Scotchkote®

3M

Fusion Bonded Epoxy Coating 206N

Designed for your specific corrosion protection needs

Scotchkote 3M Fusion Bonded Epoxy Coating Used on These Products:

WATER SPECIALTIES PROPELLER METER™

ULTRA MAG®

McCrometer, Inc. 3255 W. Stetson Avenue, Hemet, CA 92545 Phone: (951) 652-6811 Fax: (951) 652-3078
Web Site: http://www.mccrometer.com Hours: 8 A.M. - 4 P.M. PST, Monday-Friday
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PRODUCT DESCRIPTION

"Scotchkote" Brand 206N Fusion Bonded Epoxy Coating is a one-part, heat curable, thermo-setting powdered epoxy coating designed to provide maximum corrosion protection under widely varying operating conditions for both interior and exterior of pipe. The epoxy is applied to preheated steel as a dry powder which melts and cures to form a continuous, insulative corrosion barrier. This bonding process provides excellent adhesion and coverage on pipe, fittings, valves, couplers pumps and other equipment. Scotchkote 206N coating is resistant to corrosive soils, hydrocarbons, harsh chemicals and sea water.

FEATURES:

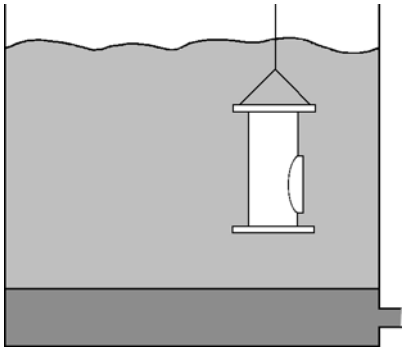
- Can be applied on girth welds in the yard or in the field.
- Allows easy visual inspection of pipe surface.
- Lightweight for lower shipping costs.
- Can be shipped with minimum damage.
- Can be stacked without padding.
- Storage in all climatic conditions without damage.
- Protects over wide temperature range.
- Resistant to soil stress and backfill compaction.
- High adhesion and toughness.
- Resistance to cathodic disbondment.
- Bendability exceeds requirements of ANSI B31.4 or B31.8 codes.
- "Scotchkote" 206N is United States Environmental Protection Agency and United Kingdom National Water Council acceptable for use as a coating in contact with potable water and meets the requirements of American Water Works Association Standard C213 and C550.
- 3M "Scotchkote" epoxy coating is NSF approved for use in potable water.
- Can be machined by grinding or cutting to meet close tolerance requirement.
- Can be painted with alkyd paint, acrylic lacquer or acrylic enamel.
- Resists abrasive action of light slurries.
- Good chemical resistance.
- Resists moisture penetration, bacteria & fungus attack, soil acids, alkalies & salts and other chemicals associated with underground and underwater use.
- Long-term performance history in water, sewage and other service environments.

PROPERTIES

Color	Blue-Green
Specific Gravity - Powder (Air Pycnometer)	1.44
Coverage	134 ft^2/lb/mil (0,700 m^2/kg/mm)
Fluidized Bed Density	25lb/ft^3 398 kg/m^3
Shelf Life at 80°F (27°C)	12 months
Gel Time at 450°F (232°C)	22-37 seconds
Minimum Explosibility Concentration	0.10 oz/ft^3 102g/m^3
Ignition Temperature	986°F (530°C)

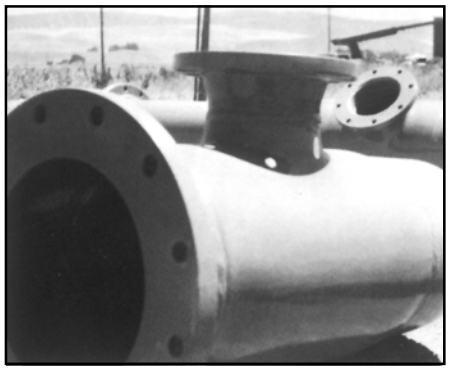
APPLICATION METHOD
FLUIDIZED BED

The fluidized bed consists of two chambers separated by a specially designed porous membrane which serves to uniformly diffuse air throughout the coating powder. In proper operation, the resin expands to twice its original volume, ready to accept preheated objects. The fluidized bed is perhaps the fastest coating method. When used with Scotchkote coatings, maximum uniformity can be obtained without sags, runs or pinholes.



