



ТЕХНИКОЛЬ

PREMIUM



LOGICBASE

WATERPROOFING OF UNDERGROUND STRUCTURES

with TechnoNICOL polymeric membranes

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INTRODUCTION

Development of underground space is one of evolution trends of presentday metropolises, suffering from the deficit of city territories, population growth and an increase of traffic flow. Underground parking, stations, stores have become an everyday occurrence for many cities in the world. Underground structures are under continuous influence of subsurface water and aggressive environment. Such influence may significantly reduce the structure service life. Waterproofing protects structures from negative influence of environment and ensures long operation of the whole building.

Installation of underground waterproofing is quite a complicated process and so requires careful and strict compliance with instructions, attention to nuances and vast experience of work with insulating materials. The price of mistakes in the course of waterproofing installation is very high. They emerge during the building operation in form of leaks, which elimination in most cases is a labourintensive and long process, involving extensive human and material resources.

The most frequent reasons of leaks are:

- mechanical damage to waterproofing in the course of concreting and installation of reinforcing bars;
- low-quality and faulty sealing of weld seams;

- violation of installation technology;
- application of low-quality materials.

In order to ensure reliable protection from leaks, underground waterproofing systems on the basis of polymeric membranes are intended. Advantages of such systems are as follows:

- **durability;**
- **reliability;**
- **repairability;**
- **quality installation ensured by special test methods.**

Thus state-of-art quality materials, systematic approach and professional installation are not just key success factors of underground structure waterproofing, but necessary conditions of prolonged service life and strength of the whole building.

POLYMERIC MEMBRANES FOR WATERPROOFING SYSTEMS



MFC TC Vodny 2013-2015
Moscow, Golovinskoye highway, 5
Waterproofing of the foundation
Area of 55 000 m²
LOGICBASE V-SL 2.0 mm and
LOGICBASE V-ST 1.6 mm

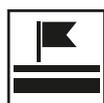
LOGICBASE V-SL

PVC MEMBRANE

1.5 mm 2.0 mm

For waterproofing of tunnels, foundations, underground parts of buildings and structures

MEMBRANE ADVANTAGES



Quick detection of membrane damages due to a yellow signal layer



Durability



High strength



Resistance to mechanical impacts



High flexibility



High chemical stability



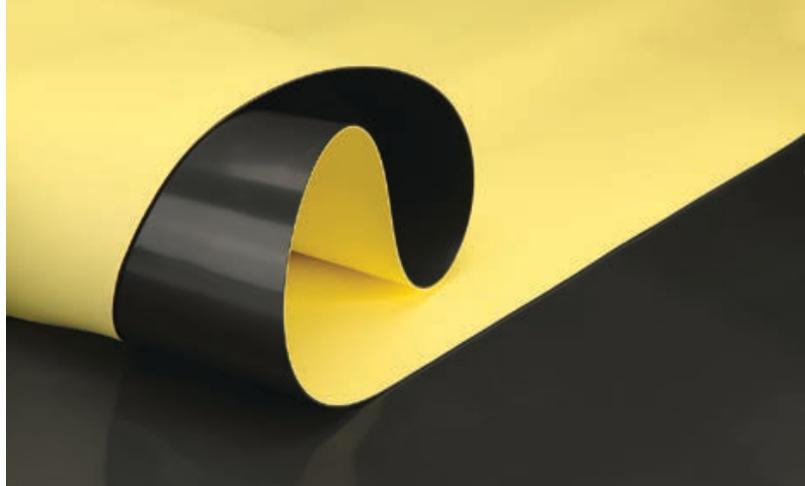
Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film.
- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	
– longitudinal	≥ 16
– transversal	≥ 15

Elongation at maximal load, %	≥ 350
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Resistance to tearing (nail shank), N	≥ 150
---------------------------------------	-------

Foldability at low temperatures, °C	≥ -35
-------------------------------------	-------

Flexibility on R=5 mm beam (there must be no cracks), °C	≥ -45
--	-------

Water absorption by weight, %	≤ 0.1
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Dimension stability when heated within 6 h at 80 °C, %	≤ 2
--	-----

Impact resistance at low temperatures (there must be no cracks), °C	≤ -25
---	-------

Seam tear strength, N/50 mm	≥ 300
-----------------------------	-------

Seam tensile strength, N/50 mm	≥ 600
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Impact strength (2.0 mm thickness)	
solid substrate, mm	≥ 1400
soft substrate, mm	≥ 1800

Resistance to static load, kg	≥ 20
-------------------------------	------

Water resistance, 1.0 MPa during 24 h	Lack of water streaks
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LOGISTICS SPECIFICATIONS

Thickness, mm	1.5	2.0
Roll width × length, m	2.05×20	2.05×20
Number of rolls on a pallet, pcs.	18	15

LOGICBASE V-ST

PVC MEMBRANE

1.6 mm

For waterproofing of tunnels, foundations, underground parts of buildings and structures as the second layer of two-layer waterproofing systems based on PVC membranes and featuring vacuum quality control
As a protective layer of LOGICBASE V-SL waterproofing PVC membranes

MEMBRANE ADVANTAGES



Features special textured surface that prevents membrane in two-layer waterproofing systems from sticking together



