



W502-C MITSUBOSHI

EPDM MEMBRANE

MIZU SHEET

A Flexible Watertight Lining System



PROVEN RELIABILITY





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EPDM MEMBRANE

MIZU SHEET

A Flexible Watertight Lining System

Easy installation

One of the best qualities of MIZU SHEET is its ease of installation. MIZU SHEET comes in a variety of sizes, up to 8m x 200m, so that a large area can be covered quickly and easily, with a minimum of joints and labor required. In addition, placement and jointing of the material requires no special tools or techniques.

Low cost

Because of this ease of installation and because MIZU SHEET is extremely light, making transportation easy, construction time needed as compared to concrete lining is only about 1/3 and lining cost can be reduced by 1/2. Also, as repair work is simple and quickly done, operation and maintenance costs are minimal.

Outstanding chemical resistance

.....A wide range of usage

Lining material is being used in a variety of industrial and agricultural usages that everyone is familiar with, such as reservoirs, farm ponds and irrigation canals, but the superior chemical resistance of MIZU SHEET enables it to also be applied in a variety of specialized usages like settling ponds, tanks, for storage of various chemicals and waste liquids and even such leisure usages like water hazards on a golf course or ponds in a park.

As methods of installation are widely varied, please consult with us at the time of design for resistance properties recommended for your particular usage.

Though, the material presented herein is considered accurate, no liability is assumed concerning any damages or results obtained through usage of said material.

[Note] Don't apply MIZU SHEET to ponds for water to drink.

Characteristics and Pr

1. Characteristics

Waterproof material supplied in sheets

The main polymer in this waterproof sheeting is Ethylene-propylene-diene monomer (EPDM) the material offers excellent resistance against weathering and aging.

Test-indicated durability : 50 years

Judging from the results of our accelerated aging tests using ozone (see page 3 for details). Should last for 50 years. The superior durability can be seen in the fact that there have been no incidents of failure during the approximately 20 years it has been on sale.

Stable physical properties at temperatures between -45°C and $+100^{\circ}\text{C}$

No change in the material's qualities is observed over a temperature range of -45°C to $+100^{\circ}\text{C}$ so that it can be used in almost any type of climate (brittleness starts at -49°C).

2. Dimensions of Mizu Sheet

Thickness (mm)	1.0	1.5	2.0
Width (m)	1.2 ~ 10.0		
Length (m)	10.5 ~ 250	10.5 ~ 200	10.5 ~ 150

3. Physical properties

Test Description	Test Method	Our Specification
Tensile strength, <i>minimum kg/cm²</i>	ASTM D412	84
Modulus at 300 percent elongation, <i>minimum kg/cm²</i>	ASTM D412	42
Ultimate elongation, <i>percent minimum</i>	ASTM D412	450
Tear resistance, <i>minimum kg/cm</i>	ASTM D624 (Die "C")	27
Heat aging 7 days at 80°C	ASTM D573	
Tensile strength retained, <i>percent of original</i>		80 ~ 150
Modulus at 300 percent elongation retained, <i>percent of original</i>		80 ~ 150
Elongation retained, <i>minimum percent of original</i>		70
Tear resistance retained, <i>percent of original</i>		50 ~ 150
Ozone resistance	1000 $\pm$ 100 pphm at $40\pm 2^{\circ}\text{C}$ Extension: 100% 168 Hours	No cracks

4. Weather resistance

It is very hard to judge to what extent the waterproofness of a material is affected by various deterioration-causing factors, such as ozone, heat, or light. However the principal reason for deterioration in rubber sheets is ozone, and so, it may be reasonable to assume that it is of the utmost importance to use materials with high ozone resistance.

The following formula has been obtained from the results of the tests performed at our plant on the correlation between deterioration in the waterproofness of sheets due to concentrated ozone and deterioration due to natural exposure.

Properties of MIZU SHEET

Ozone density: 1000pphm
 $\text{Log } Y = 1.423 \log X + 0.226$
 Y : ozone cracking time (minutes)
 X : natural exposure time (days)

On the basis of this formula, the stated test time (36,000 hours) is equivalent to 19,610 days of outdoor exposure, which is about 53.7 years. Although these are estimated values, they can be assumed to be quite reasonable from the fact that in the almost 20 years this product has been in the market no sheet has ever shown any defects nor have we received any customer complaints.

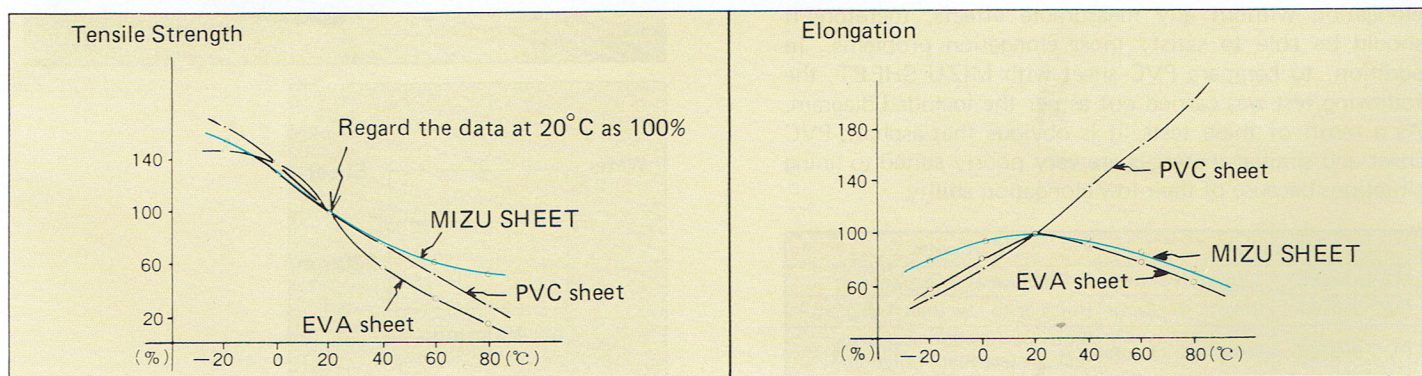
	Condition	MIZU SHEET	Butyl sheet
Ozone test (1)	Ozone density; 1000pphm Temperature ; 40°C Extension ; 100%	No cracks after 36,000hours	Cracks occurred after 17hours
Outdoor exposure test	Extension ; 100%	No cracks after 56,160hours	Cracks occurred after 240hours
Weather-0 -Meter test (2)	Extension ; 100%	No cracks after 2,000hours	Cracks occurred after 250hours

- (1) The result of 3,280 hours in ozone test is equivalent to ten years exposure, and 5,800 hours to fifteen years exposure.
- (2) The result of 240 hours in Weather -0 - Meter test is equivalent to one year exposure.

