
INTERNATIONAL STANDARD



3262

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Extenders for paints

Matières de charge pour peintures

First edition — 1975-09-01

UDC 667.622.52

Ref. No. ISO 3262-1975 (E)

Descriptors : paints, extenders, materials specifications.

FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 3262 was drawn up by Technical Committee ISO/TC 35, *Paints and varnishes*, and circulated to the Member Bodies in November 1973.

It has been approved by the Member Bodies of the following countries :

Austria	Italy	Spain
Brazil	Netherlands	Sweden
Bulgaria	New Zealand	Switzerland
Czechoslovakia	Peru	Thailand
Egypt, Arab Rep. of	Poland	Turkey
Germany	Portugal	United Kingdom
Ireland	Romania	U.S.S.R.
Israel	South Africa, Rep. of	Yugoslavia

The Member Body of the following country expressed disapproval of the document on technical grounds :

France

Extenders for paints

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the principal requirements and the corresponding methods of test for certain paint extenders.

It is applicable to the types and grades of paint extender listed in clause 4.

2 REFERENCES

ISO 787, *General methods of test for pigments*.

ISO 842, *Raw materials for paints and varnishes — Sampling*.

3 DEFINITION

extender : An inorganic material in powder form, with a refractive index usually less than 1,7, used as a constituent of paints to confer special effects and to modify properties such as sedimentation, working and film-forming properties.

4 TYPES AND GRADES

The extenders are classified in types according to the nature of the material, and in grades according to their residue on sieve and particle size.

Extender No. 1 : Barytes (grades a, b)

Barium sulphate, natural.

Extender No. 2 : Blanc fixe

Barium sulphate, precipitated.

Extender No. 3 : Whiting (grades a, b, c, d)

Calcium carbonate, natural. Craie, Kreide. Naturally occurring cretaceous chalk, primarily CaCO_3 of micro-crystalline form (essentially remains of coccoliths and foraminifera).

Extender No. 4 : Calcium carbonate, crystalline (grades a, b, c, d)

Limestone, Iceland spar, natural calcium carbonate other than that covered by extender No. 3.

Extender No. 5 : Calcium carbonate, precipitated (grades a, b)

Calcium carbonate prepared by precipitation.

Extender No. 6 : Dolomite (grades a, b, c, d)

Calcium magnesium carbonate. In chemical composition, approximately equimolecular proportions of calcium and magnesium carbonates.

Extender No. 7 : China clay (grades a, b, c)

Aluminium silicate, natural, hydrated. Kaolin, essentially kaolinite, $\text{Al}_2\text{O}_3 \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$, of lamellar crystalline form.

Extender No. 8 : Talc, fibrous form (grades a, b)

Magnesium silicate, natural, hydrated, $3\text{MgO} \cdot 4\text{SiO}_2 \cdot \text{H}_2\text{O}$.

Extender No. 9 : Talc, lamellar form (grades a, b, c)

Magnesium silicate, natural, hydrated, $3\text{MgO} \cdot 4\text{SiO}_2 \cdot \text{H}_2\text{O}$.

Extender No. 10 : Talc, containing carbonate

Magnesium silicate, natural, hydrated, $3\text{MgO} \cdot 4\text{SiO}_2 \cdot \text{H}_2\text{O}$, lamellar form. Different from extender No. 9 in that it contains carbonate.

Extender No. 11 : Mica (grades a, b)

Potassium aluminium silicate, natural, hydrated, $\text{K}_2\text{O} \cdot 3\text{Al}_2\text{O}_3 \cdot 6\text{SiO}_2 \cdot 2\text{H}_2\text{O}$, lamellar form. Muscovite. Wet ground (grade a) and dry ground (grade b).

Extender No. 12 : Silica (quartzite), type 1 (grades a, b, c, d)

Silica, natural. SiO_2 content not less than 80 % but less than 98 %.

Extender No. 13 : Silica (quartzite), type 2 (grades a, b, c, d)

Silica, natural, SiO_2 content equal to or greater than 98 %.