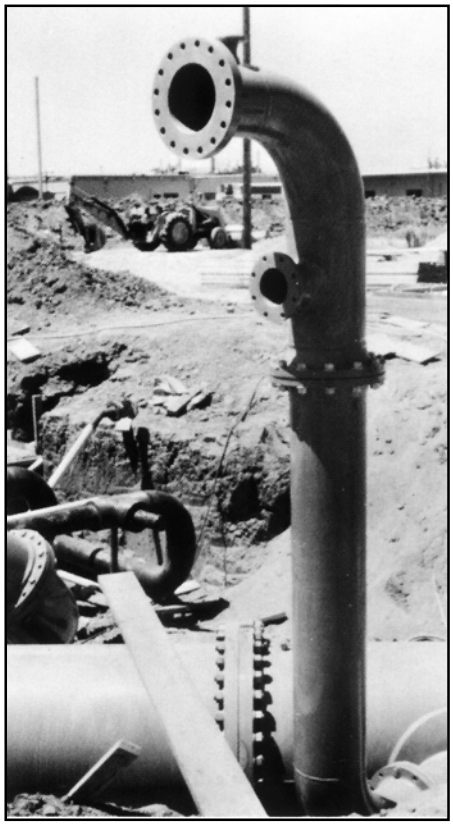
OPERATING TEMPERATURE LIMITS

"Scotchkote" 206N, when properly applied, should perform in a satisfactory manner on pipelines operating between -76°F and +230°F (-60°C and +110°C). For temperatures between +170°F and +230°F (+75°C and +110°C), laboratory tests indicate that thicker coatings may improve the service capability of the coating. However, it is difficult to accurately predict field performance from laboratory data due to the wide variation in actual field conditions. Soil types, moisture content, temperatures, coating thickness and other factors peculiar to the area all influence the coating performance and the upper temperature operating limit.



IMPORTANT NOTICE

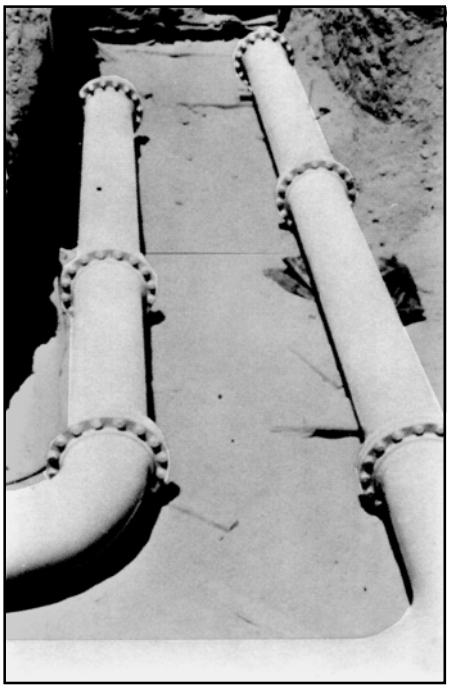
All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties, express or implied: Seller's and manufacturer's only obligation shall be to replace such quantity of the product proved to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his intended use, and user assumes all risk and liability whatsoever in connection therewith. No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by officers of seller and manufacturer.



TO THE SPECIFYING ENGINEER:

HOW TO SPECIFY SCOTCHKOTE COATING

TO THE ENGINEER: Outlined here is an example of a typical coating specification used to employ a Scotchkote Fusion Bonded Epoxy Coating on an item such as a water fitting for asbestos-cement pipe.



COATING SPECIFICATION- FUSION BONDED EPOXY COATING

MATERIAL: The lining and coating material shall be of 100% solids, thermosetting fusion bonded, dry powder epoxy coating such as Scotchkote 206N (3M Company) or approved equal and shall be NSF approved for potable water.

APPLICATION: The epoxy powder shall be applied by the fluidized bed process. The thickness of the lining and coating shall not be less than 10 mils (254 microns). Fittings shall be heated and cured in accordance with the manufacturer's specifications.

SURFACE PREPARATION: All surface irregularities, welds and weld spatter shall be ground smooth to a 1/8 in. (3,18 mm) radius. All surfaces shall be blasted to near-white metal in accordance with Steel Structures Painting Council Surface Preparation Specification SSPC-SP10 or NACE No. 2 near-white finish.

INSPECTION: The lining and coating shall be pinhole-free and tested with a low voltage, wet sponge holiday detector. All pinholes shall be marked, repaired and retested to insure a pinhole-free coating.

FIELD WELDS AND FIELD DAMAGE REPAIR

MATERIAL: All pinholes, welds and damaged areas shall be patched with Scotchkote 312 coating, a two-component, 80% solids liquid epoxy coating.