Durability



High strength



Resistance to mechanical impacts



High flexibility



High chemical stability



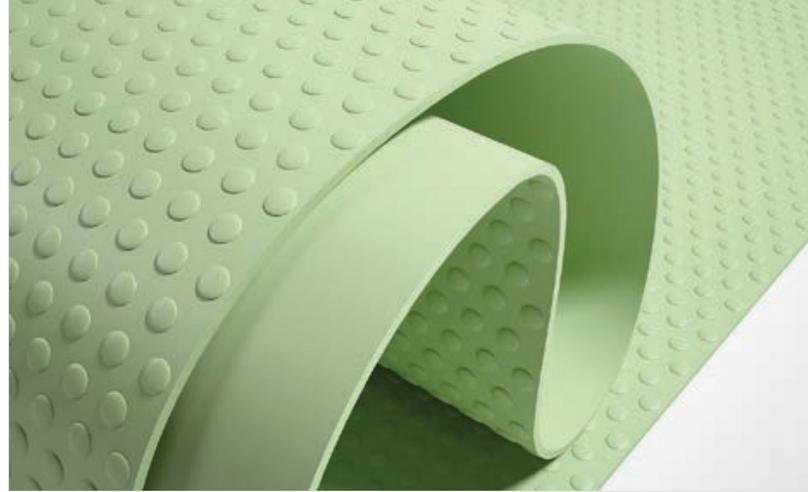
Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

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- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	
– longitudinal	≥ 14
– transversal	≥ 11
Elongation at maximal load, %	≥ 300

Resistance to tearing (nail shank), N	≥ 150
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Foldability at low temperatures, °C	≤ -30
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Flexibility on R=5 mm beam (there must be no cracks), °C	≤ -45
--	-------

Water absorption by weight, %	≤ 0.1
-------------------------------	-------

Dimension stability when heated within 6 h at 80 °C, %	≤ 2
--	-----

Impact resistance at low temperatures (there must be no cracks), °C	≤ -25
---	-------

Seam tear strength, N/50 mm	≥ 300
-----------------------------	-------

Seam tensile strength, N/50 mm	≥ 600
--------------------------------	-------

Impact strength	
(solid substrate, mm)	≥ 700
(soft substrate, mm)	≥ 1000

Resistance to static load, kg	≥ 20
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Water resistance, 1.0 MPa during 24 h	Lack of water streaks
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LOGISTICS SPECIFICATIONS

Thickness, mm	1.6
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Roll width × length, m	2.05×20
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Number of rolls on a pallet, pcs.	18
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LOGICBASE V-T

PVC MEMBRANE

2.0 mm

For waterproofing of tunnels, foundations, underground parts of buildings and structures

MEMBRANE ADVANTAGES



Due to the membrane transparency, it is possible to check quality of welding seams and condition of the substrate



Durability



High strength



Resistance to mechanical impacts



High flexibility



High chemical stability



Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film.
- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	
– longitudinal	≥ 15
– transversal	≥ 15
Elongation at maximal load, %	≥ 300
Resistance to tearing (nail shank), N	≥ 150
Foldability at low temperatures, °C	≤ -35
Flexibility on R=5 mm beam (there must be no cracks), °C	≤ -45
Water absorption by weight, %	≤ 0.1
Dimension stability when heated within 6 h at 80 °C, %	≤ 2
Impact resistance at low temperatures (there must be no cracks), °C	≤ -25
Seam tear strength, N/50 mm	≥ 300
Seam tensile strength, N/50 mm	≥ 600
Impact strength (2.0 mm thickness)	
solid substrate, mm	≥ 700
soft substrate, mm	≥ 1000
Resistance to static load, kg	≥ 20
Water resistance, 1.0 MPa during 24 h	Lack of water streaks

LOGISTICS SPECIFICATIONS

Thickness, mm	2.0
Roll width × length, m	2.1×20
Number of rolls on a pallet, pcs.	15

LOGICBASE V-ST-T

PVC MEMBRANE

2.0 mm

For waterproofing of tunnels, foundations, underground parts of buildings and structures as the second layer in PVC membrane based two-layer waterproofing systems

MEMBRANE ADVANTAGES



Features special textured surface that prevents membrane of two-layered waterproofing systems from sticking together



Due to the membrane transparency, it is possible to check quality of welding seams and condition of the substrate



Durability



High strength



Resistance to mechanical impacts



High flexibility



High chemical stability



Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film.
- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.

PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	
– longitudinal	≥ 15
– transversal	≥ 15
Elongation at maximal load, %	≥ 300
Resistance to tearing (nail shank) , N	≥ 150
Foldability at low temperatures, °C	≤ -35
Flexibility on R=5 mm beam (there must be no cracks), °C	≤ -45
Water absorption by weight, %	≤ 0.1
Dimension stability when heated within 6 h at 80°C, %	≤ 2
Impact resistance at low temperatures (there must be no cracks), °C	≤ -25
Seam tear strength, N/50 mm	≥ 300
Seam tensile strength, N/50 mm	≥ 600
Impact strength (2.0 mm thickness)	
solid substrate, mm	≥ 750
soft substrate, mm	≥ 1000
Resistance to static load, kg	≥ 20
Water resistance, 1.0 MPa during 24 h	Lack of water streaks

LOGISTICS SPECIFICATIONS

Thickness, mm	2.0
Roll width × length, m	2.1×20
Number of rolls on a pallet, pcs.	15

LOGICBASE V-PT

PVC MEMBRANE

1.5 and 2.0 mm

The membrane is used as a protective layer of PVC membrane based waterproofing systems

MEMBRANE ADVANTAGES



High impact strength makes it possible to protect a waterproofing layer reliably from damages during the installation



Good weldability of the protective and the main waterproofing membranes facilitates easy fixation of the protective layer on vertical surfaces of foundations and tunnel arches



Durability



High strength



High flexibility



High chemical stability



Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film.
- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	
– longitudinal	≥ 12
– transversal	≥ 10
Elongation at maximal load, %, at least	≥ 200
Resistance to tearing (nail shank), N	≥ 150
Foldability at low temperatures, °C,	≤ -25
Flexibility on R=5 mm beam (there must be no cracks), °C	≤ -40
Water absorption by weight, %	≤ 0.2
Dimension stability when heated within 6 h at 80 °C, %	≤ 2
Impact resistance at low temperatures (there must be no cracks), °C	at most -20
Seam tear strength, N/50 mm	≥ 300
Seam tensile strength, N/50 mm	≥ 600
Impact strength	
solid substrate, mm	≥ 1400
soft substrate, mm	≥ 1800
Resistance to static load, kg	≥ 20
Water resistance, 1.0 MPa during 24 h	Lack of water streaks

