

# Aseal 500

## Application

High temperature, corrosion and oxidation resistant coating for ferrous alloys.

## Description

Aseal 500 is a brand name for a high temperature coating composition containing aluminum powder in an inorganic binder. The coating has the unique characteristic of curing as low as 350° F. for 1 hour, which is very low compared to other ceramic/inorganic coatings available. Compared to all organic coatings, the coating formed from Aseal 500 composition excels when exposed to cyclic high temperature conditions and corrosive environments. Organic based coatings and paints deteriorate when exposed to elevated temperatures for any appreciable time period, and the higher the temperature the shorter the life expectancy. Aseal 500 composition combines thermal stability and hardness along with good flexibility, superior adhesion, and excellent corrosion and oxidation protection at high temperatures. Most important, as service temperatures increase, the corrosion and oxidation protection also increases. The optimum operating temperature range for corrosive atmospheres (salt spray, etc.) is 900 1150° F. and the optimum operating temperature for oxidation environments is 900 1600° F. After reaching 1200° F., Aseal 500 will gradually lose its salt corrosion protection but will continue to offer oxidation protection, in some cases up 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 for 1000 hours, there was no evidence of corrosion. Further, the coating formed from Aseal 500 composition offers superb thermal shock resistance. The coated metal will not crack, spall, or fail after shocking from temperatures of 1100° F. to room temperature repeatedly.

The coating formed from Aseal 500 composition has properties vastly superior to those of organic paints and coatings and provides many advantages over purely ceramic coatings. Specifically, the film formed from Aseal 500 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.

## Thinners

Aseal 500 composition is supplied as a one component coating "ready for use". Do not thin. Before using, shake compound thoroughly on mechanical paint shaker. Shake or stir frequently when using coating compound in production.

## Technical Data

Volume Solids:	36%
Number of Coats:	Dependent on application.
Film Thickness:	2 mils DFT unless otherwise specified -two coats may be required for 2 mils.
Theoretical Coverage @ 2 mils DFT:	290 sq. ft./gallon
Dry Time @ 75°F., 50% R.H.:	To touch - 20 minutes
Prebake Oven Time @ 175°F.:	15 minutes minimum
Cure Temperature and time:	350F for 1hr. / 400-600F for 30 min. (preferred)
Thinner:	Do not thin, use as received
Method of Application:	Spraying preferred
Clean Up:	Water
Shelf Life:	1 year, if unopened

## Surface Preparation

The application of Aseal 500 composition is quite similar to that of other inorganic and ceramic coatings. In that, special care must be exercised in preparation of the surface as 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 paints, 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 grit, is the recommended cleaning procedure which is necessary for maximum adhesion to steel, although other abrasive methods may be satisfactory.

## Application of Coating

Spray Application: Before applying coating, it is important that all aluminum powder be completely dispersed. Aseal 500 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.

### **\*Dip Application: Aseal 585 should be used for dip applications.\***

Aseal 585 is a minor modification of Aseal 500 solely to improve its dipping properties. All Aseal 500 data can be applied to Aseal 585.

## Number of Coats

Two coats with a minimum of 2 mils dry film thickness is generally recommended, although there may be instances where one coat will suffice.

## Curing Procedures

A) Dry to room temperature for a minimum of 15 minutes or until color is uniform light gray. If humidity is high, it may be necessary to force dry at a low temperature of approximately 100° F.

B) Prebake at 175° F. for approximately 30 minutes (no maximum time).

C) Cure at 350° F. for one hour or 400 degrees F. for 1/2 hour (surface temperature of coated area must reach recommended cure temperature.) Note: it is recommended, when possible, to cure at 600° F. for 30 minutes. This temperature produces a harder more abrasion resistant coating; however the same excellent corrosion protection is retained when cured at 350° F. as when cured at 600° F.

D) Apply second coat and follow B&C above.

## 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 ohm 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 blasted. Care should be taken when using a caustic solution since hydrogen will be generated. Area should be well ventilated.

## Toxicity

Aseal 500 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 inhalation of spray mist as this may cause irritation of the mucous membranes and lungs. Avoid contact with eyes and skin. Wear goggles and protective gloves when handling and spraying. 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 area 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 alkalis 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 can happen 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.