PROCEDURE: All field welds shall be ground smooth. The joint area should be wire brushed, sandblasted or sanded to white metal; care should be taken to remove all charred or carbonized coating from the joint area. Lightly abrade or sandblast the Scotchkote 206N coating on either side of the weld before application of the liquid epoxy coating. Apply Scotchkote 312 coating to a minimum coating thickness of 10 mils (254 microns).

Small nicks or chips in the Scotchkote 206N coating caused by field handling should be prepared prior to the application of Scotchkote 312 coating using a suitable solvent to remove all oils, grease, oxidation or other contaminants. If rust is apparent in the damaged area, remove as much as possible by wire brushing, grinding, filing or sanding. If the damaged area is more extensive, it is advisable to abrade or lightly sandblast to roughen the surface of the Scotchkote 206N coating before solvent washing and application of Scotchkote 312. Again, care should be taken to remove as much rust as possible in an attempt to achieve a white metal surface.

Chemical Resistance Properties (Exposure at 73°F [23°C])*

Below is a partial listing of tests made on Scotchkote 206N Fusion Bonded Epoxy Coating for chemical resistance.

- Acetic Acid up to 25%
- Acetone (Softened)
- Aluminum Chloride
- Aluminum Hydroxide
- Aluminum Nitrate
- Aluminum Sulfate
- Ammonium Carbonate
- Ammonium Chloride
- Ammonium Hydroxide (up to 100%)
- Ammonium Nitrate
- Ammonium Phosphate
- Ammonium Sulfate
- Amyl Alcohol
- Barium Carbonate
- Barium Chloride
- Barium Hydroxide
- Barium Nitrate
- Barium Sulfate
- Benzene
- Boric Acid
- Borax
- Butyl Alcohol
- Cadmium Chloride
- Cadmium Nitrate
- Cadmium Sulfate
- Calcium Carbonate
- Calcium Chloride
- Calcium Hydroxide
- Calcium Nitrate
- Calcium Sulfate
- Calcium Disulfide
- Carbon Tetrachloride
- Caustic Potash
- Caustic Soda
- Chlorine (2%)
- Citric Acid up to 25%
- Copper Chloride
- Copper Nitrate
- Copper Sulfate
- Crude Oil
- Cyclohexane
- Cyclohexane
- Cyclopentane
- Detergent
- Diesel Fuel
- Diethylene Glycol
- Dipropylene Glycol
- Ethanol (Softened)
- Ethylbenzene
- Ethylene Glycol
- Ferric Chloride up to 50%
- Ferric Nitrate
- Ferric Sulfate
- Ferrous Nitrate
- Ferrous Sulfate
- Formaldehyde up to 100%
- Formic Acid up to 10%
- Freon, Gas & Liquid
- Gas (Mfg.)
- Gas (Natural)
- Gasoline Leaded
- Gasoline Unleaded
- Glycerin
- Heptane
- Hexane
- Hexylene Glycol
- Hydrochloric Acid up to 25%
- Hydrofluoric Acid up to 40%
- Hydrogen Sulfide
- Isopropyl Alcohol
- Jet Fuel
- Kerosene
- Linseed Oil
- Lubricating Oil
- Magnesium Carbonate
- Magnesium Chloride
- Magnesium Hydroxide
- Magnesium Nitrate
- Magnesium Sulfate
- MEK (Softened)
- Mercuric Chloride
- Methanol (Softened)
- MIBK (Methyl-Isobutyl-Ketone)
- Mineral Oil
- Mineral Spirits
- Molasses
- Motor Oil
- Muriatic Acid
- Naphtha
- Nickel Chloride
- Nickel Nitrate
- Nickel Sulfate
- Nitric Acid up to 30%
- Nonane
- Octane
- Oxalic Acid
- Pentane
- Perchloroethylene
- Phosphoric Acid up to 50%
- Phosphorous Trichloride
- Potassium Aluminum Sulfate
- Potassium Bicarbonate
- Potassium Borate
- Potassium Carbonate
- Potassium Chloride
- Potassium Dichromate (up to 10%)
- Potassium Hydroxide
- Potassium Nitrate
- Potassium Sulfate
- Propylene Glycol
- Sewage
- Silver Nitrate
- Soap Solution
- Soaps
- Sodium Bicarbonate
- Sodium Bisulfate
- Sodium Carbonate
- Sodium Chlorate
- Sodium Chloride
- Sodium Meta Silicate (up to 5%)
- Sodium Nitrate
- Sodium Sulfate
- Sodium Thiosulfate (up to 50%)
- Stannic Chloride
- Sulfur
- Sulfuric Acid up to 60%
- Synthetic Sea Fuel (60% Naphtha, 20% Toluene, 15% Xylene, 5% Benzene)
- Synthetic Silage
- Tetrapropylene
- Toluene
- Trichloroethylene (Softened)
- Triethylene Glycol
- Trisodium Phosphate
- Turpentine
- Undecanol
- Urea
- Urine
- Vinegar
- Water
  - Chlorinated
  - Demineralized
  - Distilled
  - Salt
  - Sea
- Xylol
- Zinc Chloride
- Zinc Nitrate
- Zinc Sulfate
- 10-10-10 Fertilizer (Saturated)