LOGISTICS SPECIFICATIONS

Thickness, mm	1.5	2.0
Roll width × length, m	2.05×20	2.05×20
Number of rolls on a pallet, pcs.	18	15

ECOBASE V

PVC MEMBRANE

1.5 mm

For waterproofing of buildings and engineering structures, as well as artificial ponds

MEMBRANE ADVANTAGES



Durability



High strength



Resistance to mechanical impacts



High flexibility



High chemical stability



Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film.
- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	
– longitudinal	≥ 12
– transversal	≥ 10
Elongation at maximal load, %	≥ 200

Resistance to tearing (nail shank), N	≥ 150
---------------------------------------	-------

Foldability at low temperatures, °C	≤ -25
-------------------------------------	-------

Flexibility on R=5 mm beam (there must be no cracks), °C	≤ -40
--	-------

Water absorption by weight, %	≤ 0.2
-------------------------------	-------

Dimension stability when heated within 6 h at 80°C, %	≤ 2
---	-----

Impact resistance at low temperatures (there must be no cracks), °C	≤ -20
---	-------

Seam tear strength, N/50 mm	≥ 300
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Seam tensile strength, N/50 mm	≥ 600
--------------------------------	-------

Impact strength (solid substrate, mm)	≥ 700
soft substrate, mm	≥ 1000

Resistance to static load, kg	≥ 20
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Water resistance, 1.0 MPa during 24 h	Lack of water streaks
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LOGISTICS SPECIFICATIONS

Thickness, mm	1.5
Roll width × length, m	2.05×20
Number of rolls on a pallet, pcs.	18

LOGICBASE P-SL

TPO MEMBRANE

1.5 and 2.0 mm

For waterproofing of tunnels, foundations, underground parts of buildings and structures

MEMBRANE ADVANTAGES



Quick detection of membrane damages due to a light-beige signal layer



Durability



High strength



Resistance to mechanical impacts



Resilience at low temperatures



High chemical stability



Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film.
- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.

PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa		
– longitudinal		≥ 15
– transversal		≥ 15
Elongation at maximal load, %		≥ 600
Resistance to tearing (nail shank), N, for thickness:		
1.5		≥ 450
2.0		≥ 600
Foldability at low temperatures, °C		≤ -45
Flexibility on R=5 mm beam (there must be no cracks), °C		≤ -55
Water absorption by weight, %		≤ 0.1
Dimension stability when heated within 6 h at 80 °C, %		≤ 1.5
Impact resistance at low temperatures (there must be no cracks), °C		at most -35
Seam tear strength, N/50 mm		≥ 350
Seam tensile strength, N/50 mm		≥ 600
Impact strength: solid substrate		
soft substrate, mm		
at least, for thickness:	1.5	700 (900)
	2.0	750 (1000)
Resistance to static load, kg		≥ 25
Water resistance, 1.0 MPa during 24 h		Lack of water streaks

LOGISTICS SPECIFICATIONS

Thickness, mm	1.5	2.0
Roll width × length, m	2.1 × 25	2.1 × 20
Number of rolls on a pallet, pcs.	18	18

LOGICBASE P-PT

TPO MEMBRANE

1.2 mm 1.5 mm 2.0 mm

For protection of TPO membrane based waterproofing systems

MEMBRANE ADVANTAGES



High impact strength makes it possible to protect a waterproofing layer reliably from damages it can take in the course of civil construction works



Durability



High strength



High flexibility



High chemical stability



Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film.
- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.

PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	
– longitudinal	≥ 15
– transversal	≥ 15
Elongation at maximal load, %	≥ 600
Resistance to tearing (nail shank), N	≥ 300
Foldability at low temperatures, °C	≤ -40
Flexibility on R=5 mm beam (there must be no cracks), °C	≤ -55
Water absorption by weight, %	≤ 0.1
Dimension stability when heated within 6 h at 80°C, %	≤ 1.5
Impact resistance at low temperatures (there must be no cracks), °C	≤ -35
Seam tear strength, N/50 mm	≥ 300
Seam tensile strength, N/50 mm	≥ 600
Impact strength (2.0 mm thickness) solid substrate, mm	≥ 700
soft substrate, mm	≥ 1000
Resistance to static load, kg	≥ 25
Water resistance, 1.0 MPa during 24 h	Lack of water streaks

LOGISTICS SPECIFICATIONS

Thickness, mm	1.5	2.0
Roll width × length, m	2.1 x 25	2.1 x 20
Number of rolls on a pallet, pcs.	18	18

LOGICBASE P-ST

TPO MEMBRANE

2.0 mm

For waterproofing of tunnels, foundations, underground parts of buildings and structures as the second layer in two-layer TPO membrane based waterproofing systems

MEMBRANE ADVANTAGES



Features special textured surface that prevents membrane of two-layered waterproofing systems from sticking together



Durability



High strength



Resistance to mechanical impacts



High flexibility



High chemical stability



Resistance to microorganisms



Resistance to root penetration

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film.
- The rolls must be stored in horizontal position, in original package, on pallets. It is necessary to protect them from direct sunlight, rain and snow.
- Storage in two rows using rigid spacer plates is admissible.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	
– longitudinal	≥ 15
– transversal	≥ 15
Elongation at maximal load, %	≥ 600
Resistance to tearing (nail shank), N	≥ 600
	≥ 600
Foldability at low temperatures, °C	≤ -40
Flexibility on R=5 mm beam (there must be no cracks), °C	≤ -50
Water absorption by weight, %	≤ 0.1
Dimension stability when heated within 6 h at 80°C, %	≤ 0.5
Impact resistance at low temperatures (there must be no cracks), °C	≤ -35
Seam tear strength, N/50 mm	≥ 350
Seam tensile strength, N/50 mm	≥ 700
Impact strength (2.0 mm thickness)	
solid substrate, mm	≥ 750
soft substrate, mm	≥ 1000
Resistance to static load, kg	≥ 25
Water resistance, 1.0 MPa during 24 h	Lack of water streaks

