

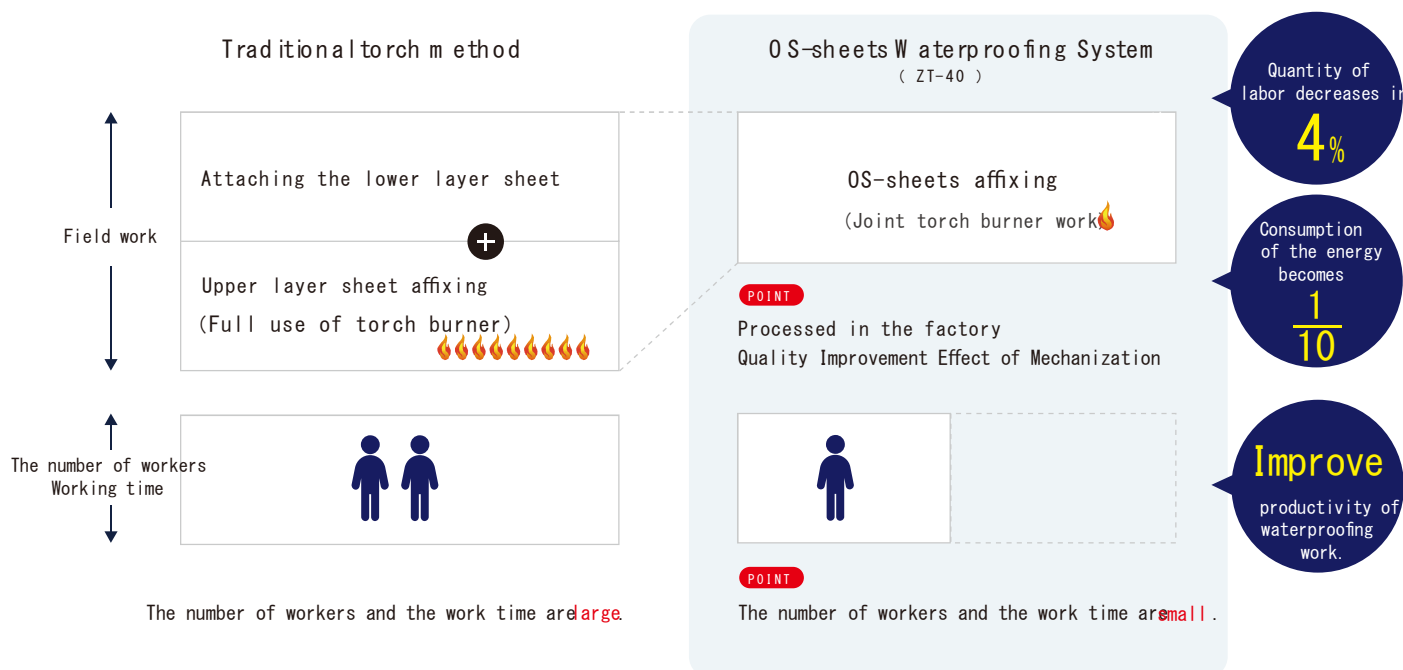
OS-sheets Waterproofing System

Waterproof construction in pursuit of simplicity and quality

Features of the OS-sheets waterproofing system.

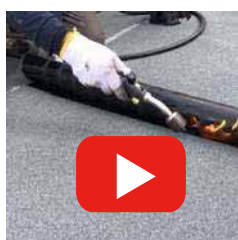
^{FUTURE} 01 Improved construction quality and stable quality that is not affected

Stable quality has been achieved by mechanizing the sheet lamination process.



^{FUTURE} 02 Faster construction speed and higher productivity!

The lower layer sheet process is omitted, and the torch work is performed only on the joint part. The labor force is small, and the construction can be done quickly.



Please check out the video of the easy installation of OS-sheets waterproofing.

^{FUTURE} 03 Realization of construction that is friendly to people and the global environment!

