BOSHIDA NONWOVEN PRODUCTS CO., LTD.

BOSHIDA

HDPE LINERS

GEOMEMBRANE

PRODUCTS · TECHNICAL PERFORMANCE · APPLICATIONS



Cover design preview

PRODUCT OVERVIEW

GEOMEMBRANE OVERVIEW

ABOUT HDPE LINERS

A geomembrane is a polymeric sheet used for engineered containment. Installed panels and welded seams form a continuous barrier to reduce leakage and migration of liquids into surrounding soil.

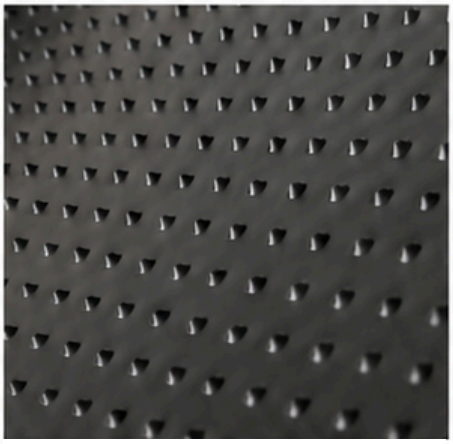
HDPE geomembranes are made primarily from high-density polyethylene and supplied in rolls. Thickness, dimensions and surface finish can be selected for project needs, together with protective geotextiles and drainage materials.

THREE SURFACE FINISHES



SMOOTH

Flat surface without pronounced raised texture.



STUDDED

Regularly distributed raised points. Available with studs on one or both sides.



SPRAY-TEXTURED

Irregular rough texture. Available with texture on one or both sides.

SELECTION NOTE

Select the surface according to adjacent materials, interface performance and engineering requirements. Appearance alone cannot establish product quality or suitability.

KEY PERFORMANCE & FEATURES

KEY PERFORMANCE & FEATURES

01

CONTAINMENT

HDPE geomembranes have low permeability. Continuous installation and reliable seams form a lining barrier to reduce liquid leakage.



02

MECHANICAL PERFORMANCE

Tensile, tear and puncture properties help assess resistance to stresses during installation and service. Requirements depend on thickness, subgrade conditions and engineering design.



03

CHEMICAL RESISTANCE

Suitable for contact with a range of media. Confirm compatibility for the specific composition, concentration, temperature and exposure time.



04

AGING RESISTANCE

Appropriate formulation and quality control support oxidation and weathering resistance. For long-term exposed use, verify the relevant durability properties.



PERFORMANCE VERIFICATION

Use technical data and test results for the specific product. Overall containment also depends on system design, installation quality and seam workmanship.

SPECIFICATIONS & COLOR OPTIONS

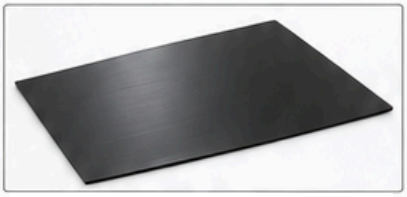
SPECIFICATIONS & COLOR OPTIONS

Available in different thicknesses, roll widths, lengths and colors. Supply dimensions can be selected to suit design, deployment and transport requirements.

ITEM	SPECIFICATIONS & OPTIONS
Thickness range	0.25-3.0 mm
Common thicknesses	0.5, 0.75, 1.0, 1.5, 2.0 mm
Width range	1-8 m; common width: 6 m
Standard roll length	50 m, 100 m; other lengths customizable
Colors	Black, white and blue
Surface finish	Smooth, studded and spray-textured
One- / two-sided options	Studded or spray-textured on one or both sides

Available specifications vary by product type and color. The confirmed order specifications take precedence.

COLOR OPTIONS



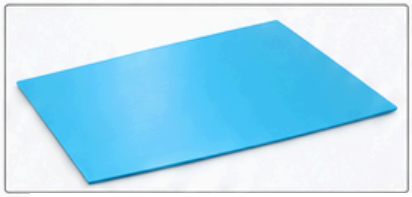
BLACK

Engineering containment



WHITE

Light-colored surface requirements



BLUE

Pool and landscape appearance

Color does not indicate quality grade. Confirm suitability for the material structure, environment and project requirements.