LOGISTICS SPECIFICATIONS

Thickness, mm	2.0
Roll width × length, m	2.1 × 20
Number of rolls on a pallet, pcs.	15

COMPONENTS FOR UNDERGROUND WATERPROOFING SYSTEMS



The «Botanic Garden» residential complex,
2015-2016 Moscow

Foundation waterproofing, 30 000 m²

LOGICBASE V-SL 1.5 mm

PLANTER STANDARD and PLANTER EXTRA

DIMPLED MEMBRANES

For waterproofing protection from external impacts and mechanical damages in the course of civil and transport construction

MEMBRANE ADVANTAGES



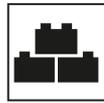
Durability



High strength



Resistance to mechanical impacts



Easy installation



High chemical stability



Resistance to microorganisms



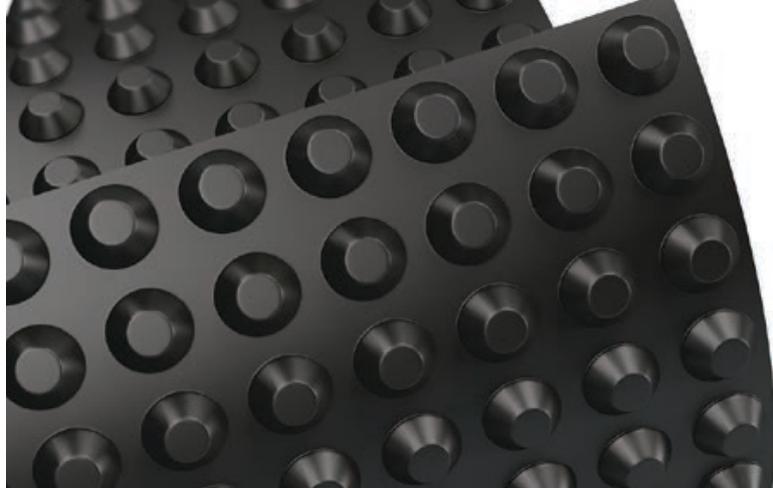
Resistance to root penetration



High water permeability

STORAGE AND PACKING

- Rolls are placed vertically on a pallet.
- Each roll is additionally wrapped in polyethylene film.
- Rolls, placed on a pallet, are packed in stretch film for protection from dirt.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Parameter	PLANTER standard	PLANTER extra
Weight of 1 m ² , kg	≥ 0.	≥ .8
Compressive strength, kPa	≥ 280	≥ 550
Maximal tension force, N/50 mm	≥ 280	≥ 450
Elongation at break, %	≥ 20	≥ 18
Flexibility on beam, °C	≤ -45	≤ -45
Water absorption, %	1	1

LOGISTICS SPECIFICATIONS

Roll width × length, m	2.0 × 20
Dimple height, mm	8
Quantity of rolls on a pallet, PLANTER standard, pcs.	16
Quantity of rolls on a pallet, PLANTER extra, pcs.	12

PLANTER GEO, EXTRA-GEO

DIMPLED MEMBRANES

For organization of various types of drainages in the course of civil and transport construction: wall drainage, bed drainage of exploited and green roofs, waterproofing protection

MEMBRANE ADVANTAGES



Durability



High strength



Resistance to mechanical impacts



Easy installation



High chemical stability



Resistance to microorganisms



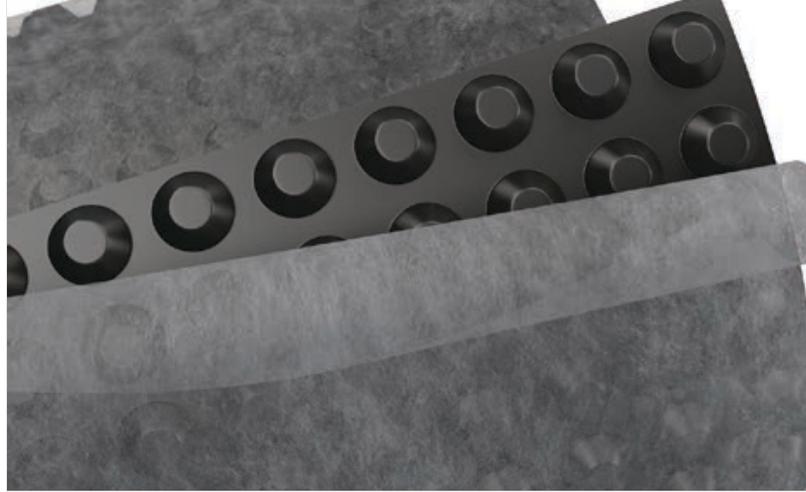
Resistance to root penetration



High water permeability

STORAGE AND PACKING

- Rolls are placed vertically on a pallet.
- Each roll is additionally wrapped in polyethylene film.
- Rolls, placed on a pallet, are packed in stretch film for protection from dirt.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Parameter	PLANTER geo	PLANTER extra-geo
Membrane thickness, mm	0.6	0.8
Dimple height, mm	8.0	7.5
Weight of 1 m ² , kg	0.65	0.9
Compressive strength, kPa	≥ 350	≥ 580
Maximal tension force longitudinal, N/50 mm	≥ 420	≥ 590
transversal, H/50 mm	≥ 420	≥ 590
Relative elongation at maximal tension force, %	≥ 30	≥ 18
Resistance to static load, kg	≤ 20	≤ 20
Flexibility on R=5 mm beam at low temperature, °C	≤ -45	≤ -45
Water absorption by weight, %	1	1

