FOREWORD

(*Formal clause would be added later)*

Dimethomorph 12% + Pyraclostrobin 6.7% Water Dispersible Granule is used as a Fungicide in Agriculture.

Dimethomorph + Pyraclostrobin Water Dispersible Granule is generally manufactured to contain Dimethomorph 12% and Pyraclostrobin 6.7%.

In the preparation of this standard due consideration has been given to the provisions of the *Insecticides Act*, 1968 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for Dimethomorph + Pyraclostrobin Water Dispersible Granules.

2 REFERENCES

The standards, given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

IS No.	*Title*
8190 (Part 1) : 1988	Requirements for packing of pesticides Part 1 solid pesticides (*second revision*)
1070 : 1992	Reagent grade water - Specification (*third Revision*)
6940 : 1982	Methods of test for pesticide and their formulations (*first Revision*)
10946 : 1984	Method of sampling for technical grade pesticides

3 REQUIREMENTS

3.1 Constituents

The material shall consist of Dimethomorph technical and Pyraclostrobin technical, together with suitable ingredients.

3.2 Physical

The material shall also comply with the physical requirements given in Table 1

3.2.1 *Description*

The material shall be in the form of free flowing granules.

TABLE 1: REQUIREMENTS FOR DIMETHOMORPH 12% + PYRACLOSTROBIN 6.7% WG
(*Clause* ***3.2*** and ***7.1)***

Sl. No	Characteristics	Requirement	Method of Test, Refer to
(1)	(2)	(3)	(4)
i.	Dimethomorph content, percent by mass, *Min*	12	Annexure A
ii.	Pyraclostrobin content, percent by mass, *Min*	6.7	Annexure A
iii.	pH of 1% aq. Solution (25±0.5°C)	7-10	IS 6940
iv.	Wettability (Seconds), *Max*	60	IS 6940
v.	Wet sieve through 75 micron test sieve (retained),percent by mass, *Min*	98	IS 6940
vi.	Degree of dispersion, percent by mass	80	IS 6940
vii.	Suspensibility, percent by mass, *Min*	80	IS 6940
viii.	Persistent foam after 60 seconds (ml)	60	IS 6940
ix.	Dustiness	30	IS 6940
x.	Flowability (formulation passing through 5 mm sieve after 20 drops),percent by mass, *Min*	90	IS 6940
xi.	Attrition resistance, percent by mass, *Min*	90	IS 6940
xii.	Acidity (as H_2SO_4), percent by mass, *Min*	0.15	IS 6940

3.3 Chemical

The material shall comply with the chemical requirements specified in **3.3.1**

3.3.1 *Dimethomorph and Pyraclostrobin content*

When determined by the method prescribed (enclosed), the observed Dimethomorph and Pyraclostrobin content (w/w), of any of the sample shall not differ from the declared nominal value by more than the percent tolerance limits indicated below:

Nominal Value, *Percent*	*Tolerance, Percent*	
Up to 9	+10	
	-5	
10 and below 50	±5	of the nominal value
50 and above	+5	
	-3	

3.3.1.1 The actual value of Dimethomorph and Pyraclostrobin content in the formulations shall be calculated to the second decimal place and then rounded off to the first decimal place before applying the tolerance given in **3.3.1**.

3.3.1.2 The average Dimethomorph and Pyraclostrobin content of all samples taken shall not be less than the declared nominal content.

4 PACKING

4.1 The product shall be packed in 300 g, 600 g, 1.5 Kg and 3 Kg HDPE containers. Which shall be further packed in 5 ply corrugated fiber board boxes as transport packing. The specifications for the containers shall be as agreed between the supplier and the manufacturer.

5 MARKING

5.1 The containers shall be securely closed and shall be bear legibly and indelibly the following information in addition to any other information as required under the *Insecticides Act,* 1968 and Rules framed thereunder:

a) Name of the material;

b) Name and address of the manufacturer;

c) Batch number;

d) Date of manufacture;

e) Date of expiry;

f) Net mass of content, percent (*m/m*);

g) Nominal Dimethomorph and Pyraclostrobin content, percent (*m/m*);

h) Cautionary notice as worded in the *Insecticides Act*, 1968, and Rules framed thereunder; and

j) Any other information required under the *Legal Metrology* (*Packaged Commodities*) *Rules*, 2011.

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

6.1 When freshly manufactured material in bulk quantity is offered for inspection, representative samples of the material shall be drawn and tested as prescribed in IS 10627 within 90 days of its manufacture. When the material is offered for inspection after 90 days of its manufacture, sampling shall be done as prescribed in IS 10627. However, the criteria for conformity of the material when tested, shall he the limits of tolerances, as applicable over the declared nominal value and given under clause **3.3.1** of the standard.