COMMON ROLL AREAS

6 m × 50 m = 300 m²/roll

6 m × 100 m = 600 m²/roll

CUSTOMIZATION & ORDER DETAILS

Specify product type, thickness and tolerance, width, roll length, color, total area and technical requirements.

WATER CONTAINMENT & AQUACULTURE

WATER CONTAINMENT & AQUACULTURE

Geomembranes provide containment liners for water storage, conveyance and aquaculture. Select specifications and associated layers according to engineering design.



01 WATER STORAGE & LANDSCAPING

For the bottoms and slopes of storage ponds, artificial lakes and landscape ponds. Combine with protective geotextiles and cover layers as required by design.



02 CHANNELS & IRRIGATION

Liners for water channels and irrigation facilities reduce seepage losses during conveyance. Exposed or covered configurations may be used as designed.



03 AQUACULTURE

Liners for fish and shrimp ponds. Select materials with regard to water quality, cleaning and maintenance methods, and the pond structure.

SELECTION NOTE

Consider the service environment, contact media, subgrade and project technical requirements.

ENVIRONMENTAL, INDUSTRIAL & MINING

ENVIRONMENTAL, INDUSTRIAL & MINING

Geomembranes act as barriers in containment systems for waste management, industrial liquids and mining facilities. Select products for the specific project requirements.



01 | WASTE MANAGEMENT

For landfill base liners, closure caps and leachate collection ponds. Combined with protection and drainage layers to form an engineered containment system.



02 | INDUSTRY & ENERGY

For wastewater, evaporation and brine ponds, and secondary containment around tanks. Confirm suitability for media composition, concentration, temperature and exposure time.



03 | MINING ENGINEERING

For tailings facilities, heap-leach pads and process-water ponds. Consider chemical exposure, loads, puncture resistance and interface stability.