Extender No. 14 : Kieselguhr, type 1 (grades a, b, c, d)

Diatomaceous siliceous earth. SiO_2 content not less than 70 % but less than 80 %.

Extender No. 15 : Kieselguhr, type 2 (grades a, b, c, d)

Diatomaceous siliceous earth. SiO_2 content not less than 80 %.

Extender No. 16 : Calcium silicate, synthetic

Hydrated synthetic calcium silicate.

Extender No. 17 : Sodium aluminium silicate, synthetic

Hydrated synthetic sodium aluminium silicate.

Extender No. 18 : Silica, synthetic

Hydrated synthetic silica.

TABLE 1 — Composition and properties of extenders

No.	Extender	Composition (% (m/m))	Test method	Colour (see clause 7)	Residue on sieve ¹⁾ (see clause 8) % (m/m) max.				Particle size distribution ²⁾ (see clause 9) % (m/m) min.			Matter volatile at 105 °C (see clause 10) % (m/m) max.	Loss on ignition (see clause 11) % (m/m)	Matter soluble in water (see clause 12) % (m/m) max.	pH of aqueous suspension (see clause 13)
					125 µm	63 µm	45 µm	< 20 µm	< 10 µm	< 5 µm	< 2 µm ³⁾				
1	Barytes grade a grade b	BaSO ₄ , 90 min.	see clause 14	No extender to be darker or more strongly coloured than an agreed sample.	—	—	2,0	65	40	20	(5)	0,5	0,5 max.	0,5	6 to 10
2	Blanc fixe	BaSO ₄ , 95 min.	see clause 14		0,02	0,1	0,2	90	80	60	(25)	0,5	—	0,54	5,5 to 9,5
3	Whiting grade a grade b grade c grade d	CaCO ₃ , 96 min. 99 max.	see clause 15		0,5 0,01 — —	6 0,5 0,05 —	15 2 0,5 0,01	— 85 90 97	— 65 80 95	— 45 55 70	— (20) (25) (35)	0,3	42 to 44	0,15	8,0 to 9,5
4	Calcium carbonate (crystalline) grade a grade b grade c grade d	CaCO ₃ , 98 min.	see clause 16		0,01 0,01 — —	1,0 0,5 0,01 —	5,0 1,5 0,1 0,01	70 80 95 —	40 45 65 98	25 30 35 70	(10) (10) (15) (25)	0,3	42 to 44,5	0,15	8 to 10
5	Calcium carbonate (precipitated) grade a grade b	CaCO ₃ , 97 min. 100 max.	see clause 15		0,1 0,1	0,25 0,25	0,5 0,5	90 —	70 90	40 70	— (20)	1,0	43,5 to 44,5	0,3	8 to 10,5
6	Dolomite grade a grade b grade c grade d	CaMg(CO ₃) ₂ , 97 min. ⁵⁾	see clause 16		0,01 0,01 — —	1,0 0,5 0,01 —	5,0 1,5 0,1 0,01	70 80 95 —	40 45 65 98	25 30 35 70	(10) (10) (15) (25)	0,3	46 to 48	0,2	8 to 10,5
7	China clay grade a grade b grade c				— — —	— — —	0,5 0,1 0,05	90 95 99,5	70 80 99	— — —	(15) (35) (70)	2	10 to 14	0,5	4,5 to 9,5
8	Talc, fibrous form grade a grade b				— —	— —	1,5 0,5	75 90	55 75	40 50	(20) (25)	0,5	4 to 7	0,5	8,5 to 10
9	Talc, lamellar form grade a grade b grade c				0,01 — —	0,5 0,01 —	3,0 0,10 0,01	80 95 —	50 70 95	30 40 70	(8) (15) (25)	0,5	4 to 8	0,5	8,5 to 10
10	Talc, containing carbonate grade a grade b grade c	Magnesium silicate with a max. of 50 % MgCO ₃ + CaCO ₃	see clause 16		0,01 — —	0,5 0,01 —	3,0 0,10 0,01	80 95 —	50 70 95	30 40 70	(8) (15) (25)	0,5	28 max.	0,5	8 to 10,5

