PRODUCT MANUAL
FOR 2,4-D ETHYL ESTER EC
ACCORDING TO 10243 : 1993

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 10243 : 1993
	Title	:	2,4-D Ethyl Ester EC - Specification
	No. of Amendments	:	03
2.	**Sampling Guidelines:**		
a)	**Raw material**	:	2,4-D ethyl ester, technical employed in the formulation of 2,4-D Ethyl Ester EC shall conform to IS 7233.
b)	**Grouping guidelines**	:	NA (No varieties for the product mentioned in IS)
c)	**Sample Size**	:	500 ml
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 :**		
	i. Description ii. Cold Test iii. Flash point (Abel) iv. Emulsion Stability v. 2,4-D Ethyl Ester content vi. Free 2,4-D content vii. Identity test		
6.	**Scope of the Licence :**		
	"Licence is granted to use Standard Mark as per IS 10243 : 1993 with the following scope:		
	Name of the product	2,4-D Ethyl Ester (38 %) EC	

ANNEX – A

TO PRODUT MANUAL
FOR 2,4-D ETHYL ESTER EC ACCORDING TO 10243 : 1993

LIST OF TEST EQUIPMENTS

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

Sr. No.	Tests used in with Clause Reference	Test Equipment
1.	Identity Test Cl 3.3 (Annex G of IS 7233)	Gas Liquid chromatography with Flame ionization detector coupled to a printer- plotter cum integrated setup, Carrier gas, fuel gas and air injection system, 2, 4-D ethyl ester reference standard solution, Acetone
2.	Cold Test Cl 3.4.1 (Cl 13.1 of IS 6940)	100 ml glass container with cork/stopper fitted with thermometer, Thermometer Range – 10 to 110^0C, Refrigerator, Analytical balance with range of 0 to 200gm & Least count of 0.1mg, water bath, Ice-cold water.
3.	Flash point (Abel) Cl 3.4.2 {IS 1448 (Part 20)}	Cleaning solvent, Coolant, Lubricant, Verification Liquids, Ignitor and pilot light gas, Flash point apparatus/Abel flash point apparatus consisting of test cup, cover assembly, heating vessel, heating device, flash detector, Stirrer, Thermometers 2 (one for the oil cup of range; - 35°C to +70°C, and another for the water bath of the range; -30°C to +80°C), Timing device, Barometer, External cooling bath, Test cup thermal insulating cap, Abel flash point apparatus provided with a stirrer & thermometer, Heating Vessel or bath, Ethylene Glycol.
4.	Emulsion Stability Cl 3.4.3 (Cl 13.3 of IS 6940)	Glass Beaker, Capacity 250ml with internal diameter of 6.0 to 6.5 cm and marked at 100 ml, Analytical Balance- Range 0 to 200gms, LC 0.1mg, Mohr-type pipette, 2ml/ 5 ml capacity/ Dropping funnel, Measuring Cylinder, graduated, Capacity 0 to 100ml , Least count 0.5ml, Stop watch 0 to 60 minutes, least count 1sec, Glass Rod, Water Bath with thermometer or digital temp indicator to maintain at 30 $\pm$ 1^0C, Beaker (250 ml), Standard Hard Water, Air conditioner, Hot plate.
5.	2,4-D Ethyl Ester content Cl 3.5.1 (Annex A or Annex B of IS 10243)	**Annex A :** Potassium Hydroxide – Pellets, Isopropanol, Petroleum Ether, Phenolphthalein Indicator, Diethyl Ether, Hydrochloric Acid 1:1, Ammonium 1:1, Hydroxide, Barium Chloride Solution 0.1 %, Methyl Orange Indicator 0.1 %, Silver Nitrate Solution -5 %,