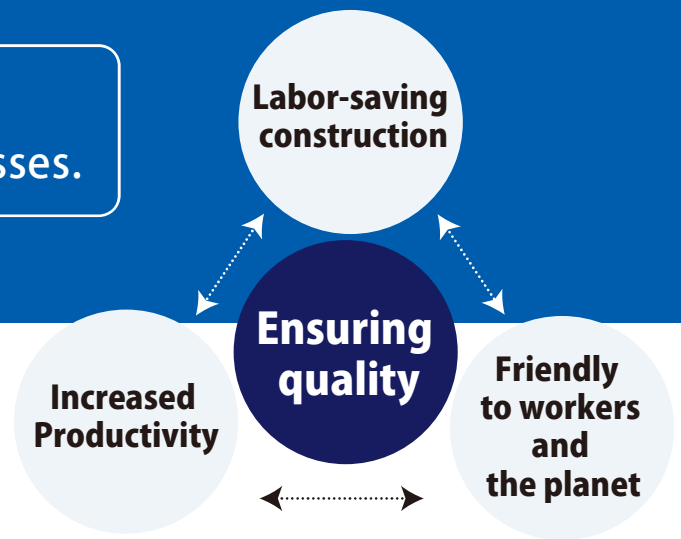
Since the torch work is performed only on the sheet joint, the burden on the operator can be greatly reduced. The amount of fire used is significantly reduced compared to the full-surface torch method, and CO₂ emissions can be reduced by about 90%.

Environmentally friendly waterproofing construction
Since the torch work area is as small as 1/10, the burden on the operator and CO₂ emissions can be greatly reduced.

Approximately
90%
reduction in
CO₂ emissions



There are so many advantages to simplifying materials and processes.



^{FUTURE} 04 Labor-saving waterproofing work

The simple material composition reduces material volume costs, and the short construction period reduces management costs.

Improvement of productivity by saving labor in construction	Reduction in the number of materials	Reduced costs for material transportation and inventory management
POINT By saving labor, it is possible to carry out construction with a small number of workers. Traditional torch method OS-sheets Waterproofing System 4 people · 5 days 3 people · 4 days POINT Due to the increased productivity, a large waterproofing area can be installed. Traditional torch method OS-sheets Waterproofing System	POINT By integrating the conventional under-pasted sheet and the top-pasted sheet at the factory, we were able to reduce the number of materials. Traditional torch method OS-sheets Waterproofing System POINT Improved quality can be achieved by mechanizing the process.	POINT The simple material composition reduces the amount of transportation and reduces transportation costs. Traditional torch method OS-sheets Waterproofing System It makes it easier to manage inventory and secure storage locations. Traditional torch method OS-sheets Waterproofing System

【 Cost per waterproofing work area 】

Through the "OS-sheets waterproofing system," we are realizing the theme of "being kind to the global environment and work environment, and reducing construction costs."

Traditional torch method	Construction cost	Material cost	Material transportation costs & Management costs	
OS-sheets Waterproofing System	Construction cost	Material cost	Material transportation costs & Management costs	Merit

The "Protective Seal" prevents rainwater and torch flames from entering the back of the sheet.

Hybrid Modified Asphalt Tarpaulin

OS-sheets

confidence

Modified asphalt
(Thermal welding surface)

The joint between the lower layer sheet and the upper layer sheet is integrated by heat welding.

Fast

Partial adhesive layer

OS-sheets peel off the release film and attach it to the base.

Sheet joint parts

film

Protective Seal
(Self-adhesive seals)



What is Os-sheets?

O → Only One

S → Simple & Speedy

Characteristics of the two construction methods of modified asphalt tarpaulin

Torch method

Advantages

Watertightness of the sheet joint parts

Disadvantages

When torching the entire back of the sheets a lot of fire is used, which can be affected by the skill of the operator.

Self-adhesive construction method

Advantages

Construction is fast, and there is no uneven adhesion to the base by the operator.

Disadvantages

There is a slight problem with the sheet joints, and it is necessary to use materials to assist in the joining.

It is an environmentally friendly, economically effective, waterproof sheet that has the excellent durability and watertightness of modified asphalt, as well as the ability to follow the substrate and breathability. Since the process can be reduced, it leads to a shortening of the construction period and a reduction in construction costs. Since only the sheet joint parts are torched, the installation is fast and easy. This is a hybrid modified asphalt tarpaulin that combines the advantages of heat welding of torch method joints and the advantages of self-adhesive construction method. Compared to the conventional torch method, the amount of fire used can be minimized, and the work environment can be greatly improved.

OS-sheets is a construction method that extends the advantages of both sides and complements the disadvantages, and can achieve both **workability** and **reliability**.

We pursue

① Quality

② Workability

③ Environmental Friendliness

④ Economic Effects

feature of OS-sheets

01

Improved quality (OS-Z40)

High Quality



By mechanization, it is made into a high-quality, high-performance tarpaulin.

Since the bonding process of the bottom and top pasting is mechanized at the factory, the quality of the adhesive surface is improved regardless of the skill of the operator.

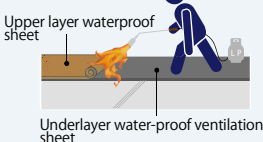
This reduces the on-site sheet lamination process while improving quality, shortening the construction period.

