



Technical Bulletin

Optēcoat™

(Patent pending)

Product Description

Optēcoat™ by Fireside Coatings is a dual color (sprayed on) composite ceramic coating specifically formulated to protect fireside boiler tubing while also acting as a visual inspection aid. The coating is an environmentally safe, non- reactive, water soluble composite ceramic that will withstand operating temperatures up to 2000°F (1093°C). Optēcoat™ is ideal for fluidized bed boilers and coal fired utility boilers experiencing tube erosion, corrosion and slagging. This sprayed-on ceramic coating system allows for fast application rates thus reducing equipment down time. Optēcoat™ is a high solids system that will withstand severe thermal cycling from -300°F (-185°C) to 1600°F (871°C). The unique composite system is applied in two distinct colors. The base (white) coat is formulated to provide high mechanical bonding and is erosion and corrosion resistant. The base coat can be applied up to .012 thick (300 microns). The top (green) coat can also be applied up to .012 thick (300 microns) both coats can achieve a final coating thickness of .024 (600 microns). This process allows for thicker applications that may be applied in areas that experience higher erosive wear such as roof tubes, refractory interface areas, corners and cyclone inlets. The top (green) coat forms a strong chemical bond to the base coat. The coating has exceptional erosion and corrosion resistance, high emissivity and is thermally neutral.

If severe erosion is experienced (after continued operation) the dual color Optēcoat™ will allow operators and inspectors to visually see any areas of erosion. These areas may begin to show the white base coat. Wear areas can then be identified and addressed before tube thinning or tube failure occurs. Coating thickness can be easily evaluated using a simple magnetic lift off device. Due to the coatings high bonding characteristics (if required),

Optēcoat™ can be brush blasted and re-applied to specification very quickly with limited down time and without removal of any existing ceramic coating.

Characteristics

- >Protects tube surfaces
- >Erosion and corrosion resistant
- >Resist slagging and scaling
- >Resistant to severe thermal cyclic conditions
- >High emissivity and thermally neutral (will not insulate)
- >Can be applied to both carbon and stainless steel substrates
- >Dual color application allows for visual verification of coating performance

Specification Data

Components	2- base (white) – top coat (green)
Type	Proprietary
Temperature resistance (metal temp.)	2000°F (1093°C)
Adhesion to substrate	+3,000 psi
Colors	White/Green
Finish	Smooth
Dry time @ 50% R.H., 70 deg. F.	To touch 1-2hr. to recoat 2 hrs. to cure 24 hours
Cure	2 hrs. at 180°F (82°C) 1 hr. at 300°F (149°C) 1 hr. at 450°F (232°C) operate as normal
Metal temperature during application	32°F to 200°F (0°C to 93°C)
Thinner	None required
Coverage 1 mil. d.f.t. (25.4 microns)	645 sq. ft. (60 sq. meters) est. 1 gallon (3.78 ltr.)
Coverage 12 mil. d.f.t. (305 microns) boiler water wall tubes	54 sq. ft. (5 sq. meters) per gallon (3.7854 ltr.)
Weight per gallon	15.2 lb. (6.9 kg)
Storage Temperature	32°F to 100°F (0°C to 38°C)
Shelf life (pre-mixed)	1 year

Surface Preparation

1. If required remove all chlorides, grease, oil, cutting compounds, UT coupling and oil based contaminants by solvent or steam cleaning before abrasive blasting begins.
2. Only **dry filtered** compressed air should be used in the abrasive blasting process. To achieve proper production rates, compressed air volume and pressure should be sized properly for the abrasive blasting equipment being used. Contact Fireside Coatings for specific application specifications.
3. Use only clean, washed, sharp blast abrasive that will create a .003 anchor tooth profile.
4. Blast surfaces to achieve a NACE 1, SSPC-SP5 white blast specification and a .003 anchor tooth profile.

Proper specification of abrasive blasted surface



Application Instructions

1. Surface temperature must be a minimum of 5°F (3°C) above the dew point. Do not apply to steel temperatures below 32°F (0 °C).
2. When applying the base (white) coat do not exceed maximum dry film thickness recommendations of .006 (150 microns).
3. Conventional spray system, pressure pot and agitator or airless spray is recommended. Pre-mixing is accomplished by using a drill with mechanical agitator. Insert the blade all the way to the bottom of the container. Mix until uniform. Continue to use mechanical agitation during the application process.
4. Apply the base coat in subsequent coats of approximately .003 (75 microns) thick.
5. Allow each coat to completely dry to the touch (est. 1-2 hour) before adding additional coats. Check coating thickness after each coat to assure proper thickness building is being achieved during application.
6. Standard minimum recommended thickness for the white base coat is min. .008-.012 (250-300 micron) after completing the base coat assure that the proper coating thickness has been achieved by inspection. Add additional coats as required to achieve the proper thickness specification for the base coat.
7. Apply the top (green coat) in subsequent coats as before. Assuring that each coat is completely dry before adding additional coats. Do not exceed the recommended coating thickness of .012 (300 microns) when applying the top coat.
8. Do not expose the ceramic coating to water or moisture before it is cured. Until fired the ceramic is uncured even when dry to the touch and may wash off with water until the curing procedure is completed.

Spraying base coat



Final thickness readings on base coat



Spraying top coat



Final thickness readings on top coat



Curing Procedure

1. After allowing the completed Optēcoat™ system to ambient dry above 50°F (10°C) For at least 24 hours curing can begin. Use the following procedures.
 - >2 hours at 180°F (88°C)
 - >1 hour at 300°F (149°C)
 - >1 hour at 450°F (232°C)

After one hour at 450°F (232°C) the Optēcoat™ system is ready for service

Typical Optēcoat™ application in CFB boiler showing both white base and green top coat



CFB (water wall) condition upon inspection after one year run in CFB boiler



Contact Information

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