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**Pesticides – Cypermethrin  
Part 2:  
Emulsifiable concentrates(EC) –  
Specification**

## Foreword

This Ethiopian Standard has been prepared under the direction of the Technical Committee for Pesticides (TC 19) and published by the Ethiopian Standards Agency (ESA).

The standard isCanceles and replaces of the Ethiopian Standard ES 1352:2005 - *Pesticides - Cypermethrin Part 2 Emulsifiable concentrates(EC) - Specification*, with some editorial changes without altering the technical contents in the former text.

In preparing this Ethiopian Standard reference has been made to the following:

- AGP:CP/316:1995, FAO specification for plant protection products, “Cypermethrin emulsifiable concentrates, FAO specification 332/EC/S/F (1993)”, published by the Food and Agriculture Organization of the United Nations (FAO), Rome.

Acknowledgement is made for the use of information from the above publication.

# Pesticides — Cypermethrin

## Part 2: Emulsifiable concentrates( EC) — Specification

### 1 Scope

This Ethiopian Standard specifies the requirements for the emulsifiable concentrates (for plant protection purpose).

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ES 693, *Pesticides – Terminology.*

ES 694, *Pesticides – Methods of sampling.*

ES 695, *Pesticides – Packing requirements for pesticides.*

ES 696, *Pesticides – Guideline on good labelling practice.*

ES 697, *Pesticides – Guideline for retail distribution, storage and handling.*

ES 700, *Pesticides – Guideline on the disposal of bulk quantities of obsolete pesticides.*

ES 705-1, *Pesticides – Cypermethrin – Part1: Technical material (TC) – Specification.*

ES 717, *Pesticides – Standard waters specification.*

ES 722, *Pesticides – Determination of total cypermethrin content.*

ES 749, *Pesticides – Determination of water content.*

ES 750, *Pesticides – Determination of free acidity or alkalinity content.*

ES 751, *Pesticides – Determination of characteristics of EC.*

ES 752, *Pesticides – Determination of stability of liquid formulation at 0°C.*

ES 753, *Pesticides – Determination of accelerated storage stability.*

ES 759, *Pesticides – Determination of the stability of dilute emulsions by chlorimetric method.*

ES 760, *Petroleum products and other liquids – Determination of flash point.*

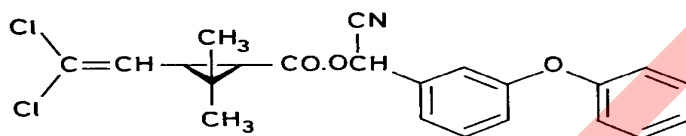
### 3 Definitions

For the purpose of this Ethiopian Standard terms defined in ES 693 shall apply.

### 4 General information

COMMON NAME:cypermethrin (ISO)

STRUCTURAL FORMULA:



EMPIRICAL FORMULA: C<sub>22</sub>H<sub>19</sub>Cl<sub>2</sub>NO<sub>3</sub>

RMM:416.3

CAS REGISTRY NUMBER:52315-07-8

CIPAC CODE NUMBER: 332

CHEMICAL NAMES:

(*RS*)-1-cyano-3-phenoxybenzyl (1*RS*,3*RS*;1*RS*,3*SR*)-3-

(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate (IUPAC)

(*RS*)-1-cyano-3-phenoxybenzyl (1*RS*)-*cis-trans*-3-

(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate (Rothamsted IUPAC)

cyano(3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl)-

2,2-dimethylcyclopropanecarboxylate (CA)

CHEMICAL GROUP: Pyrethroid

USE CATEGORY: Insecticide

WHO CLASS<sup>1)</sup>

<sup>1</sup> Based on the technical material

## 5 Requirements

### 5.1 Description

The material shall consist of technical cypermethrin, complying with the requirements of ES 705-1 dissolved in suitable solvents, with any other necessary formulants. It shall be in the form of a stable liquid, free from visible suspended matter and sediment.

### 5.2 Active ingredient

#### 5.2.1 Identity tests

Where the identity of the active ingredient is in doubt it shall be determined in accordance with ES 722 and then the isolated active ingredient shall comply with at least one additional test.

#### 5.2.2 Cypermethrin

The cypermethrin content shall be declared in g/kg or g/l at 20 °C and, when determined in accordance with ES 722, the content obtained shall not differ from that declared by more than the following amounts:

| <u>Declared content</u>         | <u>Permitted tolerance</u>    |
|---------------------------------|-------------------------------|
| Above 25 up to 100 g/l or g/kg  | ± 10% of the declared content |
| Above 100 up to 250 g/l or g/kg | ± 6% of the declared content  |
| Above 250 up to 500 g/l or g/kg | ± 5% of the declared content  |

NOTE 1 - If the buyer requires both g/kg and g/l at 20 °C, then in case of dispute the analytical results shall be calculated as g/kg.

#### 5.2.3 Cis-isomer

The *cis*- isomer content shall be declared and shall be between 40% minimum and 60% maximum of the declared cypermethrin content.

When determined in accordance with ES 722, the permitted tolerance shall be ± 10% of the declared *cis*- isomer content

### 5.3 Impurities

#### 5.3.1 Water

When determined in accordance with clause 4.1 of ES 749, the water content shall not exceed 2 g/kg.

