**Nevada Thermal Spray Technologies (NTST)**
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# NTST PORCELAIN COATINGS

## General Information:

**NTST has recently developed the capability to fabricate porcelain coatings. Figure 1 illustrates a typical NTST coating.**

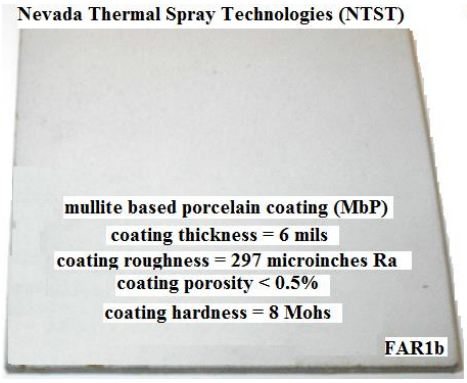


**Figure 1. NTST porcelain coating**

### Coating Properties/Characteristics:

**Key design requirements for porcelain coatings are a low thermal expansion coefficient, low thermal conductivity, and high material stability (i.e., high resistance to chemical attack). Other properties associated with porcelain coatings include low density, low permeability, high temperature strength, hardness, toughness, good wear resistance, and good thermal shock resistance. Maximum service temperatures is 1095C.**

**This NTST coating was developed for both an alkaline and acidic environment and can be enhanced for acid or alkaline solutions by slight modification of the current formulation. The generic coating was tested in water and shows no corrosion through the coating, indicating an almost nonexistent porosity. Porcelain enamel coatings (i.e., ASM handbook, Volume 13, Corrosion) are resistant to sulfuric acid, nitric acid, and hydrochloric acid; but, not resistant to hydrofluoric acid.**

### Porcelain Coating Performance Evaluation

**The NTST coating (Figure 2) was tested in water and shows no corrosion through the coating, indicating a very low, non-interconnected porosity.**


**Figure 2. NTST Corrosion Test for MbP coating**

**Experiments for the maximum service temperature for the porcelain coatings were conducted. Coatings were successfully tested for up to 10 minutes using an oxy-acetylene rig at a standoff that would allow the flame to completely blanket the substrate. The maximum flame temperature for an oxygen-acetylene mixture is 3110C.**

## Porcelain Coating Characterization

**NTST porcelain coatings are hard and wear resistant. Hardness is 7 (i.e. Mohs), and surface roughness is 297 microinches Ra.**

## Porcelain Applications:

**Current applications are found in the automotive, aircraft, aerospace, and power industries.**