5. Effect of temperature

In resin (EVA, PVC, etc.) and asphalt sheets, the structure is deficient in bending between the molecules and so is quite unstable—the sheets soften at high temperatures and become extremely hard at low temperatures.

Non-vulcanized type rubber sheets show the same tendency, but vulcanized type sheets like MIZU SHEET, with its strong molecular bond, are physically stable both at low and at high temperatures. As it will be used under severe natural conditions, a material should be physically stable over a wide range of temperatures. In this sense MIZU SHEET is perfectly suited as a waterproof material.



6. Heat aging

While naturally depending on the surroundings or the specifications, there are reports that the surface temperature of our sheets has risen as high as 70°C in mid-summer.

The following chart shows the physical change in MIZU SHEET and butyl sheet over a long period at 100°C.

The results of the test clearly show the outstanding characteristics of both MIZU SHEET and butyl sheets, i.e. the fact that the maintenance rate of MIZU SHEET elongation and butyl sheet's tensile strength decreases.

This is caused by the difference in position of the double bond which is necessary for vulcanization of rubber. In butyl rubber this is located in the main chain and molecules are cut and softened because of heat aging, while in MIZU SHEET it is located in the lateral chain and the molecules are not cut and vulcanization by heat is continues, and the elongation percentage decreases. In the event that long term physical stability is required, hardening type MIZU SHEET will naturally have a higher safety margin than the softening type butyl.

7. Pressure resistance

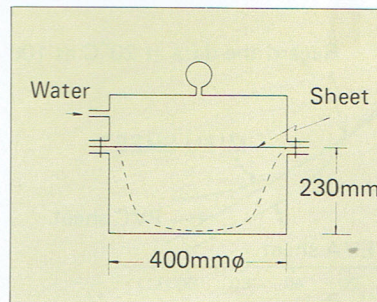
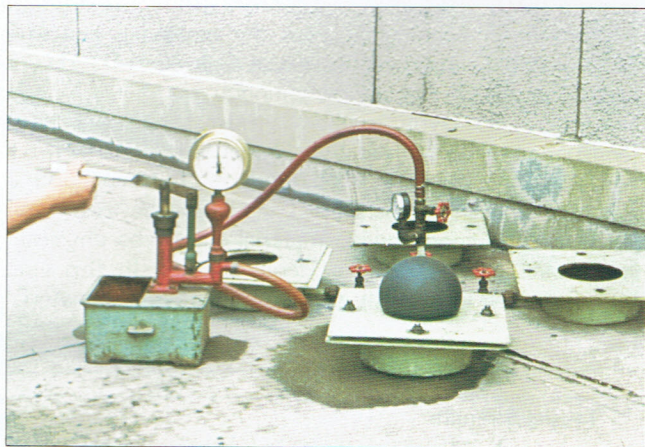
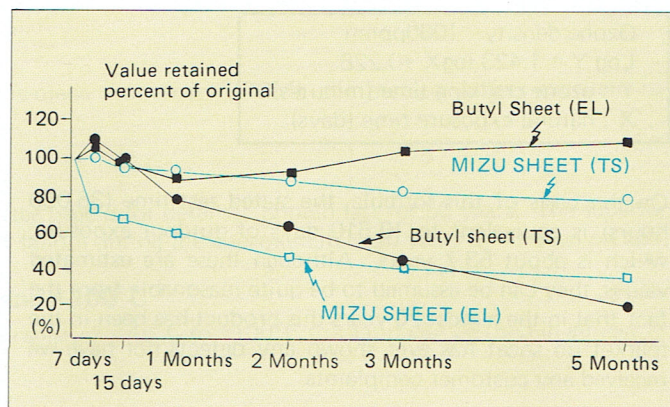
Water Pressure	MIZU SHEET	Asphalt Panel
0.2kg/cm ²	Elongation about 30% No leakage	Began to bulge
0.3kg/cm ²	Elongation about 60% No leakage	Cracking occurred
0.5kg/cm ²	Elongation about 260% No leakage	Burst open

In the above water pressure test, pressure was applied to an area of 20cm diameter on the test pieces. The thickness of MIZU SHEET tested was 1.5mm and the thickness of the asphalt was 15mm.

In testing the elongation of MIZU SHEET, two guidelines were drawn close to the center of the test piece and the distance measured. During each step of this testing, the distance was again measured and the elongation calculated. (The central area of the test piece was used as it is in that area where the highest elongation occurs.)

The results of the test indicated that MIZU SHEET is able to withstand over 0.5kg/cm² of pressure and 260% elongation without any measurable effects, therefore it should be able to satisfy most elongation problems. In addition, to compare PVC sheet with MIZU SHEET, the following test was carried out as per the included diagram. As a result of these tests, it is obvious that asphalt, PVC sheet and similar materials are very poorly suited to lining situations because of their low elongation ability.

Materials	Results
MIZU SHEET 1.5mm thickness	No leakage at 2.3kg/cm ²
PVC SHEET 2.0mm thickness	Burst open less than 1.0kg/cm ²
PVC SHEET 0.4mm thickness	Small perforation appeared; leakage less than 1.0kg/cm ²



8. Chemical resistance

As shown in the following chart of test results, MIZU SHEET has excellent resistance to chemicals, with the exception of strong acids, aliphatic solvents and petroleum; this enables it to be used as an inner coating on tanks for storing various chemicals or waste liquids, and as a protective layer for canals. For unknown chemicals or waste liquids, a soaking test should be carried out each time to confirm its suitability.