【Conventional construction methods】 【The composition of the waterproofing layer】

<Construction details>

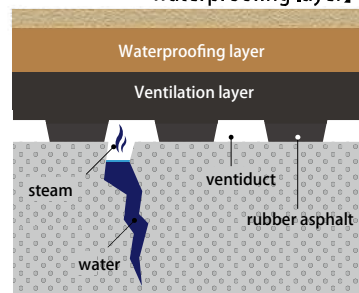
After attaching the lower layer waterproof ventilation sheet, it is necessary to perform skilled work of gluing the entire back surface of the upper layer tarpaulin with a torch.

- 1 Attach the underlayer waterproof ventilation sheet.
- 2 Weld the entire back of the upper-layer waterproof sheet to the lower waterproof ventilation sheet while torching the entire surface.



<Quality>

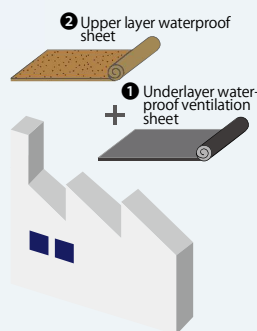
It is easily affected by the competence of the worker, and the quality is likely to vary.



Even if the composition of the finished waterproofing layer is the same, **OS-sheets** are mechanized to achieve high quality.

【OS-sheets at a factory】

The lower waterproof ventilation sheet and the upper layer of tarpaulin are bonded together at the factory.



<Construction details>

A tarpaulin consisting of an integrated lower waterproof ventilation sheet and an upper waterproof sheet is attached to the base, and the sheet joint part is welded and bonded with a torch.

By omitting the under-coating process and reducing the torch area to 1/10, the burden on the operator and the environment can be greatly improved. Reducing the process and torch area can shorten the construction period.

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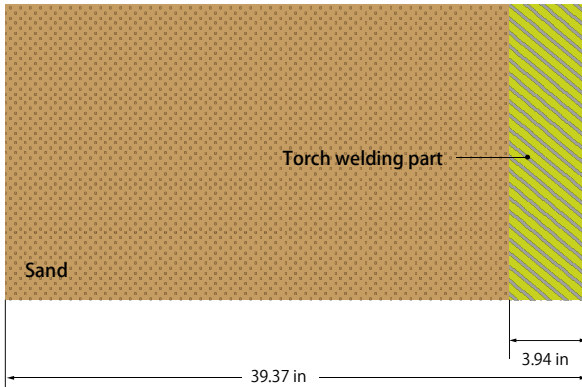
Quality is improved by mechanizing the laminating process.

Reliable design to prevent water from entering the sheet when applying the tarpaulin (OS-Z40)



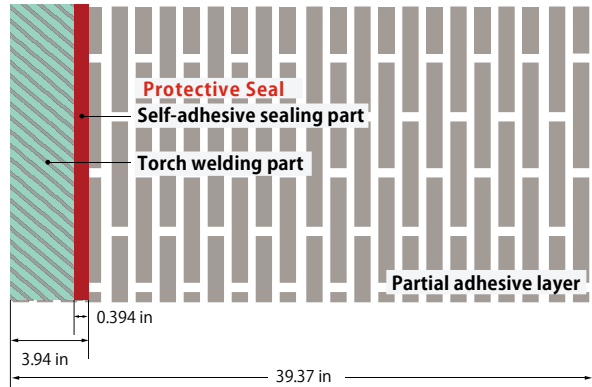
■ OS-sheets (surface)

(Sandysurfaceside of OS-sheets)

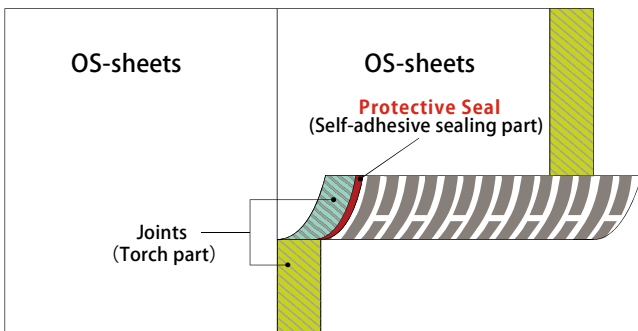


■ OS-sheets (back)

(Ventilation layer (Partial adhesive self-adhesive))



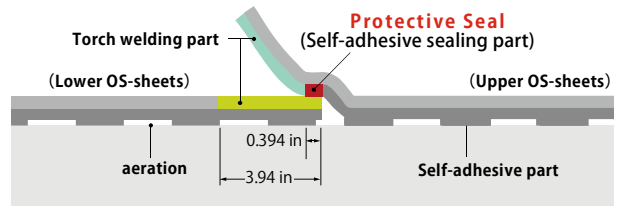
■ Seal image of joint part of OS-sheets



■ Construction of side wraps (long-sided joints)

