
Remarks of AED/M&C

CWE/W


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AMENDMENT SHEET

Alt. 'g' Clause No.	Alt. 'h' Clause No.	Description	Job No.	Sign
--	9	Clause added: 9.0 QUALITY ASSURANCE PLAN (QAP) The supplier shall submit their Quality Assurance Plan (QAP) along with their bid for approval by RWF, which will be followed in the processing of graphite powder to satisfy the technical requirement as required under this specification. Supplier shall get their QAP approved from RWF in advance, unless a waiver is given to this effect.	6891	
--	10	Clause added: 10.0 TRIAL OF THE SUPPLY The material for trial shall necessarily meet all the requirements mentioned elsewhere in this specification prior to shop floor trial. Only after this, the material will be taken up for shop floor trial by RWF as per trial scheme at Annexure-1 and the corresponding trial report shall be prepared as per Annexure-2.		
--	Annexure-1	Added Annexure-1 TRIAL SCHEME OF GRAPHITE POWDER		
--	Annexure-2	Added Annexure-2 TRIAL REPORT OF GRAPHITE POWDER		


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