
DESCRIPTION:

Nukote Chemshield FC is a plural component system composed of a proprietary polymeric binder, providing excellent performance in highly corrosive, chemical and abrasive environments, at ambient or elevated temperatures. This product is designed for industrial use at elevated temperatures and will maintain its physical properties under continued exposure at high constant temperature both in exposed as well as immersion conditions. Nukote Chemshield FC is resistant to many solvents, hydrocarbons, steam, chemicals including high levels of hydrochloric acid, sulphuric acid, Alkalis, Mineral Spirits, Cutting oil, Sulphur fumes, Seawater, in ambient or elevated temperatures. Nukote Chemshield FC has good bond to rubber, metal as well as concrete surfaces and also is suitable in cryogenic applications. Chemshield FC is excellent for lining vessels in direct constant contact with hydrochloric acid at elevated temperature and acid fumes.

FEATURES:

- 100% solids with excellent resistance to equipment exposed to high-pressure process fluids and gas mixtures
- Self-priming, Fast curing and back to service in 24 hours
- Excellent chemical resistance to wide range of chemicals
- Excellent resistance to hydrocarbons, water and gases rich in H₂S and CO₂
- Resists rapid decompression and steam out process
- Good bond to rubber and tenacious bond to metals
- High temperature resistance- up to 200 °C (390 °F)
- Inflammable without carbonization
- Good erosion, abrasion and impact resistance

TYPICAL USES:

- Internal and external coating for flow lines and transmission lines
- Petroleum and chemical tanks, process equipment, bulk carriers
- Specifically designed for gas pressure / separator vessels and down-hole tubulars
- Offshore rigs and platforms
- Sour gas pipelines and process equipment.
- Repairs of Pitted steel

COLORS:

Standard grey only.

PACKAGING:

3.5-gallon (14-liter) kits, shipped in plastic pails of 3 gallons (12 liters) of side A and 0.5 gallons (2 liters) side B.
0.8-gallon (3-liter) kits, shipped in plastic pails of 0.7 gallons (2.57 liters) of side A and 0.1 gallons (0.43 liters) side B

COVERAGE:

Nukote Chemshield FC may be applied at any rate to achieve the desired thickness. Calculation for theoretical coverage: 40 Ft²/gal @ 40 mils (1 m²/liter @ 1mm).

STORAGE:

Eighteen to twenty four months in factory delivered, unopened drums. Store on pallets and keep away from extreme heat, freezing, and moisture. The use of drum heaters is encouraged to reduce material viscosity at low temperatures.

| TECHNICAL DATA (All values @ 77 °F / 25 °C) | US | Metric |
|---|---|-----------------------------|
| Solids by volume (ASTM D2697) | 100% | 100% |
| Volatile organic compounds (ASTM D2369) | 0 lb./gal | 0 gm/ lit |
| Theoretical coverage | 40 ft ² /gal @ 40 mils | 1m ² / lit @ 1mm |
| Specific Gravity of materials (ASTM D792) | A: 13. 5, B: 9.01 lbs./gal | A: 1.62, B: 1.08 kg/ liter |
| Viscosity at 77 °F /25 °C in cps ±10% (ASTM D4878) | A-300000, B-4000 | A-300000, B-4000 |
| Shelf life @ 77 °F /25 °C | 18 to 24 months | 12 to 18 months |
| Tensile strength (ASTM D412-C) | 4350 to 5100 psi | 30 to 35 MPa |
| Elongation (ASTM D412-C) | 0.1-2 % | 0.1-2 % |
| Hardness (ASTM D2240) | 90 Shore D | 90 Shore D |
| Flexural strength (ASTM D790) | 7250 - 8700 psi | 50 - 60 MPa |
| Water absorption -24 hours (ASTM D570) | < 0.5 % | < 0.5 % |
| Adhesive tensile shear (ASTM D1002) | 2500 -3000 psi | 17 -21MPa |
| Thermal Fatigue ASTM D 6944 (-31 °F/ -35 °C to 248 °F/ 120 °C,)- 20 cycles | No cracking, checking, blistering or loss of adhesion | |
| Pinhole Pressure Test @ 1400 psi (100 kgf/cm ²) 1/8”(3 mm) hole, 30 minutes (in-house test) | Pass | |
| Impact Resistance (ASTM D 256) Izod impact test (reverse) | 10.1 in.lbs/in | 45J/m |
| Flash point Pensky Martin | N/A | N/A |
| Service temperature Dry, Spike, Immersion * | 345 °F , 400 °F, 300 °F | 175 °C, 200 °C, 150 °C |
| Abrasion Resistance (ASTM D4060) weight loss | < 45 mg loss Taber CS 17 wheel 1Kg/1000 rev | |
| PROCESSING PROPERTIES (Under standard lab conditions) | | |
| Mix Ratio V/V | 6 A :1 B | |
| Gel time | 15 to 20 minutes | |
| Tack free time (DFT & Temperature dependent) | 30 to 45 minutes | |
| Post cure time | 4 to 6 hours | |
| <i>Properties and values are highly dependent on equipment, spray gun, mix chamber temperature, pressure and related parameters. Variations are possible and expected. .* Please consult NCSI prior to use on suitability</i> | | |

