COATINGS FOR INDUSTRY, INC.
www.coatingsforindustry.com
manufacturers of Alseal

# Alseal 519

**Description and Uses**

Alseal 519 is a coating composition formulated for protecting ferrous alloys from both high temperature heat oxidation and at the same time offer sacrificial (cathodic) protection to the base metal. Because of its high temperature capabilities, it offers excellent protection when exposed to cyclic high temperature and corrosive salt environments, continuing to provide sacrificial properties at temperatures to 1150°F. Although a ceramic coating, it combines thermal stability, excellent adhesion and hardness, along with good flexibility... a property not found in most ceramic coatings. As mentioned above it offers salt corrosive protection to 1150°F. At about 1200°F. the aluminum oxidizes to a point where it no longer provides its excellent sacrificial properties, however, it will continue to offer excellent heat oxidation continuously to 1600°F. and in some cases, depending on metal substrate, has offered heat oxidation protection to 2200°F.

Tests have been conducted using low carbon steel alloys. There was no loss of weight after several weeks continuous exposure at 1000°F. After exposure to 5% salt spray for 1000 hours, there was no evidence of corrosion.

Further, the coating formed from Alseal 519 composition offers superb thermal shock resistance. The coated metal will not crack, spall, or fail after shocking from 1100°F. to room temperature repeatedly.

The coating formed from Alseal 519 composition has all the excellent heat and corrosion resistant properties of Alseal 518 but was formulated to provide a somewhat smoother, denser and more abrasion resistant coating. Alseal 519 coating composition offers greater protective properties in combination of heat, weathering, corrosion, and oxidation resistance than organic paints and is lighter in weight and more flexible than most ceramic coatings.

**Technical Data**

| | |
|---|---|
| Volume Solids: | 40% |
| Number of Coats: | Dependent on application. |
| Film Thickness: | 2 mils DFT unless otherwise specified<br>-two coats may be required for 2 mils. |
| Theoretical Coverage @ 2 mils DFT: | 320 sq. ft./gallon |
| Dry Time @ 75°F., 50% R.H.: | To touch - 20 minutes |
| Prebake Oven Time @ 175°F.: | 15 minutes minimum |
| Cure Temperature 500°F. 600°F. Preferred: | 30 minutes minimum |
| Thinner: | Do not thin, use as received |
| Method of Application: | Spraying preferred |
| Clean Up: | Water |
| Shelf Life: | 1 year, if unopened |

319 TOWNSHIP LINE ROAD, SOUDERTON, PA 18964
(215) 723-0919 • Fax (215) 723-0911

**Test Data**
5% Salt Fog ASTM B117: 3000 hrs., no undercutting at scribe.
Falling Sand Abrasion ASTM D968: 1.5 mils lost after 300L.
Adhesion after 90 degree bend around 1/4" mandrel: Pass
Cyclic Heat / Salt Fog (1010 steel panels) - No corrosion after 10 cycles, each cycle consisting of 6 hrs. @ 875F followed by 18 hrs. in ASTM B117 salt fog. An additional 168 hrs. of B117 salt fog was run after the 10th cycle with no corrosion noted.
Tensile Adhesion (ASTM C633) - >8500 psi
Oxidation Resistance - 1.1% weight gain (36 sq. in. panel) after exposure at 1600F for 250 hours

**Surface Preparation**
Special care must be exercised in the preparation of the surface for all high quality, premium performance coatings.
1) Degreasing. All oil, grease and other organic deposits must be removed by suitable degreasing operation or by heating parts to temperature sufficiently high to facilitate removal.

2) Cleaning and Roughening. All old coats, mill scale, rust, or other tightly adherent deposits must be removed by a method such as dry grit blasting or vapor blasting. Grit blast, using clean aluminum oxide ($AL_2O_3$) grit, is the recommended cleaning procedure which is necessary for maximum adhesion to steel, although other abrasive methods may be satisfactory.

**Application of Coating**
Before applying coating, it is important that all aluminum powder be completely dispersed. Alseal 519 coating composition should be applied by spray application to obtain optimum smoothness and uniform film thickness. Use standard paint spray equipment. Equipment can be readily cleaned using tap water.
**Note**: This product is not to be thinned, use as received.