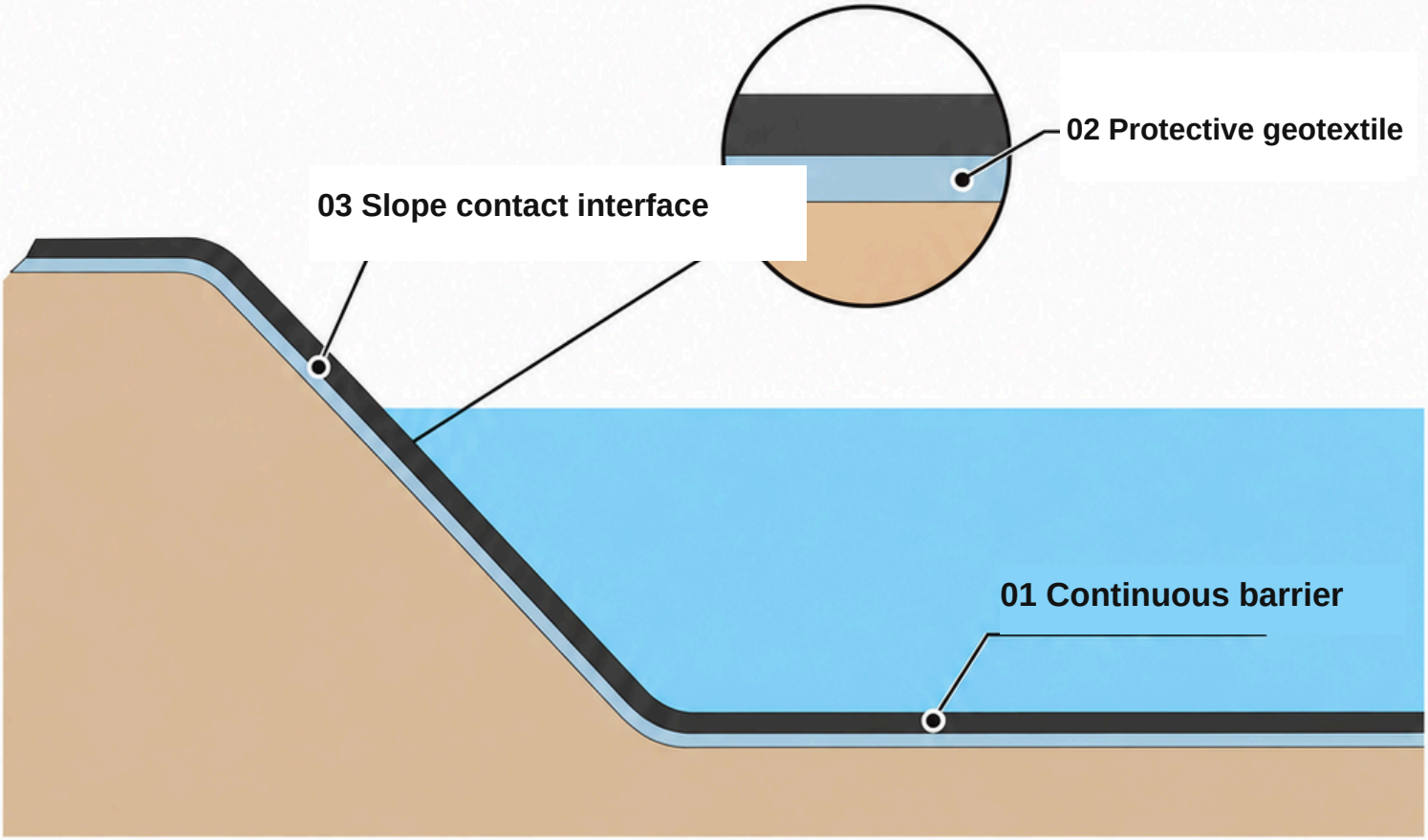
SPECIAL APPLICATIONS

Pools, tunnels and drinking-water facilities require suitable dedicated materials, system design and relevant test documents.

GEOMEMBRANES IN LINING SYSTEMS

GEOMEMBRANE IN A LINING SYSTEM

A storage pond with slopes illustrates continuous lining across the base and sides. Subgrade, protective layers and crest anchorage are configured according to engineering design.



01 BASE & SLOPE LINING

Geomembranes extend from the base to the slopes, with adjacent panels welded into a continuous barrier. In landfills and leachate ponds, the barrier also limits migration into surrounding soil and groundwater.

02 MEMBRANE & PROTECTION

Depending on the subgrade and cover materials, protective geotextiles may be placed below or above the membrane. Underlay separates the membrane from rough ground; overlay reduces damage from direct contact with cover materials.

03 SLOPE INTERFACES

Slope selection considers friction at interfaces with adjacent materials. Smooth, studded or spray-textured surfaces should be chosen according to slope conditions, adjacent materials and design requirements.

The illustration shows relative layer positions only. Thickness, surface finish, protection layout and anchorage are determined by project design.

INSTALLATION & SEAM INSPECTION

GEOMEMBRANE INSTALLATION & SEAM INSPECTION



01 DEPLOYMENT & LAYOUT

Unroll the liner on a prepared, level subgrade according to the deployment plan. Leave the required overlap between adjacent panels.



02 OVERLAP & WELDING

Weld adjacent panels at the overlap to form a continuous connection.



03 SEAM INSPECTION

Inspect seams after welding. Testing methods and acceptance criteria are determined by project documents.

Photo 1 is an actual installation site. Images 2 and 3 illustrate installation activities.

CHOOSING A GEOMEMBRANE SURFACE

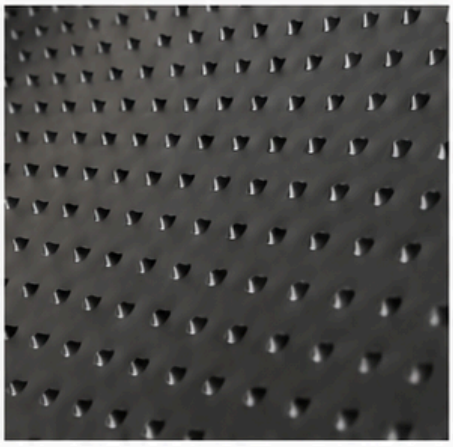
CHOOSING A GEOMEMBRANE SURFACE

First identify the material in contact with each side of the geomembrane, then check the required interface friction performance.



SMOOTH

Flat surface; confirm the specified product requirements.



STUDDED

Regular raised points; check asperity height and interface performance.



SPRAY-TEXTURED

Irregular texture; check texture height and interface performance.

ONE SIDE OR BOTH?



TEXTURE ON ONE SIDE



TEXTURE ON BOTH SIDES

For one-sided products, confirm the textured-face orientation. For two-sided products, check the adjacent material on each side.

DRAWING ONLY SAYS “DOUBLE-TEXTURED”?

