



Standard Classification of Water Used in Milling of Porcelain Enamel¹

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^{ε1} NOTE—Standard was editorially corrected in April 2011

INTRODUCTION

This standard sets forth Class A, B, and C categories for water used for milling porcelain enamel based on the concentrations of allowable contaminants and the quality requirements of the fired finish.

1. Scope

1.1 This classification covers water used in the milling of porcelain enamel frit.

2. Referenced Documents

2.1 *ASTM Standards*:²

D511 Test Methods for Calcium and Magnesium in Water
D512 Test Methods for Chloride Ion in Water
D513 Test Methods for Total and Dissolved Carbon Dioxide in Water
D516 Test Method for Sulfate Ion in Water
D858 Test Methods for Manganese in Water
D1068 Test Methods for Iron in Water
D1126 Test Method for Hardness in Water
D1293 Test Methods for pH of Water

¹ This classification is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.12 on Materials for Porcelain Enamel and Ceramic-Metal Systems.

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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.

D1888 Methods Of Test for Particulate and Dissolved Matter in Water

D3370 Practices for Sampling Water from Closed Conduits

3. Classification

3.1 Three classes of water are covered, based on the maximum impurity analyses as defined in Table 1. For porcelain enamel frits, Class A water should cause no difficulties in the production of a high quality finish. Class B water may be used by slight compensations in processing. Mill addition water falling into Class C should be treated before use in order to preclude faulty enamel production.

4. Methods of Analysis

4.1 Determine the elements and properties listed in Table 1 in accordance with the following ASTM methods:

4.1.1 *Sampling*—Practice D3370.

4.1.2 *Bicarbonate*—Test Method D513.

4.1.3 *Calcium and Magnesium*—Test Method D511.

4.1.4 *Chloride*—Test Method D512.

4.1.5 *Hardness*—Test Method D1126.

4.1.6 *Iron*—Test Method D1068.

4.1.7 *Manganese*—Test Method D858.

4.1.8 *pH*—Test Method D1293.

4.1.9 *Sulfate*—Test Method D516.

4.1.10 *Total Solids*—Test Method D1888.

TABLE 1 Classification of Water for Use in Milling Porcelain Enamel

Class	Maximum Concentrations, ppm									pH
	Calcium	Magnesium	Iron	Manganese	Sulfate	Chloride	Hardness	Total Solids	Bicarbonate	
A	31	7.5	0.30	0.005	25	13	38.5	147	117	7.6
B	43	10.0	0.62	1.05	102	18	53.0	198	86	7.5
C	53	18.0	0.43	...	105	18	71.0	284	78	7.3

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