



# Scotchkote™


## 134 Fusion-Bonded Epoxy Coating

### Product Description

3M™ Scotchkote 134 Fusion-Bonded Epoxy Coating is a one-part, heat curable, thermosetting epoxy coating designed for corrosion protection of metal. The epoxy is applied to preheated steel as a dry powder which melts and cures to a uniform coating thickness. This bonding process provides excellent adhesion and coverage on applications such as valves, pumps, pipe drains, hydrants and porous castings. Scotchkote 134 coating is resistant to wastewater, corrosive soils, hydrocarbons, harsh chemicals, and sea water. Powder properties allow easy manual or automatic application by electrostatic or air-spray equipment.

### Product Features

- No primer required for most applications.
- Particularly suitable for electrostatic or air-spray application on preheated metal articles.
- Can be electrostatically applied to unheated metal parts and subsequently cured by baking.
- Long gel time allows application on large or complex articles, minimizing fear of runs, sags, laminations, or unsightly overspray.
- Especially useful for coating the inside of pipe or other fabrications where a smooth, corrosion resistant coating is required.
- Can be machined by grinding or cutting to meet close tolerance requirements.
- Allows easy visual inspection of coated articles.
- Can be painted with alkyd paint, acrylic lacquer, polyurethane, or acrylic enamel for color coding.
- Will not sag, cold flow, or become soft in storage. Long term storage under most climatic conditions.
- Lightweight for lower shipping costs.
- Protects over wide temperature range.
- Resists direct burial soil stress.
- High adhesion and toughness.
- Resists cavitation and cathodic disbondment.
- Excellent chemical resistance.

- Suitable for elevated temperature service in presence of H<sub>2</sub>S, CO<sub>2</sub>, CH<sub>4</sub>, crude oil and brine when applied over phenolic primer such as Scotchkote 345.
- Long-term performance history in water, sewage, and other service environments.
- Scotchkote 134 coating has been tested and certified to ANSI/NSF Standard 61, Drinking Water System Components. 
- Scotchkote 134 FBEC meets the requirements of AWWA Standard C213 and C550.
- Operating temperature dry is 235°F/ 113°C and wet is 175°F/79°C.

### General Application Steps

1. Remove oil, grease and loosely adhering deposits.
2. Abrasive blast clean the surface to NACE No. 2/SSPC-SP10 ISO 8501:1, Grade SA 2 1/2 near-white metal.
3. Apply mechanical masks or mask with materials such as Scotch™ Glass Cloth Tape 361 or Scotch Aluminum Foil Tape 425 as required.
4. Preheat article to the desired application temperature per cure specifications.
5. Deposit Scotchkote 134 coating by powder spray to the specified thickness.
6. Cure according to cure specifications.
7. Visually and electrically inspect for coating flaws after the coating has cooled.
8. Repair all defects.

### Cure Specifications

Scotchkote 134 coating may be applied to metal articles which have been preheated to a temperature of 300°F/149°C to 475°F/246°C. After application, Scotchkote 134 coating must be cured according to the cure guide to achieve maximum performance properties.

If Scotchkote 134 coating is electrostatically applied to unheated parts, the cure time should be measured from the time the coated part reaches the cure temperature. After cure, the coating may be force cooled using air or water to facilitate inspection and handling.

### 3M Scotchkote 134 Fusion-Bonded Epoxy Coating Cure Guide

Temperature of Article at Time of Powder Application	Typical Gel Time	Cure Time
475°F/246°C	40 seconds	7 minutes
450°F/232°C	60 seconds	10 minutes
400°F/204°C	120 seconds	15 minutes
350°F/177°C	330 seconds	25 minutes

## Typical Properties

Property	Value
Color	Forest Green
Specific Gravity - Powder (Air Pycnometer)	1.51
Coverage	127 ft <sup>2</sup> /lb/mil (0,66 m <sup>2</sup> /kg/mm)
Fluid Bed Density	33 lbs/ft <sup>3</sup> (530 kg/m <sup>3</sup> )
Shelf Life at 80°F/27°C	18 months
Average Gel Time 400°F/204°C	120 seconds
Edge Coverage	12% to 18%
Minimum Explosive Concentration	0.03 oz/ft <sup>3</sup> (30,6 g/m <sup>3</sup> )
Ignition Temperature	986°F/530°C

## Chemical/Pressure/Temperature Resistance

All tests performed on Scotchkote™ 134 Fusion Bonded Epoxy Coating applied over a 1 mil/25,4 µm phenolic primer.  
Liquid phase for all test conditions: 33% kerosene, 33% toluene, 34% brine solution of 5% NaCl.

