



## MP – 9.2

### Porcelain Enamel Continuity Testing Procedure

#### **9.2.1 Purpose**

Proper application of the Porcelain Enamel Coating provides beneficial long-term characteristics of lubricity, adherence, and resistance to corrosion and high temperature. Currently, there is no test method, either destructive or non-destructive, which directly measures these characteristics. Rather, the Industry has developed a testing method utilizing a Holiday Detector, which determines the continuity of the glass lining and indicates the relative quality of the process. This method is commonly referred to as “ Spark Test “.

#### **9.2.2 Test Description**

##### **9.2.2.1 Equipment**

The equipment consists of a Tinker & Razor electronic device designed to locate holidays (pinholes, voids, fishscales, etc.) in the non-conducting Porcelain Enamel Lining. It functions by applying a 67.5volt potential current across the glass lining. Any pinholes or other holidays in the glass lining will close the circuit and produce an audible signal from the detector for any resistance less than 10,000 OHMS. The current is applied through a circular sponge which has been dampened using tap water. All excess water must be squeezed from the sponge to avoid “streaming” which can cause false negative readings.

##### **9.2.2.1 Procedure**

For testing long pipe sections, the diameter of the dampened sponge shall exceed the diameter of the pipe so that the sponge is in full circumferential contact with the Porcelain Enamel Lining of the pipe. The sponge is attached to a rod that allows the sponge to be pushed through at least 50% of the pipe. Any discontinuities will result in an audible signal, which will be recorded with regard to the position along the pipe. Testing is performed from both ends of the pipe. Special techniques are required at the exposed pipe ends, which are not porcelain coated. If, due to excess water on the sponge, the electric current short circuits to the end of the pipe resulting in an audible signal (typically within 3” of the pipe end), the test personnel shall also make a visual inspection to determine if discontinuities exist.



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**9.2.3 Acceptance Criteria**

The pipe or fittings as tested by the procedure shall be rejected from shipment if testing reveals more than isolated voids due to casting irregularities. Acceptance criteria is as follows:

<u>Fittings</u>	<u>Maximum Pinholes</u>	<u>Pipe</u>	<u>Maximum Pinholes</u>
4" through 8" diameter	3-5	4" through 8" diameter	10-12 per 20' of length
10" through 18" diameter	5-8	10" through 18" diameter	18-20 per 20' of length
20" and larger	8-10	20" and larger	25-28 per 20' of length

The above criteria represents non-visible pinholes detectable by spark test only. Any pinholes visible to the naked eye that expose the base metal are cause for rejection.

**9.2.4** All pipe and fittings shall be factory tested for holidays by the manufacturer, with certified copies of test results accompanying each shipment. These test results and documents shall identify each item by customer mark number and description, Quality Control Sequence Number and show date tested, inspector identity, and test results. A sticker will be affixed to the interior of each piece showing the inspector's initials and the Quality Control Sequence Number of the part. Upon request by the engineer, the manufacturer shall perform jobsite test verification.