



Oxidation Protection

Cerablak™ is an exceptionally promising oxidation-resistant coating because of its extremely low oxygen diffusivity. Cerablak™ forms a hermetic coating through very simple coating processes. Cerablak™ can be applied by dip coating, as well as by brush and spray painting. Both brush and spray coating techniques are easily scalable and are easily applied in the field.

Cerablak™ can be used as a protective coating for a wide variety of materials, effectively increasing their maximum-use temperature or extending their useful life at current temperatures. This can allow selection of a less expensive alloy for a specific application, or longer time periods between shut-down for inspection and maintenance.

Substrate	Temperature limit for protection in air with Cerablak™ coating
304 stainless steel	1000°C (1832°F)
Nickel-base superalloy	1150°C + (2100°F +)
SS321	1000°C (1832°F)
Inconel 718	760°C + (1400°F)

Although the Cerablak™ coating is very thin, it provides significant protection by promoting the growth of dense, stable oxide scale. The oxygen diffusivity through Cerablak™ is very low, and retards the growth of iron and nickel oxides. The low partial pressure of oxygen that is present at the interface between Cerablak™ and the substrate promotes the growth of more stable and protective oxides, like chromia and alumina.

Cerablak™ can be used as a protective coating on a wide variety of substrates.

Substrate	Use Temperature
Stainless steel Inconel Superalloys Alumina Silicon carbide	Above 800°C (1472°F)
Cast iron Calcium silicate Aluminum alloys	550-800°C (1022-1472°F)
Graphite Aluminum Borosilicate glass Copper	Below 550°C (1022°F)

Oxidation Behavior

Specific Weight gain for Cerablak™ coated and uncoated SS304. Note that the weight gain is much greater for the rough surface than the highly polished samples.