Test Conditions	Gas Phase	Results
Autoclave, 120°F/49°C 48 hours, 1500 psi/10.3 MPa	99.5% CO <sub>2</sub> 0.5% H <sub>2</sub> S	Excellent adhesion, no coating loss or blisters in aqueous, hydrocarbon, or gas phase
Autoclave, 150°F/66°C 48 hours, 2200 psi/15.2 MPa	80% CH <sub>4</sub> 12% CO <sub>2</sub> 8% H <sub>2</sub> S	Excellent adhesion, no coating loss or blisters in aqueous, hydrocarbon, or gas phase
Autoclave, 200°F/93°C 24 hours, 3300 psi/22.8 MPa	86% CH <sub>4</sub> 8% CO <sub>2</sub> 6% H <sub>2</sub> S	Excellent adhesion, no coating loss or blisters in aqueous, hydrocarbon, or gas phase
Autoclave, 300°F/149°C 24 hours, 3000 psi/20.7 MPa	90% CH <sub>4</sub> 10% CO <sub>2</sub> Trace H <sub>2</sub> S	Excellent adhesion, no coating loss or blisters in aqueous, hydrocarbon, or gas phase

## Chemical Resistance Exposure at 73°F/23°C\*

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

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

# 3M™ Scotchkote™ 134 Fusion-Bonded Epoxy Coating Test Data

Property	Test Description	Results
<b>Adhesion</b>	Elcometer	> 3000 psi (glue failure)/ 210 kg/cm <sup>2</sup>
<b>Adhesion to Steel (Shear)</b>	ASTM D 1002 10 mil/254 µm glue line	4300 psi/302 kg/cm <sup>2</sup> cohesive failure
<b>Impact</b>	Gardner 5/8 in/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
<b>Hardness</b>	Barcol ASTM D 2583	23
<b>Abrasion Resistance</b>	ASTM D 4060 CS-17 1000g weight / 5000 cycles	0,07 g loss
<b>Thermal Shock</b>	310°F/154°C to -320°F/-195°C coated pipe	10 cycles, no effect
<b>Penetration</b>	ASTM G 17 -40°F/-40°C to 240°F/116°C	0
<b>Tensile Strength</b>	ASTM D 2370	7300 psi/512 kg/cm <sup>2</sup>
<b>Elongation</b>	ASTM D 2370	4.2%
<b>Compressive Strength</b>	ASTM D 695	12800 psi/900 kg/cm <sup>2</sup>
<b>Coefficient of Friction</b>	API RP5L2-1968, App 8	23°
<b>Electric Strength</b>	ASTM D 149	1000 volts/mil (39,4 kv/mm)
<b>Hot Water Resistance</b>	160°F/71°C immersion / 120 days	Good adhesion, no blistering
<b>Electrical Resistivity</b>	ASTM D 257	1.2 x 10 <sup>15</sup> ohm•cm
<b>Thermal Conductivity</b>	MIL-I-16923E	7 x 10 <sup>-4</sup> cal/sec/cm <sup>2</sup> /°C/cm
<b>Water Absorption</b>	3M 10 mil/254 µm free film 30 days	6,5 g/m <sup>2</sup>
<b>Fungus Resistance</b>	MIL-STD 810-B Method 508	Funginert
<b>Salt Fog</b>	MIL-E-5272C	No effect
<b>Weatherometer</b>	ASTM G 23 5000 hours	Surface chalk
<b>Soil Stress - Burial</b>	Bureau of Reclamation 25 cycles	No effect
<b>Salt Crock</b>	30 day, 5 volt, 5% NaCl sand crock 230°F/110°C	Disbondment diameter 24 mm average
<b>Bendability</b>	3/8"9,5 mm coupon mandrel bend at 73°F/23°C	30 pipe diameters 1.9° / diameter length

## Handling and Safety Precautions

Read all Health Hazard, Precautionary, and First Aid statements found in the Material Safety Data Sheet, and/or product label of chemicals prior to handling or use.

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## Corrosion Protection Department

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