



PM/ 17042 (Pt.1)/ 2
Aug 2020

**PRODUCT MANUAL
FOR
Diesel Engines — NO_x Reduction Agent AUS 32
Part 1 Quality Requirements
According to IS 17042 (Part 1) : 2020/ISO 22241-1 : 2019**

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	Product	:	IS 17042 (Part 1) : 2020/ISO 22241-1 : 2019
	Title	:	Diesel Engines — NO _x Reduction Agent AUS 32, Part 1 Quality Requirements
	No. of amendments	:	NIL
2.	Sampling Guidelines		As per Annex A of IS 17042 (Part 2):2020/ISO 22241-2:2019
a)	Raw material	:	No specific requirement
b)	Grouping Guidelines	:	Not applicable
c)	Sample Size	:	2 ltr
3.	List of Test Equipment	:	Please refer Annex –A
4.	Scheme of Inspection and Testing	:	Please refer Annex –B
5.	Possible tests in a day	:	Urea content, Refractive index ,Alkalinity, Aldehydes, Insoluble matter, Phosphate, All trace element content.
6.	Scope of the Licence :		
	Licence is granted to use Standard Mark as per IS 17042 (Part 1) : 2020/ISO 22241-1 : 2019 with the following scope:		
	Name of the product		Diesel Engines — NO _x Reduction Agent AUS 32, Part 1 Quality Requirements
	Designation		AUS 32

ANNEXURE A

LIST OF TESTING EQUIPMENT

Major test equipment required to test as per requirements of Indian Standard.

Sl. No.	Test equipment/Apparatus/Chemicals	Test used in	Clause reference
1.	<p>Apparatus: Automatic nitrogen analyser, Analytical balance, Auxiliary devices for sample preparation (tweezers,, micr-spatula, pipette), Customary chemically resistant glass,</p> <p>Chemicals: De-ionized water, Auxiliary combustion agent and other equipments, Standard substances for nitrogen determination, Oxygen, min. 99,995 %, Other ultrapure gases, Other reagents or auxiliary agents</p> <p>OR</p> <p>Apparatus: Refractometer, Analytical balance, Thermostat , Drying oven , 150 ml beaker, Typical laboratory glass</p> <p>Chemicals: De-ionized water , Urea, (crystalline), Urea test solution</p>	Urea content	<p>Clause 5/ ISO 22241-2 Annex B</p> <p>or</p> <p>ISO 22241-2 Annex C</p>
2.	<p>Apparatus: Refractometer, Analytical balance, Thermostat , Drying oven , 150 ml beaker, Typical laboratory glass</p> <p>Chemicals: De-ionized water , Urea, (crystalline), Urea test solution</p>	Refractive index at 20 °C c	Clause 5/ ISO 22241–2 Annex C
3.	<p>Apparatus: Analytical balance, Automatic burette, Potentiometer, Magnetic stirrer, Beaker, Measuring cylinder,</p> <p>Chemicals: distilled or de-ionized water, Hydrochloric acid., Buffer solutions</p>	Alkalinity as NH ₃	Clause 5/ ISO 22241–2 Annex D
4.	<p>Apparatus: Laboratory balance, Vacuum filtration unit, Vacuum filtration unit, Spectrophotometer , Volumetric flasks , Pipettes, Rotary evaporator, Constant-temperature bath</p> <p>Chemicals: Chemicals of analytical grade , Saturated potassium carbonate-solution , Copper sulphate-solution, Alkaline potassium sodium tartrate-solution , Biuret-</p>	Biuret content	Clause 5/ ISO 22241–2 Annex E

