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RDSO Specification for Chemical Cleaning Compound & Procedure for Cleaning of Tank Wagons other than LPG and BTPN (Petrol) Tank Wagons			

# **RDSO SPECIFICATION NO. M&C/PCN/118/2020**

**(Rev 1.0)**



**SPECIFICATION FOR CHEMICAL CLEANING COMPOUND AND  
PROCEDURE FOR CLEANING OF TANK WAGONS OTHER THAN  
LPG AND BTPN (PETROL) TANK WAGONS**

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#### 0.0 FOREWORD

This specification was initially adopted in 1999. In this revision, cleaning of Black Oil Tank Wagons has also been incorporated under scope.

#### 1.0 SCOPE

1.1 This standard covers the requirements and methods of testing of chemicals required for the cleaning of Tank Wagons & procedure for cleaning of Tank Wagons other than LPG and BTPN (Petrol) Tank Wagons used for transporting the following:

- a) Black oil, Crude oil, Lubricating oil, Furnace oil, Vegetable oil, Diesel oil, Mineral Turpentine oil etc.
- b) Benzene, Toluene, Xylene, Styrene, Methanol, Hexane, Naphtha, Power alcohol, Spirits, etc.

1.2 For tender evaluation, the cost of 100 litres of chemical composition in “Ready to use condition” shall be taken into consideration for cost comparison.

**NOTE:** “Firm should comply Make in India Policy and Public Procurement (Preference to Make in India) Order-2017 under this specification” and subsequent Amendment done time to time.

#### 2. TERMINOLOGY

2.1 For the purpose of this standard, the Glossary of Terms given IS: 1448-67-1982 Reaffirmed 2006 or its latest version and IS 1303 -1983, Reaffirmed 2017 or its latest version shall apply.

#### 3. REQUIREMENTS

##### 3.1 COMPOSITION

The material shall be transparent homogeneous clear liquid, non-toxic, non-inflammable compound containing no caustic, alkali or mineral acid.

3.2 The degassing-cum-sludge remover shall meet the requirements stipulated in TABLE-I

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**TABLE-I: REQUIREMENTS FOR CHEMICAL CLEANING COMPOUND**

SN	Characteristics	Requirements	Test Method
1-	Appearance	Clear liquid free from foreign matter	Visual
2-	Colour	Light yellow	IS:1448-2013(P-12)
3-	Specific Gravity at 27±2 <sup>0</sup> C	1.0 ± 0.05	IS:1448-2014(P-16)
4-	pH value of 10% solution	7.0 – 8.5	APPENDIX -A
5-	Flash Point	Above 40 <sup>0</sup> C	IS:1448-2019(P-20)
6-	Skin Irritation	Shall not irritate the skin during handling/working	By handling and working with compound
7-	Corrosion rate on mild steel with compound in fresh water 1:10 (V/V), at 27±2 <sup>0</sup> C, max.	10.0 mg/sq. dm/day	APPENDIX- B
8-	Oil residue removing efficiency	Shall remove Black oil, Crude oil, Lubricating oil, Furnace oil, Vegetable oil, Diesel oil, Mineral Turpentine oil etc. residues effectively.	APPENDIX -C
9-	Ability to form Emulsion (a) 1:5 Tap water (b) 1:10 Tap water (c) 1:30 Tap water	Shall readily emulsify and form excellent foam	APPENDIX- D
10-	Keeping Property	Not less than one year	When tested any time within the keeping property period, the material shall retain the properties given above.

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#### 4. PROCEDURE OF CLEANING

4.1 For cleaning of Tank Wagons carrying commodities listed in (a) and (b), the Degassing-cum-Sludge remover compound shall be used conforming to the requirements stipulated in TABLE-I

4.2 **PROCESS OF CLEANING OF TANK WAGONS:** Unload the commodity from the Tank Wagon completely, leaving inside the sediment formed.

42.1 Close bottom discharge valve and all the other openings on side and bottom.

#### 4.3 PROCESS OF DEGASSING

43.1 Fill the tank wagon to 1/3<sup>rd</sup> of its capacity with water and add approximately 5 litres (or as recommended by the supplier) of Degassing-cum-Sludge remover chemical compound, keeping the top dome open.