Chemicals	Density (%)	Judgement	Chemicals	Density (%)	Judgement
Hydrochloric acid	10	○	Acetone		○
Hydrochloric acid	Conc	XX	Methyl ethyl keton		△
Sulfuric acid	10	◎	Methyl isobutyl keton		X
Sulfuric acid	Conc	XX	Carbon tetrachloride		XX
Nitric acid	10	◎	Chloroform		XX
Nitric acid	Conc	X	Ethylene chloride		XX
Phosphoric acid	Conc	◎	Acetic acid	5	○
Sodium hydroxide	10	◎	Acetic acid	10	△
Sodium hydroxide	Conc	◎	Glacial acetic acid		XX
Potassium hydroxide	10	◎	Phosphoric acid	10	◎
Ammonium hydroxide	10	◎	Carbolic acid	100	○
Ammonium hydroxide	Conc	◎	Tartaric acid	10	◎
Calcium hydroxide	10	◎	Methyl alcohol		◎
Sodium chloride	25	◎	Ethyl alcohol		◎
Calcium chloride	25	◎	Ethylen glycol		◎
Ammonium nitrate	25	◎	Glycerin		○
Ammonium sulfate	25	◎	Aniline		○
Diethylene glycol		○	Triethanolamine		○
Ethyl acetate		△	Cottonseed oil		△
Amyl acetate		X	Olive oil		△
Diethyl phthalate		○	ASTM oil No. 1		X
Dibutyl phthalic acid		○	ASTM oil No. 3		XX
Benzene		XX	Gasoline		XX
Hexane		XX			
Toluene		XX			
Xylene		XX			

Evaluation: Sufficient for actual use (◎) To be used under certain condition (○, △)
Not usable (X, XX)

Method: Test piece was totally submerged in solution at 20°C for one month.

Planning Musts

In order to fully utilize the qualities of Mizu Sheet, it is necessary to take into consideration the manner in which the sheeting will be used and placed, including such things as slope, base material, climatic factors, placement, etc. Therefore, the following points are suggested to insure the best possible usage of Mizu Sheet.

1. Slope

Various factors, such as soil and the foundation ground, will affect the degree of slope, however, we have found that the most suitable slope for Mizu Sheet is a run of 1:1.5 to 1:2.5.

As the slope stability is an important consideration in building a foundation slope, this too must be considered when planning to use Mizu Sheet, especially under the following conditions:

1. When the bank is especially high, (Generally 10m or more)
2. When the bank soil has a low shear strength.
(e.g. the bank soil has clay with high moisture content)
3. When the bank is to be built on poor base material.
4. When the bank is to be built on a steep slope.

Note:

When the bank is high and water is to flow down the bank at a high rate, it is often necessary to construct a berm about halfway down the slope to slow the water.

The suitable slope of banking and cutting

Banking	height (m)	Slope	Cutting	height (m)	Slope
Well-graded sand, Poorly-graded gravelly soil	0 ~ 5	1.5 ~ 1.8	sand		1.5 ~
	5 ~ 15	1.8 ~ 2.0	Sandy loam	0 ~ 5	1.0 ~ 1.2
Poorly-graded sand	0 ~ 10	1.8 ~ 2.0		5 ~ 10	1.2 ~ 1.5
Sandy loam, Hard clay loam, clay	0 ~ 5	1.5 ~ 1.8	Gravelly soil	0 ~ 10	1.0 ~ 1.2
	5 ~ 10	1.8 ~ 2.0		10 ~ 15	1.2 ~ 1.5
Soft clay loam, clay	0 ~ 5	1.8 ~ 2.0	Clay loam, clay	0 ~ 10	1.0 ~ 1.2

2. Foundation Work

As the elongation properties of Mizu Sheet are extremely good when compared to concrete, asphalt or PVC sheet lining, Mizu Sheet can be placed over a large variety of foundation surfaces. In addition, the Mizu Sheet will be able to accommodate most surface changes, such as differential settlement, by automatically assuming the shape of any irregularities. However, in situations where, for example, the foundation base material is poor, or water content is high, due consideration must be given to the large irregularities that might result and, planning should be done with an eye towards protecting the Mizu Sheet. This can be accomplished with such things as pre-loading and sand draining. Finally, before foundation work is finished and the Mizu Sheet installed, sufficient calculation and planning for the load or weight to be placed on the foundation (e.g. the weight of the volume of water) must be taken into account; this is of course to lessen the chance of future surface irregularities and protect the Mizu Sheet.

3. Ground Surface Preparation

Next, it is necessary to prepare the ground surface sufficiently. The surface to be lined should be raked, smoothed, and rolled if necessary. It should be free of all large, sharp rocks, gravel or other sharp objects. (any objects over 5mm diameter should be removed)

Also, the surface should be free of all vegetation and vegetation stubble, such as tree and plant roots that protrude.

In case the surface to be lined is exceedingly hard or rough, or sufficient surface preparation is impossible, a 10cm layer of sand should be layed down to protect the Mizu Sheet.

Last, in order to keep the Mizu Sheet from moving, an anchor trench on the shoulder of the slope should be dug to form a perimeter around the area to be lined.

