



Standard Classification of Water Used in Milling of Porcelain Enamel¹

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1. Scope

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

2. Referenced Documents

2.1 *ASTM Standards*:

- D 511 Test Methods for Calcium and Magnesium in Water²
- D 512 Test Methods for Chloride Ion in Water²
- D 513 Test Methods for Total and Dissolved Carbon Dioxide in Water²
- D 516 Test Method for Sulfate Ion in Water²
- D 858 Test Methods for Manganese in Water²
- D 1068 Test Methods for Iron in Water²
- D 1126 Test Method for Hardness in Water²
- D 1293 Test Methods for pH of Water²
- D 1888 Test Methods for Particulate and Dissolved Matter, Solids, or Residue in Water³
- D 3370 Practices for Sampling Water²

¹ This classification is under the jurisdiction of ASTM Committee B-8 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 *Annual Book of ASTM Standards*, Vol 11.01.

³ *Discontinued*—See 1990 *Annual Book of ASTM Standards*, Vol 11.01.

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*—Practices D 3370.
- 4.1.2 *Bicarbonate*—Test Methods D 513.
- 4.1.3 *Calcium and Magnesium*—Test Methods D 511.
- 4.1.4 *Chloride*—Test Methods D 512.
- 4.1.5 *Hardness*—Test Method D 1126.
- 4.1.6 *Iron*—Test Methods D 1068.
- 4.1.7 *Manganese*—Test Methods D 858.
- 4.1.8 *pH*—Test Methods D 1293.
- 4.1.9 *Sulfate*—Test Method D 516.
- 4.1.10 *Total Solids*—Test Methods D 1888.

TABLE 1 Classification of Water for Use in Milling Porcelain Enamel

Class	Maximum Concentrations, ppm						Hardness	Total Solids	Bicarbonate	pH
	Calcium	Magnesium	Iron	Manganese	Sulfate	Chloride				
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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