DESCRIPTION:

NUKOTE HTD® is a high performance polyurea designed and developed to protect buried and exposed pipeline. It performs well as an anticorrosion protective liner in many industrial applications on steel, concrete, GRP, FRP and many other substrates. Nukote HTD is a two-component, 100% solids, pure polyurea that significantly outperforms coatings traditionally used in transmission lines and industrial applications used in conjunction with cathodic protection systems. Nukote HTD is modified version of Nukote HT suitable in applications requiring more flexural modulus, hardness and stiffness. Nukote HTD is specifically formulated for application through NCSI designed 360 RINGTECH ™ robotic pipe coating equipment as well as Nukote automated pipe lathes.

FEATURES:

- 100% solids with zero VOC
- Fast reactivity and cure time resulting in almost immediate return-to-service time
- Performs in constant temperatures from -40 °F to 250 °F (-40 °C to 120 °C)
- Retains physical properties on weathering
- Excellent elongation and tear properties
- Seamless, resilient, flexible, tough
- Puncture resistant
- Excellent corrosion protection
- Excellent impact and abrasion resistance
- Excellent thermal Stability
- Resistant to many solvents, acids and alkalis (consult NCSI)
- Excellent for cold bends
- Coated pipes can be transported and installed immediately
- Excellent performance with cathodic protection
- Suitable for field joints

TYPICAL USES:

- Below and above grade pipeline applications
- Fresh, saltwater submersed pipeline applications
- Waste water, effluent transmission lines
- Field jointing and pipeline repairs
- Steel, concrete piles, penstocks, cooling water towers, offshore jackets and platforms
- Steel and concrete protection in power, paper & pulp mills, petrochemical industries

COLORS:

Standard medium grey only. Custom colors, blended to match any RAL number, are available upon request subject to minimum quantity.

Clear/Neutral available upon request. Color Packs, when used, must be added to Side-B.

PACKAGE:

100-gallon (380-liter) drum sets, shipped in metal drums of 50 gallons (190 liters) each of side A and side B
10-gallon (38-liter) kits, shipped in plastic pails of 5 gallons (19 liters) each of side A and side B
500-gallon (1900 liter) totes, 250 gallons (950 liters) each of side A and side B

COVERAGE:

Nukote HTD may be applied at any rate to achieve the desired thickness.
Calculation for theoretical coverage: 40 Ft^2 /gal @ 40 mils (1 m^2/liter @ 1mm).

TECHNICAL DATA (All values @ 77 ºF / 25 ºC)	**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: 9.35, B: 8.43 lb./gal Mixed: 8.8 lbs./gal	A: 1.12, B: 1.01 kg/ liter Mixed: 1.05 kg/liter
Viscosity at 158 ºF/70 ºC in cps ±10% (ASTM D4878)	A-100 ± 20, B-60 ± 20	A-100 ± 20, B-60 ± 20
Shelf life @ 77 ºF /25 ºC	12 to 18 Months	12 to 18 Months
Tensile strength (ASTM D412-C)	3000 ± 200 psi	21 ± 1 MPa
Elongation (ASTM D412-C)	275 ± 50 %	275 ± 50 %
Hardness (ASTM D2240)	60 ± 5 Shore D	60 ± 5 Shore D
Cathodic disbondment (ASTM G8-30 days), (ASTM G95)	< 0.12", < 0.16"	< 3mm. < 4mm
Flexibility (2mm mandrel ASTM D522)	Pass	Pass
Water vapour transmission rate (ASTM E96)	0.037-0.038grains/hr-ft^2	0.2 to 0.3gms/hr-m^2
Water absorption -24 hours (ASTM D570)	~ 1 %	~1%
Crack Bridging @ -13 ºF/-25 ºC(ASTM C1305), 25 cycles	Pass	Pass
Tear strength (ASTM D624)	450 ± 50 pli	79 ± 9 kN/m
Impact Resistance (ASTM G14), No Holidays	> 200 in-lbf.	> 20 J (N-m)
Fire Rating (ASTM E108)	Meets Class A for Flame spread	
Flash point pensky Martin	>200 °F	>93 °C
Service temperature (Dry)	-40 °F to 250 °F	-40 °C to 120 °C
Service temperature (Wet)	40 ºF to 120 ºF	4 ºC to 50 ºC
Abrasion Resistance (ASTM D4060) weight loss	< 12 mg loss Taber CS 17 wheel 1Kg/1000 rev	
PROCESSING PROPERTIES (Under standard lab conditions)		
Mix Ratio V/V	1:1	