4. Underground Water

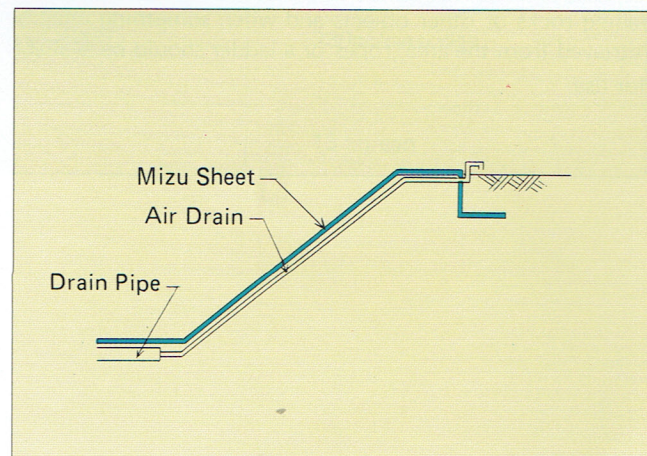
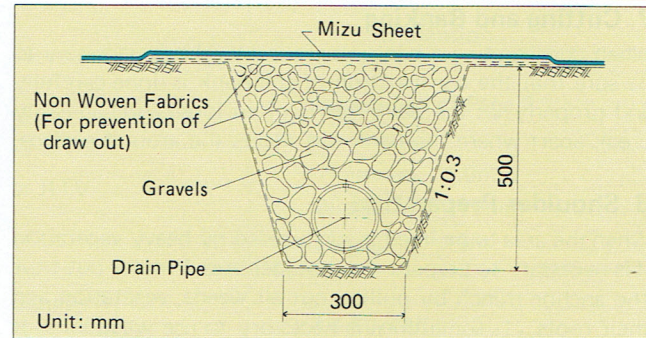
As a rule, underground water problems are often present therefore making it necessary to install drainpipes on the flat area of the surface to be lined.

When a slope of the area to be lined cuts into a mountain or hillside, springs and/or dripping water often cause problems. To solve this, a system of drainpipes running down the slope in a herringbone pattern and tying into the flat area's drain system should be installed.

5. Air Drain

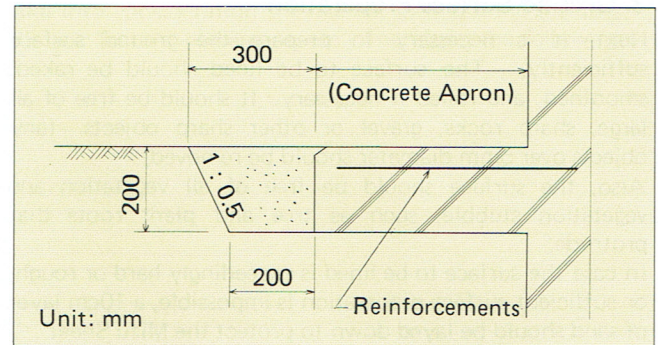
Because air present in the ground sometimes causes the Mizu Sheet layer to bulge it is necessary to install an air drain to prevent this from happening.

The method is to connect the ground drain system and slope drain system to a pipe which protrudes above the bank level and allows the air to escape. This, of course is done before the Mizu Sheet is laid. See illustration.



6. Concrete Abutments

If any spillways or other concrete objects are to be placed where they will come into contact with the Mizu Sheet, a concrete apron will be necessary to facilitate placement of the sheeting. The apron should extend at least 500mm and should be flat. It is especially important to remember that after installing the concrete apron and backfilling, the area backfilled must be sufficiently compacted to prevent any sinkage and consequent damage to the Mizu Sheet where the Mizu Sheet and the concrete apron meet. One good way to prevent this from happening is to backfill the hole with sand, water down the sand until sinkage stops completely and then compact.



7. Cutting and Banking

When constructing a bank on ground level it is necessary to be sure that the construction of the bank is done carefully and properly, as the bank dirt is often loose and can easily break apart where the bank dirt meets the ground surface.

8. Shoulder Preparation

When the area to be lined is surrounded by heavy vegetation, it is necessary to prepare the shoulder area 1 meter out from the anchor trench by pulling out all weeds, vegetation and their roots. It sometimes is necessary to use weed killer to complete the job sufficiently.

9. Oil and Chemical Liquid Problems

If there is any chance that oil might be introduced into an area where Mizu Sheet is present, it is a must to place a floating oil fence to protect the Mizu Sheet.

If there is a possibility that an oil fence is necessary, or that chemical liquids are to be used, or if the area is to be used to grow food materials such as in the case of a fish farm, please contact Mitsuboshi during your planning.

10. Protective Measures

It is extremely important that, after the Mizu Sheet is in place and the lined area is in use, measures are taken to protect the Mizu Sheet from outside damage, especially puncture or tear damage.

Therefore it is necessary to protect the Mizu Sheet from falling rocks or other objects and when something must be retrieved from the area, ropes or a ladder should be available for use.



MIZU SHEET Materials List

Material	Application	Dimension
Mizu Sheet	Waterproof membrane	mentioned of Page 2
RTV Joint Tape	Adhesive tape for sheet joint for RTV jointing method	Thickness 1.0mm Width 110mm Length 15m
Neo-Joint Primer	Solution for increasing adhesiveness of RTV Joint Tape	12 kg/can
Neo-Bond #110JSD	Adhesive for sheet joint	A and B each 3kg/can
Neo-Bond Seal E	Adhesive for sheet and concrete For sealing the end of sheet	A and B each 3kg/can
EJ Tape	Tape for reinforcing the joint part	Thickness 1.8mm Width 70mm Length 15m
Neo-Roofing RN	In order to avoid leaks in external and internal corners, gutters, pipes and other intricate areas, etc. (Non vulcanization type)	Thickness 1.5mm Width 300mm Length 10m
Neo-Seal	For sealing the gap of end-of-sheet joint, lapping edge where three layers of sheet meet and corners.	330cc/cartridge
Neo-Color E	Coloring paint	15 kg/can

Installation Method

Before Mizu Sheet is to be installed, make sure that all of the "Planning Musts" have been thoroughly read and followed. When a project is in the planning stages, it is of course necessary to develop a blueprint of the project to insure the construction techniques are the most applicable and economical possible. The contractor should confer with Mitsuboshi in order to develop a sheet distribution drawing or should bring a sheet distribution drawing to Mitsuboshi so that we might help to make the use of Mizu Sheet economical and effective.