LOGISTICS SPECIFICATIONS

Roll width × length, m	2.0 × 15
Dimple height, mm	8
Number of rolls on a pallet, pcs.	9

TECHNONICOL GEOTEXTILE

To protect a waterproofing membrane from mechanical damages in the course of civil construction works

ADVANTAGES



Durability



High strength



Possibility to operate at high and low temperatures



Possibility to operate at continuous pressure and friction



High chemical stability



Resistance to microorganisms

MATERIAL PROPERTIES

- TECHNONICOL needle-punched heat treated geotextile is a non-woven fabric made of polypropylene fibres. It has surface density of 300 and 500 g/m².
- This material is available in white, gray and brown colors.
- Two-sided heat treatment of the fibres increases strength and dimensional stability under tension.

STORAGE AND PACKING

- Every roll is packed in individual protective polyethylene film to protect geotextile from soaking and damages.



PHYSICAL AND MECHANICAL SPECIFICATIONS

Parameter	300 g/m ²	500 g/m ²
Roll width, m	2.15	2.15
Roll length, m	70	45
Surface density, g/m ²	300	500
Tensile strength (in longitudinal direction), kN/m	≥ 14	≥ 17
Tensile strength (in transversal direction), kN/m	≥ 11	≥ 15
Elongation at break (in longitudinal direction), %	≤ 90	≤ 100
Elongation at break (in transversal direction), %	≤ 100	≤ 110
Resistance to UV radiation	yes	yes
Biostability	yes	yes

LOGISTICS SPECIFICATIONS

Density, g/m ²	300	500
Roll width × length, m	2.15 x 70	2.15 x 45

TECHNONICOL PVC BAND

A PVC band, one side of which is covered with white polypropylene based geotextile for gluing to substrate. From the other side, it is covered with gray PVC, which makes it possible to weld LOGICBASE V-SL membranes to the band.

The band is glued to a substrate by means of two-component epoxy glue that must be applied over the whole its surface or along the edges



PHYSICAL AND MECHANICAL SPECIFICATIONS

Tensile strength, MPa	≥ 6
Elongation at break, %	≥ 160
Water resistance, 0.3 MPa during 2 h	Lack of water streaks
Flexibility on R=5 mm beam, °C	≤ -60
Shore hardness A, conventional units	≥ 53

STORAGE AND PACKING

— Delivered in 30 m long rolls.

TECHNONICOL TWO-COMPONENT EPOXY GLUE

For gluing of PVC bands to structure surfaces, repair concrete structures, sealing of cracks and process seals, jointing of concrete elements.

Appears as a gray paste



PHYSICAL AND MECHANICAL SPECIFICATIONS

Parameter	Component A	Component B
Mixture pot life at 23 °C, min.		40
Solid residue, % weight		100
Density, g/cm ³	1.9	1.8
Viscosity, Pa•s	1.5 — 3,0	1.5 — 3,0

STORAGE AND PACKING

— Delivered in sets of 7.5 and 15 kg, in metal or plastic package.

TECHNONICOL WATERSTOPS

For sealing of construction and movement joints of concrete structures, continuously or temporary affected by underground waters

ADVANTAGES

- 
Possibility to operate at high and low temperatures
- 
Durability
- 
High chemical stability
- 
Easy installation
- 
Reliable mounting in concrete
- 
High strength
- 
High flexibility
- 
Resistance to mechanical impacts



PHYSICAL AND MECHANICAL SPECIFICATIONS

Parameter	Value
Shore hardness A, units, range	75±5
Nominal tensile strength, MPa (kg/cm ²)	≥11.7 (117)
Elongation at break, %	≥ 200
Tearing strength, N/mm (kg/cm ²)	39.2 (4.0)
Change of performance characteristics after aging of 125 °C:	
— hardness, Shore A units, range	±4
— nominal tensile strength, %	≥ ±30
— Elongation at break, %	≥ ±30
Brittle point at -40 °C	Lack of cracks
Integrated toxicity value, %	≤ 1
Operating temperature range, °C	from -40 to +70

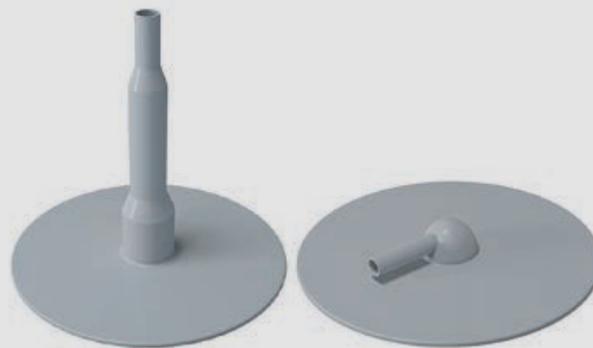
TYPES OF TECHNONICOL WATERSTOPS

Model	Picture	Profile	APPLICATION
TECHNONICOL EC-220-3			External waterstop for sealing of construction joints and compartmentalization of waterproofing based on PVC membranes
TECHNONICOL EC-320-4			External waterstop for sealing of construction joints and compartmentalization of waterproofing based on PVC membranes
TECHNONICOL IC-240-2			Internal waterstop for sealing of construction joints in underground structures.
TECHNONICOL IC-240-6			Internal waterstop for sealing of construction joints in underground structures.
TECHNONICOL EM-260/20			External waterstop for waterproofing of movement joints by construction of underground structures. Applied together with waterproofing PVC membranes.
TECHNONICOL EM-260/50			External waterstop for waterproofing of movement joints by construction of underground structures. Applied together with waterproofing PVC membranes.
TECHNONICOL IM-240/20			Internal waterstop for sealing of movement joints by construction of underground structures.
TECHNONICOL IM-260/50			Internal waterstop for sealing of movement joints by construction of underground structures.

