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Standard Specification for Aluminum Powder and Paste Pigments for Paints¹

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1. Scope

1.1 This specification covers four types and three classes of aluminum pigments for use in paints.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D480 Test Methods for Sampling and Testing of Flaked Aluminum Powders and Pastes

E34 Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys (Withdrawn 2017)³

3. Classification

3.1 *Type I—Leafing Aluminum Pigment Powder:*

3.1.1 *Class A, Fine*—Maximum of 0.1 % retained on a No. 325 (45- μ m) sieve.

3.1.2 *Class B, Medium*—Maximum of 1.5 % retained on a No. 325 (45- μ m) sieve.

3.1.3 *Class C, Coarse*—Maximum of 20 % retained on a No. 325 (45- μ m) sieve.

3.2 *Type II—Leafing Aluminum Pigment Paste:*

3.2.1 *Class A, Fine*—Maximum of 0.1 % retained on a No. 325 (45- μ m) sieve.

3.2.2 *Class B, Medium*—Maximum of 1.0 % retained on a No. 325 (45- μ m) sieve.

3.2.3 *Class C, Coarse*—Maximum of 15 % retained on a No. 325 (45- μ m) sieve.

3.3 *Type III—Nonleafing Aluminum Pigment Powder (Note):*

3.3.1 *Class A, Fine*—Maximum of 1.5 % retained on a No. 325 (45- μ m) sieve.

3.3.2 *Class B, Medium*—Maximum of 6.0 % retained on a No. 325 (45- μ m) sieve.

3.3.3 *Class C, Coarse*—Maximum of 20 % retained on a No. 325 (45- μ m) sieve.

3.4 *Type IV—Nonleafing Aluminum Pigment Paste (Note 1):*

3.4.1 *Class A, Fine*—Maximum of 0.1 % retained on a No. 325 (45- μ m) sieve.

3.4.2 *Class B, Medium*—Maximum of 1.0 % retained on a No. 325 (45- μ m) sieve.

3.4.3 *Class C, Coarse*—Maximum of 11.0 % retained on a No. 325 (45- μ m) sieve.

NOTE 1—The particle size characteristics of the Type 3 and Type 4 pigments of the same class do not correspond with each other; in the case of Types 1 and 2 they do.

4. Composition and Properties

4.1 *Aluminum Pigment Powder (Type 1, Leafing and Type 3, Nonleafing)*—The aluminum pigment powder shall consist of commercially pure aluminum in the form of fine, polished flakes, and a suitable fatty lubricant. It shall contain no filler or extender pigments.

4.2 *Aluminum Pigment Paste (Type 2, Leafing and Type 4, Nonleafing)*—The aluminum pigment paste shall consist of commercially pure aluminum in the form of fine, polished flakes, and a suitable fatty lubricant combined with a volatile thinner. It shall contain no filler or extender pigments.

4.3 The aluminum pigments, powder, and paste of both leafing and nonleafing types shall conform to the requirements given in **Table 1**.

4.4 The paint made from the powder or paste shall be free-flowing and shall give a continuous coating at least equal in smoothness, luster, and general appearance to that of a reference sample mutually agreed upon by the purchaser and the seller.

¹ This specification is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.31 on Pigment Specifications.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

TABLE 1 Requirements for Aluminum Pigments

	Leafing		Nonleafing	
	Type 1 (Powder)	Type 2 (Paste)	Type 3 (Powder)	Type 4 (Paste)
Nonvolatile matter at 105 to 110°C, min, %	99	65	99	65
Easily extracted fatty and oily matter (polishing lubricant), max, % ^A	4.0	3.0	4.0	3.0
Total impurities other than fatty and oily matter, max, % ^A	1.0	0.7	1.0	1.25
Coarse particles, max, %:				
Class A (total residue retained on a No. 325 (45-µm) sieve)	0.1	0.1	1.5	0.1
Class B (total residue retained on a No. 325 (45-µm) sieve)	1.5	1.0	6.0	1.0
Class C (total residue retained on:				
No. 100 (150-µm) sieve	0.5	0.5	0.5	0.5
No. 325 (45-µm) sieve)	20.0	15.0	20.0	11.0
Leafing, min, %:				
Class A	50	55	absent	absent
Class B	50	50	absent	absent
Class C	50	50	absent	absent

^A Nonleafing pigments may contain metal compounds as dispersants. If required, a complete analysis may be made in accordance with Test Methods E34.

4.5 The aluminum pigments, powder and paste of both leafing and nonleafing types, stored in unopened original packages within 6 months after shipment shall pass all tests applicable to the respective type and class as described in Test Methods D480.

5. Test Methods and Sampling

5.1 Sampling and tests shall be conducted in accordance with Test Methods D480. Since several of the methods are empirical and the results are affected by the method, the specified procedures should be closely followed.

6. Packaging

6.1 Aluminum paste should be packaged in a polyvent container that can be safely vented in case of pressure build-up.

7. Keywords

7.1 aluminum powder; flake; leafing; nonleafing; paste; polishing lubricant

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