43.2 Formation of copious foam indicates reaction of the chemical with residue/sludge.

43.3 At this stage, fill the Tank Wagon with water, up to the brim and dispel the trapped gasses from the inside of the tank.

43.4 Allow the reaction to take place for a minimum of 4 hours.

43.5 Now transfer the 3/4<sup>th</sup> of the aqueous solution of the degassing-cum-sludge remover to second tank wagon through a pump or other device and remaining solution is drained out completely. The transferred solution can be used for cleaning of 7 more tank wagons by topping-up with fresh 2 litres compounds (or as recommended by supplier of degassing-cum-sludge remover) so as to form copious foam as produced initially (Cl.4.3.2)

#### 4.4 PROCESS OF CLEANING

44.1 After degassing, open the bottom valve to drain out the remaining liquid.

44.2 Rub/scrap the inner side and bottom of the barrel by wire brush.

44.3 Apply/spray liquid cleaner with diesel/kerosene oil in the ratio of 1:20 and allow 15-20 minutes for the reaction.

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444 Wash with the jet of water and then scrap with a scrapper with wire brush.

445 Now again apply/spray liquid cleaner i.e. degassing-cum-sludge remover and allow 15-20 minutes for the reaction.

446 Wash with the jet of water.

447 Repeat the above process till it cleans completely.

448 Wipe out the entire surface with cotton waste or jute for final cleaning.

## 5. PACKING

The products shall be packed in suitable airtight HDPE/HMHDPE containers of 20 Liters capacity, unless otherwise specified.

## 6. MARKING

Each container shall be marked with following legible & indelible legends:

1. Name of the product with Grade/Type
2. Name of the Manufacturer and/or his Trade Mark if any
3. Quantity of the product packed
4. Batch no or Lot no
5. Specification no.
6. Month & year of manufacturing
7. Storage conditions
8. Product is Environmental friendly

## 7. ENVIRONMENTAL ASPECTS

71 The products should be safe to store & handle and hazards if any associated with them shall be clearly marked on the packing. Material Safety Data Sheet (MSDS) shall be given for each product at the time of supply.

72 Product shall be biodegradable and safe for disposal in waste water treatment plant, as per requirements of respective Pollution control boards

## 8. STORAGE & SHELF LIFE

The products shall be stable and shall not degrade or deteriorate when stored at 0° C to 50° C, in original packing protected from direct light heat & humidity.

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## **APPENDIX-A**

### **DETERMINATION OF pH VALUE**

The pH value of the cleaning compound is determined by means of pH meter. Standardise the pH meter and electrodes with standard pH solution. Prepare a 10% solution of cleaning compound by using distilled water used as a solvent. Determine the pH of 10 % solution at  $(27\pm 2)^{\circ}\text{C}$ .

## **APPENDIX-B**

### **DETERMINATION OF CORROSION RATE**

Corrosion rate is carried out by immersing mild steel panel in 10 % aqueous solution of cleaning compound.

Place 3 weighed mild steel panels of 100 mm X 50 mm X 1.25 mm size, in 10 % aqueous solution of cleaning compound at  $(27\pm 2)^{\circ}\text{C}$  for 48 hours . Remove the panels from the solution, clean with running water followed by distilled water and wipe thoroughly. Dry and weigh the panels to constant weight. Report the average weight loss of the panels in mg/ sq. dm /day.

## **APPENDIX-C**

### **DETERMINATION OF OIL REMOVING EFFICIENCY**

A mild steel panel of 100 mm X 50 mm size is spread with oil sludge (Lubricating Oil / Furnace Oil etc.) and allow to dry for 3 days. Now 10 % solution of cleaning compound is spread over the entire panel and continuously agitated for effective cleaning. The panel is then examined visually.

## **APPENDIX--D**

### **DETERMINATION OF EMULSION CHARACTERISTICS**

Take 10 ml. sample in 3 different graduated stoppered cylinders and tap water in proportions as indicated in clause 9 of Table 1. Put stoppers and shake thoroughly till dispersal. Allow the mixture to stand for half an hour. The emulsion shall be in a stable form without any separation.