CONTROL AND INJECTION FLANGES (PVC AND TPO)

Flange is an element for the injection system, it is designed for delivery of repair injection compound to the damaged section of waterproofing system.

- straight flange
- angular flange



INJECTION HOSE

Element for the injection systems used to deliver repair compound to injection flange.



CONNECTING FITTING, STRAIGHT AND ANGULAR

Fittings are used for connection of injection hoses to injection flanges and connection of one injection hose to another.



TECHNICAL DISKFIXING ELEMENT

Fastening element used for mechanical fastening of geotextile and LOGICBASE V-SL membranes to vertical surfaces and tunnel arch.



CLEANER FOR TECHNICAL PVC MEMBRANES

The cleaner is used for cleaning of local impurities on PVC membranes and for preparation of membrane surface for welding.

CONTACT ADHESIVE FOR TECHNICAL PVC MEMBRANES

The adhesive is used for glueing of PVC membranes to brick, concrete, wooden and metal surfaces, as well as for spot attachment of geotextile to LOGICBASE V-SL PVC membrane.



TECHNICAL POLYETHYLENE FILM 200 µm

The film is used as a separation layer between the geotextile protective layer and cement-sand screed; prevents geotextile soaking with cement laitance.



TECHNICAL POLYURETHANE SEALANT

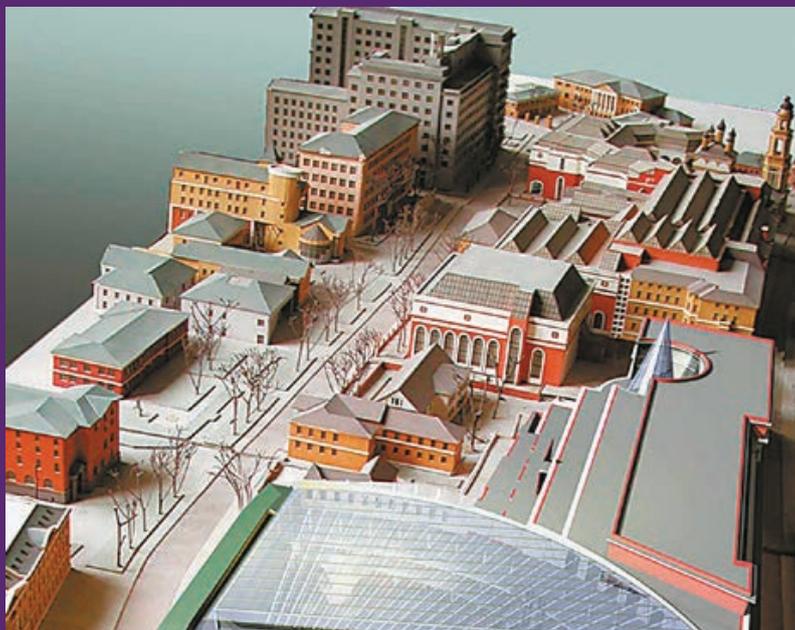
It is used for sealing of termination of waterproofing system.





The «Capital Heart» residential complex,
2014-2016
Moscow
Foundation waterproofing, 100 000 m²
LOGICBASE V-SL 2.0 mm
LOGICBASE T-PL 1.6 mm