		Ethanol neutral or methanol, neutral, Sodium Hydroxide solution -0.1 N, Bromothymol Blue Indicator Solution- 0.04 %, Round-bottom flask, distilled water, glass beads, Water bath, reflux condenser, Hot Plate, 500-ml separatory funnel, volumetric flask, Analytical balance (0-200 gm, LC – 0.01 mg). **Annex B:** Gas Liquid Chromatograph, gas chromatograph (GLC) equipped with FID and coupled to a printer-plotter-cum-integrator, Micro Syringe, 2-µl capacity, Standard Glassware. Acetone, analytical reagent (AR) grade, Internal Standard — Di-*n*-Butyl Phthalate, AR grade or equivalent, 2, 4-D Ethyl Ester Reference Standard, of known purity, Analytical balance (0-200 gm, LC – 0.01 mg).
6.	Free 2,4-D content Cl 3.5.2 (Annex B of IS 7233)	Bromothymol Blue Indicator Solution, Ethanol Neutral or methanol neutral, Standard Sodium Hydroxide Solution, ice-water-bath, distilled water, Hot plate, Analytical balance (0-200 gm, LC- 0.1 mg) General glasswares : Pipettes, Measuring jars, Conical flask, Volumetric flasks (5 ml to 1000 ml), Burettes, Beakers, Test tube, Glass rod.

The above list is indicative only and may not be treated as exhaustive

ANNEX - B
SCHEME OF INSPECTION AND TESTING FOR 2,4-D ETHYL ESTER EC ACCORDING TO IS 10243 : 1993

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 licence, shall be stenciled/printed on each container of 2,4-D Ethyl Ester EC or printed on the label applied to it, as the case may be, provided always that the material in each container to which this mark is thus applied, conform to every requirement of the specification.

3.1 Packing and marking shall be done as per the provision of the Indian Standard. In addition, the following details shall be mentioned on each container legibly and indelibly:

a) BIS Licence No. CM/L _____.
b) BIS website details i.e – "For details of BIS certification please visit www.bis.gov.in".

4. **CONTROL UNIT**- For the purpose of this Scheme, the entire quantity of the material formulated in a vessel at a time in one operation 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.

5.2 On the basis of the test results, decision regarding conformity or otherwise of a Control unit to the given requirements shall be made as follows:

5.2.1 In case the control unit fails in any of the requirements, the material represented by the control unit may be suitably reprocessed and the defect(s) rectified, such reprocessed material shall be tested again as per Table 1 and the material shall satisfy all the requirements of the specification.

6. RAW MATERIALS – 2, 4-D Ethyl Ester, technical used in the formulation of 2,4-D Ethyl Ester EC shall conform to IS 7233. A sample from each consignment of 2, 4-D Ethyl Ester technical shall be tested for its conformity to IS 7233. Alternatively, each consignment shall be covered by a test certificate from the supplier or a recognized independent laboratory guaranteeing its conformity to IS 7223 or it shall be ISI marked.

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

(1)				(2)	(3)		
TEST DETAILS				**Test Equipment Requirement**	**LEVELS OF CONTROL**		
Cl.	**Requirements**	**Test Method Cl. Ref.**	**Test Method IS**	**R: required (or)S: Sub-contracting permitted**	**No. of samples**	**Frequency**	**Remarks**
3.1.2	Raw material 2,4-D ethyl ester, technical	-	IS 7233	S	One	Each consignment	See clause 6 of SIT
3.2	Description	3.2	IS 10243	R	One	Each Control Unit	
3.3	Identity Test	Annex G	IS 7233	R	One	-do-	
3.4.1	Cold Test	13.1	IS 6940	R	One	-do-	
3.4.2	Flash Point (Abel)	-	IS 1448(Part 20)	R	One	-do-	
3.4.3	Emulsion stability	13.3	IS 6940	R	One	-do-	
3.5.1	2,4-D Ethyl Ester content	Annex A or Annex B	IS 10243	R	One	-do-	
3.5.2	Free 2,4-D	Annex B	IS 7233	R	One	-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. Subcontracting 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 for approval by BO Head.