	standard-solution		
5.	<p>Apparatus: Laboratory balance, Spectrophotometer, Volumetric flasks, Volumetric flasks, Pipettes</p> <p>Apparatus: Chemicals of analytical grade, Sulphuric acid, Chromotropic acid, Formaldehyde standard solution</p>	Aldehydes	Clause 5/ ISO 22241–2 Annex F
6.	<p>Apparatus: Filtration equipment for vacuum filtration], Membrane filter, Petri dish with cover, Flat-tipped tweezers, Analytical balance, Balance, Glass beaker, Drying oven, Desiccator filled with a drying agent, Standard laboratory glass</p> <p>Chemicals: De-ionized water</p>	Insoluble matter	Clause 5/ ISO 22241–2 Annex G
7.	<p>Apparatus: Analytical balance, Incineration dish (platinum or quartz glass), Heating plate or sand bath, Muffle furnace (700 °C), Spectrophotometer, Cells, Graduated flasks, Bulb pipettes.</p> <p>Chemicals: De-ionized water, Calcium carbonate, Hydrochloric acid, Sulphuric acid, Ascorbic acid, Ammonium heptamolybdate tetrahydrate, Potassium antimony(III) oxytartrate hemihydrates, Ascorbic acid solution, Molybdate solution, Potassium hydrogen phosphate, Phosphate stock solutions</p>	Phosphate (PO ₄)	Clause 5/ ISO 22241–2 Annex H
8.	<p>Direct determination:</p> <p>Apparatus: Volumetric flask, Fixed volume pipette or variable piston pipettes, Atomic emission spectrometer with inductively coupled plasma (ICP-OES)</p> <p>Reagents and materials: Water, in accordance with ISO 3696 grade 1 or water with resistance of 18.2 MΩ, 32.5% urea solution, 65 % Nitric Acid, 37% hydrochloric acid, Single-element standard stock solutions, Multi-element standard stock solutions, Internal standard solution, Argon, with a purity ≥99,996.</p>	Aluminium, Calcium, Chromium, Copper, Iron, Potassium, Magnesium, Sodium, Nickel, Zinc	Clause 5/ ISO 22241–2 Annex I

- **Specification, Least Count and Range of apparatus and chemicals as applicable should match the values/parameters/tolerances mentioned in the Indian Standard.**
- **The above list is meant only for guidance and may not be treated as exhaustive.**



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ANNEXURE B

SCHEME OF INSPECTION AND TESTING

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipments.

2. TEST RECORDS – The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. PACKING AND MARKING –The Standard Mark, as given in the Schedule of the license shall be incorporated on each container of the product provided that the product contained in the container thus marked conforms to the requirement of the specification.

3.1 Packing and Marking shall be done as per the provisions of the Indian Standard. In addition, following details shall be marked on each container:

- i) BIS Licence Number CM/L—
- ii) BIS website details as follows “For details of BIS certification please visit www.bis.gov.in”

3.2 **HANDLING, TRANSPORTATION AND STORAGE:** Handling, Transportation and Storage shall be done as per IS 17042 (Part 3): 2018/ ISO 22241-3: 2017. Materials used for packing shall be as prescribed in IS 17042 (Part 3): 2018/ ISO 22241-3: 2017.

4. CONTROL UNIT – For the purpose of this scheme the product manufactured in one day under similar conditions shall constitute a control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standards and covered by the licence should be marked with Standard Mark.

7. REJECTIONS – Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1
LEVELS OF CONTROL
(Clause 5 of SIT)

(1)			(2)	(3)			
TEST DETAILS			Test Equipment R: required S: Sub Contracting	LEVELS OF CONTROL			
Cl.	Requirement	Test Methods			No. of samples	Frequency	Remarks
		Clause	Reference				
5	Quality Requirements						
i.	Urea content		ISO 22241-2 Annex B ISO 22241-2 Annex C	R	One	Each control Unit	
ii.	Refractive index at 20 °C		ISO 22241-2 Annex C	R	-do-	-do-	
iii.	Alkalinity as NH ₃		ISO 22241-2 Annex D	R	-do-	-do-	
iv.	Biuret		ISO 22241-2 Annex E	R	-do-	-do-	

v.	Aldehydes		ISO 22241-2 Annex F	R	-do-	-do-	
vi.	Insoluble matter		ISO 22241-2 Annex G	R	-do-	-do-	
vii.	Phosphate (PO ₄)		ISO 22241-2 Annex H	R	-do-	-do-	
viii.	Aluminium, Calcium, Chromium, Copper, Iron, Potassium, Magnesium, Sodium, Nickel, Zinc		ISO 22241-2 Annex I	R	-do-	-do-	

Note-1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empanelled by the Bureau.

Note-2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification.