
DESCRIPTION:

Nukote HAR is the premium modified polyurea available for industrial applications in severe and demanding applications that require very high abrasion resistance, combined with hydrolytic stability, high impact as well as tear resistance. Nukote HAR is a two-component, 100% solids, modified polyurea that significantly outperforms general polyurea elastomer traditionally used particularly in mining and industrial applications. Nukote HAR is suitable in applications which require very high abrasion in dry or wet conditions for lining the plant, conveyors, vehicle, screens, processing vessels as well as transmission lines. Nukote HAR is a unique rapid curing, flexible, two component spray elastomer exhibiting high wear properties that can be applied at temperatures ranging from -20 to 250 °F (-30 ° to 120 °C). This aromatic Polyurea Elastomer displays good chemical resistance, thermal stability and UV resistance. Nukote HAR is suitable for application on steel, cement, GRP, FRP and other substrates in combination with suitable primer. This product outperforms 27% chrome iron in a slurry abrasion test and is highly recommended for applications in mineral and ore transportation to minimize hang and reduce carry back.

FEATURES:

- 100% solids with zero VOC
- Fast reactivity and cure time resulting in almost immediate return-to-service time
- Performs in constant process temperatures from -40 °F to 250 °F (-40 °C to 120 °C)
- Maintains high physical properties on weathering
- Superior elongation and tear properties
- Seamless, resilient, flexible and durable
- Excellent corrosion protection
- Very high impact and abrasion resistance
- Exceptional hydrolytic stability
- Continuous thermal stability
- Resistant to many solvents, acids and alkalis (consult NCSI)

TYPICAL USES:

- Dredging operations
- HDD pipe crossings
- Below and above grade or submersed applications
- Transportation of highly abrasive ores or slurries
- Waste water and effluent basins and transmission lines
- Steel and concrete piles, penstocks, offshore jackets and platforms
- Steel or concrete protection in power, paper & pulp mills, mining and refineries
- Lining of tanks and or processing vessels in high wet abrasive conditions
- Industrial and manufacturing facilities.
- Mining operations, Petrol refineries, Marine Environments
- Cargo containers
- Landfill containments

COLORS:

Standard brick red, grey, clear/Neutral. Custom colors, blended to match any RAL number are available upon request subject to minimum quantity.

PACKAGING:

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
 275-gallon (1045 liter) totes.

COVERAGE:

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

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 Mixed (ASTM D792)	A: 9.28 lbs./gal	A: 1.11 kg/ liter
Viscosity at 158 °F/70 °C in cps ±10% (ASTM D4878)	A-200 ± 50	A-200 ± 50
	B-200 ± 50	B-200 ± 50
Shelf life @ 77 °F /25 °C	12 months	12 months
Tensile strength (ASTM D412-C)	3200 ± 300 psi	22 ± 2 MPa
Elongation (ASTM D412-C)	275 ± 50 %	275 ± 50 %
Hardness (ASTM D2240)	42 ± 3 Shore D	42 ± 3 Shore D
Flexibility (2mm mandrel ASTM D522)	Pass	Pass
Water vapor permeability (ASTM E96)		1.340 perm-inch
Water absorption -24 hours (ASTM D570)	~ 0.5 %	~0.5 %
Crack Bridging @ -13 °F/-25 °C (ASTM C1305), 25 cycles	Pass	Pass
Tear strength (ASTM D624)	350 ± 25 pli	61 to 4 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 °F to 120 °F	4 °C to 50 °C

Abrasion Resistance (ASTM D4060) weight loss	< 1 mg loss Taber CS 17 wheel 1Kg/1000 rev < 39 mg loss Taber H 18 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)	20 to 40 seconds
Recoat time	< 1 hour
Return to Service – Foot Traffic	2 to 4 hours
Return to Service – Full Service	10 to 24 ours
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. Values included above are per NCSI standard lab practices & methodology of draw down film at various dry film thicknesses.</i>	

MIXING:

Nukote HAR might not be diluted under any circumstance. Thoroughly mix Nukote HAR Part B resin material with air driven power equipment until a homogeneous mixture and color is obtained. Always use dedicated spray equipment.

STORAGE:

Twelve 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. Twelve months in factory delivered, unopened drums. Keep away from extreme heat, freezing, and moisture. The resin side (B side) is sensitive to temperature below 50°F (10°C). Always store above 68°F (20°C). Should the Product be subjected to lower temperature during transit/shipping or was stored or exposed to lower temperature, the product (Side B) rheology will change and appear as a thick mass to semi solid depending on the duration of exposure to low temperature . This can be rectified and brought back to solution by heating.

Heat the resin side B Drum using a heating blanket or band heater and maintain a temperature between 140° -158° F (60°-70°C) for 6 to 12 hours. This will bring back the product to solution. The Duration is dependent on the level of solidification and heat loss due to ambient conditions. Pre heat A side at 104°F (40°C) for not more than 3 hours if exposed to low temperature.

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-2/SSPC SP-10/Sa 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. *Refer to NCSI surface preparation manual for detailed procedures for different types of substrates.*

APPLICATION:

Must be applied utilizing high-pressure, heated plural component spray proportioning equipment, such as Graco Reactor 2, or equivalent, capable of delivering materials without loss of pressure or drop in temperature for the appropriate hose length on a consistent basis. Both side A and side B materials should be sprayed at a minimum of 2000 psi and at temperatures above 160-170 °F. Adequate pressure and temperature should be maintained at all times. For optimum performance, the substrate should be abrasive blasted. Concrete substrates should be allowed to cure a minimum of 30 days. On concrete, Nukote HAR should always be applied over a suitable primer for maximum adhesion. For all submersed or immersion applications, use of a suitable primer is absolutely essential. On horizontal surface applications, a texture “stipple” coat can be applied for non-skid purposes, after reaching the initial desired film thickness. Recommended DFTs are a function of the project specific requirements. Please review your specific project with Nukote technicians. Please refer to instructions in storage if the material (Resin B side has solidified) due to low temperature exposure.

EQUIPMENT CLEAN UP:

Cured product may be disposed of without restriction. Uncured Isocyanate 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. Adding a nitrogen blanket is strongly recommended for the ‘A’ component when storing after opening. The resin side (B side) is sensitive to temperature below 50 °F (10 °C).

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 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 °F (80 °C)	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 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.