1. Installation of Mizu Sheet

First of all, the dimensions of the project where Mizu Sheet is to be laid must be accurately measured and decisions made as to the placement and usage of Mizu Sheet. Then the sheets can be brought to the site and placed in the proper position.

The sheets for the slopes should be laid down first in order to protect the slope from soil erosion by rain, etc.

The sheet should be unfolded gradually, starting from the top of the slope.

On a slope, the parts which are overlapped on the site (not the factory joints) must be laid with the upper sheet overlapping the lower sheet. If flowing water is present, the overlapped parts must not be laid against the water flow in any area.

The factory joints on overlapping sheets must be spaced at least 300mm apart.



2. Jointing Method of Mizu Sheet

The jointing method should be done as per the following illustrations. As there are no special tools or techniques necessary, the jointing work is easily and quickly done.

A. RTV (Room Temperature Vulcanization) jointing method

Each joint should be overlapped by at least 100mm as per the sectional drawing.

Step 1

Fold back Mizu Sheet (A) and (B) and set the underlay (rubber mat) between (A) and (B) so that the underlay extends past the end of sheet (A) by about 50mm.

Step 2 Setting the gum tape

Laying the gum tape on the underlay with the adhesive side up, set the edge of Sheet (A) in the center of the tape and make a guide line on Sheet (A) for the joint width of 200mm in from the edge of Sheet (A). Then set Sheet (B) along the guide line and fix it by pressing down on the gum tape.

Step 3 Application of RTV Joint Tape

Lay RTV joint tape in position just after protection tape is removed with leaving release paper on RTV Joint Tape.

Step 4. Comming MIZU SHEET together in width

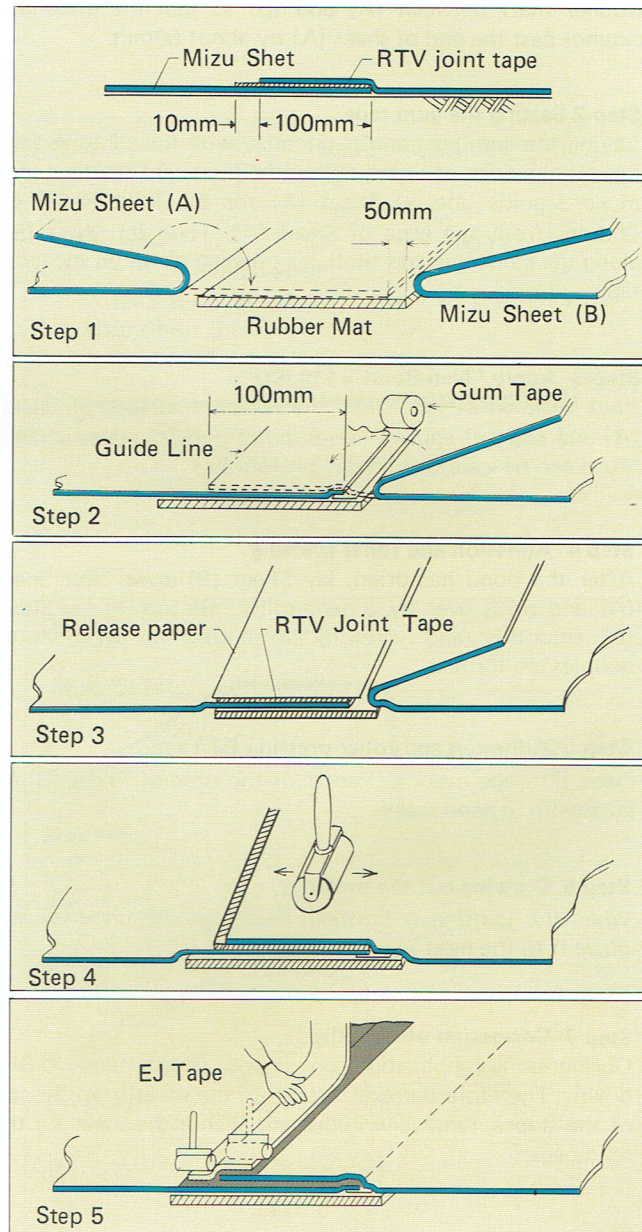
After removing release paper, come MIZU SHEET together in width and roll the full length with a hand roller. Take care not to trap air between the sheet and the joint tape.

Step 5 Application of EJ Tape

Apply EJ Tape to top sheet along length of splice. Roll down completed splices with roller, using positive pressure. Roll toward outer edge to remove trapped air and then along length of splice.

Step 6 Draw of rubber mat

Draw out rubber mat after jointing work has finished.



B. Cold jointing method

Each joint should be overlapped by at least 200mm as per the sectional drawing.

Step 1 Setting "Mizu Sheet" and Rubber Mat

Fold back "Mizu Sheet" (A) and (B) and set the underlay (rubber mat) between (A) and (B) so that the underlay extends past the end of sheet (A) by about 50mm.

Step 2 Setting the gum tape

Laying the gum tape on the underlay with the adhesive side up, set the edge of Sheet (A) in the center of the tape and make a guide line on Sheet (A) for the joint width of 200mm from the edge of Sheet (A). Then set Sheet (B) along the guide line and fix it by pressing down on the gum tape.

Step 3 Apply "Neo-Bond #110JSD"

Fold back Sheet (B), clean the adhesive surface of Sheet (A) and (B) and apply "Neo-Bond #110JSD". (Use a hand brush and be careful to apply uniformly.)

Step 4 Adhesion and roller-pressing

After the bond has dried, lay Sheet (B) down over Sheet (A) and press over by a hand-roller. Be sure to lay Sheet (B) smoothly and carefully to ensure no wrinkles or bubbles are formed.

Step 5 Adhesion and roller-pressing EJ Tape

Place EJ Tape over the center of the edge of Sheet (B) and press with a hand-roller.

Step 6 Drawing out the underlay

When the jointing is finished, draw out the underlay and move it to the next joint to be worked on.