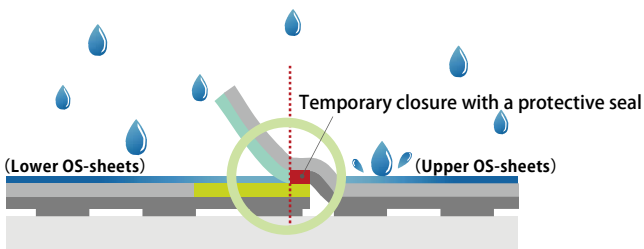
There is a 3.94 inch side wrap on the long side of the OS-sheets. Of these, 0.394 inch has a self-adhesive sealing part, and the remaining 3.54 inch is welded and bonded with a torch.

When the sheet is attached, it is sealed with the red part (Protective Seal) in the figure, so it is possible to block the intrusion of rainwater into the sheet when it is attached.



Side Wrap

■ Safe even in sudden rain during construction



Protective Seal prevents rainwater from entering.



Please take a look at the experimental video to see if Protective Seal alone can prevent rainwater from entering.



Reliability of sheet joints (OS-Z40)



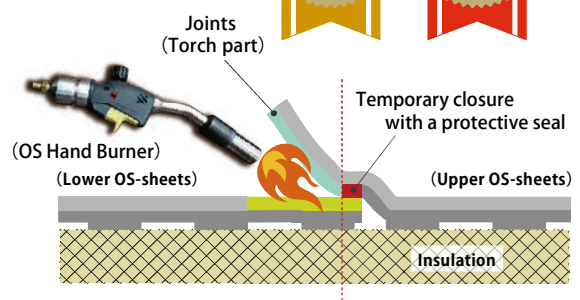
Integrated by joint weld bonding

Rather than joint bonding with adhesive layers or adhesives, the sheet joints are integrated by thermal welding bonding with a torch.

Since it is temporarily waterproofed with Protect Seal when OS-sheets are attached, OS-sheets attachment and torch installation can be performed separately.

Therefore, the operator can concentrate on the torch work again after attaching the OS-sheets. Alternatively, other workers can concentrate on the torch work, which improves the construction quality of the joints.

In addition, Protective Seal also prevents flames from entering the inside of the OS-sheets, so you can use the torch burner with peace of mind without burning the waterproof base.



Protective Seal prevents flames from entering, so you can install with confidence without burning the insulation



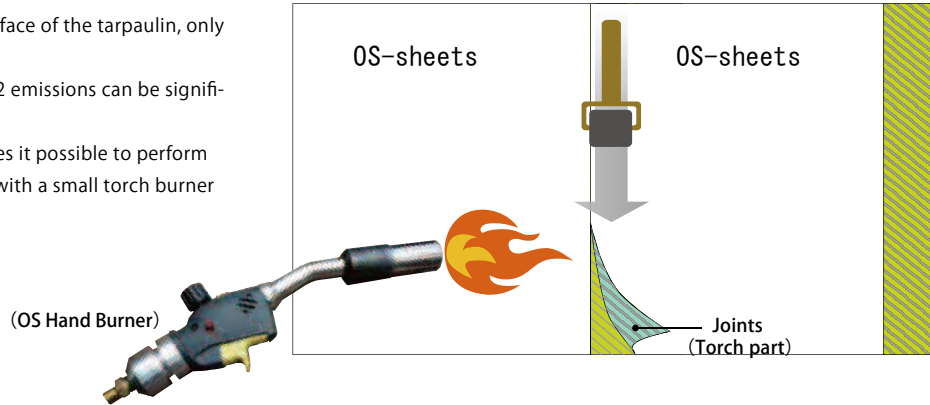
Tarpaulin to minimize fire usage

Without torching the entire back surface of the tarpaulin, only the sheet joint part is melt joined.

As a result, torch operations and CO2 emissions can be significantly reduced (1/10).

Torch work with only the joints makes it possible to perform waterproofing work on a large area with a small torch burner (OS hand burner).

■ OS-sheets Bonding Image



Degassing cylinder that brings out the best of OS-sheets

Deaeration System for OS-sheets

The degassing passage that continues from the ventilation layer is uninterrupted and degassing efficiently.

The "OS Degassing Cylinder" is devised so that moisture from the base is released to the outside air without interruption through the degassing passage on the back of the OS-sheets.



