भारतीय मानक **IS 7716 : 2024**

Indian Standard

घरेलू डिब्बों में भंडारण किये हुए अनाज को कीटाणुरहित करने के लिए धूम्रीकरण की प्रभावकारिता — परीक्षण पद्धति

(पहला पुनरीक्षण)

Efficacy of Fumigation for Disinfestation of Foodgrains Stored in Domestic Bins — Method of Test

(First Revision)

ICS 65.040.20; 67.060

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November 2024 **Price Group 4**

Foodgrains, Allied Products, and Other Agricultural Produce Sectional Committee, FAD 16

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Foodgrains, Allied Products, and Other Agricultural Produce Sectional Committee had been approved by the Food and Agriculture Division Council.

Efficacy of a fumigant for its toxicity to insect pests in a storage bin is required to be evaluated for ascertaining proper disinfestation. Therefore, in order to make the fumigation operations more certain, comparative efficacy of various fumigants is tested. Accordingly, this standard was published in 1975 to provide a uniform procedure for efficacy of fumigants and interpretation of results.

This revision has been undertaken to update the standard with latest technological advancements and major changes include:

a) Use of gas indicator has been replaced by gas monitor for determining the concentration of fumigant; and

b) Fumigant ethylene dibromide has been deleted as the use of ethylene dibromide has been completely banned by Directorate of Plant Protection, Quarantine, and Storage vide S.O. 682 (E) dated 17 July 2001.

The composition of the Committee responsible for the formulation of this standard is given in Annex A.

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*)’.

Indian Standard

EFFICACY OF FUMIGATION FOR DISINFESTATION OF FOODGRAINS STORED IN DOMESTIC BINS — METHOD OF TEST

(First Revision)

1 SCOPE

This standard prescribes method for testing efficacy of fumigation for disinfestation of grains in domestic bins.

2 REFERENCE

The standards given below contain provisions, which through reference in this text, constitute provision 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 is encouraged to investigate the possibility of applying the most recent edition of this standard:

IS No.	*Title*
IS 6151 (Part 1) : 2020	Storage management code: Part 1 Terminology (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, the definitions of various terms given in IS 6151 (Part 1) shall apply.

4 APPARATUS

4.1 Gas Monitor — range, 1 ppm to 2 000 ppm (resolution 1 ppm)

4.2 Leak Detector — range, 1 ppm to 20 ppm (resolution 0.01 ppm)

4.3 Insect Cages

5 TEST FUMIGANTS

5.1 Aluminium Phosphide Tablets/Pouches

5.2 Ethylene Dichloride and Carbon Tetrachloride (EDCT) Mixture

6 PROCEDURE

6.1 The efficacy of a fumigant is evaluated at a dose that will normally produce lethal concentration of gaseous fumigant in the treated space during a specified duration of time or exposure period. Hence, various factors are taken into account while evaluating the efficacy of fumigation in a domestic bin.

6.2 Dose

Calculate the fumigant dose in bulk grain either on volume basis, that is, g/m^3 or ppm.

Aluminium phosphide tablets at the rate of 4.2 g/m^3 and EDCT mixture at the rate of 300 g/m^3 may be used.

6.3 Determine the concentration of gas fumigant in the volume of treated space in ppm, with the help of a gas monitor.

6.4 The exposure period or duration of fumigation time should be 7 days for the fumigants (*see* 5).

6.5 Major and minor pests which cause damage to the food grains during storage may be used for the tests. These pests may be rice weevil (*Sitophilus oryzae*), lesser grain borer (*Rhizopertha dominica*), *khapra* larvae, *khapra* beetle (*Trogoderma granarium*), red rust flour beetle (*Tribolium castaneum*), saw-toothed grain beetle (*Oryzaephilus surinamensis*), pulse beetle (*Calosobruchus chinensis*), grain moth (*Sitotroga cerealella*), etc. Usually red rust flour beetle and *khapra* larvae may be used in the tests. Grain infested with larvae and pupae of borers should also be used for making the assessment.

6.6 Take specified number of these pests, say 50, in wire mesh insect cages containing the same grains with which the bin is filled. Insert these cages in the bin at different depths; top, middle and bottom, in the periphery and in the middle of the bulk grain. Fumigate the bin and after the above exposure period (*see* 6.4) count the mortality of insects.

7 TEST RESULTS

Express the result as percent kill. The fumigant, its dosage, application technique and the air-tightness of the bin shall be considered satisfactory, if mortality obtained is 100 percent.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Foodgrains, Allied products, and Other Agricultural Produce Sectional Committee, FAD 16

Organization	*Representative(s)*
ICAR - Central Institute of Post-Harvest Engineering & Technology, Ludhiana	DR NACHIKET KOTWALIWALE **(*Chairperson*)**
Central Warehousing Corporation, New Delhi	DR ANURAG TRIPATHI DR SIDHARTH RATH (*Alternate*)
Confederation of Indian Food Trade and Industry, New Delhi	SHRI KANNAN B.
Confederation of Indian Industry, New Delhi	SHRI HIMALAYA KOUL MS NEHA AGGARWAL (*Alternate*)
Consumer Guidance Society of India, Mumbai	DR SITARAM DIXIT DR M. S. KAMATH (*Alternate*)
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Protein Foods and Nutrition Development Association of India, Mumbai	DR SHASHANK BHALKAR DR JASVIR SINGH (*Alternate*)
Roller Flour Millers Federation of India, New Delhi	SHRI D. V. MALHAN

Organization	*Representative(s)*
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Member Secretary
MS LAVIKA SINGH
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Panel on Storage of Foodgrains, FAD 16/Panel 2

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