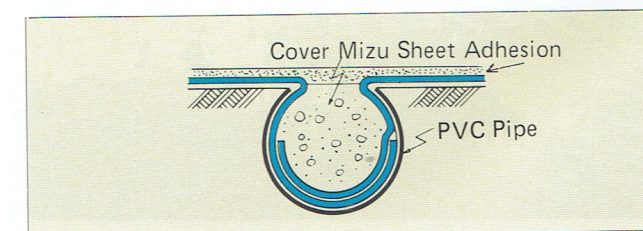
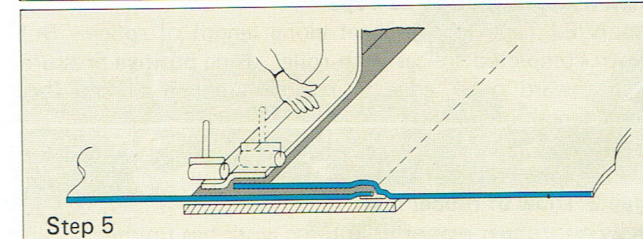
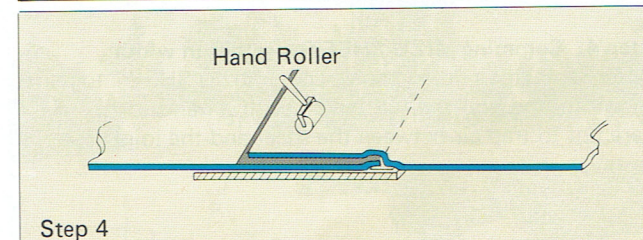
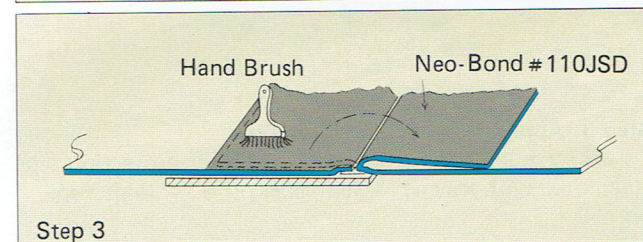
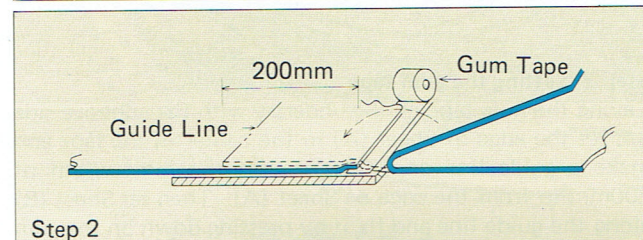
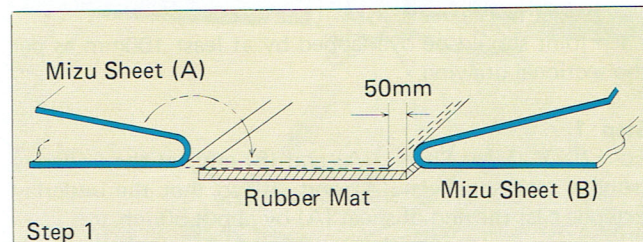
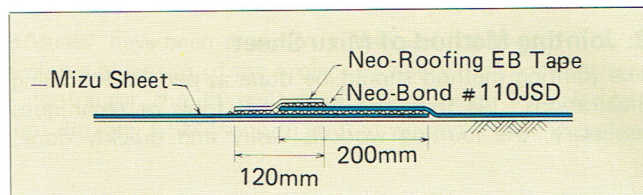
Step 7 Correction of wrinkles

During bond application on slopes, sheets tend to slip down. Therefore be sure to pull up the sheet from the top of the slopes, remove wrinkles and anchor the sheet by the sand bags.

Note:

Installed sheets should be jointed only after their wrinkles and other irregularities have been corrected.

In case it is deemed necessary to "anchor" Mizu Sheet to the ground surface, the method of anchoring should be as per the sectional drawing, which is called a "Pipe-joint".



3. Jointing method at the concrete abutment

If any spillways or other concrete objects are to be placed where they will come into contact with Mizu Sheet, a concrete apron will be necessary to facilitate placement of the sheeting. The apron should extend at least 500mm and should be flat. The jointing method should be done as per the following steps.

- Step 1** Clean the foundation and the apron.
- Step 2** Apply Neo-Bond Seal E to an area 300mm of the foundation and/or the apron normally 1kg/m^2 . Apply it uniformly by rubber spatula.
- Step 3** Apply 600mm wide Mizu Sheet as a protection patch to the apron.
- Step 4** Apply Neo-Bond #110JS to an area 200mm from the concrete foundation out towards the edge of the apron and sheet.
- Step 5** Apply Mizu Sheet to the areas to be covered. And press down the sheet to prevent air from entering.
- Step 6** Nail the anchor or coping bar.
- Step 7** Seal the end by Neo-Bond Seal E.

Note:

If a concrete joint exists on a level with the flat area. Mizu Sheet must be applied on the vertical surface to a level above the joint. Overlapping at corners should be avoided as much as possible.

4. Shoulder anchoring

The slope shoulder part, Mizu Sheet is buried in the anchor trench in the form of the letter "L". The edge of the slope to the edge of the anchor trench should measure at least 500mm, as per the illustration (A). Illustration (B) shows the typical anchoring method when permeation of rainwater from the shoulder should be avoided in such as gypsiferous terrain. When a fence is to be placed in the anchor trench, the shoulder of the slope should be made of concrete as per the illustration (C).