OS Degassing

SUS 304 stainless steel
Installed average calculation
1 ea. / 538.2~1,076.4 ft²

Size: Inner cylinder outer diameter $\Phi 1.65$ in

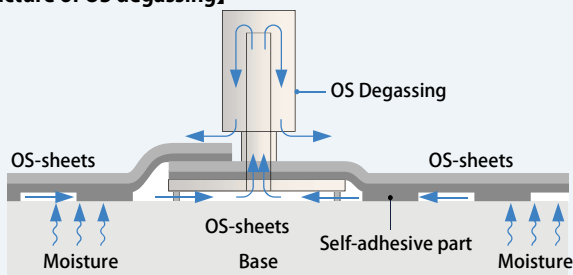
Size: h6.69 in (Cap ... 3.03 in $\times$ h5.51 in)

Size: Board ... 7.87 in $\times$ 7.87 in

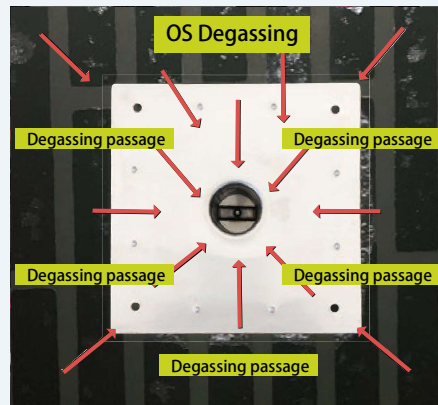
Degassing cylinders that make the most of the features of OS-sheets, which have both ventilation and waterproof layers

The protrusion of the self-adhesive part on the back of OS-sheets is used to create a degassing path.
The de-aeration path that runs over the entire back surface of OS-sheets smoothly releases moisture to the outside air and prevents the sheet from swelling.

[Structure of OS degassing]

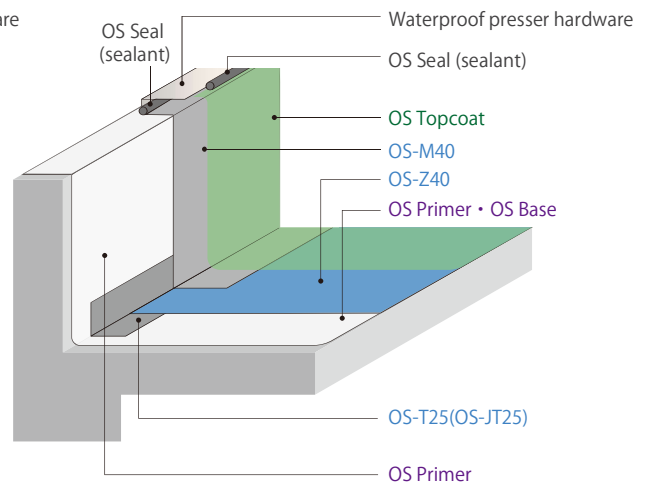
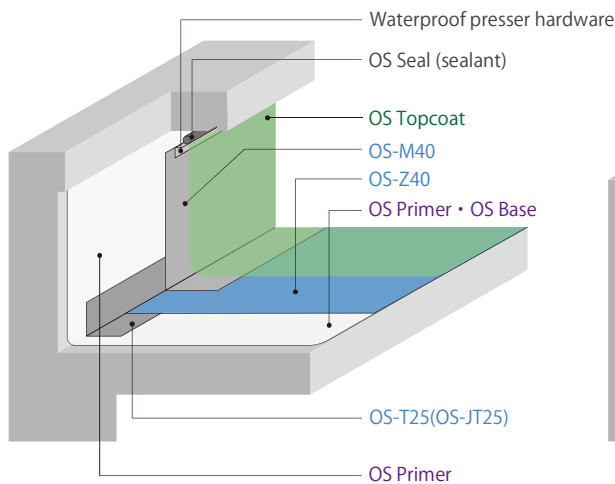


Degassing system for OS-sheets seen from the back



Degassing insulation method

Method: OS-sheets ZT-40



Method: OS-sheets ZT40		STEP 1	STEP 2	STEP 3
Aeration method	Flat area	OS Primer 0.04 lbs/ft ²	OS-Z40	OS Topcoat 0.08~0.12 lbs/ft ²
		OS Base 0.16~0.24 lbs/ft ²		
Adhesion method	Rising part	OS Primer 0.04 lbs/ft ²	Corner reinforcement OS-T25 OS-JT25 OS-M40	

Products used

OS Primer



The ground treatment material adheres dirt and dust that cannot be removed from the surface of the base to the base and improves the adhesive strength of OS-sheets. It is a solvent type with little odor.

Specification : 35.2 lbs / steel can
Solids : 45%
Dangerous goods
Solvent: Acetone, Xylene

OS Base



It is an organic solvent-based primer active modifier and has an excellent conditioning effect.

