



**RWANDA
STANDARD**

**DRS
581-1**

First edition

2024-mm-dd

**Alpha-cypermethrin Pesticides —
Specification — Part 1: Technical material**

ICS 65.100.10

Reference number

DRS 581-1: 2024

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Requests for permission to reproduce this document should be addressed to:

Rwanda Standards Board

P.O Box 7099 Kigali-Rwanda

KK 15 Rd, 49

Tel. +250 788303492

Toll Free: 3250

E-mail: info@rsb.gov.rw

Website: www.rsb.gov.rw

ePortal: www.portal.rsb.gov.rw

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Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

DRS 581-1 was prepared by Technical Committee RSB/TC 64, *Pesticides*

IS 15616, *Alpha-cypermethrin, Technical — Specification*

The assistance derived from the above source is hereby acknowledged with thanks.

DRS 581 consists of the following parts, under the general title *Alpha-cypermethrin pesticides — Specification*

— *Part 1: Technical specification*

— *Part 2: Wettable powder*

— *Part 3: Suspension concentrate*

— *Part 4: Emulsifiable concentrate*

— *Part 5: Ultra low volume liquid*

Committee membership

The following organizations were represented on the Technical Committee on *Agrochemicals* (RSB/TC 007) in the preparation of this standard.

Rwanda Food and Drugs Authority

Rwanda Forensic Institute

University of Rwanda/College of Sciences and Technology

Standards of Sustainability

CYIRA Ltd

P-TECHNIKS Ltd

Rwanda Inspectorate, Competition and Consumer Protection Authority

Rwanda Investigation Bureau

RAIDO

Rwanda Standards Board (RSB) – Secretariat

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Introduction

A paragraph.

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Alpha-cypermethrin pesticides — Specification — Part 1: Technical material

1 Scope

This Draft Rwanda Standard specifies the requirements for the technical material of alpha-cypermethrin used for agricultural purpose.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

RS 405, *Pesticides — Sampling*

RS 406, *Pesticides — Terminology*

RS 565-2, *Packaging of Pesticides — Requirements — Part 2: Liquid pesticides*

DRS 578, *Pesticides — Guidelines on good labelling practices*

DRS 579, *Pesticides — Guidelines for retail, distribution, storage and handling*

DRS 589, *Pesticides — Guidelines for the disposal of bulk quantities of obsolete pesticides*

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in RS 406 apply.

4 Requirements

4.1 Active ingredients

4.1.1 Identity tests

The active ingredient shall comply with an identity test and, where the identity remains in doubt, shall comply with at least one additional test.

4.1.2 Alpha-cypermethrin content

The alpha-cypermethrin content shall be declared not less than 930 g/kg and, when determined, the average measured content shall not be lower than the declared minimum content.

4.2 General requirements

4.2.1 The material shall consist of alpha-cypermethrin together with related manufacturing impurities

4.2.2 The material shall be a white- to cream-coloured crystalline powder with characteristic odour

4.2.3 The material shall be free from visible extraneous matter and added modifying agents.

4.3 Specific requirements

The product shall comply with the requirements given in table 1 when tested in accordance with the methods prescribed therein.

Table 1 — Specific requirements for Alpha-cypermethrin, technical

S/N	Characteristics	Requirements	Test method
i.	Alpha-cypermethrin content, % by mass, min.	95	Annex A
ii.	Alkalinity (as NaOH), % by mass, max.	0.25	
iii.	Moisture content, % by mass, max.	0.25	

5 Packaging

The product shall be packaged in accordance with RS 565-2.

6 Labelling and marking

The pesticide shall be labelled and marked in accordance with DRS 578.

7 Retail, distribution, storage and handling

The pesticide shall be handled in accordance with DRS 579

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

8 Sampling

Sampling shall be carried out in accordance with RS 405.

9 Disposal

Disposal of bulk quantities of obsolete pesticides shall be in accordance with DRS 589.

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Annex A (normative)

Determination of alpha-cypermethrin content

A.1 General

Alpha-cypermethrin content is determined by the HPLC method. This will be the routine as well as referee method.

A.2 HPLC method

A.2.1 Principle

A HPLC unit with a UV detector is used for this assay. HPLC unit with a UV detector is used for this assay. Using solutions containing known amounts of standard alpha-cypermethrin and internal standard, the response factor (RF), for alpha-cypermethrin and internal standard is arrived at. A solution containing known mass of the technical sample and internal standard is injected subsequently. The percentage of alphacypermethrin in the sample is then computed by standard relationship.

