भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
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DRAFT(S) IN WIDE CIRCULATION

DOCUMENT DISPATCH ADVICE	
Our Ref:	**Date**
FAD 01/T	**23-02-2018**

TECHNICAL COMMITTEE: FAD 01

ADDRESSED TO:
1. All Members of Pesticides Sectional Committee, FAD 01
2. Selected members of FADC
3. All interested

Dear Madam/Sir(s),
Please find enclosed the following documents:

Sl. No.	Doc. No.	Title
1	FAD 1 (11012)C	Draft Indian Standard Captan + Hexaconazole, Wettable Powder (WP) — Specification

Kindly examine the draft Indian Standards and forward your views stating any difficulties which you are likely to experience in your business or profession, if these are finally adopted as Indian Standards. Comments if any may please be made in the format attached and mailed to the undersigned at the above address.

Last date for comments: 02 May 2018.

In case no comments are received or comments received are of editorial nature, kindly permit us to presume your approval for the above documents as finalized. However, in case of comments of technical in nature are received then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee. The document is also hosted on BIS website www.bis.gov.in.

Thanking you,

Yours faithfully,

(P Rajesh)
Scientist 'E' & Head (Food & Agri)
E-mail: fad1@bis.gov.in

Encl: As above.

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व्यापक परिचालन मसौदा

प्रलेख प्रेषण संज्ञापन	
संदर्भ	**दिनांक**
एफ ए डी 01/टी	**23–02-2018**

तकनीक समीति एफ ए डी 01

प्रेषिती

1 खाद्य एवं कृषि के लिए कीटनाशक विषय समिति ,एफ ए डी 01 के समस्त सदस्य ।
2 खाद्य एवं कृषि विभाग परिषद एफ ए डी सी के सदस्य ।
3 रूचि रखने वाले सभी निकाय ।

महोदय /महोदया,

आपके अवलोकन हेतु निम्नलिखित मसौदे संलग्न हैं :

क.स.	मसौदा संख्या	विषय
1	एफएडी 01 (11012) सी	भारतीय मानक मसौदा कैपटेन + हेक्साकोनाज़ोल, आर्द्रकरणीय पाउडर (डब्लु पी) — विशिष्टि

कृपया इस प्रलेख का अवलोकन कर अपनी सम्मतियॉ यह बताते हुए भेजे कि यदि अंतत :यह मसौदे भारतीय मानक के संशोधन के रूप में प्रकाशित हो जाए तो इन पर अमल करने में आपके व्यवसाय अथवा कारोबार में क्या कठिनाइयाँ आ सकती हैं । सम्मतियां कृपया संलग्न प्रारूप में अधो-हस्ताक्षरी को भेजें ।

सम्मतियां भेजने की अंतिम तिथि:02 – 05 - 2018

यदि कोई सम्मति प्राप्त नही होती है अथवा सम्मति मे केवल भाषा संबंधी त्रुटि हुई तो उपरोक्त प्रलेख को यथावत अंतिम रूप दिया जायेगा । यदि कोई सम्मति तकनीकी प्रकृति की हुई तो विषय समिति के अद्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजें जाने के बाद प्रलेख को अंतिम रूप दे दिया जायेगा ।

धन्यवाद, **भवदीय**

प्रति उपरिलिखित

वैज्ञानिक ई एवं प्रमुख
(खाद्य एवं कृषि विभाग)
ई-मेल :fad1@bis.gov.in

भारतीय मानक मसौदा

कैपटेन + हेक्साकोनाज़ोल, आर्द्रकरणीय पाउडर (डब्लु पी) — विशिष्टि

Draft Indian Standard

CAPTAN + HEXACONAZOLE, WETTABLE POWDER (WP) — SPECIFICATION

ICS No. 65.100.30

Pesticides Sectional Committee, FAD 1

FOREWORD

(Adoption clause will be added later).

Captan + Hexaconazole wettable powder is generally used as fungicide in agriculture.

Captan + Hexaconazole WP formulation is generally manufactured to contain a mixture of 70 percent (*m/m*) of Captan and 5 percent (*m/m*) of Hexaconazole.

In the preparation of this standard, due consideration has been given to the provisions of *Insecticides Act*, 1968 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under the *Insecticides Act* and Rules, 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 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Draft Indian Standard
CAPTAN + HEXACONAZOLE, WETTABLE POWDER (WP) — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for Captan + Hexaconazole wettable powder.