Confirm whether a studded or spray-textured product is specified, then check adjacent materials and interface performance requirements on both sides.

RAW MATERIALS & PERFORMANCE

RAW MATERIAL OPTIONS & PRODUCT PERFORMANCE



The same surface finish and thickness may be available with different raw-material formulations. First confirm the raw-material requirements, then assess finished-product performance.

01

VIRGIN-RESIN OPTION

Made with virgin polyethylene resin as the base material. Where virgin resin is specified, state this in the enquiry and verify finished-product performance against the project specification.

02

RECYCLED-CONTENT OPTION

The formulation contains recycled polyethylene material. Where the project permits recycled content, assess suitability using the technical data and test results of the specific product.

SAME THICKNESS: HOW TO COMPARE?

Check thickness tolerances, tensile and puncture performance, and durability against the same project requirements. Then compare the options that meet those requirements.

SMOOTH HDPE TECHNICAL DATA

SMOOTH HDPE GEOMEMBRANE · TECHNICAL DATA

ENVIRONMENTAL GRADE · GH-2S

Nominal thickness (mm)	Tensile yield strength (N/mm)	Tensile break strength (N/mm)	Right-angle tear load (N)	Puncture force (N)
0.75	≥11	≥20	≥93	≥240
1.00	≥15	≥27	≥125	≥320
1.25	≥18	≥33	≥160	≥400
1.50	≥22	≥40	≥190	≥480
2.00	≥29	≥53	≥250	≥640
2.50	≥37	≥67	≥315	≥800
3.00	≥44	≥80	≥375	≥960

PARAMETER SCOPE

This table applies to GH-2S environmental-grade smooth geomembranes. Reference: GB/T 17643-2025. Tensile and tear requirements apply in both machine and cross-machine directions.

TEXTURED HDPE TECHNICAL DATA

TEXTURED HDPE GEOMEMBRANE · TECHNICAL DATA

ENVIRONMENTAL GRADE · GH-2T1 / GH-2T2

Nominal thickness (mm)	Tensile yield strength (N/mm)	Tensile break strength (N/mm)	Right-angle tear load (N)	Puncture force (N)
1.00	15	15	125	270
1.25	18	20	160	335
1.50	22	24	190	400
2.00	29	32	250	535
2.50	37	39	315	670
3.00	44	48	375	800

ASPERITY HEIGHT

Average ≥0.25 mm | Minimum ≥0.20 mm

Reference: GB/T 17643-2025. Tensile and tear requirements apply in both machine and cross-machine directions.

EXPOSED & COVERED APPLICATIONS

EXPOSED & COVERED GEOMEMBRANE APPLICATIONS

The same geomembrane may need different durability considerations under different service conditions.

01

EXPOSED USE

The membrane is directly exposed outdoors. Check UV-aging resistance and consider sunlight, membrane temperature and contact media.



Exposed membrane (installation site)

02

COVERED USE

A designed cover layer is placed above the membrane. Consider cover materials, construction loads and whether an upper protective geotextile is required.



Cover-layer placement (installation site)

Image source: LaBella Associates

HOW IS SERVICE LIFE ASSESSED?

Assessment should consider product performance data, site conditions, contact media and the containment-system design. Service-life expectations and warranty conditions are confirmed for the specific project.

WHY USE A GEOTEXTILE WITH THE LINER?

GEOMEMBRANE & GEOTEXTILE

The geomembrane provides containment; a geotextile can provide designed protection. When used together, specify the required properties of each material separately.

THE LINER PROVIDES THE BARRIER

Continuous polymeric sheets, installed and welded at the seams, form the containment barrier.

THE GEOTEXTILE PROTECTS

Needle-punched nonwoven geotextiles can act as protective cushioning, reducing local damage from contact with rough subgrades or granular materials.



01 BELOW THE LINER

Place the geotextile between the membrane and subgrade. The subgrade must still be leveled, compacted and cleared of sharp objects.

02 ABOVE THE LINER

Place the geotextile between the membrane and cover material to reduce damage during backfilling and cover placement.

03 BOTH SIDES

Provide protection on both sides where designed, and specify the required performance separately for each side.

HOW TO SELECT THE GEOTEXTILE

Consider subgrade particles, cover materials, loads and construction conditions when choosing fiber material, mass per unit area and mechanical properties. Fabric weight is only one specification; assess protection using performance data as well.

