



NUKOTE
COATING SYSTEMS

High Performance Coating Solutions



Introduction

Nukote Coating Systems India Pvt. Ltd. provides a comprehensive range of High Performance Polymer Coatings comprising of various proprietary formulations that include; Aromatic, Aliphatic and Aspartic Polyureas, Ceramic Metal Polymers and Composites. Nukote products are widely accepted for their unique functional properties as a protective coating for corrosion resistance, waterproofing liners & membranes and solutions for thermal insulation with composites as well.

Nukote products are designed for specific requirements be it for corrosive chemical exposures, submerged or partially submerged conditions, severe weather and/or high levels of ultraviolet exposure, high impact and abrasion potential, marine environments etc. The thrust is on executing the projects in a planned and professional way.

Nukote products are made available to customers and clients through a national distribution network. The application of the products is accomplished through an established regional network of Qualified Applicators.

Research and Development:

Nukote currently has the widest range of High Performance Coatings available globally. Yet Nukote's qualified & talented R&D team at the US manufacturing facility are currently developing fifth and sixth generation polymer formulations, utilizing the latest raw material and processing technologies, providing continuous improvement to existing products.

Technical Support:

Nukote Coatings maintains regional offices and qualified personnel to provide specification and design support to customers. The Nukote team provides Complete QA-ITP Process and Implementation and has in house capabilities to inspect projects for application compliance and suitability be they for Corrosion Control, Primary Containment or Secondary Containment.



High Performance Polymers

Nukote product lines primarily comprise of high performance polymers that include Polyureas, Ceramic Metal Polymers or Composites that combine features and benefits of different chemistries. These products demonstrate varying degrees of physical & chemical properties to suit specific needs viz. high tensile strength & elongation, impact resistance, abrasion resistance, chemical resistance, impermeability, flexibility or their combinations.

Zero Volatile Organic Content:

Nukote polyureas contain Low to Zero levels of volatile organic content (VOC), allowing applications even under the strictest environmental regimens, in confined spaces including applications in potable-water and food processing industries or in applications where chemical contamination is not acceptable.

High Abrasion Resistance:

Nukote polyureas' anti-abrasion properties protect surfaces to which they are applied, including in extreme conditions like interiors of Rail Cars and Barge Decks, Coal / Iron Ore Rail Wagons & Transport Trucks, Cement Mixers etc., where abrasion is both intense & constant.

Stability:

Nukote polyureas are designed to perform regardless of exposures to ultraviolet, salt spray or extreme weather.

Environmental Protection:

Nukote polyureas being 100% inert after application are ideal in applications where chemicals and wastes are barred from creating any adverse effect by entering the ecosystem and are approved for use even in environmentally protected areas.

Fast Reaction Time:

Nukote polyureas offer very fast reaction time (variable from 3-20 seconds). Compared to any traditional coating product, these provide advantage of very quick return to service times for the coated areas after application.

Moisture and Temperature Insensitivity:

