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**Pesticides — Carbaryl  
Part 1:  
Technical material (TC) —  
Specification**

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ICS: 65.100.10

Published by Ethiopian Standards Agency

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## 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 cancel and replaces the Ethiopian Standard ES 709-1:2002 - *Pesticides - carbaryl* Part 1 :Technical(TC) - 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/231:1988, FAO-Specification for plant protection products- Specification 26/TC/S (1989)

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

## Pesticides —Carbaryl Part1: Technical material (TC) - Specification

### 1. Scope

This Ethiopian Standard specifies requirements for technical material of carbaryl for plant protection purpose.

### 2. Normative references

The following Ethiopian Standards contain provisions which, through reference in this text, constitute the provisions of this Ethiopian Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this Ethiopian Standard are encouraged to investigate the possibility of applying the most recent editions of the Ethiopian Standards indicated below. Registers of currently valid standards are maintained in the Ethiopian Standards Agency (ESA).

ES 693, Pesticides - Terminology.

ES 694, Pesticides - Methods of sampling.

ES 695, Pesticides - Packaging.

ES 696, Pesticides - Guideline on good labelling practice.

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

ES 700, Pesticides - Guidelines for the disposal of bulk quantities of obsolete pesticides.

ES 724, Pesticides - Determination of identity and impurities in carbaryl technical

ES 726, Pesticides - Determination of carbaryl content in carbaryl technical.

ES 735, Pesticides - Determination of loss on vacuum drying at room temperature. ES 744, Pesticides - Determination of melting point.

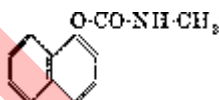
### 3. Definitions

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

### 4. General information

COMMON NAME: Carbaryl (ISO)

STRUCTURAL FORMULA:



EMPIRICAL FORMULA:  $C_{12}H_{11}NO_2$

RMM: 201.2

CAS REGISTRY NUMBER: 63-25-2

CIPAC CODE NUMBER: 26

CHEMICAL NAME:

1-naphthyl methylcarbamate (IUPAC) 1-

naphthylenyl methylcarbamate (CA)

CHEMICAL CATEGORY: Carbamet  
 USE CATEGORY: Insecticide  
 WHO CLASS: ii

## 5. Requirements

### 5.1. Description

The material shall consist of carbaryl together with related manufacturing impurities and shall be an off-white crystalline or granular material, with no more than a faint odour, free from visible extraneous matter and added modifying agents.

### 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 724 and it shall comply with at least one additional test.

#### 5.2.2. Carbaryl

The carbaryl content shall be declared in not less than 980 g/kg, and when determined in accordance with ES 726 the content obtained shall not differ from that declared by more than  $\pm 20$  g.

### 5.3. Impurities

#### 5.3.1. 2-Naphthol

When determined in accordance with ES 724, the O,S-TEPP content shall not exceed 0.2 g/kg.

#### 5.3.2. 2-Naphthol methyl carbamate

When determined in accordance with ES 724, the maximum content of 2-Naphthol methylcarbamate shall be 0.5 g/kg.

#### 5.3.3. Loss of vacuum drying

When determined in accordance with ES 735, the maximum content of vacuum drying loss shall be 10 g/kg.

### 5.4. Physico-chemical properties

#### 5.4.1. Melting point

When determined in accordance with ES 744, the maximum melting point of the material shall be 142°C.

**Table 1. Physico-chemical properties of pure carbaryl**

| Parameter                    | Value(s) and conditions                                  | Purity % | Method                                              | Reference     |
|------------------------------|----------------------------------------------------------|----------|-----------------------------------------------------|---------------|
| Vapour pressure              | $4.16 \times 10^{-5}$ Pa at 23.5°C                       | 99.8     | OECD 104; USEPA: CFR 40, 158, gas saturation method | M-188624-01-1 |
| Melting point                | 138°C                                                    | 99.1     | OECD 102                                            | M-203752-02-1 |
| Boiling point                | 210°C                                                    | 99.1     | OECD 103                                            | M-205640-02-1 |
| Temperature of decomposition | >254°C                                                   | 99.1     | OECD 113                                            | M-204896-02-1 |
| Solubility in water at 20°C  | 9.4 mg/l at pH 4<br>9.1 mg/l at pH 7<br>7.2 mg/l at pH 9 | 99.1     | OECD 105                                            | M-202462-02-1 |
| Partition coefficient        | $\log P_{ow} = 2.36$ at 23°C                             | 99.8     | OECD 107; USEPA CFR 40, 158, HPLC method            | M-188695-01-1 |

|                                      |                                                                                                                                   |       |                                         |               |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------|---------------|
| Hydrolysis characteristics at 20°C   | Stable at pH 5<br>Half-life 12.5/11.6 days at pH 7<br>Half-life 3.2 hours at pH 9                                                 | 99.7  | USEPA CFR 40, 158 Series 161-1          | M-188860-01-1 |
| Photolysis characteristics at 25°C   | Half-life = 9.9 days at pH 5 under continuous artificial sunlight (510.5 Watts/m <sup>2</sup> ) corresponding to natural sunlight | >98.0 | USEPA CFR 40, Series 161-2              | M-188630-01-1 |
| Dissociation characteristics at 24°C | pKa = 10.4 ± 0.4                                                                                                                  | 99.7  | OECD 112; USEPA CFR 40,158 Series 63.10 | M-188661-01-1 |

## 6. Handling

Pesticides shall be handled in accordance with ES 697.

## 7. Sampling

Samples shall be taken in accordance with ES 694.

## 8. Packaging

Pesticides shall be packed in accordance with ES 695.

## 9. Labeling

Pesticides labeling 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 1970.

### 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 Standards 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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