ONE- AND TWO-FABRIC COMPOSITES

Selecting a composite structure for the required protection

The membrane provides containment, while geotextiles provide protection and cushioning. First identify which membrane face needs protection, then specify membrane thickness, fabric weight and joining method.



01 | ONE FABRIC + ONE MEMBRANE

ONE-SIDED PROTECTION

One geotextile layer bonded to a membrane; the other face has no fabric.

WHEN TO CONSIDER IT

When one side needs fabric protection and the other has a suitable contact layer or protective measures meeting the design.

KEY CONSIDERATIONS

Orient the fabric toward the side needing protection. Keep sharp particles away from the unprotected membrane face.

Example: cushioning below, with a separate suitable protective layer above.

02 | TWO FABRICS + ONE MEMBRANE

TWO-SIDED PROTECTION

A geotextile on each side of a central barrier membrane.

WHEN TO CONSIDER IT

When the lower face contacts the subgrade, the upper face will receive fill or cover material, and both sides need fabric protection.

KEY CONSIDERATIONS

Specify each fabric layer separately. Subgrade preparation and cover-placement loads must still be checked.



Product appearance shown; actual structure may vary.

ALSO CONFIRM BEFORE SELECTION

Specify membrane thickness and fabric weight separately. Total mass does not define thickness.

Confirm exposed membrane edges, welding and fabric-joint details.

Check interface stability on slopes. Layer count alone is insufficient.

The membrane and geotextiles may also be supplied separately and installed in layers, according to design and site conditions.

COMPOSITE SPECIFICATIONS EXPLAINED

Understanding membrane thickness, fabric weight and total mass

Specify the fabric and membrane layers separately. A total mass per unit area alone does not fully describe the composite structure.



01 | MEMBRANE THICKNESS

UNIT: mm

The thickness of the membrane itself, not the total finished thickness of the fabric-and-membrane composite.

02 | FABRIC WEIGHT

UNIT: g/m²

The mass of geotextile per square meter. For two-fabric composites, state each side separately; they may differ.

WHY IS “500 g/m²” NOT ENOUGH?

If this is the finished composite’s total mass per unit area, it does not directly identify the membrane thickness or the weight of each fabric layer.

The same total mass may contain different layer configurations.

HOW TO STATE A COMPLETE SPECIFICATION

ONE FABRIC	Geotextile 200 g/m² + membrane 0.5 mm
TWO FABRICS	Upper fabric 200 g/m² + membrane 0.5 mm + lower fabric 200 g/m²

Values illustrate the specification format only; they are not recommended configurations or supply limits.

Also specify width, roll length, membrane polymer and geotextile material.

THREE LEVELS OF PRODUCT COMPARISON

01 SAME STRUCTURE

First identify one-fabric or two-fabric construction.

02 EACH LAYER

Check membrane thickness and fabric weight on each side.

03 PERFORMANCE

Compare barrier, composite mechanical and peel properties, not total mass alone.

SMOOTH OR TEXTURED: HOW TO CHOOSE?

First assess the risk of sliding between adjacent materials

Both finishes provide containment. Selection depends on the materials touching the membrane and the interface slip-resistance requirements.



Slope installation reference | Image source: Naue

WHEN TO CONSIDER A SMOOTH SURFACE

Consider smooth liners on relatively flat pond or reservoir bases where interface stability meets design requirements. Exposure outdoors does not automatically require smooth material; check subgrade stability and anchorage on slopes.

WHEN TO CONSIDER A TEXTURED SURFACE

Where slopes contact geotextiles, drainage materials or cover soil and greater interface resistance is needed, consider textured products with suitable interface shear performance.

Texture improves interface slip resistance; it does not necessarily improve barrier performance.

TEXTURE ON ONE SIDE OR BOTH?

Identify the adjacent material on each face, then assess which face needs additional resistance. Consider one-sided texture for one face and two-sided texture where both interfaces require it.

