

## Freeze Thaw Cycling

### 1. Test Standard

#### 1.1 Test Method

ASTM C1026 "Freeze Thaw Cycling"

#### 1.2 Test Procedure

- 1) Dry each specimen in the oven at 150±5°C (302±9°F) for 24 hours.
- 2) Allow the specimens to cool in the desicator until they can be safely handled.
- 3) Record the initial dry weight (Wi) of each specimen.
- 4) Place the specimens in a container of boiling deionized water for 5 hours.
- 5) After 5 hours boil, allow the specimen soak for at least an additional 24 hours.
- 6) Continue to immerse the treated quartz in water until ready for Freeze thaw cycling
- 7) At the end of 300 cycles, dry the specimen in the oven at 150±5°C (302±9°F) for 24 hours.
- 8) Allow the specimens to cool in the desicator and record the final dry weight (Wf) of each specimen.
- 9) Visually inspect each specimen carefully for cracks, disintegration, or spalling, or combinations thereof.
- 10) The visual inspection shall be conducted at a standard distance of 250±3mm (10±1/2 inches) under sufficient lighting with 300 lux of illumination.

#### 1.3 Caculate the total weight loss

Total weight loss (%) =  $[(W_i - W_f) / W_i] \times 100$

※ **Wi**=Initial Dry Weight, **Wf**=Final Dry Weight

### 2. Test Result (300 Cycles)

Specimen	Dry Weight		Observations After 300 cycles	Total Weight Loss	Pass or Fail
	Initial (Wi)	Final (Wf)			
1	496.43	496.23	Surface Darkened	0.04%	Pass
2	495.29	495.04	Surface Darkened	0.05%	Pass
3	494.36	494.22	Surface Darkened	0.03%	Pass
4	493.39	493.19	Surface Darkened	0.04%	Pass
5	493.95	493.76	Surface Darkened	0.04%	Pass

**Result: Pass**

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