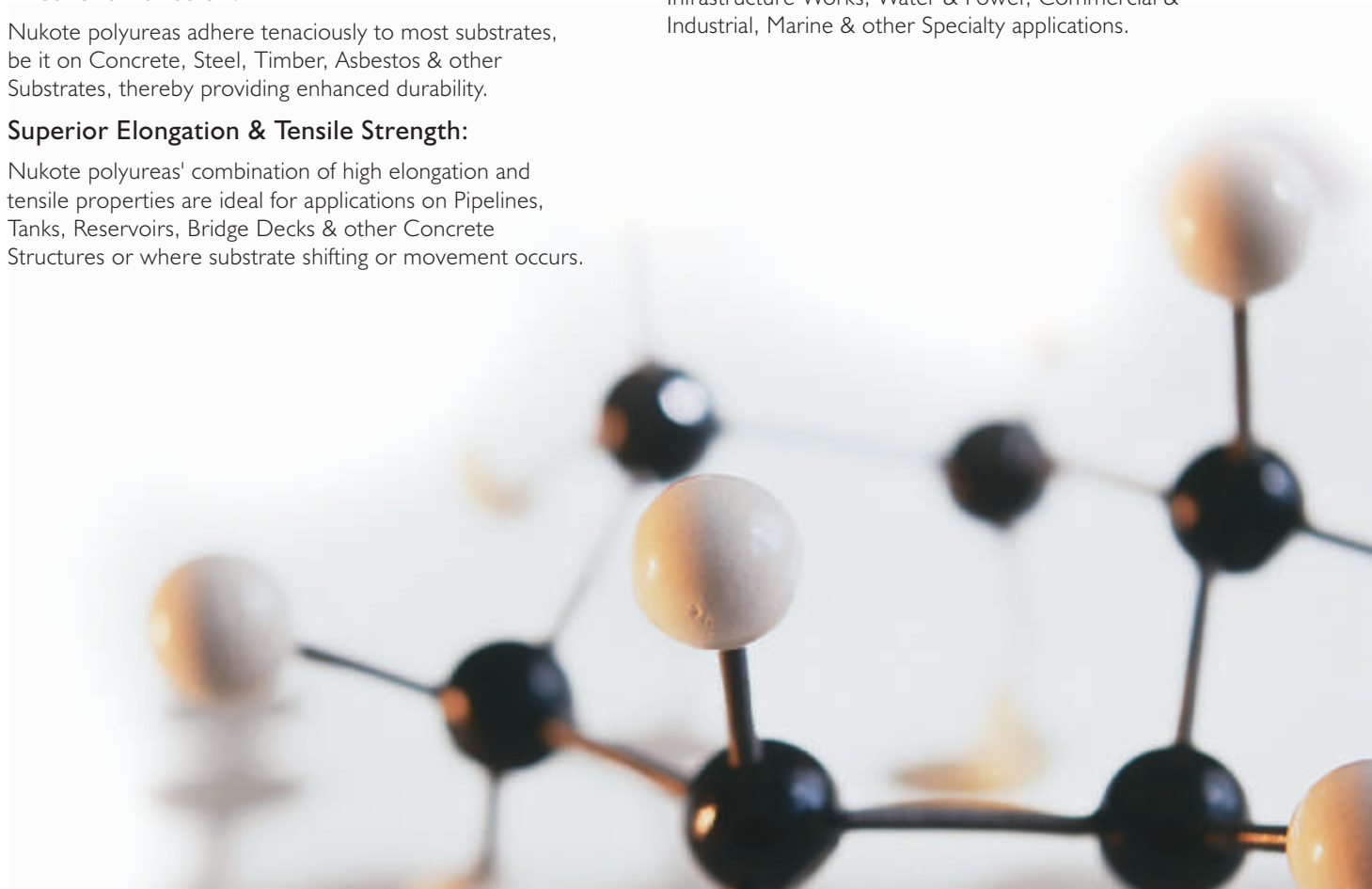
Nukote polyureas are moisture and temperature insensitive, allowing for continuous application even in extreme environments.

Excellent Adhesion:

Nukote polyureas adhere tenaciously to most substrates, be it on Concrete, Steel, Timber, Asbestos & other Substrates, thereby providing enhanced durability.

Superior Elongation & Tensile Strength:

Nukote polyureas' combination of high elongation and tensile properties are ideal for applications on Pipelines, Tanks, Reservoirs, Bridge Decks & other Concrete Structures or where substrate shifting or movement occurs.





1



2



3

Water Industry

Water Supply & Treatment Systems:

100% Solid content and Low to No VOC content in the sprayed on coatings, ensure suitability for potable water systems. The high "C" value due to the smooth finish ensures enhanced efficiency and whole life cost savings when used as internal lining of water pipelines.

In water treatment plants, the chemical resistance, UV resistance & resistance to growth of micro organisms make Nukote polyureas the ideal internal lining material inside of Alum Dosing Tanks, Raw Water Tanks, and other critical applications like Supply Pipelines etc., be they of concrete or steel, suitable for both new construction or renovation.

Waste Water Applications:

The high physical properties coupled with the high chemical resistance, especially to H₂S, make Nukote polyureas the preferred lining material inside of Sewers, Manholes, Digesters, Waste Water Re-cycling Plants etc. and have been extensively used in these applications world over.

Being seamless, fast set and fast cure, it is an effective material for restoration of STPs, ETPs, Storm Water Pipes, Sewers, Reservoirs and Waste Water Re-cycling Plants.