2 REFERENCES

The following standards 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 indicated below:

IS No.	*Title*
460 (Part 1) : 1985	Test Sieves: Part 1 Wire Cloth Test Sieves (*third revision*)
1070 : 1992	Regent grade water (*third revision*)
2771 (Part 1): 1992	Corrugated Fibreboard Boxes — Part 1 : General Requirements (*second revision*)
6940 : 1982	Method of Tests for pesticides and their formulations (*first revision*)
7601 : 1983	Fibreboard Drums For General Purposes (*first revision*)
8190 (Part 1) : 1988	Requirements for packaging of pesticides (Part 1) Solid pesticides (*second revision*)
10627 : 1983	Method of sampling for pesticides formulations
14251 : 1995	Captan, Technical — Specification
14549 : 1998	Hexaconazole, Technical — Specification

3 REQUIREMENTS

3.1 Constituents

3.1.1 The material shall consist of Captan technical and Hexaconazole technical together with suitable carrier (s), stabilizer (s) and other formulants (s).

3.1.2 Captan technical employed in the manufacture of the material, shall conform to IS 14251 : 1995.

3.1.3 Hexaconazole technical employed in the manufacture of the material shall conform to IS 14549 : 1998.

3.2 Physical

The material shall comply with the following physical requirements:

3.2.1 *Description*

The material shall be in the form of a homogeneous powder, white to off-white in colour and shall wet readily on mixing with water providing a suspension suitable for use as a spray.

3.2.2 *Sieving Requirement*

When determined by the method specified in **11.1** of IS 6940, the amount of material passing through 45 micron IS sieve [IS 460 (Part l)], should not be less than 99 percent by mass.

3.2.3 *Suspensibility*

The suspensibility shall not be less than 80 percent (*m/m*), when tested by the method specified in **11.2** of IS 6940.

3.2.4 *Wettability*

The time when the whole material gets completely submerged in water shall not exceed 120 seconds when tested by the method specified in **11.4** of IS 6940.

3.3 Chemical

The material shall comply with the following chemical requirements.

3.3.1 *Captan and Hexaconazole Content*

When determined by the method prescribed in Annex A, the observed Captan content, percent (*m/m*) and Hexaconazole content, percent (*m/m*) of any of the samples shall not differ from the declared nominal value by more than the percent tolerance limits indicated below:

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

3.3.1.1 The actual values of Captan and Hexaconazole content in the formulation shall be calculated to the second decimal place and then rounded off to first decimal place before applying the tolerances given in **3.3.1**.

3.3.2 *Acidity / Alkalinity*

When determined by the method prescribed in **13.5** of IS 6940, the acidity (as H_2SO_4) or alkalinity (as NaOH) of the material shall not be more than 0.2 percent (*m/m*).

4 PACKING

The product shall be packed in HDPE container lined with polyethylene film of thickness not less than 0.06 mm or trilaminated pouch of 12u polyester + 9u AL + 100u LDPE of capacity 25 gm, 50 gm, 100 gm, 250 gm, 500 gm & 1 kg for retail packing. The individual pouched shall be further inserted in the card board carton or the pouches may also be packed in PVA (SWF) (Grade ET-29) made from polyvinyl alcohol cast film. The individual pouches of WSF shall be further packed in PET/L/LDPE laminated pouch of capacity 25 gm, 50 gm, 100 gm, 250 gm & 500 gm. This shall be further packed in corrugated fibreboard boxes [*see* IS 2771 (Part 1)] of maximum capacity 20 kg. For bulk packing, the product shall be packed in LDPE/HDPE liner inserted into Fibreboard drum of 25 kg and 50 kg capacity confirming of IS 7601. The Fibreboard drum shall be closed by plywood lid and metallic lever type ring closer to make it pilfer and leak proof. All the containers shall also comply with the general requirements as stipulated in IS 8190 (Part 1).

5 MARKING

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

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 quantity;
g) Nominal Captan and Hexaconazole 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 may also be marked with the Standard Mark.

5.2.1 The use of the standard mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING

6.1 When freshly manufactured material in bulk quantity and / or the retail pack of the formulated product is / or offered for inspection, representative sample of the materials shall be drawn as prescribed in IS 10627 and if tested within 90 days of its date of manufacture, the criteria for conformity shall be the contents in percent (*m/m*), shall not be less than the declared nominal value. The upper limit for conformity shall be the same as those given in clause **3.3.1** of this standard.

6.2 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 be the limits of tolerances, as applicable over the declared nominal value and given under Cl. **3.3.1** of this standard.

7 TESTS

7.1 Tests shall be carried out as prescribed in **3.2** and **3.3**.

7.2 Quality of reagents

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

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

ANNEX A
[*Clause* 3.3.1]
DETERMINATION OF CAPTAN & HEXACONAZOLE CONTENT

A-1 PRINCIPLE

Captan & Hexaconazole contents in wettable powder formulation sample are determined simultaneous by employing high performance liquid chromatographically with a UV detector.

A-2 APPARATUS

High Performance Liquid Chromatograph equipped with a constant flow pump, constant temperature column compartment, sample injector capable of injecting 20 microlitre aliquots, a 210 nm wavelength adjusted in ultraviolet detector and a recorder (digital integrator or other data handling device) is used for this determination. The suggested operative parameters are as follows, but can be changed if necessary, provided standardization is done.

