

Teranap[®] TP

Large width SBS elastomeric bitumen geomembrane



- ▶ Excellent resistance to ageing due to the elastomeric bitumen compound enabling the material to retain its elasticity for extensive periods
- ▶ High resistance to puncturing allows Teranap TP to be laid on a substrate which is not specially prepared
- ▶ Double protection by polyester film surfacing and a thick polyester fabric reinforcement
- ▶ Easy anchoring and joining to concrete structures
- ▶ Reliability and simplicity in application:
 - once unrolled, the overlaps can be immediately sealed by propane torch. This simple welding method is less dependent on weather conditions and less sensitive to dirt
 - less stress due to temperature, humidity or dust during application
- ▶ Repairs of accidental leaks can be carried out under water using a specially prepared resin. No need to remove the water

Main uses

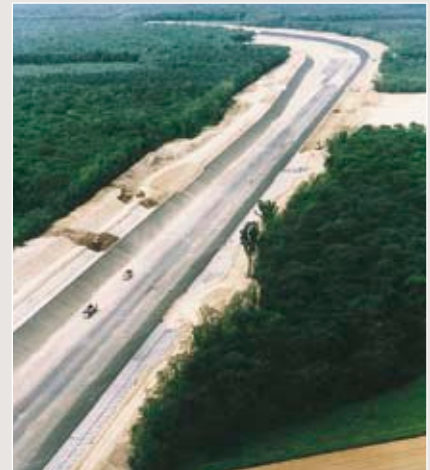
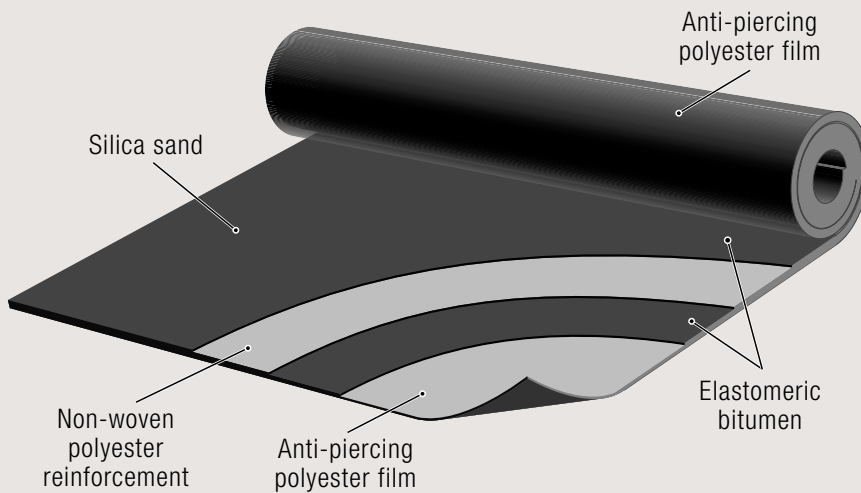
- Tanking and underground installations.
- Hydraulic engineering: waterproofing of tanks, reservoirs, waste water storage ponds, canals, dams.
- Waterproofing of "cut-and-cover" tunnels, pre-cast ducts.
- Waterproofing of environmental protection installations.

Description

Teranap TP is a geomembrane manufactured from SBS elastomeric bitumen reinforced with a non-woven polyester geotextile.

- The underside, covered with a polyester film, is highly resistant to root penetration.
- The surface is coated with silica sand.

Teranap® TP



Packaging

Range	Thickness at selvedge	Width	Length	Weight/roll
Teranap in 2m width				
Teranap 331 TP 2m	3mm	2m	20m	≈ 160kg
Teranap 431 TP 2m	4mm	2m	20m	≈ 210kg
Teranap in 4m width				
Teranap 331 TP 4m*	3.6mm	4m	100m	≈ 1,800kg
Teranap 431 TP 4m*	4mm	4m	80m	≈ 1,700kg
Teranap GTX = Teranap TP 4m factory-bonded to a 300g/m² geotextile				
Teranap GTX 300	3.3mm	4m	67m	1,250kg
Solnap GTX				
Solnap GTX	3mm	4m	67m	1,025kg

* Asqual certified products.

Complementary information

- Installation manual for Teranap TP.
- References (job list).

Customs nomenclature

- 68.07.10.19.0.00.0.P

Safety

Teranap TP is not rated dangerous (for the applications described in this document).

Teranap GTX/Solnap GTX

- ▶ The close factory-bonding of Teranap TP to an antipuncturing geotextile enhances its mechanical performance
- ▶ Improved frictional resistance on the underlying substrate
- ▶ Allows innovative methods of application of layered concrete above the Teranap GTX membrane, such as:
 - extruded concrete applied using slipform
 - shotcrete (fibre-reinforced concrete)
- ▶ Successfully applied on new and refurbished canals

It is possible to strengthen one or several characteristics of Teranap TP, by bonding an anti-puncturing or a drainage geotextile, UV-stabilised if requested.