※ Inhalation may cause poisoning, so be careful of ventilation and fire.

Specification : 44 lbs / steel can
Solids : 75%
Dangerous goods
Solvent: Asphalt, Mineral Spirit

OS-sheets OS-Z40



A hybrid modified asphalt tarpaulin with a striped self-adhesive layer on the back of the sheet, which functions as both a ventilation layer and a waterproof layer. Torch only the sheet joint parts.

JIS : A6013 Class R Class 2 for exposed single layer
Thickness : 157 mil
Length : 3.28 ft × 22.97 ft

OS-sheets OS-M40

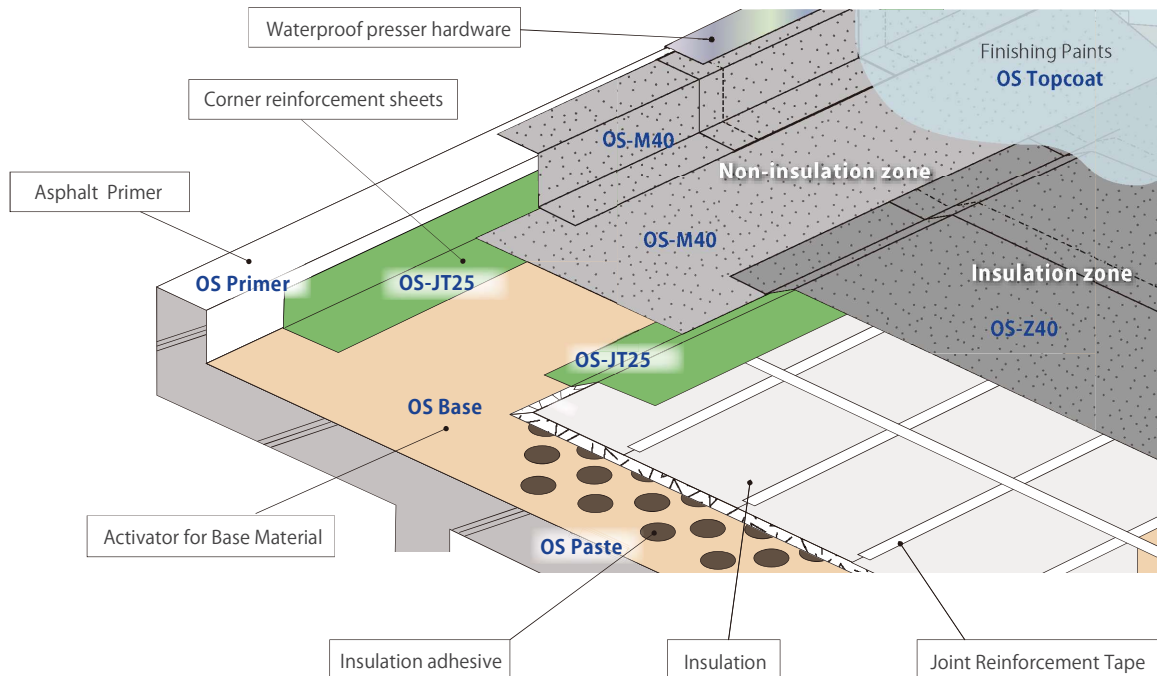


Modified asphalt tarpaulin by torch method. It is a type of sheet that torches the entire back of the sheet.

JIS : A6013 Class R Class 2 for exposed single layer
Thickness : 157 mil
Length : 3.28 ft × 26.25 ft

Exposed insulation method

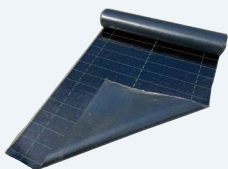
Method: OS-sheets RD-Z40



	1	2	3	4
Rising part and concrete base part	OS Primer 0.04 lbs/ft ²	Corner reinforcement OS-JT25	OS-M40	OS Topcoat 0.08~0.12 lbs/ft ²

	1	2	3	4	5	6
Overlay part of the asphalt waterproofing layer	OS Base 0.16~0.24 lbs/ft ²	OS Paste 0.16 lbs/ft ²	Insulation + Joint Reinforcement Tape	OS-JT25	OS-Z40	OS Topcoat 0.08~0.12 lbs/ft ²

OS-T25



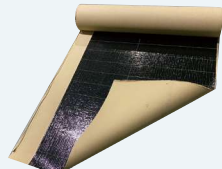
It is used for reinforcement. It is constructed with a double-sided torch.