A.2.2 Apparatus

A.2.2.1 High Performance Liquid Chromatography — Equipped with a printer plotter-cum-integrator or computer and UV detector, and preferably with chromatographic software. The suggested parameters are given below, and these operating conditions can be varied, provided standardization is done.

A.2.2.1.1 **Column:** Stainless steel, 250 mm x 4.6 mm id., packed with silica of 5 µm particle size

A.2.2.1.2 **Detector:** UV ($\lambda = 280$ nm)

A.2.2.1.3 **Mobile phase:** 3.0 percent (v/v) Di-isopropyl ether in n-pentane

A.2.2.1.4 **Flow rate:** 1.5 ml/min.

A.2.2.1.5 **Sample size:** 20 µl

A.2.2.1.6 **Temperature:** Ambient ($25 \pm 2^\circ\text{C}$).

A.2.2.2 **Glassware**— Standard volumetric flasks of 100 ml capacity. Bulb pipettes of 10 ml capacity.

A.2.3 Reagents

A.2.3.1 **Internal Standard** — Benzyl benzoate.

A.2.3.2 **Alphacypermethrin Reference Standard**— of known purity.

A.2.3.3 **Di-isopropyl Ether** — HPLC/ Spectroscopic grade.

A.2.3.4 **n-Pentane** — HPLC/Spectroscopic grade.

A.2.3.5 **Toluene** — AR grade.

A.2.4 Procedure

A.2.4.1 Preparation of internal standard solution

Weigh accurately about 2.0 g of internal standard into a 100 ml standard volumetric flask and add about 20 ml of toluene to dissolve the contents. Make up to volume using toluene. Shake well to homogenize. This will give a 20 mg/ml solution of internal standard.

A.2.4.2 Preparation of Working Standard Solution

A.2.4.2.1 Weigh accurately about 100 mg of alpha-cypermethrin reference standard, in duplicate, into two 100 ml standard volumetric flasks.

A.2.4.2.2 Pipette out 10ml of internal standard solution into each flask. Ultrasonicate for about 5 min to dissolve the contents.

A.2.4.2.3 Dilute with mobile phase to the mark and mix well to homogenize. Label these solutions as CA and CB respectively.

A.2.4.3 Preparation of Sample Solution

A.2.4.3.1 Weigh accurately 100 mg of the technical sample (or EC sample containing an equivalent amount of alpha-cypermethrin) in duplicate, into two 100 ml standard volumetric flasks.

A.2.4.3.2 Pipette out 10 ml of internal standard solution into each flask. Make up to volume with mobile phase and mix well. Label these solutions as SA and SB respectively.

A.2.4.4 Estimation

Introduce 20 µl of the working standard solutions CA and CB and the sample solutions SA and SB into the HPLC unit in the indicated sequence. From the integrator/computer print out, note down the peak areas of alpha-cypermethrin and internal standard in each case.

A.2.4.5 Injection sequence

CA1, SA1, SA2, CB1, CA2, SB1, SB2, CB2.

A.2.4.5.1 Calculate the response factor (RF) for the pair of calibration solutions, which bracket the sample solutions, for example, use CA1 and CB1 for SA1 and SA2, etc.

A.2.4.5.2 Inject two or three times until response factor (RF) agrees within one percent.

A.2.4.5.3 Calculate the alphacypermethrin content as indicated under A.2.5.

A.2.4.6 Elution Order

A.2.4.6.1 **Internal standard** ■ 5.0 min

A.2.4.6.2 **Alpha-cypermethrin** ■ 8.0 min

A.2.5 Calculation

$$\text{RF (sample solution)} = \frac{\text{Area of sample peak (A2)}}{\text{Area of internal standard peak (A4)}}$$

$$\text{RF (standard solution)} = \frac{\text{Area of standard peak (A1)}}{\text{Area of internal standard peak (A3)}}$$

$$\text{Alpha-cypermethrin, percentage by mass} = \frac{\text{RF (sample solution)}}{\text{RF standard solution}} \times \frac{M1}{M2} \times P$$

Where,

M1 is the mass of alphacypermethrin reference standard in solution CA/CB, in mg;

M2 is the mass of alphacypermethrin in sample solutions SA/SB, in mg;

A1 is the peak area of alphacypermethrin in standard solutions CA/CB;

A2 is the peak area of alphacypermethrin in solutions SA/SB;

A3 is the peak area of internal standard in solutions CA/CB;

A4 is the peak area of internal standard in solutions SA/SB; and

P is the percent purity of alphacypermethrin reference standard.

Annex B
(informative)

Which styles correspond to which element — Quick reference guide

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Bibliography

- [1] FAO Specifications and evaluations for agricultural pesticides for *Alpha-cypermethrin*

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