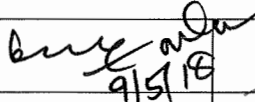
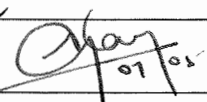
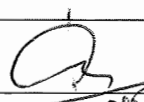
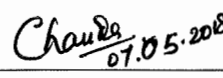


**GOVERNMENT OF INDIA  
(Ministry of Railways)**

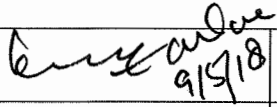


**SPECIFICATION FOR  
CMC TYPE – 7 HIGH  
PL No. 81981107**

**ISSUED BY  
MECHANICAL DRAWING OFFICE  
RAIL WHEEL FACTORY  
YELAHANKA, BENGALURU-560 064  
INDIA**

 9/5/18	 07/05		 07.05.2018
PCME	CWE/W	Dy. CME/M	SSE/MDO
APPROVED BY	REVIEWED BY	VERIFIED BY	PREPARED BY

## AMENDMENT SHEET

Alt 'a' Clause No.	Alt 'b' Clause No.	Description	Job No	Sign
--	COVER PAGE (Page 1) & AMENDMENT SHEET (page 2)	The Specification is prepared in format to incorporate approval signature of PCME & amendment sheet is relocated at the beginning of the specification		
--	7.0	Clause added :  <b>7.0 SHELF LIFE</b>  In packed condition the material should have a shelf life of minimum one year from the date of receipt at RWF. The date of manufacture of CMC must be indicated on every bag		
--	8.0	Clause added :  <b>8.0 QUALITY ASSURANCE PLAN (QAP)</b>  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 CMC Type 7 High 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.	7084	Chanda 07.05.2018
7.0 & 7.1	9.0 & 9.1	Clause numbers changed due to induction of new clauses as above		

 9/5/18			Chanda 07.05.2018
PCME	CWEM	Dy. CME/Infg.	SSE/MDO
APPROVED BY	REVIEWED BY	VERIFIED BY	PREPARED BY

## SPECIFICATION FOR CMC TYPE –7 HIGH

### 1.0 SCOPE:

1.1 This Specification covers the manufacture and supply of Carboxy Methyl Cellulose (CMC) Type –7 High at Rail Wheel Factory, Indian Railways, Yelahanka, Bengaluru - 560 064, Karnataka State, India as per the instructions and conditions of Contract and Tender Papers.

### 2.0 GENERAL DESCRIPTION:

2.1 Carboxy Methyl Cellulose (CMC) Type –7 High (a Cellulose Gum) is a film former, thickener, suspending agent, stabilizer and binder. Its chief use is for its adhesive qualities. CMC is a well known suspending and bonding agent, which thickens, and increase the viscosity of the slurry. Type – 7 refer to 7 Carboxymethyl molecular groups for every ten (10) Cellulose Groups. This degree of substitution (7 for 10, or 0.7) lies in group type of 0.65 – 0.90. H refers to High range of viscosity 1500 – 3000 Centipoises.

### 3.0 MATERIAL:

Material is 99.5% pure CMC.

### 4.0 TECHNICAL REQUIREMENTS:

#### 4.1 COLOUR AND APPEARANCE:

The material shall be a white to Creamish powder. It shall be free from extraneous matter and other thioxotropic materials such as starches, gums on sodium alginate and shall be free flowing, granular, fluffy or fibrous.

#### 4.2 SOLUBILITY IN WATER:

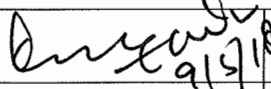
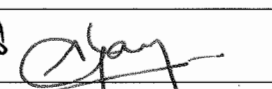
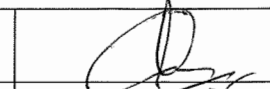
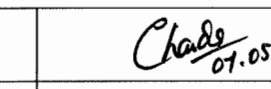
The material shall be soluble in water to give a clear and colloidal solution.

#### 4.3 VISCOSITY:

The viscosity of a 1% solution of CMC in water at 25°C shall be within the range of 1500 – 300 Centipoise.

### 5.0 METHOD OF SAMPLING:

All contains of same batch in a single supply shall be grouped together to constitute a lot and each lot shall be sampled separately.

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The number of containers to be selected at random from a lot shall be as follows:

No. of containers	No. of containers to be in a lot sampled
upto 5	all
6-50	5
51-100	8
101-300	13

From each containers selected as above, approximately equal quantity of CMC will be drawn so as to form a composite sample weighing about 150 gm. The composite sample shall be thoroughly mixed by cone and quartering method.

#### 6.0 TEST METHOD FOR DETERMINATION OF VISCOSITY:

Viscosity of a 1% solution at 25°C will be determined by using Brookfield Viscometer (LVF model). An accurately weight 5.0 grams sample of CMC, will be added to 500 ml distilled water as a beaker. Slowly stirring continuously with a mechanical stirrer, till all the CMC is completely dissolved. The beaker will be set aside for some time to remove the air bubbles formed during the preparation of the solution. When the solution is free from air bubbles the temperature will be brought to 25°C for determining viscosity.

The beaker will be kept under the Brookfield viscometer and spindle number 3 inserted in such a manner that air bubbles are entrapped, care being taken that the spindle does not touch the sides of the beaker, while in motion.

The solution level will be adjusted at the immersion groove cut on the spindle shaft. The spindle will be allowed to rotate (Spindle number 3 at 12 rpm) till constant reading on the scale is obtained. The reading will be noted and reported as viscosity in Centipoise by multiplying with the standard factor, corresponding to spindle and speed from the factor finder chart supplied along with the Brookfield Viscometer.

#### 7.0 SHELF LIFE

In packed condition the material should have a shelf life of minimum one year from the date of receipt at RWF. The date of manufacture of CMC must be indicated on every bag.

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**8.0 QUALITY ASSURANCE PLAN (QAP)**

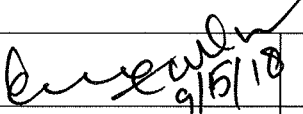


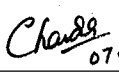
The supplier shall submit their Quality Assurance Plan (QAP) along with their bid for approval by RWF, which will be followed in the processing of CMC Type 7 High to satisfy the technical requirement as required under this specification. Supplier shall get their QAP approved from RWF in advance, unless a waiver is given to this effect.

**9.0 PACKING AND MARKING:**

The material shall be packed in moisture proof multilayer paper bags or containers weighing 2 kg net.

9.1 Each container shall be securely closed and shall bear legibly the following information:

- i) Name of the material.
- ii) Name of the manufacturer.
- iii) Batch number and date of manufacture.
- iv) Net Weight.

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