Gel time	2 to 4 seconds
Tack free time (DFT & Temperature dependent)	15 to 30 seconds
Recoat time	0 to 6 hours
Post cure time	24 hours
(The above properties and values are highly dependent on equipment, spray gun, mix chamber temperature, pressure and related parameters and variations are possible and expected). The above values are as per NCSI Standard lab practices & methodology at various film thickness)	

STORAGE:

Twelve to eighteen months in factory delivered, unopened drums. Keep away from extreme heat, freezing, and moisture. The use of drum heaters is encouraged to reduce material viscosity at low temperatures.

MIXING:

Nukote HTD might not be diluted under any circumstance. Thoroughly mix Nukote HTD Part B resin material with air driven power equipment until a homogeneous mixture and color is obtained, usually accomplished through the dedicated spray equipment.

SURFACE PREPARATION:

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-2/SSPC SP-10Sa 2.5, 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 level depending on applications.

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 laitance and expose voids. Use a good quality epoxy filler or mortar for blow hole filling, skim coat or repairs. Prime, fill imperfections in the substrate surface to limit out-gassing. All concrete subfloors on or below grade level should be tested for moisture. On-grade or below-grade concrete floors 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.

Refer to NCSI surface preparation manual for detailed procedures for different types of substrates.

APPLICATION:

Contact Nukote regional representative for more information on Nukote RINGTECH 360 and automated lathe. This material must be applied utilizing high-pressure, heated plural component spray proportioning equipment, such as H-EXP-2 or equivalent capable of delivering materials without loss of pressure or drop in temperature for the appropriate

hose length on a consistent basis. For optimum performance, the substrate should be abrasive blasted. Concrete substrates should be allowed to cure a minimum of 30 days. On concrete, Nukote HTD should always be applied over a suitable primer for maximum adhesion... For all submersed applications, a primer is absolutely essential, after proper preparation. The required DFT's are function of the project requirements and hence please review your specific project with Nukote technicians available regionally for correct recommendation. On horizontal surface applications, a texture "stipple" coat can be applied for non-skid purposes, after reaching the initial desired film thickness.

EQUIPMENT CLEAN UP:

Cured product may be disposed of without any restrictions. The uncured Isocyanate and resin portions should be mixed together and disposed of in a normal manner. "drip-free" 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. Adding a nitrogen blanket is strongly recommended for use on the 'A' component for storage after opening.

Due to its aromatic composition, Nukote HTD will tend to yellow or darken in color and will become flat after exposure to UV light. A topcoat can be applied to Nukote HTD within six hours of application with an aliphatic polyurethane/polyurea coating for a colorfast finish.

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 at ambient conditions. 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 10%	R	Ammonium Hydroxide 20%	R
Sulphuric Acid 15%	R	Ammonium Hydroxide 50%	RC
Phosporic Acid 10%	R	Pottasium Hydroxide 10%	R
Acetic Acid 10%	R	Pottasium Hydroxide 20%	RC
Sea water	R	Sodium Hydroxide 20%	R
Waste Water	R	De ionized Water	R
Water @ 176 ºF (80 ºC)	R	Diesel Fuel, Gasoline (unleaded)	R

Hydrogen Sulphide (gas)	R	Motor Oil, Brake Oil	RC
Sodium Hydroxide-50%	RC	Hydraulic Oil	R

R- Resistant, RC – Slight surface change,discolouration with no loss of hardness.

WARNING:

This product contains Isocyanate and curatives.

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.