

# SLOVENSKI STANDARD

## SIST EN 13752:2003

01-oktober-2003

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### Izdelki, ki se uporabljajo za pripravo pitne vode – Manganov dioksid

Products used for treatment of water intended for human consumption - Manganese dioxide

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Mangandioxid

Produits utilisés pour le traitement de l'eau destinée à la consommation humaine - Dioxyde de manganese

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Ta slovenski standard je istoveten z: **EN 13752:2003**

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#### ICS:

|           |                             |                                     |
|-----------|-----------------------------|-------------------------------------|
| 13.060.20 | Pitna voda                  | Drinking water                      |
| 71.100.80 | Kemikalije za čiščenje vode | Chemicals for purification of water |

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EUROPEAN STANDARD

EN 13752

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2003

ICS 71.100.80

English version

## Products used for treatment of water intended for human consumption - Manganese dioxide

Produits utilisés pour le traitement de l'eau destinée à la consommation humaine - Dioxyde de manganèse

Produkte zur Aufbereitung von Wasser für den menschlichen Gebrauch - Mangandioxid

This European Standard was approved by CEN on 19 August 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

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## Contents

|                                                                      |    |
|----------------------------------------------------------------------|----|
| Foreword .....                                                       | 3  |
| 1 Scope .....                                                        | 5  |
| 2 Normative references .....                                         | 5  |
| 3 Terms, definitions and symbols .....                               | 5  |
| 4 Description .....                                                  | 5  |
| 5 Physical properties .....                                          | 6  |
| 6 Chemical properties .....                                          | 7  |
| 7 Specific properties .....                                          | 7  |
| 8 Test methods .....                                                 | 7  |
| 9 Labelling, transportation and storage .....                        | 9  |
| Annex A (informative) General information on manganese dioxide ..... | 11 |
| Annex B (normative) General rules relating for safety .....          | 14 |
| Bibliography .....                                                   | 15 |

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SIST EN 13752:2003

<https://standards.iteh.ai/catalog/standards/sist/d1946aff-9d89-4072-8c5b-da121ed74a3d/sist-en-13752-2003>

## Foreword

This document (EN 13752:2003) has been prepared by Technical Committee CEN/TC 164 "Water supply", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2003, and conflicting national standards shall be withdrawn at the latest by September 2003.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom.

Annex A is informative and annex B is normative.

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## Introduction

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this standard :

- a) this standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA ;
- b) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

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## 1 Scope

This European Standard is applicable to manganese dioxide used for treatment of water intended for human consumption. It describes the characteristics of manganese dioxide and specifies the requirements and the corresponding test methods for manganese dioxide. It gives information on its use in water treatment.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 12901, *Products used for treatment of water intended for human consumption - Inorganic supporting and filtering materials - Definitions.*

EN 12902, *Products used for treatment of water intended for human consumption - Inorganic supporting and filtering materials - Methods of test.*

EN ISO 3696:1995, *Water for analytical laboratory use - Specification and test methods (ISO 3696:1987).*

ISO 385-1, *Laboratory glassware - Burettes - Part 1 : General requirements.*

ISO 6333, *Water quality - Determination of manganese - Formaldoxime spectrometric method.*

## 3 Terms, definitions and symbols

[SIST EN 13752:2003](https://standards.iteh.ai/catalog/standards/sist/d1946aff-9d89-4072-8c5b-da121ed74a3d/sist-en-13752-2003)

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For the purposes of this European Standard, the terms, definitions and symbols given in EN 12901 apply.

## 4 Description

### 4.1 Identification

#### 4.1.1 Chemical name

Manganese dioxide.

#### 4.1.2 Synonym or common names

Manganese(IV) oxide, pyrolusite.

#### 4.1.3 Chemical formula

MnO<sub>2</sub>.

**NOTE** Manganese dioxide used as a catalytic filtering medium is a natural ore, usually pyrolusite. Manganese dioxide ores differ widely in their chemical composition depending on their origin. Most are composed of manganese dioxide together with silica, alumina, iron oxide and numerous other elements present in varying proportions.

**EN 13752:2003 (E)****4.1.4 CAS Registry number <sup>1)</sup>**

Manganese dioxide : 1313-13-9.

**4.1.5 EINECS reference <sup>2)</sup>**

Manganese oxides : 215-202-6.

**4.2 Commercial form**

Manganese dioxide is a granular material usually available in two size ranges, 0,355 mm to 0,850 mm and 0,50 mm to 1,00 mm.

**5 Physical properties****5.1 Appearance**

The product is a granular material varying in colour from dark brown to dark grey to black depending upon its origin. It consists of amorphous grains which can be rounded or sub-angular.

The product shall be generally homogeneous and shall be visibly free of extraneous matter.

**5.2 Particle size distribution**

The particle size distribution shall be described by either:

a)

- effective size :  $(d_{10})$  with a maximum deviation of  $\pm 5\%$  ;
- uniformity coefficient :  $(U)$  less than 1,5 ;
- minimum size :  $(d_1)$  with a limit deviation of  $\pm 5\%$  ;

NOTE 1 The particle size can decrease during transportation and handling.

or

b) particle size range and mass fraction of oversize and undersize particles according to application.

The maximum contents of oversize and undersize shall be a mass fraction of 5 % for application of the product in multimedia filters and a mass fraction of 10 % for use in single media filters. See A.2.3 for examples of available particle sizes that are used.

NOTE 2 Other values can be necessary for certain applications.

**5.3 Density****5.3.1 Bulk density loose**

The bulk density loose shall be in the range of 1 750 kg/m<sup>3</sup> to 1 850 kg/m<sup>3</sup>.

<sup>1)</sup> Chemical Abstracts Service Registry Number.

<sup>2)</sup> European Inventory of Existing Commercial Chemical Substances.

### 5.3.2 Bulk density packed

The bulk density packed shall be in the range of 1 950 kg/m<sup>3</sup> to 2 050 kg/m<sup>3</sup>.

## 6 Chemical properties

For the composition of the commercial product see A.2.1.

NOTE 1 After filling, washing and commissioning of a filter system producing drinking water, manganese dioxide should not increase the concentrations of chemical parameters above the regulated values (see [1]).

NOTE 2 Water extractable substances, determined in accordance with the method for granular materials given in EN 12902, can be used to estimate the leaching of the chemicals specified in EN 12902.

## 7 Specific properties

The oxidation capacity of manganese dioxide shall be at least 500 bed volumes when tested according to the method described in 8.2.4.

## 8 Test methods

### 8.1 Sampling

Prepare the laboratory sample(s) required by the relevant procedure described in EN 12902.

### 8.2 Analysis

[SIST EN 13752:2003](https://standards.iteh.ai/catalog/standards/sist/d1946aff-9d89-4072-8c5b-da121ed74a3d/sist-en-13752-2003)

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#### 8.2.1 Particle size distribution

The particle size distribution shall be determined on samples taken at the point of manufacture using the method of test given in EN 12902.

#### 8.2.2 Bulk density loose

The bulk density loose shall be determined in accordance with EN 12902.

#### 8.2.3 Bulk density packed

The bulk density packed shall be determined in accordance with EN 12902.

#### 8.2.4 Oxidation capacity

##### 8.2.4.1 Principle

A solution of manganese sulfate is passed through a bed of “regenerated” manganese dioxide. Portions of the effluent are analysed for manganese and the cumulative volume, until breakthrough of manganese, is determined.

##### 8.2.4.2 Reagents

###### 8.2.4.2.1 General

All reagents shall be of a recognized analytical grade and the water used shall conform to grade 2 in accordance with EN ISO 3696:1995.