Irrigation:

The elastomeric property of Nukote polyurea, combined with its impermeability and resistance to UV, allows for an effective bridging of movement joints in canals, dams and pipelines, to stop leakage and prevent loss of water.

The coating also acts as an effective waterproof lining in aqueducts, wear resistant and corrosion resistant protective coating for sluice gates and spillways or leakproof lining at up-stream side of dams. Nukote polyureas provide an easy and fast application solution and have been extensively used in the irrigation industry.

The polyurea-geotextile composites find numerous and effective applications as lake bed liners & earth containment liners to reduce silting.

Corrosion Control in STPs 1

Waste Water Treatment 2

Irrigation Canals 3

Power Industry

Nukote polyurea coatings are widely utilized by the power generation industry across the globe. The state of the art coating systems find applications in Thermal, Hydel as well as Nuclear Power Generation.

Thermal Power:

Nukote polyurea are used to extend durability of water intake and outfall pipelines for internal linings for sea water and fresh water, as well as external coatings in case of buried pipelines. They also ensure long term seepage proofing of Water Reservoirs, ETPs, Cooling Tower Basins,

create containment areas directly on compacted earth or grade eliminating the need for expensive concrete.

Ceramic Metal Polymer "Metalshield" provides excellent abrasion and corrosion resistance at elevated temperatures, making it suitable for linings inside the Flue Gas De-sulphurisation Unit Ducts and other critical areas in the Power Generation Plants.

Hydel Power:

Nukote polyurea coatings on the upstream faces of the Hydel power dams prevent leakage of water. Higher



Ash Ponds etc. The solutions provided by using the Nukote polyurea & geo-textile composite are extremely cost and time efficient considering the fact that these can be used to

thicknesses of these coatings are used on the downstream spillways to protect the surface from impact and erosion thereby greatly enhancing the life of the structure.

Nuclear Power:

Nukote polyureas are commonly used in nuclear facilities for protection of concrete and / or steel surfaces and structures that are critical to the design life of the project. Nukote's products are used in nuclear containment applications as secondary and tertiary methods of reducing the potential of soil and ground water contamination from waste products. Polyurea & Geotextile Composite are also used as disposable liners for transportation of toxic and / or nuclear waste or by-products.

- 1 *Lining of Cooling Tower Basins - Thermal Power Plant*
- 2 *Reservoir Linings*
- 3 *Dam Spillway Protection*





Civil and Infrastructure Industry

Bridges, Tunnels & Dams:

Nukote's impermeable membrane systems have been commonly specified for bridges and used in applications including waterproofing of bridge decks & flotation structures, corrosion protection for submerged & intermittently submerged steel & concrete structural components & colour stable architectural finishes.

Common applications in tunnels would include waterproofing membrane composites for shedding water internally (bored systems), waterproofing through external coatings on structures (submerged structures), temporary

Nukote polyureas find applications on the upstream faces of dams for leak prevention and on the spillways for erosion prevention.

Polyurea - Geotextile Composite Applications:

NCS has developed the use of polyurea - geotextile fabric composites. Unique geotextile fabrics combined with Nukote polyureas form a seamless membrane composite increasing tear puncture resistance as well as the tensile strength. This system is ideal for large primary and secondary containment projects including man-made Lakes and Canals, Leach Ponds, Landfills, Drainage Basins, Tank



containment of bored areas prior to shoring etc. Tunnel applications utilize Nukote products not only for waterproofing applications but for erosion and corrosion control of structural components.

Farm Bunds and other Applications. The composite system is cost effective and durable and can be applied directly to compacted soils.

Tunnel Waterproofing 1

Bridge Deck Coating 2

Polyurea Geotextile Composites 3

Commercial and Industrial Constructions

Waterproofing & Roofing Systems:

Nukote polyureas provide for a variety of coating and composite systems that form impermeable waterproof membranes, either bonded to or freely resting on host substrates. With their high tensile strength, tear resistance, abrasion resistance and flexibility, Nukote products ideally fulfill the property requirements for waterproofing, be it Basements, Podiums, Wet Areas, Pools, Balconies, Roofs etc.

The fast curing spray-applied roof coating systems have the unique ability to adhere and conform to the unusual shapes and profiles of modern building designs. Insulation

composites over polyurethane foam on roof or wall create seamless membranes or composites that insulate and provide long term waterproofing solutions.