JIS : A6013 Class R Class 2 for non-exposed multi-layer waterproofing

Thickness : 98.4 mil

Length : 3.28 ft × 26.25 ft

OS-JT25



It is used for reinforcement. It is constructed by self-adhesive on the front torch and back side.

JIS : A6013 Class R Class 2 for non-exposed multi-layer waterproofing

Thickness : 78.7 mil

Length : 3.28 ft × 26.25 ft

OS Paste



Insulation glue. It is an adhesive consisting of special rubber asphalt and solvent. It provides a strong bond between the base and the insulation.

Specification : 39.7 lbs / steel can

Solids : 65%

Dangerous goods

Solvent: Asphalt ,Mineral Spirit

OS Topcoat (No sand)



This is an emulsion-type protective paint based on acrylic resin used for exposure waterproofing. It protects the waterproof layer, maintains durability, prevents the temperature rise due to heat, and prevents the deterioration of the waterproof layer due to ultraviolet rays.

Specification : 39.7 lbs / steel can

Principal component : Acrylic emulsion

Color : Grey & Green

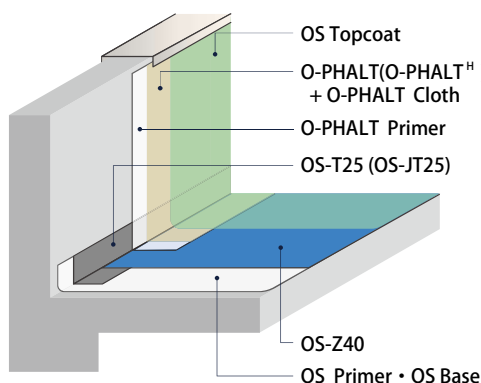
Compatible with various shapes!

Combination method of OS-sheets and O-PHALT (O-PHALT^H)

O-PHALT, a safe coating waterproofing material based on modified asphalt, is extremely compatible with OS-sheets.

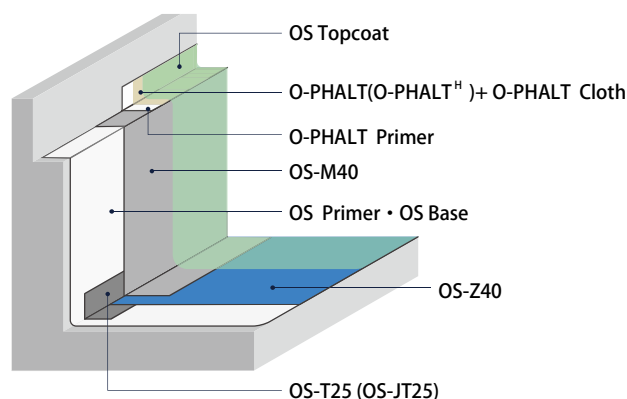
Rising part-O-PHALT Waterproof

- Flat area part : OS-sheets (OS-Z40)
- Rising part : O-PHALT (O-PHALT^H)



OS-Sheets Ends-O-PHALT Waterproof

- Flat area part : OS-sheets (OS-Z40)
- Rising part : O-PHALT (O-PHALT^H)
- OS-sheets edge : O-PHALT (O-PHALT^H)



OS-sheets / JIS A 6013 (OS-Z40•OS-M40)

Test items (JIS A 6013)				Criteria	OS-Z40	OS-M40
Tensile	Tensile strength N/cm	No processing	Long direction	≥ 80% of No processing test value	156	146
			Short direction		116	119
		After heating	Long direction		159	152
			Short direction		109	121
		After alkali immersion	Long direction		153	147
			Short direction		111	117
	Growth %	No processing	Long direction	≥ 15	58	32
			Short direction		63	38
		After heating	Long direction		57	29
			Short direction		65	35
Tensile product N • %/cm	No processing	Long direction	Short direction	≥ 2,500	9,048	4,672
			Short direction		7,308	4,522
	Tensile strength N	Long direction	Short direction		43	54
			Short direction		63	71

Test items (JIS A 6013)				Criteria	OS-Z40	OS-M40
Heat resistance performance	Drooping length mm			≤ 5	0	0
	Appearance			No drooping and foaming	No abnormalities	No abnormalities
Dimensional stability performance	Dimensional change rate %	Long direction		0.0 ± 1.0	-0.1	-0.1
		Short direction			+0.3	+0.2
Bonding strength N/cm		Appearance		No abnormal wrinkles, warping, or delamination	No abnormalities	No abnormalities
Fatigue resistance		More than 50 or more than 70% of the untreated tensile strength in short directions			98	118
Dent-resistant performance		No holes			No abnormalities	No abnormalities
Fatigue resistance		No cracks, splits or breaks			No abnormalities	No abnormalities
Bending resistance	No processing			No cracking at 5°F	No abnormalities	No abnormalities
	After heating			No cracking at 23°F	No abnormalities	No abnormalities

OS Seal



Since it is mainly made of special rubber asphalt, it has excellent adhesion and durability, and is used for places where watertightness is required, such as the end of OS-sheets, the end of pasting, drainage drains, and around pipes.