WATERPROOFING SYSTEMS FOR FOUNDATIONS

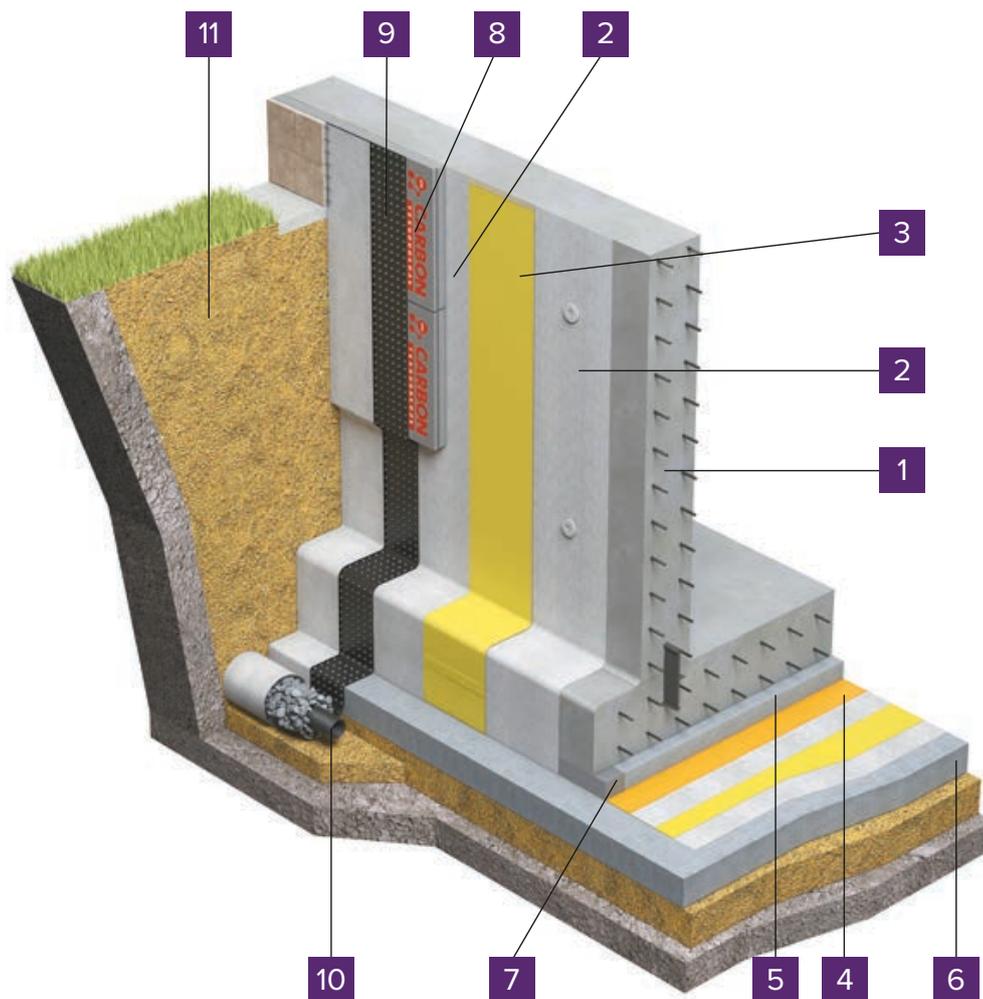


Museum complex of the
State Tretyakov Gallery, 2013-2015
Moscow, Kadashevskaya nab., 10
Waterproofing and in-situ concreting, 10 000 m²
LOGICBASE V-SL 2.0 mm

TN-FOUNDATION Barrier

FOUNDATION WATERPROOFING SYSTEM

For waterproofing of foundations of small buildings and structures with low level of responsibility, constructed in ditches with backfill in the absence of underground water



1. Reinforced concrete structure
2. TECHNONICOL needle-punched geotextile, 500 g/m²
3. LOGICBASE V-SL PVC membrane
4. TECHNONICOL polyethylene film, 200 μm
5. Protective cement-sand screed
6. Base concrete
7. TECHNONICOL CARBON PROF XPS angular compensator
8. TECHNONICOL CARBON PROF XPS thermal insulation
9. PLANTER extra-geo dimpled membrane
10. Drainage pipe
11. Backfilling material

FIELD OF APPLICATION

- absence of specific soils on construction site with predominant sandy soil;
- no underground water or there is only one horizon of it located below the foundation base and the water is homogeneous in terms of chemical composition and degree of aggressiveness.

SYSTEM FEATURES

The optimal system for waterproofing of shallow foundations made of monolithic concrete. All materials of the system are based on thermoplastic polymers. They are an excellent alternative of materials based on modified bitumen.

Among specific features of the system are structural simplicity and high speed of installation.

One-layer system based on LOGICBASE V-SL waterproofing membrane. The membrane is mechanically fixed on walls and loosely layed on the base concrete.

Sheets of the waterproofing membrane are joined by welding of overlaps. Special automatic welding equipment is used to form a double seam with a central air channel intended to check the seam tightness. As an additional measure to protect the structure, a foundation drainage system can be arranged.

SYSTEM ADVANTAGES



Loose layed system, ensuring efficient compensation of any movements and deformations.



Possibility to install at the temperature of down to -10°C



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire



Quick installation

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ²	Rolls	2.3
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015*, m ²	Rolls 2.05 x 20 m	1.15
TECHNONICOL CARBON PROF 300 extruded polystyrene foam STO 72746455-3.3.1-2012, m ³	580 x 1180 mm	as per design
PLANTER extra-geo** dimpled membrane STO 72746455-3.4.2-2014, m ²	2 x 15 m	1.15
TECHNONICOL CARBON PROF 300 extruded polystyrene foam compensator STO 72746455-3.3.1-2012, m ³	580 x 1180 mm	as per design
TECHNONICOL polyethylene film 200 µm, m ²	1.5-3.0 m wide rolls	1.15

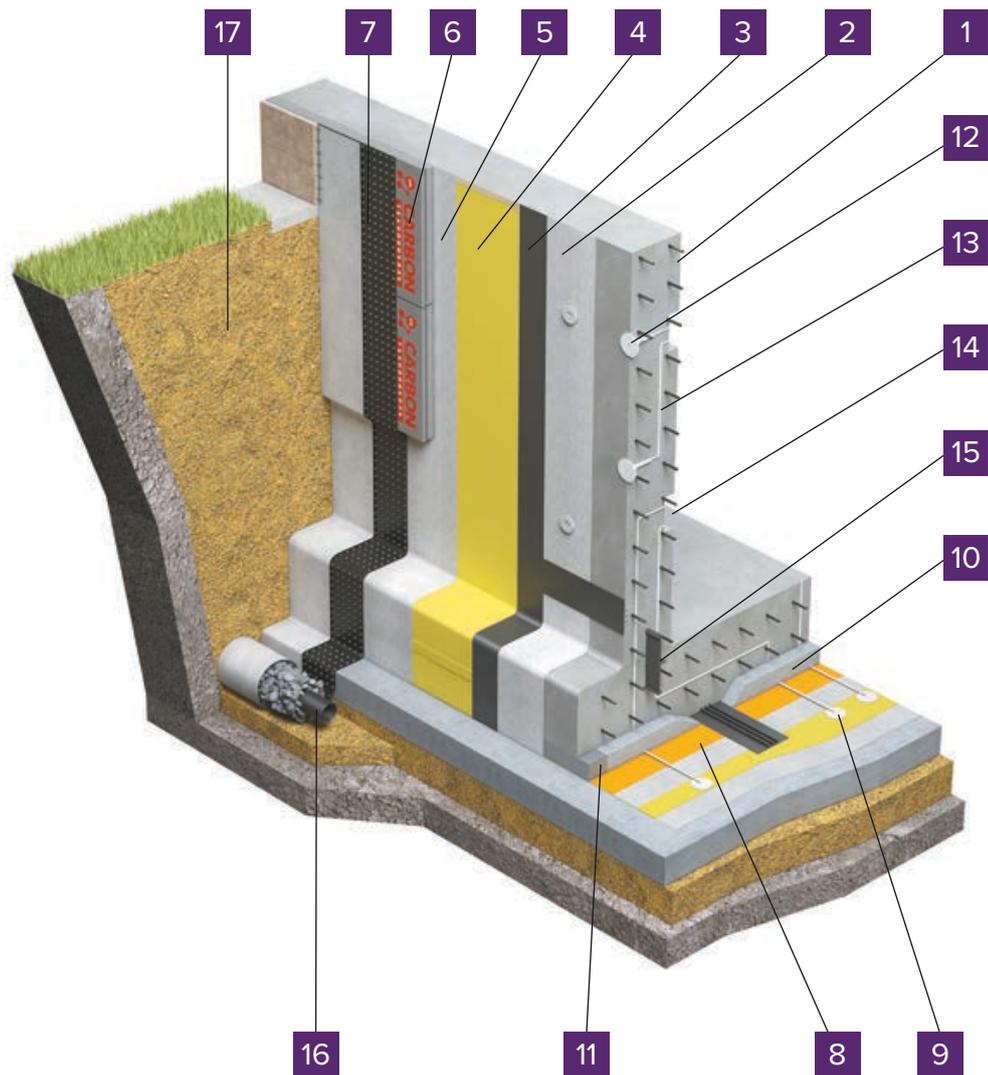
* Alternative material — LOGICBASE P-SL waterproofing membrane based on thermoplastic polyolefines.