DIFFERENT AREAS CAN USE DIFFERENT FINISHES

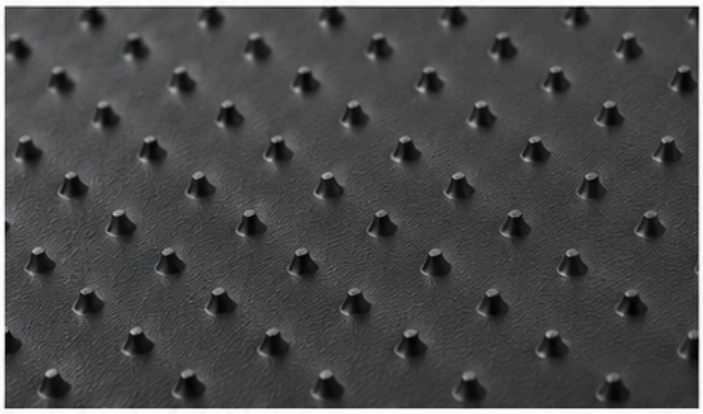
The base and slopes can use different surfaces. “Smooth for flat areas, textured for slopes” is not a universal rule, and there is no single slope limit for every product.

Base the final choice on slope, adjacent materials, cover loads and relevant interface shear data.

STUDDED OR SPRAY-TEXTURED?

Both are textured finishes; appearance alone cannot establish slip resistance

Studded and spray-textured surfaces have different texture patterns. Both may be considered where higher interface resistance is needed; compare the actual product with the intended adjacent material.



STUDDED GEOMEMBRANE

Regularly distributed raised points.



SPRAY-TEXTURED GEOMEMBRANE

Irregular rough surface texture.

WHEN TO CHOOSE EACH TYPE

Where both products meet membrane requirements, select the one whose interface shear performance meets the design under project contact and loading conditions, and whose joining and installation methods are suitable.

Studded for gentle slopes and spray-textured for steep slopes is not a general rule.

01 CONTACT MATERIALS

Soil, geotextiles and drainage composites have different contact characteristics. The same finish may behave differently with each material.

02 SERVICE CONDITIONS

Assess slope, cover loads and wet or dry conditions. Use interface shear testing representative of project conditions where required.

03 PRODUCT EVIDENCE

Check the texturing process, membrane properties, interface data and welding requirements. Asperity height and visual roughness alone cannot prove resistance.

AVOID TWO SELECTION MISCONCEPTIONS

Higher asperities do not necessarily provide greater slip resistance.

A textured surface does not eliminate protective geotextiles or anchorage.

Without corresponding interface data, do not rank products solely by the names “studded” or “spray-textured”.

GEOMEMBRANE SELECTION FAQ

Clear service conditions support better material choices

In addition to dimensions and surface finish, service life, color and contact media influence selection. Consider the product and engineering conditions together.

01 | HOW LONG CAN A GEOMEMBRANE LAST?

Service life depends on formulation, aging resistance, exposure or cover, temperature, contact media and installation quality. The same material may perform differently in different environments.

Do not apply one product's lifetime data to every thickness and application.

Where a service life is specified, assess relevant durability data and project service conditions.

02 | DOES GREATER THICKNESS MEAN BETTER QUALITY?

Thickness is one selection parameter, not a quality grade. First determine the required thickness, then compare raw materials, mechanical performance and durability.

Check material performance and grade as well as thickness.

Increasing thickness cannot replace verification of raw materials and performance.

03 | ARE BLACK, WHITE AND BLUE ONLY VISUALLY DIFFERENT?

Color selection also relates to formulation, service conditions and project requirements. Black is common in carbon-black formulations; white and blue products also require weathering and application checks.



Blue does not automatically qualify a liner for pools; white does not guarantee long-term exposed suitability.

For pools or drinking-water contact, confirm the relevant suitability and hygiene requirements.

04 | DOES CHEMICAL RESISTANCE COVER EVERY MEDIUM?

Chemical resistance does not mean compatibility with every wastewater, oil or chemical liquid. Composition, concentration, temperature, contact time and mixtures all affect suitability.

Identify the medium and service conditions, then check material compatibility.

For special media, refer to the relevant product data and confirm by testing where necessary.

PLEASE PROVIDE

Application · Media · Temperature · Exposed / covered · Design requirements

BOSHIDA NONWOVEN PRODUCTS CO., LTD.

BOSHIDA

FOR YOUR PROJECT

THE RIGHT CONTAINMENT MATERIAL

HDPE GEOMEMBRANES · COMPOSITE LINERS
SUPPORTING GEOTEXTILES

Share your application, specifications, quantities and technical requirements so we can help identify a suitable material solution.

PRODUCT & PROJECT ENQUIRIES

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