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**Description:**

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Nukote Chemshield MS is a plural component system composed of metals and ceramics in a polymeric binder, providing excellent performance in corrosive, chemical and abrasive environments, at ambient or elevated temperatures. This product is designed for industrial use at elevated temperatures and will maintain its gloss, physical properties under continued exposure at high constant temperature in exposed conditions. Nukote Chemshield MS is resistant to spillages of many solvents, chemicals including high levels of hydrochloric acid, sulphuric acid mineral spirits, cutting oil, sulphur fumes, seawater, in ambient or elevated temperatures. Chemshield MS is also suitable in cryogenic applications.

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**Features:**

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- 100% solids with zero VOC
- High temperature resistance- up to 430 °F (220 °C )
- Excellent abrasion resistance
- Strong chemical resistance
- Spray or brush and roller applied
- Can be applied on slightly damp surface
- Excellent adhesive bond in power tool prepared surfaces
- Gloss retention properties and very less chalking

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**Typical uses:**

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- Protective coating for flow lines and transmission lines in elevated temperature
- External coating for storage tanks holding hot cargoes
- Petroleum and chemical tanks, process equipment, bulk carriers
- Offshore rigs and platforms

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**Colors:**

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Standard grey. Custom colors, blended to match close to few RAL numbers, are available upon request subject to minimum quantity and color

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**Packaging:**

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4.23-gallon (16-liter) kits, shipped in plastic pails of 3.2 gallons (12 liters) of side a and 1.1 gallons (4 liters) side b  
Smaller package 1-gallon is available for order size more than 500 gallons

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**Coverage:**

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Nukote Chemshield MS should be applied at 6-8 mils (150-200 microns) DFT each coat to achieve the recommended thickness. Theoretical coverage: 400 ft<sup>2</sup> /gal @ 4 mils (10 m<sup>2</sup>/liter @ 100 microns).

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**Limitations:**

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Do not open until ready to use, and store in a sealed container after opening. Do not leave it on open sun. Do not subject it to cyclic weather.

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**Storage:**

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Twelve to eighteen 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	400 ft <sup>2</sup> /gal @ 4 mils	10m <sup>2</sup> / lit @ 100 microns
Specific gravity of materials (ATM D792)	A: 13.8, B: 8.3 lbs./gal	A: 1.65, B: 0.99 kg/ liter
Viscosity at 77 °F /25 °C in cps ±10% (ASTM D4878)	A-180000, b-1000	A-180000, b-1000
Shelf life @ 77 °F /25 °C	12 to 18 months	12 to 18 months
Tensile strength (ASTM D412-C)	4900 - 5600 psi	35 - 40 MPA
Hardness (ASTM D2240)	80-85 shore D	80- 85 shore D
Flexural strength (ASTM D790)	8400 - 9800 psi	60 -70 MPA
Water absorption -24 hours (ASTM D570)	< 0.5 %	< 0.5 %
Adhesive shear strength (ASTM D1002)	2000 - 2300 psi	14 - 16 MPA
Thermal fatigue (-31 °F/ -35 °C to 248 °F/ 120 °C, 20 cycles)	Pass	Pass
Impact resistance (ASTM D 256 ) izod impact test (reverse)	10.1 in.lbs/in	45 j/m
Flash point pensky martin	N/A	N/A
Heat resistance dry, spike	345 °F , 400 °F	175 °C, 200 °C
Abrasion resistance (ASTM D4060) weight loss	< 45 mg loss taber CS17 wheel 1kg/1000 rev	
Processing properties (under standard lab conditions)		
Mix ratio v/v	3 A :1 B	
Gel time	30 to 45 minutes	
Tack free time ( DFT & Temperature dependent)	4 hours	
Post cure time	24 hours	
<i>Properties and values are highly dependent on equipment, spray gun, mix chamber temperature, pressure and related parameters. Variations are possible and expected.</i>		

**Mixing:**

Mixing ratio for Chemshield MS is 3:1 by volume. Add 3 parts of base (a) to 1 part of hardener (b). 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 color is obtained. Chemshield MS is ready to be applied and may add 5% thinner when utilizing airless spray equipment. 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 below 50 °F (10°C), the product can be indirectly heated to 70 to 80 °F (20-25 °C). This will make mixing easier and accelerate curing and may have effect on pot life.

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**Surface preparation:**

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**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-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.*

**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.

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**Application:**

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This product can be applied by common airless spray equipment, brush, roller or trowels. The nukote recommended spray equipment is Graco extreme mix 440/360 which will completely avoid material loss due to exothermic heat, gelling and pot life. An airless pump 45:1 or higher is recommended. Chemshield MS trowel grade material is also available for metal repair and rebuilds application. Metalshield is applied over properly repaired substrates in the method most suitable for the application type. Complete application details are provided in supplementary data sheet)

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**Equipment clean up:**

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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.

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**Warning:**

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This product contains amine and curatives

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**Chemical resistance:**

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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 spills and fumes of chemicals tested as per modified ASTM D 3912.

Chemicals	Resistance	Chemicals	Resistance
Hydrochloric acid upto 15%	R	Xylene, toluene (ambient)	R
Sulphuric acid 20%	R	Crude oil, jet fuel	R
Nitric acid 25%	R	Gasoline, kerosene, diesel	R
Acetone, mek	R	Refined petroleum products	R
Acetic acid 10%	R	Sewage, waste water	R
Ammonium hydroxide 50%	R	Most industrial effluents	R
Water @ 302 °F (150 °C)	R	Sea water	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.*