


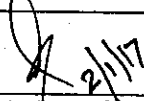
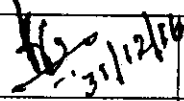
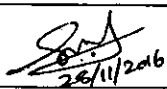
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**GOVERNMENT OF INDIA
(Ministry of Railways)**

**SPECIFICATION FOR
GRAPHITE GRANULES
(PL No. 81982896)**

Issued By

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

 20/11/16	 2/1/17	 31/12/16	 26/11/2016
CWEM APPROVED	AED/M&C REVIEWED	Dy. CME/Mfg VERIFIED	SSE/D PREPARED

SPECIFICATION FOR GRAPHITE GRANULES**1.0 SCOPE**

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

2.0 GENERAL DESCRIPTION

Graphite Granules for use as carbon raiser in the steel melting process in Electric Arc Furnace.

3.0 JOB REQUIREMENT

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

4.0 MANUFACTURING, TESTING FACILITIES AND 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 Min 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 the testing facilities and instruments to carry out tests as required for clause 5.1

4.4 The manufacturer shall submit their QAP that will be followed in the manufacturing of graphite granules to achieve the performance requirement described in clause 5.1 and 5.2. The QAP shall consider the following

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described in clause 5.1 and 5.2. The QAP shall consider the following requirement.

- a) Details of the grade, source, specification and acceptance criteria of the 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 (fixed carbon)	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

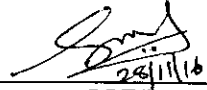
5.2 PHYSICAL REQUIREMENT

The Graphite granules shall be free from moisture, oil, visible impurities namely mica, pyrites and other harmful contaminations.

6.0 SIZE RANGE

The size range shall be from 0.5 mm to 5.6 mm. Variations shall be permitted as per the following:

- Size less than 0.5 mm : 10% (max.)
- Size above 5.6 mm : 10% (max)
- Max. Size allowed : 8.0 mm


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For each lot of graphite granules quantity, the number of bags selected to collect samples are indicated 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

From each lot as indicated in the table above, with the help of suitable sampling instrument about 0.5 kg of material shall be drawn from each selected bag. It 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 0.5 kg for the chemical requirement, physical properties and size (clause 5.1, 5.2 and 6.0). If the composite sample fails to meet the above requirements then two more composite sample may be drawn from the lot as per above sampling norms and shall be tested for the chemical requirement, physical properties and size and if any of the composite sample fails to meet the requirement then the entire lot stands rejected.

8.0 TEST CERTIFICATE

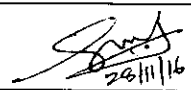
The supplier shall submit the test certificate pertaining to the lot, ensuring conformance to the specification.

9.0 PACKING

The material shall be packed in multi-walled paper sacks of 25 kg capacity. The packing material should be eco-friendly and biodegradable. The particles of graphite granules must be thoroughly mixed before packing.

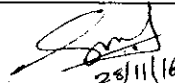
10.0 QUALITY ASSURANCE PLAN (QAP)

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 granules 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.

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11.0 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 GRANULES

1	Trial scheme No.	RWF/M/SPECN-1/100 /2007 alt --- / Trial Scheme PL NO.....
2	Objective of Trial	To establish the suitability of Graphite granules as per Specn No. RWF/M/SPECN-1/100 /2007 alt ---
3	Description of Material PO Number & PO date PO Qty. Supplier	GRAPHITE GRANULES
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-1/100 /2007 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

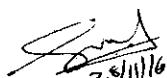
(..... to be filled by Team Members)

Trial Parameters:

1. Total quantity Graphite Granules 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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Annexure -2

TRIAL REPORT OF GRAPHITE GRANULES

1	Trial No.	RWF/M/SPECN-1/100 /2007 alt -- / Trial Scheme PL NO.....
2	Objective of Trial	To establish the suitability of Graphite granules as per Specn No. RWF/M/SPECN-1/100 /2007 alt --
3	Description of Material PO Number & PO date PO Qty. Supplier	GRAPHITE GRANULES
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-1/100 /2007 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	ACMTW & AWM/SMS

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

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

Trial Parameters

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

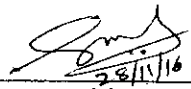
Comments:

- 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:

- 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

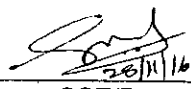
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WM/W

Remarks of Dy CME/Mfg.

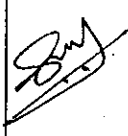
Remarks of AED/M&C


CWE/W

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AMENDMENT SHEET

Alt. 'g' Clause No.	Alt. 'h' Clause No.	Description	Job No.	Sign
-	10	Clause added: 10.0 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 granules 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.	6892	
-	11	Clause added: 11.0 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 GRANULES		
-	Annexure-2	Added Annexure-2 TRIAL REPORT OF GRAPHITE GRANULES		


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