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Lead and lead alloys - Lead oxides

Plomb et alliages de plomb - Oxydes de plomb

Blei und Bleilegerungen - Bleioxide

This European Standard was approved by CEN on 19 May 2000.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 306 "Lead and lead alloys", 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of an identical text or by endorsement, at the latest by December 2000, and conflicting national standards shall be withdrawn at the latest by December 2000.

The annexes A, B, C and D are normative.

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, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the requirements, acceptance tolerances and chemical and physical test procedures for lead oxides, including litharges (powder or granulated), battery oxides (Barton or Mill) and crystal red lead.

WARNING Lead and lead compounds are toxic by inhalation and/or ingestion.

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 23923-2, *Metallic powders - Determination of apparent density - Part 2 : Scott volumeter method (ISO 3923-2 : 1981)*.

EN ISO 787-11, *General methods of test for pigments and extenders - Part 11 : Determination of tamped volume and apparent density after tamping (ISO 787-11:1981)*.

3 Terms and definitions

For the purpose of this European Standard, the following terms and definitions apply :

3.1

lead oxide

product obtained from oxidation of lead metal with air

3.2

battery oxide

product obtained from partial oxidation of lead metal with air and composed of lead monoxide (PbO) and lead metal (Pb)

NOTE There are two varieties used in batteries : Barton (see 3.2.1) and Mill (see 3.2.2).

3.2.1

Barton

type of battery oxide obtained from oxidation of molten lead metal with air

3.2.2

Mill

type of battery oxide obtained from oxidation of lead metal with air together with a grinding process

3.3

litharge

product composed of lead monoxide (PbO) and obtained from oxidation of lead metal, supplied either as powder or granulated

3.4

red lead

product essentially composed of lead(II)-lead(IV) oxides ($2\text{PbO} \cdot \text{PbO}_2$) (also known as lead orthoplumbate, trilead tetroxide, minium, etc.) obtained from oxidation of lead metal

4 Production process

The process for the production of lead oxides shall be left to the discretion of the producer.

5 Requirements

The requirements for lead oxides differ, depending on the type and the application of the oxide. The lead oxides shall be in accordance with the requirements given in the relevant table (see Table 1 to 7). The test method shall be in accordance with the relevant method (see clause 7).

NOTE 1 Additional requirements or a range of values within, but narrower than those stated in this European Standard, can be specified in the order by agreement between the supplier and the purchaser.

NOTE 2 In all cases, the level of impurities is a consequence of impurities present in the lead used.

5.1 Battery oxides

Table 1 - Battery oxide - Mill type

Requirements	Units	Values
PbO content (mass fraction)	%	65 to 82
Free Pb content (mass fraction)	%	18 to 35
Apparent density (Scott)	g/cm ³	1,1 to 1,5
Tamped density	g/cm ³	2,9 to 3,5
Residue in sieve over 63 µm	%	0,5 max.
H ₂ SO ₄ absorption index	mg/g	240 to 270

Table 2 - Battery oxide - Barton type

Requirements	Units	Values
PbO content (mass fraction)	%	65 to 82
Free Pb content (mass fraction)	%	18 to 35
Apparent density (Scott)	g/cm ³	1,0 to 2,0
Tamped density	g/cm ³	3 to 4
Residue in sieve over 63 µm	%	0,5 max.
H ₂ SO ₄ absorption index	mg/g	150 to 210

5.2 Litharges

Table 3 - Litharge - Powder

Description		
Denomination		Litharge
Colour		Yellow/orange
Formulae		PbO
Requirements	Units	Values
PbO content (mass fraction)	%	99,5 min.
PbO ₂ content (mass fraction)	%	0,05 max.
Free Pb content (mass fraction)	%	0,05 max.
Apparent density (Scott)	g/cm ³	1,8 to 2,6
Tamped density	g/cm ³	3,7 to 5,1
Residue in sieve over 63 µm	%	0,3 max.
Characteristics ^a	Units	Values
Melting point	°C	886
Molecular mass	g/mol	223,2
^a The following characteristics are given for information only.		

Table 4 - Litharges – Granulated

Description		
Denomination		Litharge - granulated
Colour		Yellow/orange
Formulae		PbO
Requirements	Units	Values
PbO content (mass fraction)	%	99,5 min.
Free Pb content (mass fraction)	%	0,05 max.
Characteristics ^a	Units	Values
Melting point	°C	886
Molecular mass	g/mol	223,2
^a The following characteristics are given for information only.		

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