(C)

Note. Illustration (B)

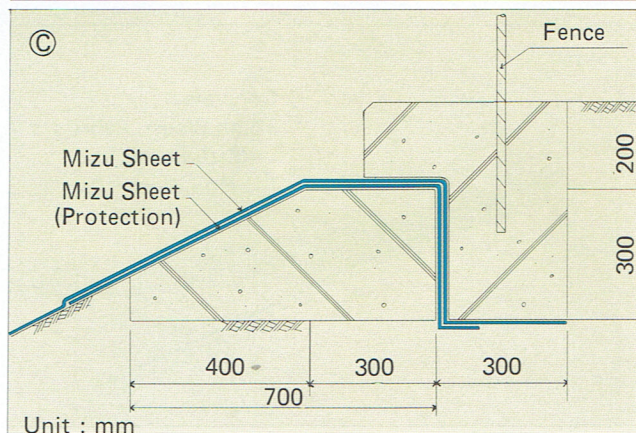
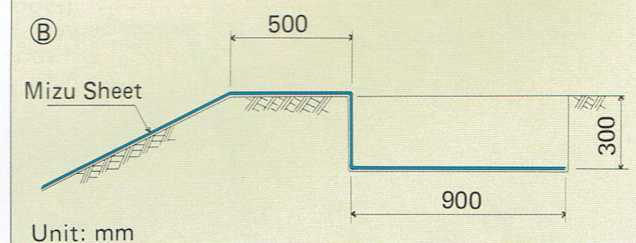
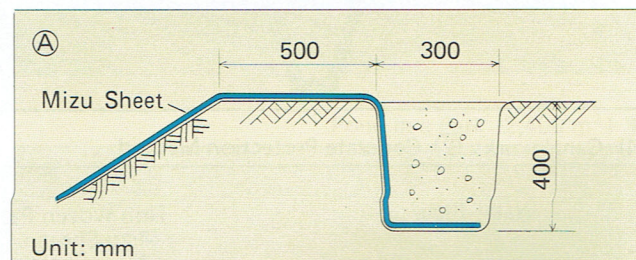
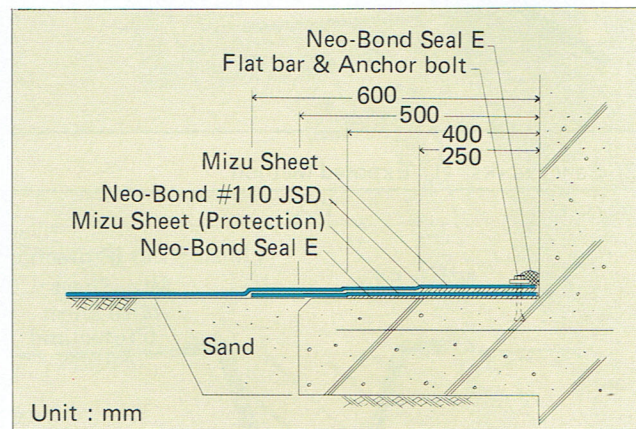
The edge of Mizu Sheet is buried widely to prevent the permeation of rain water from the shoulder, otherwise the surface of the top of embankment should be coated by prime-coat.

5. Air drain

The details are illustrated on Page 7.

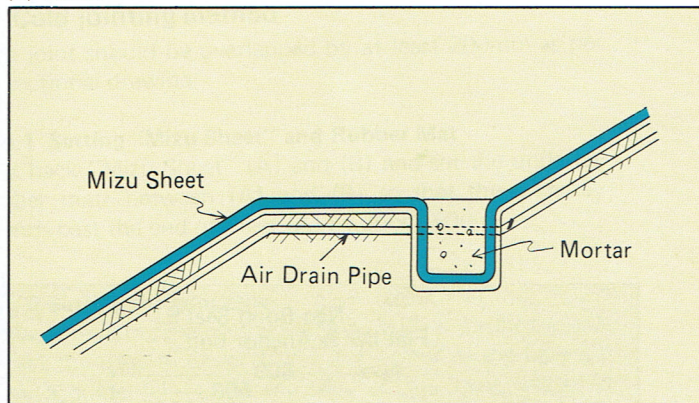
6. Coloring

When it is necessary to color up the surface of the area, apply Neo-Color E with a roller brush.

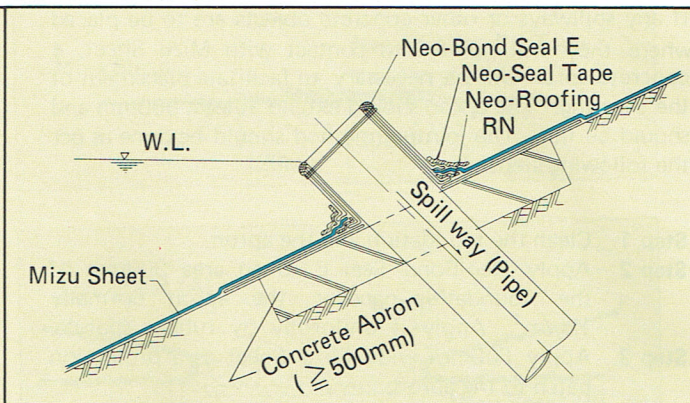


Typical Details

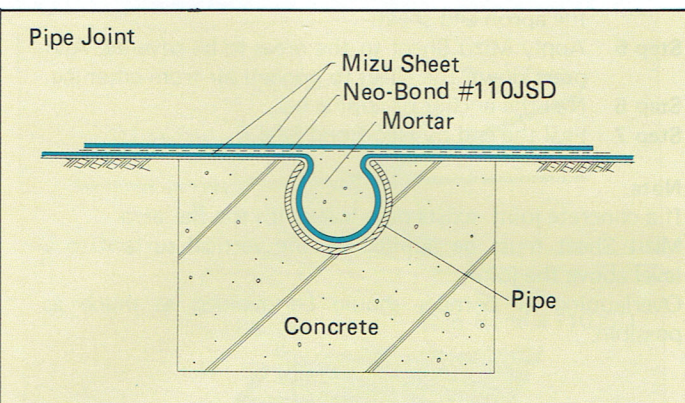
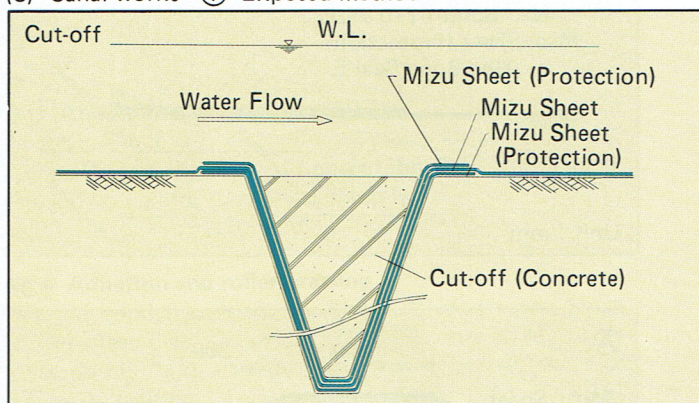
(1) Berm