MIXING:

Nukote Chemshield FC might not be diluted under any circumstance. Mixing ratio for Chemshield FC is 6:1 by volume. Add 6 parts of Base (A) to 1 part of Hardener (B) to a wide mouthed mixing container. Mix gently the Side A (base)

using a heavy duty slow speed drill fitted with a mixing paddle or commercially available paint mixers. Add side B (hardener) to side A and mix it thoroughly until a streak free homogeneous colour is obtained. Chemshield FC is ready to be applied. Mix only the quantity that can be used during the pot life. Discard material when the mixed material start gelling and do not try to re-use by adding thinner. Mixing this product manually by hand is not recommended. When environment temperature is 50 °F (10°C) or lower, the product can be indirectly heated to 70 – 75 °F (20-25 °C). This will make mixing easier and accelerate the curing and may have effect on Pot life. The mixed material will develop high exothermic heat and it is advisable to use small quantity to prevent wastage and mix it in a wide mouth container keeping the mixing vessel in cold/ice water where possible.

SURFACE PREPARATION:

Concrete:

The surface of a concrete subfloor should be dry, smooth, structurally sound and free of depression, scale, or foreign deposits of any kind. Remove all curing compounds. Abrasive blast, sweep blast or water blast to remove all latent material and expose voids. Use a good quality epoxy filler or mortar for void and spall filling, skim coat or repairs. Prime, fill imperfections in the substrate surface to limit out-gassing. All concrete substrates, on or below grade level should be tested for moisture content. On-grade or below-grade concrete floors or slabs should have a moisture barrier installed to protect from ground moisture. The surface preparation of concrete should meet and conform to Joint NACE 6/SSPC-SP 13 standards and achieve a concrete surface profile of CSP 3 to CSP 6 as per ICRI Guideline No.03732 for optimum performance.

Metal:

All surfaces should be clean and free from contamination. The surface should be assessed and treated in accordance with ISO 8504, Abrasive blast the surface to minimum NACE-1/SSPC SP-5/Sa 3, as per ISO 8501-1, for a visual assessment of surface cleanliness with an anchor profile of 3 to 4 mils (75 -100 microns). Soluble salts must be removed to an acceptable levels. *Refer to NCSI surface preparation manual for detailed procedures for different types of substrates.*

APPLICATION:

This product is ideally applied by airless spray equipment. The Nukote recommended spray equipment is GRACO EXTREME XP 70 or similar which will completely avoid material loss due to exothermic heat, Gelling and pot life. (Please contact NCSI technical department for Equipment type and configuration). Trowel grade material is also available for a higher DFT, metal repair and rebuilds application. Chemshield FC is applied over properly repaired substrates in the method most suitable for the application type. Complete application details are provided in SDS. Supplementary data sheet.

EQUIPMENT CLEAN UP:

Cured product may be disposed of without restriction. Uncured activator and resin portions should be mixed together and disposed of in accordance with local regulations. Containers should be disposed of according to local environmental laws and ordinances.

LIMITATIONS:

Do not open until ready to use, and store in a sealed container after opening. Do not leave it on open sun. Not good for applications below 45 °F (7 °C).

WARNING:

This product contains Amine and curatives

CHEMICAL RESISTANCE:

Each Nukote product formulation has varying levels of resistance to specific chemicals. Please review the chemical immersion test data included in the Nukote Test Book for general resistance to specific chemicals at specific concentration levels. Chemical concentrations are complex and when combined with temperatures above ambient levels this complexity increases exponentially. Contact Nukote Technical Personnel for specific recommendations for chemical resistance prior to specifying these products in this application type. Consult with NCSI for more details on product and chemical resistance. The following chart is the results of Polyurea immersed in chemicals and tested as per modified ASTM D 3912.

| Chemicals | Resistance | Chemicals | Resistance |
|--|------------|----------------------------------|------------|
| Hydrochloric acid upto 33% at elevated temperature | R | Xylene, Toluene | R |
| Sulphuric Acid 70% | R | Acetone, MEK | R |
| Sulphuric Acid 50% at elevated temperature | R | Hydrogen Peroxide 30% | R |
| Nitric Acid 15% | R | Refined Petroleum products | R |
| Acetic Acid 10% | R | Sewage, Waste water | R |
| Crude Oil, JetFuel | R | Most Industrial effluents | R |
| Water @ 302 °F (150 °C) | R | Diesel Fuel, Gasoline (unleaded) | R |
| Motor Oil, Lubricants | R | Methanol, Ethanol | R |

R = Resistant RC = Slight surface change or discolouration with no loss of hardness

WARRANTIES AND DISCLAIMERS:

Nukote Coating Systems International, a Nevada, USA Corporation warrants that the two components of this product shall conform to the technical specifications published in the product literature. The quality and fitness of the product is dependent upon the proper mixture and application of the components by the applicator. Nukote Coating Systems has no role in the application of the finished polymer other than to manufacture and supply its two components. It is vital that the person applying this product understands the product and is fully trained and certified in the use of plural component equipment and application of plural component materials. There are no warranties that extend beyond the description on the face of this instrument, except when provided in writing, directly by Nukote Coating Systems International and executed under seal by a company officer.