Column : Phenomenex C-8, 250mm x 4.6mm, 5□ or equivalent

Mobile Phase : Acetonitrile (containing 0.1% formic acid) : Water (containing 0.1% formic acid) (60:40)

Flow Rate : 1.3 mL/min.

Wavelength : 210 nm

Injector volume : 20 µL

Analytical Balance with 0.1mg readability

Microlitre Syringe – 50 µL

Filtration apparatus with 0.2 µm membrane filters

Ultrasonic bath

Standard glassware

A-1.1.1 REAGENTS

a Acetonitrile, HPLC grade
b. Water, HPLC grade
c. Biphenyl (internal standard) AR grade
d. Captan reference standard of known purity
e Hexaconazole reference standard of known purity

A-1.2 PROCEDURE

A-1.2.1 Preparation of Internal Standard Solution

Weigh accurately about 360 mg of Biphenyl as an Internal standard into a 100 mL volumetric flask. Sonicate for 5 minutes and make up to the volume with HPLC grade acetonitrile.

A-1.2.2 Preparation of Captan + Hexaconazole Reference Standard solution:

Weigh accurately about 200 mg of Captan and 20 mg of Hexaconazole reference standard of known purity into a 100 mL volumetric flask and add 50 mL acetonitrile to it, sonicate to dissolve, add 5 mL of internal standard solution (5.1) in it and dilute with acetonitrile up to the mark. Mix well.

Pipette out 2 mL of above diluted solution (5.2.1) in a 50 mL volumetric flask and dilute up to the mark with mobile phase. Mix well and use for chromatographic injections.

A-1.2.3 Preparation of Sample Solution

Weigh accurately about 300 mg sample of Captan (70%) + Hexaconazole (5%) WP formulation into a 100 mL volumetric flask and add 50 mL acetonitrile to it. Sonicate for 15 min, allow it to come to room temperature then add 5 mL of internal standard solution in it and dilute with acetonitrile upto the mark. Mix well.

Filter the above solution (5.3.1) through 0.2 µm membrane filter. Pipette out 2mL of this filtrate in a 50 mL volumetric flask and dilute up to the mark with mobile phase. Mix well and use this solution for chromatographic injections.

A-1.3 Estimation:

Equilibrate the column with the mobile phase for 45 minutes before injecting the standard/sample. After the column has been equilibrated and a stable baseline is obtained inject, 20□L of the standard solution of Captan + Hexaconazole until the area quotients of internal standard / reference standard of two successive chromatograms do not deviate from each other by more than 2 percent. Then use the following injection sequence:

…….C S1 S1, C S2, S2, C S3…..

Where

C = standard solution, and S = sample solution (1,2,…..n)

From the chromatograms of the standard solution and sample solution measure the peak responses in terms of areas of the active ingredient and the internal standard and calculate the percentage of the active ingredient content as given in Calculation

A-1.3.1 Retention times : (Guide values)

Captan	:	~ 6.2 minutes
Hexaconazole	:	~ 7.0 minutes
Biphenyl	:	~ 10.5 minutes (Internal Standard)
Total run time	:	15.0 minutes

A-1.3.2 Calculation

$$\%\frac{W}{W} = \frac{M1 \times A3 \times A2}{M2 \times A4 \times A1} \times P$$

Captan or Hexaconazole content,

,

Where

M1 = Weight taken in mg, of standard Captan or Hexaconazole in standard solution.

M2 = Weight taken in mg for sample preparation.

A1 = Area of Captan or Hexaconazole peak in the chromatogram of the standard solution

A2 = Area of Captan or Hexaconazole peak in the chromatogram of the sample solution

A3 = Area of internal standard peak in the chromatogram of the standard solution

A4 = Area of internal standard peak in the chromatogram of the sample solution; and

P = Percent purity of Captan or Hexaconazole reference standard.

TEMPLATE FOR SENDING COMMENTS ON BIS DOCUMENTS

Date:		Document No.:		Title of the Document:	
Name of the Commentator/ Organization:				Abbreviation of the Commentator/Organization:	

(Comments on each clause/subclause/table/fig, etc be started on a fresh box. Information in column 5 should include reasons for the comments/suggestions for modified wordings of the clauses when the existing text/provision is found not acceptable. Adherence to this format facilitates Secretariat's work)

Abbreviation of the Commentator/Organization	**Clause/ Subclause No.** (e.g. 3.1)	**Paragraph No. / Figure No. / Table No.** (e.g. Table 1)	**Type of Comment**[1)]	**Comments/Suggestions along with Justification for the Proposed Change**	**Proposed Change/Modified Wordings**
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**

1) **Type of comment:** **ge** = general **te** = technical **ed** = editorial