TABLE 1 (continued)

No.	Extender	Composition % (m/m)	Test method	Colour (see clause 7)	Residue on sieve ¹⁾ (see clause 8) % (m/m) max.		Particle size distribution ²⁾ (see clause 9) % (m/m) min.					Matter volatile at 105 °C (see clause 10) % (m/m) max.	Loss on ignition (see clause 11) % (m/m)	Matter soluble in water (see clause 12) % (m/m) max.	pH of aqueous suspension (see clause 13)	
					125 µm	63 µm	45 µm	< 20 µm	< 10 µm	< 5 µm	< 2 µm ³⁾					
11	Mica grade a grade b			No extender to be darker or more strongly coloured than an agreed sample. —	—	1,0	3,0 0,5	98 98	80 70	30 30	(5) (10)	0,5	5,5 max.	0,5	7 to 9,5	
12	Silica (quartzite) type 1 grade a grade b grade c grade d	SiO ₂ , 80 to 98	Any recognized classical method		40 2 —	— 25 0,5	— 60 5,0 0,1	— — 70 —	— — 10 95	— — — —	— — — —	0,5	5 max.	0,5	7 to 10	
13	Silica (quartzite) type 2 grade a grade b grade c grade d	SiO ₂ , 98 min.			40 2 —	— 25 0,5	— 60 5,0 0,1	— — 70 —	— — 10 95	— — — —	— — — —	0,5	0,2 max.	0,5	7 to 8,5	
14	Kieselguhr, type 1 grade a grade b grade c grade d	SiO ₂ , 70 to 80			— — — —	— — — —	15 5 1 1	70 75 80 90	10 20 30 50	— 5 10 30	— — — —	12	15 max.	1,0	6,5 to 10	
15	Kieselguhr, type 2 grade a grade b grade c grade d	SiO ₂ , 80 min.			— — — —	— — — —	15 5 1 1	70 75 80 90	10 20 30 50	— 5 10 30	— — — —	2	1 max.	1,0	6,5 to 10	
16	Calcium silicate, synthetic	To be agreed between the interested parties	To be agreed between the interested parties		—	1,0	3,0	90	70	40	—	12	8 max.	To be agreed between the interested parties		8 to 12,5
17	Sodium aluminium silicate, synthetic				—	2,0	4,0	85	50	20	—	12	8 max.			8 to 12,5
18	Silica, synthetic	SiO ₂ , 97 min.	see clause 17	—	2,0	5,0	80	50	20	—	12	8 max.			3,5 to 8,0	

The determination of residue on sieve using the method in this International Standard requires considerable experience. More reproducible results may be obtained if a mechanical flushing method is used (see ISO 787, Part XVIII) but these results will be lower than those obtained using the manual method. The results obtained, therefore, by the different methods should not be used for comparison.

The method for the determination of particle size distribution is based on Stokes' law. Strictly speaking, Stokes' law applies to spherical particles. Extender particles are not strictly spherical, therefore the given figures are not an absolute measure of particle size, but serve as a means of comparing different samples of the same extender. They should not be used to compare one extender with another because different extenders have different particle shapes. Furthermore, the figures do not necessarily relate to those given under "Residue on sieve", since these refer to actual dimensions of the particles.

The 2 µm limits are given for guidance only.

4) Excluding water-soluble alkaline earth compounds. (See 12.3, Method 1A.)

5) The proportion by mass of CaCO₃ to MgCO₃ is in practice between 1,18 and 1,23 CaCO₃ : 1,0 MgCO₃.

5 COMPOSITION AND PROPERTIES

The material shall be in the form of a dry powder or in such condition that it may readily be reduced thereto by crushing under a palette knife without any grinding action being necessary. When examined microscopically at a suitable magnification, it shall closely resemble an agreed sample.

The composition and properties of the materials shall be as given in table 1.

It should be noted, however, that in table 1 no reference is made to oil-absorption values; these are given in the table in the annex for information only.

6 SAMPLING

Sampling shall be carried out in accordance with ISO 842.