Specification : 11.16 oz cartridge

Solids : 70%

Dangerous goods

Solvent: Asphalt, Xylene

Refurbished Drain

Vertical for Φ1.575 ~ Φ3.937 in



Horizontal for Φ1.181 ~ Φ5.512 in



O-PHALT Primer



It is an asphalt emulsion type water-based primer. It is a material for good adhesion with the base material. It is suitable for asphalt-based waterproofing materials.

Specification : 39.7 lbs / steel can

Solids : 18 ~ 22 %

O-PHALT



This is an emulsion-type one-component modified asphalt-based coating waterproofing material made mainly of rubber and asphalt. Regardless of the shape of the substrate, it forms a seamless waterproofing layer. It is an environmentally friendly waterproof material that is safe for the human body and does not use fire or solvents.

Specification : 39.7 lbs / steel can

Solids : 62 ~ 68 %

JIS A 6021 Rubber asphalt type



In these three respects, the "Hybrid modified asphalt tarpaulin construction method(OS-sheets) " has been recognized as an inventive step and has been registered as a new technology in the Ministry of Land, Infrastructure, Transport and Tourism's "NETIS".

This method, which has been registered as NETIS, has brought about an epoch-making change in each process of the "ASI-T1 for Exposed Roof Insulation and Insulation Insulation" and "AS-T3 for Exposed Waterproof Insulation Method" in the Ministry of Land, Infrastructure, Transport and Tourism's Standard Specifications for Public Building Works.

Since the torch work area is as small as 1/10, the burden on the operator can be greatly reduced.

1/10

Construction speed Up!



By mechanizing the sheet bonding process, we were able to eliminate one construction process, thereby reducing costs.



Construction period can be shortened.

25%

Cost reduction



31%

With OS-sheets, you can check the bonding status results at a glance.



Construction management is easy!

OS-sheets make them easy to lay sheets.

Reliable design to prevent water from entering the sheet when applying the tarpaulin.

We compared the conventional construction method and the process.

◆ Roof Exposed Waterproofing Insulation Insulation Method Process (ASI-T1)

	ASI-T1 (Conventional construction methods)		ASI-T1 (OS-sheets)
Process	Materials & Construction Methods	Process	Materials & Construction Methods
1	Primer coating	1	Primer coating
2	Insulation	2	Insulation
3	Modified asphalt sheet with partial adhesive layer	3	OS-sheets Z40
4	Modified Asphalt Sheet	4	Finishing paint painting
5	Finishing paint painting		

Cutting the process

Method : OS-sheets RD40

This is the **Point!!**

In the two processes of the red frame, the inventive step of the construction method of "Hybrid modified asphalt tarpaulin OS-sheets" was recognized, and it was registered as a new technology in "NETIS".

◆ Roof Exposed Waterproofing Insulation Method Process (AS-T3)

	AS-T3 (Conventional construction methods)		AS-T3 (OS-sheets)
Process	Materials & Construction Methods	Process	Materials & Construction Methods
1	Primer coating	1	Primer coating
2	Modified asphalt sheet with partial adhesive layer	2	OS-sheets Z40
3	Modified Asphalt Sheet	3	Finishing paint painting
4	Finishing paint painting		

Cutting the process

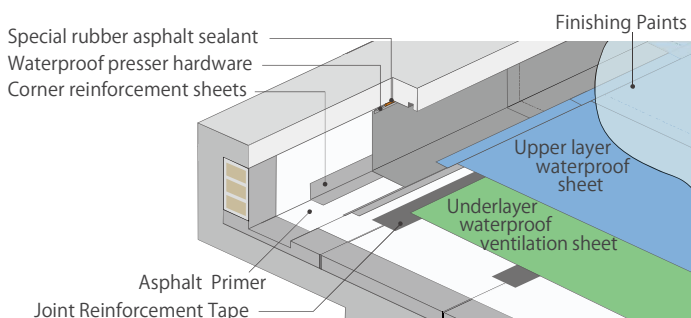
Method : OS-sheets ZT40

NETIS Registration No.

KT-200118-VR

■ Roof Exposed Waterproofing Insulation Method Process [AS-T3 (Torch method)]

Conventional construction methods



Hybrid modified asphalt tarpaulin OS-sheets method [ZT40 method]