### 5.4 Physical properties

#### 5.4.1 Acidity

When determined in accordance with clause 6.1.3 of ES 750, the acid content, if any, shall not exceed 1.5 g/kg (calculated as H<sub>2</sub>SO<sub>4</sub>)

#### 5.4.2 Emulsion stability and re-emulsification

5.4.2.1 When determined in accordance with clause 6.1.1 of ES 751, after the heat stability test (5.5) the product, when diluted at 30°C with standard waters A and C (see ES 717), shall comply with the following.

| <u>Time after dilution</u> | <u>Limits of stability</u>      |
|----------------------------|---------------------------------|
| 0 h                        | Initial emulsification complete |
| 0.5 h                      | 'Cream' maximum: 1 ml           |

|        |                            |
|--------|----------------------------|
| 2 h    | 'Cream' maximum: 2 ml      |
|        | 'Free oil': nil            |
| 24 h   | Re-emulsification complete |
| 24.5 h | 'Free oil' maximum 0.5 ml  |

NOTE 2 - Use either 5.4.2.1 or 5.4.2.2 as agreed with the buyer.

NOTE 3 - Unless other temperatures are specified.

In special cases a test using standard waters A and C (ES 717) before the heat stability test may be necessary. Alternatively, if the buyer requires other standard waters to be used, then this shall be specified when ordering.

**5.4.2.2** After the heat stability test (5.5) when determined in accordance with ES 759, and diluted at 30°C (Note 3 ) with standard water A and C, shall comply with the following:

| <u>Time after dilution</u> | <u>Limits of stability</u>      |
|----------------------------|---------------------------------|
| 0 h                        | Initial emulsification complete |
| 0.5 h                      | Minimum 75%                     |
| 2.0 h                      | Minimum 60%                     |
| 24 h                       | Re-emulsification complete      |
| 24.5 h                     | Minimum 75%                     |

NOTE 4 - These tests need be carried out only in case of doubt as to the result of the 2-hour emulsion stability test.

In special cases a test using standard waters A and C (ES 717) before the heat stability test may be necessary. Alternatively, if the buyer requires other standard waters to be used, then this shall be specified when ordering.

### 5.4.3 Flash point

If required, when determined in accordance with ES 760 the flash point of the product shall not be lower than the minimum declared flash point(a closed cup method shall also be used).

## 5.5 Storage stability

### 5.5.1 Stability at 0°C

When determined in accordance with clause 6.1 of ES 752, after storage for 7 days at  $\pm 1^\circ\text{C}$ , the volume of solid and/or liquid, which separates, shall not be more than 0.3ml.

### 5.5.2 Stability at 54°C

When determined in accordance with clause 6.1.3 of ES 753, after storage at  $54 \pm 2^\circ\text{C}$  for 14 days, the determined average active ingredient content must not be lower than 95% relative to the determined average content before storage and the product shall continue to comply with clause 5.2.2.

NOTE 5 - Samples of the product taken before and after the storage stability test (in each case 4 representative sub-samples) should be analyzed together after the test to reduce the analytical error.

## 6 Handling

Pesticides handling shall be in accordance with ES 697.

NOTE 6 - Attention is drawn to the appropriate national and international regulations on the handling and transport of flammable materials.

## **7 Sampling**

Samples shall be taken in accordance with ES 694.

## **8 Packing**

Pesticides shall be packed in accordance with ES 695.

## **9 Labelling**

Pesticides labelling shall be in accordance with ES 696.

## **10 Disposal**

Disposal of bulk quantities of obsolete pesticides shall be in accordance with ES 700.

## Organization and Objectives

The Ethiopian Standards Agency (ESA) is the national standards body of Ethiopia established in 2010 based on regulation No. 193/2010. ESA is established due to the restructuring of Quality and Standards Authority of Ethiopia (QSAE) which was established in 1998.

### ESA's objectives are:-

- ❖ Develop Ethiopian standards and establish a system that enable to check whether goods and services are in compliance with the required standards,
- ❖ Facilitate the country's technology transfer through the use of standards,
- ❖ Develop national standards for local products and services so as to make them competitive in the international market.

## Ethiopian Standards

The Ethiopian Standards are developed by national technical committees which are composed of different stakeholders consisting of educational institutions, research institutes, government organizations, certification, inspection, and testing organizations, regulatory bodies, consumer association etc. The requirements and/or recommendations contained in Ethiopian Standards are consensus based that reflects the interest of the TC representatives and also of comments received from the public and other sources. Ethiopian Standards are approved by the National Standardization Council and are kept under continuous review after publication and updated regularly to take account of latest scientific and technological changes. Orders for all Ethiopian Standards, International Standard and ASTM standards, including electronic versions, should be addressed to the Documentation and Publication Team at the Head office and Branch (Liaisons) offices. A catalogue of Ethiopian Standards is also available freely and can be accessed in from our website.

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### International Involvement

ESA, representing Ethiopia, is a member of the International Organization for Standardization (ISO), and Codex Alimentarius Commission (CODEX). It also maintains close working relations with the international Electro-technical Commission (IEC) and American Society for Testing and Materials (ASTM). It is a founding member of the African Regional Organization for standardization (ARSO).

### More Information?

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