* Tests conducted for two years on similar products. No effect unless otherwise stated.

TEST DATA - COATING

PROPERTY	TEST DESCRIPTION	RESULTS
ABRASION RESISTANCE	ASTM D 1044, CS-17 wheel 1000 g weigh, 5000 cycles	0,114 g loss
ADHESION	ASTM D 4551-89	>3000 psi (210 kg/cm^2)
ADHESION TO STEEL (Shear)	ASTM D 1002	6150 psi (433 kg/cm^2)
BENDABILITY[1]	72°F (22°C) 20°F (-7°C) -3°F (-19°C) -17°F (-27°C) -40°F (-40°C)	>1.5%/diameter length >1.5%/diameter length >1.5%/diameter length >1.5%/diameter length >1.2%/diameter length
BENDABILITY[1] After 2 Years Outdoor Exposure	72°F (22°C)	>1.5%/diameter length
CATHODIC DISBONDMENT	90 day, 1.5 volts 3% ASTM G 8 salt solution	Disbondment diameter 24 mm average
COEFFICIENT OF FRICTION	API RP5L2 - 1968 Appendix 8	10.8°
COMPRESSIVE STRENGTH	ASTM D 659	11600 psi (819 kg/cm^2)
ELECTRIC STRENGTH	ASTM D 1000	1150 volts/mil - 45 kv/mm
ELONGATION	ASTM D 2370	6.9%
HARDNESS	Barcol ASTM D 2583	18
HOT WATER RESISTANCE	212°F (100°C) immersion 1000 hours	No blistering, good adhesion, slight discoloration, surface roughening and softening
IMPACT	Gardner 5/8" (1,6 cm) diameter tup 1/8" x 3" x 3" (0,32 cm x 7,6 cm x 7,6 cm) steel panel	160 in-lbs 1.8 kg•m
MOISTURE VAPOR TRANSMISSION	MIL-I-16923E	4.5 X 10^{-7} g/hr/cm/cm^2
PENETRATION	ATSM G 17 -40° to 240°F (-40° to 116°C)	0.0
SALT CROCK	90 day, 5 volt, 5% NaCl 90 day, 1.5 volt, 3% ASTM G 8 salt solution 90 day, 6 volt, 3% ASTM G 8 salt solution 30 day, 5 volt, 5% NaCl sand crock 230°F (110°C) 180 day, 1.5 volt, 3% ASTM G 8 salt solution sand crock 230°F (110°C) panel temperature 26 mil (0,660 mm) coating thickness	Disbondment diameter 29 mm average Disbondment diameter 24 mm average Disbondment diameter 31 mm average Disbondment diameter 26 mm average Disbondment diameter 39 mm average
SALT FOG	ASTM B 117 1000 hrs	No blistering, no discoloration, no loss of adhesion
SOIL STRESS - Burial	Bureau of Reclamation 25 cycles	No effect
TENSILE STRENGTH	ASTM D 2370	9300 psi (654 kg/cm^2)
THERMAL CONDUCTIVITY	MIL-I-16923E	6-10^{-4} cal/sec/cm^2/°C/cm
THERMAL SHOCK	310° to -100°F (154° to -73°C) 4" x 4" (10,2 cm x 10,2cm) coated panel	10 cycles no effect
VOLUME RESISTIVITY	ASTM D 257	1.3 x 10^{15} ohm•cm
WATER ABSORPTION	ASTM D 570 free film, 140°F (60°C), immersion 28 days	<3.0%
WEATHEROMETER	ASTM G 53, 1000 hrs	Surface chalk

[1]Tests conducted on coupons cut from production coated 26" O.D., .406" wall X52 pipe 12 mil (0,305 mm) average coating thickness.