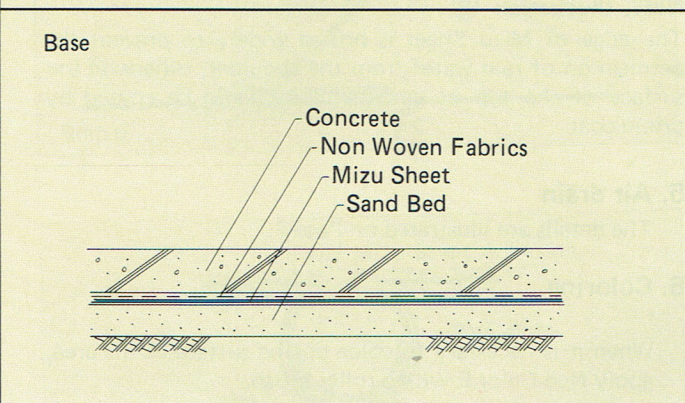
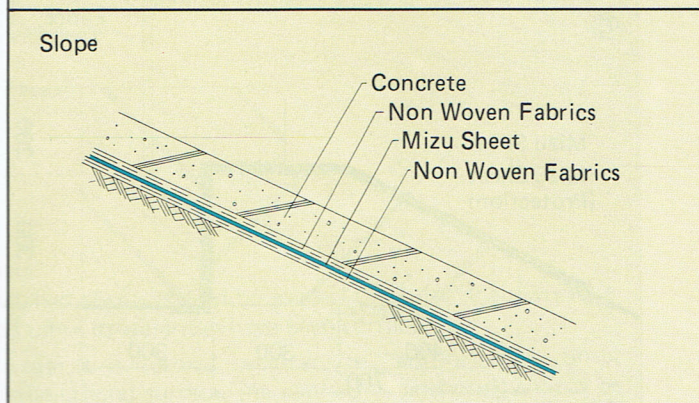
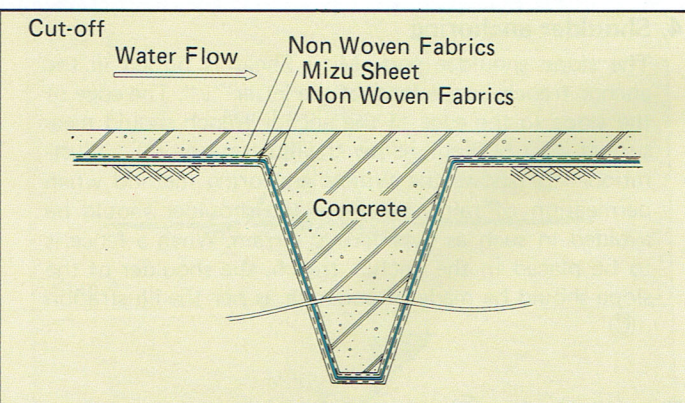
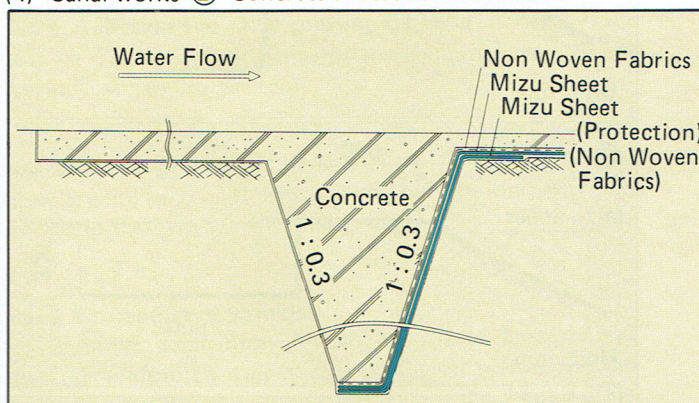
(2) Spill way (Pipe)



(3) Canal works ① Exposed Method



(4) Canal works ② Concrete Protection Method



Applied MIZU SHEET Photos



▲ Waste Disposal (28,000 m²)

Pond in a Park (2,400 m²) ▼





▲ Regulating Reservoir (10,000 m²)

Water Control Facilities (120,000 m²) ▼





▲ Flood Storage Basin (10,000 m²)

Irrigation Reservoir (7,500 m²) ▼





▲ Water Hazard on a Golf Course (1,380 m²)

Pond in a Park (1,010 m²) ▼





▲ Industrial Reservoir (30,000 m²)

Waste Disposal (28,000 m²) ▼



Application Example in Iraq

The Tigris and the Euphrates, one of the large rivers in the world, run across the Republic of Iraq, and her land is fertile. However, only the vicinity of the river is used for agriculture because the rainfall is very small throughout the year. Therefore the Government of Iraq has been very aggressive to facilitate the construction of irrigation canal.

Here we introduce Ishaqi Main Canal, one of the largest land reclamation projects, which was constructed in 1968 to 1970. The total length of this canal is about 40 km.

But the most of this canal is covered with gypsiferous soil and it couldn't withstand the direct contact with water. Mitsubishi Belting Ltd. contributed to this project by lining it with MIZU SHEET in as much as 18 km length (750,000 sq. m) in 1978 to 1980.





Crew progressively unfolds liner of MIZU SHEET and pulls it up embankmen



Press down with hand roller



MIZU SHEET is cleaned, RTV-JOINT TAPE is applied to make the splice.



MIZU SHEET at the pier



Removing the release paper of RTV-JOINT TAPE