**Number of Coats**
Two coats with a minimum of 2 mils total dry film thickness is generally recommended, although there may be instances where one coat will suffice or where a thickness tolerance dictates one coat.

**Curing Procedures**
1) Dry to room temperature for a minimum of 15 minutes or until color is uniform matte light gray. If humidity is high and coating is drying slowly, it may be necessary to force dry at a low temperature, approximately 100 to 125°F. with air movement.

2) Prebake at 175°F. metal surface temperature for a minimum of 20 minutes (no maximum time). Large parts act as heat sinks and will require longer times.

3) Cure at a minimum of 500°F. for minimum of 30 minutes (no maximum time). Surface temperature of coated part must reach recommended cure temperature for 30 minutes.

4) Apply second coat immediately after parts have cooled to prevent possible contamination. Repeat cure cycle in steps 1, 2 and 3. **Note :** preferred cure temperature of 600°F. will yield a somewhat harder more abrasion resistant coating.

**Note**: This coating may be cured as low as 400°F. for two hours. Surface temperature must reach 400°F. and be held there for 2 hours. At 400°F. the coating will not be as hard or as abrasion resistant as when cured at higher temperatures, but will retain its excellent corrosion resistant properties.

**Surface Treatment**
Coating must be made electrically conductive to obtain sacrificial properties. There are two ways this can be done.

A) Coating may be post cured at 1025°F. for 60 minutes.

B) Coating may be burnished by any suitable method such as glass bead peening, or using aluminum oxide. It is important when using a blast cabinet for burnishing that 25 to 35 PSI be used in a suction blast cabinet and 5 to 10 PSI in a pressure blast cabinet.

**Note:** It is important that the coating is electrically conductive. Using light pressure with probes of an ohm meter held 1" apart, a reading of 10 ohms or less should be obtained.

**Removal of Coating**
If it should be necessary to remove the cured coating, it can be stripped by grit blasting or immersing in a hot (approximately 150°F.) caustic soda solution (approximately 10% caustic soda) then lightly grit blasting. Care should be taken when using a caustic solution since hydrogen will be generated. Area should be well ventilated.

**Toxicity**
Alseal 519 composition contains phosphoric acid and a small amount of chromic acid which are toxic. Normal precautions should be taken against ingestion, inhalation, and contact with eyes. Precautions should be taken to insure that the wet compound does not come in contact with sores or cuts.

Toxic phosphide may be given off in fire or other very high temperature conditions.

Contains hexavalent chromium. The national toxicology program lists chromium and certain chromium compounds to be carcinogenic.

See material safety data sheet before using.

**Precautions**
Contains aluminum metal powder, phosphate and dichromate. Normal precautions should be taken for handling of acidic materials. Avoid ingestion. Harmful or fatal if swallowed. Avoid inhalation of spray mist and contact with eyes. In case of eye contact flush immediately with plenty of water and consult a physician. Avoid prolonged or repeated contact with skin. For skin contact flush with plenty of water.

When spraying, a suitable exhaust system should be used. If spray mist is not completely removed from air, a suitable respirator should be used.

In case of spill, use absorbing material to soak up and neutralize with sodium bicarbonate. Do not use strong alkalis. Then flush with water.

**Waste Disposal Method:** Filter to remove aluminum and discard as solid chemical waste. Treat remaining liquid with sodium metabisulfite, then precipitate trivalent chromium by neutralizing with alkali such as lime. Dispose of waste in accordance with federal, state and local environmental control regulations.

**Important:** Avoid direct contact with alkalis and strong oxidizing or reducing agents since this may produce hydrogen gas.

Since this compound contains aluminum powder, a clean spray area and duct system are important. It is hazardous to allow an accumulation of dried material to occur since this dried material in the form of dust could be ignited by sparks or other means and possibly cause a dust explosion as with any finely divided powdered material.

**Note:** Some manufacturers requiring this coating composition develop their own procedure specifications and in all cases they should be followed in place of the foregoing procedures.