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“Knowledge is such a treasure which cannot be stolen”



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*Indian Standard*  
SPECIFICATION FOR FLUCHLORALIN,  
TECHNICAL CONCENTRATE

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# Indian Standard

## SPECIFICATION FOR FLUCHLORALIN, TECHNICAL CONCENTRATE

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# Indian Standard

## SPECIFICATION FOR FLUCHLORALIN, TECHNICAL CONCENTRATE

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 30 October 1978, after the draft finalized by the Pest Control Sectional Committee had been approved by the Agricultural and Food Products Division Council and the Chemical Division Council.

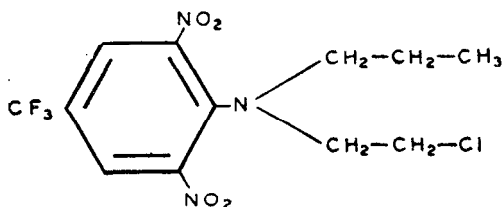
**0.2** Fluchloralin is a pre-emergence herbicide used selectively in different crops, such as cotton, rice, jute, etc.

**0.3** Fluchloralin is the accepted common name by the International Organization for Standardization (ISO) for *N*-(2-chloroethyl)-2,6-dinitro-*N*-propyl trifluoromethylaniline. The empirical and the structural formulae and the molecular mass of fluchloralin are indicated below:

*Empirical Formula*  
C<sub>12</sub>H<sub>13</sub>ClF<sub>3</sub>N<sub>3</sub>O<sub>4</sub>

*Structural Formula*

*Molecular Mass*  
355.7



**0.4** 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.

**0.5** 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\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

\*Rules for rounding off numerical values (revised).

## 1. SCOPE

**1.1** This standard prescribes the requirements and the methods of sampling and test for fluchloralin, technical concentrate.

## 2. REQUIREMENTS

**2.1 Description** —The material shall be in the form of a clear, orange liquid free from extraneous matter. It shall contain only xylene as the main solvent.

**2.2** The material shall also comply with the requirements specified in Table 1.

**TABLE 1 REQUIREMENTS FOR FLUCLORALIN, TECHNICAL CONCENTRATE**

( Clauses 2.2 and 5.1 )

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST, REF TO	
			Appendix of this Standard	Cl No. of IS : 6940-1973*
(1)	(2)	(3)	(4)	(5)
i)	Fluchloralin content, percent by mass, <i>Min</i>	55	A	—
ii)	Moisture content, percent by mass, <i>Max</i>	0.5	—	4
iii)	Acidity ( as $H_2SO_4$ ), percent by mass, <i>Max</i>	0.2	—	11.3
	<i>OR</i>			
	Alkalinity ( as NaOH ), percent by mass, <i>Max</i>	0.2	—	11.3

\*Methods of tests for pesticides and their formulations.

## 3. PACKING AND MARKING

**3.1 Packing** — The material shall be packed in clean and dry containers made of mild steel, suitably and properly lacquered from inside. Aluminium containers may also be used. The containers shall also conform to the general requirements stipulated in 2 of IS : 8190 ( Part II )-1976\*.

**3.2 Marking** — The containers shall bear legibly and indelibly the following information in addition to any other information, as is necessary under the Insecticides Act and Rules:

- a) Name of the material;
- b) Name of the manufacturer;

\*Requirements for packing of pesticides: Part II Liquid pesticides.



- c) Date of manufacture;
- d) Batch number;
- e) Net mass of contents;
- f) Fluchloralin content, percent ( *m/m* ); and
- g) The minimum cautionary notice as worded in the Insecticides Act and Rules.

**3.2.1** In addition to the above, the containers shall also be marked with the symbol of danger for poisoning as specified in IS : 1260 ( Part I )-1973\*.

**3.2.2** Each container may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution ( Certification Marks ) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

#### 4. SAMPLING

**4.1** The representative samples of the material shall be drawn as prescribed in 'Indian Standard Methods for sampling of pesticides and their formulations' ( *under preparation* ).

NOTE — Till such time the standard under preparation is published, the matter shall be as agreed to between the concerned parties.

#### 5. TESTS

**5.1** Tests shall be carried out as prescribed in col 4 and 5 of Table 1.

**5.2 Quality of Reagents** — Unless specified otherwise, pure chemicals and distilled water ( *see* IS : 1070-1977† ) shall be employed in the tests.

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

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\*Pictorial markings for handling and labelling of goods: Part I Dangerous goods ( *first revision* ).