Composite Solutions:

Nukote polymer composites find crucial applications in commercial and industrial constructions as a tanking membrane for positive waterproofing of basements and retaining walls as well as in negative waterproofing in sandwich constructions. Some typical applications include Deep Basements, Retaining Walls, Podium Slabs, Terrace Gardens, Balconies, Water-Features and Pond Liners.

Deck & Floor Coating Systems:

The high abrasion resistance and hardness values of Nukote products, complemented by the tenacious bond achieved with most host



substrates and the ease of achieving varying textures for skid resistance, ensure effective protection to Floors and Decks of Car Parks, Driveways, Ramps, Aircraft Hangars, Industrial Kitchens, Chemical Industries, Laboratories, Mechanical Workshops and Warehouses. The requirement of seamless

coatings, in pharmaceutical industries, hospitals and hotels, to avoid joints and enhance hygiene are met by Nukote's products.



- 1 *Roof Waterproofing*
- 2 *Protective Floor Coating*
- 3 *Car Parks*

Oil and Gas Industry

Pipeline Systems:

Nukote polyurea formulations provide external and internal corrosion protection for both onshore and offshore pipeline for applications in direct burial or above ground pipelines or for submersion. The coatings / linings ensure the formation of a smooth, seamless, monolithic, corrosion resistant & protective barrier that considerably enhances durability of the pipelines.

Pipe coating facilities, which utilize Nukote technologies and products, are fully operational globally, as are the certified application firms, allowing for their production and field jointing in any location and climate condition.

Primary & Secondary Containment Systems:

Nukote polyureas are utilized for the Primary Containment of water, crude oil, refined fuels, petrochemicals and derivatives. These coatings are used commonly on concrete / steel tanks for internal waterproofing / anti-corrosion at varying film thicknesses depending on specific property requirements. Nukote's solutions provide long term trouble free service against aggressive chemical, climatic and ultraviolet conditions.

Nukote's polyurea - geotextile composites provide unique & durable Secondary Containment Solutions that outperform concrete retention structures and common seamed membranes. In the Oil & Gas industry, the composite systems are widely utilised for spill containment applications in Tank Farms, Sludge Ponds, Man Made Storage Basins, either directly on compacted earth, or on concrete substrates.

Offshore Platforms:

The highly saline & corrosive atmosphere combined with the constant exposure to UV makes Nukote polyureas a coatings solution of choice for Offshore installations. The abrasion resistant properties suit the Decks, Helipads and other trafficable areas, whereas the corrosion proofing provides a durable coat on the submerged and the splash areas.

Ceramic Metal Polymers - Nukote Metal Shield:

Nukote Metal Shield is recommended for critical applications that involve combinations of chemical & abrasion resistance at elevated temperatures.

Typical applications being Chemical

Containment, Process Vessels, High Sulphur and / or Hydrocarbon Content at elevated temperatures, abrasives in Sour Gas Pipelines, Petrochemical, Oil, Gas & Power Industries.

Field Jointing 1

Drill Casings Coated with Metalshield 2

Deck Coating on Offshore Installations 3



Marine Applications

Ships / Vessels:

Nukote products are commonly used as waterproofing and anti-corrosion coatings on marine vessels including naval vessels. Common applications include Anti-Slip Deck Coatings, Hull Coatings, Ballast Tank Coatings and Bulk Holds.

Pilings, Pier & Wharf:

Nukote's anti-corrosion products ideally suit piling applications, including in-situ applications prior to pile driving, as well as in renovation applications where the fast curing nature of the products allow for coating down to ebb tide levels. Common applications include Pier and Wharf Structures, Vessel Anchoring Bollards, Sheet Piles, Dock and Jetty Surface Coatings in cargo loading and unloading areas.

Specialty Applications

Blast Mitigation Solutions:

Nukote's range includes products with tenacious bond & elastomeric property that find application in mitigation of explosive blasts, reducing loss of human life through reduction of flying debris from windows and other structural components of buildings. Originally designed for use in military for personnel protection, these products are also used to armoured vehicles, naval vessels etc. reducing projectile penetration levels.