- Teranap GTX is a Teranap TP geomembrane with a factory-bonded geotextile.
- The close bonding of the membrane to an anti-puncturing geotextile enhances the mechanical performance of Teranap TP. Moreover, it has high frictional resistance on the underlying substrate.
- Teranap GTX is a Siplast patented product.
- Solnap GTX is a glass mat geomembrane with a machine-bonded geotextile.

Performances

Properties	Standard	Units	Teranap 331 TP 4m Average values	Teranap 431 TP 4m Average values
Thickness	NF EN 1848-1	mm	3.6	4.1
Weight	NF EN 1849-1	g/m ²	4,150	4,850
Strength at break (MD x CD) ¹	NF EN 12311-1	N/5cm	1,000 x 650	1,300 x 1,100
Elongation at break	NF EN 12311-1	%	49 x 53	49 x 53
Static puncturing – Force – Displacement	NF EN ISO 12236	kN mm	2.46 44	3.42 47
Cold temperature flexibility	NF EN 1109	°C	-20	-20
Flow resistance	NF EN 1110	°C	100	100
Water tightness	EN 14150	m ³ /m ² /j	≤ 1 x 10 ⁻⁷	≤ 1 x 10 ⁻⁷
Gas tightness	ASTMD 1434-82	m ³ /m ² /j	≤ 2.76 x 10 ⁻⁶	≤ 2.76 x 10 ⁻⁶
Resistance to oxidation	NF EN 14575	Conformable		
Resistance to weathering ²	NF EN 12224	No loss in tensile properties		
Potability/non toxicity	<ul style="list-style-type: none"> ▶ Test in France: Testcertificate of the Environmental Protection Dpt. of the City of Paris (Test n° 95 MAT 02). ▶ Test in U.S.A.: ANSI/NSF Standard 61, for Teranap 331 TP and Teranap 431 TP. 			
Resistance to root penetration	▶ Test in Germany: Stuttgart FMPA certificate n° 47.95.729 dated 10/11/1995.			
Resistance to corrosive solutions	▶ A list of resistances to different chemical solutions is available from Siplast. For any particular project, apply to the Siplast Technical Dept.			

* Teranap 331 TP 4m and Teranap 431 TP 4m are ASQUAL certified and CE marked.

¹ MD: Machine Direction; CD: Cross Direction ² Test conditions: 5 hours UV cycle at 50°C followed by 1 hour condensation at 20°C; Total: 3000 hours.

Resistance to ageing

The effect of ageing on the bituminous elastic mixture at 70°C is given in the table below.

Ageing at 70°C	Day 0	7 Days	15 Days	1 Month	2 Months	3 Months	6 Months
Ring and Ball test (°C)	112-116	114-117	115-119	118-116	111-116	109-118	110-114
Penetration at 25°C to 1/10mm (Dow test)	42-52	42-50	35-45	35-40	30-35	30-35	28-35
Resistance to break (bar) (±0.3 bar)	5.5	6	6	5.5	5	4.5	4.2
Elongation to break (%)	> 1,200	> 1,200	> 1,150	> 1,200	> 1,050	> 1,100	> 1,100
Elastic limit (24R) (%)	> 200	> 200	> 200	> 200	> 200	> 100	> 50
Modulus at 100% (kg/m ²)	0.140	0.150	0.160	0.120	0.080	0.060	0.050
Permanent elongation (%)	< 5	< 5	< 5	< 5	< 5	< 5	< 12
Fragility temperature (°C) (dia. 10mm in 5s)	-25	-25	-25	-25	-25	-25	-20
Compatibility	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good

Typical characteristics resulting from tests made in the Siplast Laboratories on materials taken from stock.

Scope of application

Water retention installations

- Irrigation works: earth canals, concrete canals, aqueducts, reservoirs.
- Dams, embankments.
- Drinking water reservoirs.
- Fire-fighting water tanks, sprinkler basins.
- Storm water regulation ponds.
- Leisure lakes, ponds for golf courses.
- Fish breeding ponds.

Waste water storage, landfill sites

- For settling, aeration, purification.
- For industrial waste water and deposits.
- For agricultural waste: sewage treatment.
- Domestic waste landfill sites.

Tanking and underground installations

- Any tanking: foundation rafts, structures, underground parking.
- Cut-and-cover tunnels, subways, pre-cast ducts.
- Shelters for civil or military purposes.

This document is only a guide. Siplast-Icopal reserves the right to change the composition and fixing recommendations of products as a result of evolution of knowledge and technology.