†Specification for water for general laboratory use ( *second revision* ).

# APPENDIX A

[ Table 1, Item (i) ]

## DETERMINATION OF FLUCHLORALIN CONTENT

### A-0. GENERAL

**A-0.1** Either of the two methods, namely, gas chromatographic method and spectrophotometric method may be used for determination of fluchloralin content.

### A-1. GAS CHROMATOGRAPHIC METHOD

**A-1.1 Principle** — The method consists of injecting a sample along with a reference standard in a known proportion with a gas chromatograph and determining the area under each peak. The area under the peak is proportional to the mass of sample. By comparison of this area with that of the standard the percentage purity of the sample is determined.

#### A-1.2 Apparatus

**A-1.2.1 Gas-Liquid Chromatograph** — equipped with a recorder and disc integrator and fulfilling the following conditions:

Column length	2 m
Detector	Thermal conductivity type
Column temperature	230°C
Injection port temperature	250°C
Detector temperature	250°C
Flow rate	50 ml/min
Carrier gas	Helium or hydrogen

**A-1.2.2 Column** — consisting of 2.0 m stainless steel (designation 04Cr14Ni10) tubing, of 2.17 mm internal diameter packed with 5 percent silicon XE 60 deposited on chromosorb G-AW-DMCS, 60-80 micron.

**A-1.2.3 Micro-Syringe** — 10  $\mu$ l capacity.

#### A-1.3 Reagents

**A-1.3.1 Acetone** — pure by gas chromatography.

**A-1.3.2 Standard Reference Fluchloralin**

## A-1.4 Procedure

**A-1.4.1 Preparation of the Solution** — Weigh accurately about 1 to 2 g of fluchloralin, technical sample and dissolve in 10-ml volumetric flask with acetone. Adjust to the mark with acetone.

**A-1.4.2 Preparation of the Reference Standard** — Weigh accurately about 0.5 to 1.0 g of the standard and dissolve in 10-ml volumetric flask with acetone. Adjust to the mark with acetone.

**A-1.4.3 Analysis of the Sample** — Check the chromatograph for thermal and flow equilibrium. Inject 2  $\mu$ l of standard solution followed by sample solution alternatively at least thrice.

Measure the peak areas with reference to the sample as well as standard and calculate fluchloralin content in the sample.

## A-1.5 Calculation

$$\text{Fluchloralin content, percent by mass} = \frac{A \times M \times P}{A_1 \times M_1}$$

where

- $A$  = peak area corresponding to fluchloralin sample,
- $M$  = mass of fluchloralin sample taken for the test,
- $P$  = percentage purity of the standard for the test,
- $A_1$  = peak area corresponding to fluchloralin standard, and
- $M_1$  = mass of fluchloralin standard taken for the test.

## A-2. SPECTROPHOTOMETRIC METHOD

**A-2.1 Principle** — Determination of the active ingredient in fluchloralin can be carried out by using a spectrophotometer.

### A-2.2 Apparatus

#### A-2.2.1 Spectrophotometer

### A-2.3 Reagent

#### A-2.3.1 Methanol

### A-2.4 Procedure

**A-2.4.1 Preparation of Sample Solution** — Weigh 1 ml of sample solution precisely to the 0.1 mg, transfer the same to a 200-ml volumetric flask, and make up the volume with methanol. Dilute 10 ml of this solution once again to 200 ml with methanol ( sample solution B ).

**A-2.4.2 Preparation of Standard Solution** — Weigh accurately about 0.45 g of fluchloralin standard into a 200-ml volumetric flask. Add methanol to dissolve the same and make up to the mark with methanol. Pipette 10 ml of this solution to another 200-ml volumetric flask and make up to the mark with methanol ( standard solution *B* ).

**A-2.4.3 Analysis** — Read spectrum of sample solution *B* and standard solution *B* in the ultra-violet region against methanol in a cell path of 1 cm. Measure absorption on an absorbance maximum of 368.5 nm.

### A-2.5 Calculation

$$\text{Fluchloralin content, percent by mass} = \frac{A \times M \times P}{A_{\text{std}} \times M_1}$$

where

*A* = observed absorbance of sample solution *B*,

*M* = mass of standard taken for analysis,

*P* = percent purity of standard,

*A*<sub>std</sub> = absorbance of standard solution *B*, and

*M*<sub>1</sub> = mass of sample taken for analysis.

**NOTE** — The absorbance values of the standard as well as sample should not differ by more than  $\pm 10$  percent.

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