Truck Bed Linings:

Nukote manufactures spray applied truck and trailer lining products that are widely used to protect personal and commercial vehicles globally. These products conform to the bed or trailer providing durable protection.



1 Vessel Deck Coating

2 Pontoons

3 Truck Bed Liner

Others:

Nukote products find application in Theme Park Applications, Aquariums, Composite Sculptures, Facades and Exhibits. Special applications utilize composites of Polyurethane Foam and Polyurea Coatings to create finishes that range from futuristic theme park rides and attractions to architectural finishes that appear to be solid carved sculptures from antiquity.

Applications Guide

Typical Uses	Nukote ST	Nukote HT	Nukote CG	Nukote XT	Nukote BM	Nukote AL
Bridge Coating	S	R				
Potable Water	R					
Tank Coatings External	R		R			R
Tank Linings Internal	R	R		R		
Internal / External Coatings for Pipelines	S	R		R		
Marine Application	R	R	R	R	R	R
Waste Water Treatment Linings	R			R	S	
Manhole & Sewer Linings	R			R		
Truck Bed Liners	R	S		S		
Theme Park & Decorative Design	R		S		R	R
Flooring and Parking Decks	R					R
Aquarium Lining	R					
Landscape & Water Containment	R				R	
Architectural Design						R
Water Parks & Playgrounds	R					R
Railcar Lining & Track Containment	R	S				
Offshore Applications	R	R				
Crude & Sour Crude Pipelines & Process Equipment	R	R				
Fuel Storage & Containment	R	R		R		
Structural Waterproofing	R		S		R	
Airports Line Marking	R	R				R
Food Processing Plants	R					
Canals, Dams & Holding Tanks	R					
Live Stock Facilities	R					
Mining Operations	R	S				
Cold Storage Facilities	S					
Industrial & Manufacturing Facilities	R	S	R	R	R	
Structural Steel	R	S				
Chemical Plants	S	R		R		
Power Plants	R	R				
Plywood Coating & Furniture Manufacturing	S					R
Landfill Containment	R				R	
Top Coat for other NCS Products						R
	R	Recommended				
	S	Suitable				

This list is by no means an exhaustive list and the limit is only the creativity.

General Applications Quick Pick

Nukote Products*	Product Formulation	Product Type and Application
Nukote ST	Pure Aromatic Polyurea	Coating-Liner-Membrane: Standard Applications
Nukote HT	Pure Aromatic Polyurea	Coating-Liner-Membrane: Higher Physicals and Temperature
Nukote CG	Modified Aromatic Polyurea	Coating-Liner-Membrane: Commercial Grade
Nukote XT	Modified Aromatic Polyurea	Coating-Liner-Membrane: High Chemical Resistance
Nukote BM	Pure Aromatic Polyurea	Coating-Liner-Membrane: Slower Gel, Versatile
Nukote AL	Pure Aliphatic Polyurea	Colour Stable Coating Product: Good Physicals

Indicative Physicals

Nukote Products	Tensile N/mm ² ASTM D-412	Elongation % ASTM D-412	Hardness Shore D ASTM D-2240	Service Temperature Range Deg C	Abrasion Resistance C17 Wheel, lkg, 1000 Cycles	Tack Free Time Seconds	Flexibility 3 mm Mandrel ASTM D 1737	Tear Strength- Die C Kn/M ASTM D-624	Fire Rating UBC	UV Stable	Colour Stable
Nukote ST	20	400	50	-30 to 130	< 15mg	40	Pass	75	Class II	Yes	No
Nukote HT	22	400	50	-30 to 160	< 15 mg	25	Pass	75	Class II	Yes	No
Nukote CG	18	200	50	-30 to 120	< 25 mg	25	Pass	65	Class II	No	No
Nukote XT	22	400	50	-30 to 125	< 15 mg	60	Pass	90	Class II	Yes	No
Nukote BM	20	650	42	-30 to 120	< 20 mg	75	Pass	75	Class II	Yes	No
Nukote AL	22	400	50	-30 to 150	< 20 mg	90	Pass	70	Class II	Yes	Yes

*The above data is only a guideline for quick referral selection of Nukote products vis-a-vis applications. The products illustrated above are the most widely used, however Nukote has a wider choice of products for varied applications, available in consultation with the Nukote Technical Team.





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