7 TESTS

7.1 Tests shall be carried out by the appropriate methods referred to Table **1**

7.2 Quality of Reagent

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070) shall be employed in tests.

NOTE – 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

[*Table* 1, *SI. No.* (i)]

DETERMINATION OF DIMETHOMORPH AND PYRACLOSTROBIN CONTENT

A-1 PRINCIPLE

Dimethomorph and Pyraclostrobin content in Dimethomorph 12% + Pyraclostrobin 6.7% WG samples was determined by a HPLC method. The identity of the active ingredient was established by comparison with the equivalent authentic standard.

A-2 REAGENTS

Acetonitrile

Dimethomorph - Analytical Standard

Pyraclostrobin - Analytical Standard

A-3 PROCEDURE

A-3.1 Preparation of Calibration Solution

A-3.1.1 *Dimethomorph*

Approximately 75 mg Dimethomorph analytical standard was weighed into a 50 mL volumetric flask and added small amount of acetonitrile. The flask was sonicated for 5 minutes. The solution was allowed to cool to room temperature. The flask was filled up to the mark using acetonitrile and mixed well. From this solution 5.0 mL was pipetted and transferred into a 50 mL volumetric flask, diluted and filled up to the mark using acetonitrile.

A-3.1.2 *Pyraclostrobin*

Approximately 60 mg pyraclostrobin analytical standard was weighed into a 100 mL volumetric flask and added 75 mL of acetonitrile. The flask was sonicated for 5 minutes. Added water to just below mark and mixed well. The solution was allowed to cool to room temperature. The flask was filled up to the mark using water and mixed well. From this solution 10.0mL was pipetted and transferred into a 50mL volumetric flask, diluted and filled up to the mark using mobile phase**.**

A-3.2 Preparation of sample solution

A-3.2.1 *Dimethomorph*

Approximately 60 mg test item was weighed into a 50.0 mL volumetric flask. A 5.0 mL of water was added to suspend the sample. The flask was sonicated for 5 minutes. The solution was allowed to cool to room temperature. The flask was filled up to the mark using acetonitrile and mixed well. From this solution 5.0mL was pipetted and transferred into a 50.0 mL volumetric flask, diluted and filled up to the mark using acetonitrile. The solution was centrifuged and transferred in to a HPLC vial for analysis.

A-3.2.2 *Pyraclostrobin*

Approximately 60 mg test item was weighed into a 100 mL volumetric flask. A small amount of water was added to suspend the sample. A 75 mL of acetonitrile was added into the flask and the flask was sonicated for 5 minutes. Added water to just below mark and mixed well. The flask was shaking for several times. The solution was allowed to cool to room temperature. The flask was filled up to the mark using water and mixed well. From this solution 10.0mL was pipetted and transferred into a 50mL volumetric flask, diluted and filled up to the mark using mobile phase. The solution was centrifuged and transferred in to a HPLC vial for analysis.

A-3.3 Sample analysis

Injected in the sequence C1, S1R1, S1R2, C1, C2, S2R1, S2R2, C2 and calculated for Dimethomorph and Pyraclostrobin content.

CHROMOTOGRAPHIC SEPARATION PARAMETER

DIMETHOMORPH

Instrument		HPLC 1200 series system equipped with Quaternary pump, degasser column oven
Column used		C18 (75mm length x 4.6mm x 3.5µm)
Mobile Phase		Acetonitrile : 0.1% H_3PO_4 in milli-Q-water (35:65)
Detecter		DAD detector interfaced with Chem station software system
Wave Length		246 nm
Injection Volume		15 µL
Flow rate		1.00 ml/min
Retention time (approximately)	Cis	9.3 min
	Trans	10.5 min

PYRACLOSTROBIN

Instrument	HPLC 1200 series system equipped with Quaternary pump, degasser column oven
Column used	C18 (25cm length x 4.6mm x 5 µm)
Mobile Phase	Acetonitrile : water (75:25)
Detecter	DAD detector interfaced with Chem station software system
Wave Length	270 nm
Oven	40 °C
Injection Volume	20 µL
Flow rate	1.0 ml/min
Retention time (approximately)	6.2 min

A-4 CALCULATION

Dimethomorph / Pyraclostrobin content percent by mass = $\frac{H_w \times I_r \times M \times P}{H_s \times I_q \times W}$

where,

H_s = Peak area of Dimethomorph/Pyraclostrobin in the Standard solution (mAU)

H_w = Peak area of Dimethomorph / Pyraclostrobin in the sample solution (mAU)

I_r = Peak area of internal standard in standard solution (mAU)

I_q = Peak area of internal standard in sample solution (mAU)

M = Mass of Dimethomorph / Pyraclostrobin in the Standard solution (mg)

W = Mass of sample taken (mg)

P = Purity of Dimethomorph / Pyraclostrobin reference standard (%)