** Alternative material — PLANTER geo dimpled membrane.

TN-FOUNDATION Prof

FOUNDATION WATERPROOFING SYSTEM

For waterproofing of foundations of mass construction buildings and structures with normal and increased level of responsibility, constructed in ditches with backfill in complicated and ediumcomplicated



- | | |
|--|---|
| 1. Reinforced concrete structure | 8. TECHNONICOL polyethylene film, 200 µm |
| 2. TECHNONICOL needle-punched geotextile, 500 g/m ² | 9. Angular injection flange |
| 3. EC-220-3 waterstop | 10. Protective cement-sand screed |
| 4. LOGICBASE V-SL PVC membrane | 11. TECHNONICOL CARBON PROF XPS angular compensator |
| 5. TECHNONICOL needle-punched geotextile, 500 g/m ² | 12. Straight injection flange |
| 6. TECHNONICOL CARBON PROF XPS thermal insulation | 13. Injection hose |
| 7. PLANTER extra-geo dimpled membrane | 14. Niche for injection hoses |
| | 15. IC-240-6 waterstop |
| | 16. Drainage pipe |
| | 17. Backfilling material |

FIELD OF APPLICATION

- specific soils of limited expansion with predominant clay and loamy ground.
- ground water formed as a result of accumulation of ice and rain water. Underground water is represented by one or more horizons, located at the level or above the foundation slab. Underground water is not homogeneous in terms of chemical composition and contains impurities.

SYSTEM FEATURES

The system is used for construction in open ditches. On vertical surfaces, components of the system are mounted to finished reinforced concrete structures. As a waterproofing material, LOGICBASE V-SL PVC membranes with yellow signal layer are used.

Among specific features of the TN-FOUNDATION Prof system are compartmentalization of the waterproofed area with waterstops and repair injection system, which consists of injection hoses and flanges.

The compartmentalization is necessary to localize leaks if they appear. Waterstops prevent water from freely flowing between waterproofing and structure: it is confined in a section limited by waterstops. This greatly facilitates detection and elimination of leaks comparing to systems without compartmentalization. Special injection compounds are injected through the injection system to repair damaged section. Compounds fill the section up, polymerize and restore the integrity of waterproofing.

EC-220-3 or EC-320-4 dimpled PVC waterstops are usually used for compartmentalization of the waterproofing. In some cases, for waterproofing compartmentalization on foundation walls and covering plates TECHNONICOL glued waterstops are used. For covering plates this option is preferred.

On horizontal surfaces waterproofing is protected from mechanical damages by means of TECHNONICOL geotextile (with density of 500 g/m²), TECHNONICOL polyethylene film 200 µm and protective cement-sand screed. On vertical surfaces, the protection is ensured by means of TECHNONICOL geotextile (with density of 500 g/m²) and PLANTER standard or PLANTER geo dimpled sheet. Usage of PLANTER geo makes it possible to install a wall drainage system to increase reliability of the waterproofing.

SYSTEM ADVANTAGES



Repairability within the whole service life of the structure



Loose layed system, ensuring efficient compensation of any movements and deformations.



Possibility of installation at low temperatures



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2.15x45	2.3
LOGICBASE V-SL waterproofing membrane* STO 72746455- 3.4.3-2015, m ²	Rolls 2.05x20 m	1.15
TECHNONICOL CARBON PROF 300 extruded polystyrene foam STO 72746455-3.3.1-2012, m ³	580 x 1180 mm	as per design
EC-220-3 PVC waterstop**, r.m.	Bundles, 20 m	as per design
PLANTER extra-geo dimpled membrane*** STO 72746455-3.4.2-2014, m ²	2.0x15 m	1.15
TECHNONICOL CARBON PROF 300 extruded polystyrene foam compensator STO 72746455-3.3.1-2012, m ³	580 x 1180 mm	as per design
TECHNONICOL polyethylene film 200 µm, m ²	Rolls 1.5 — 3.0 m wide	1.15
TECHNONICOL injection flange, pcs.	Boxes, 50 pcs.	as per design
IC-240-6 waterstop****, r.m.	Bundles, 20 m	as per design
Injection hoses, r.m.	Bundles, 50 m	as per design

* Alternative material — LOGICBASE P-SL waterproofing membrane based on thermoplastic polymers.

** Alternative material — EC-320-4 waterstop or TECHNONICOL waterproofing PVC band.

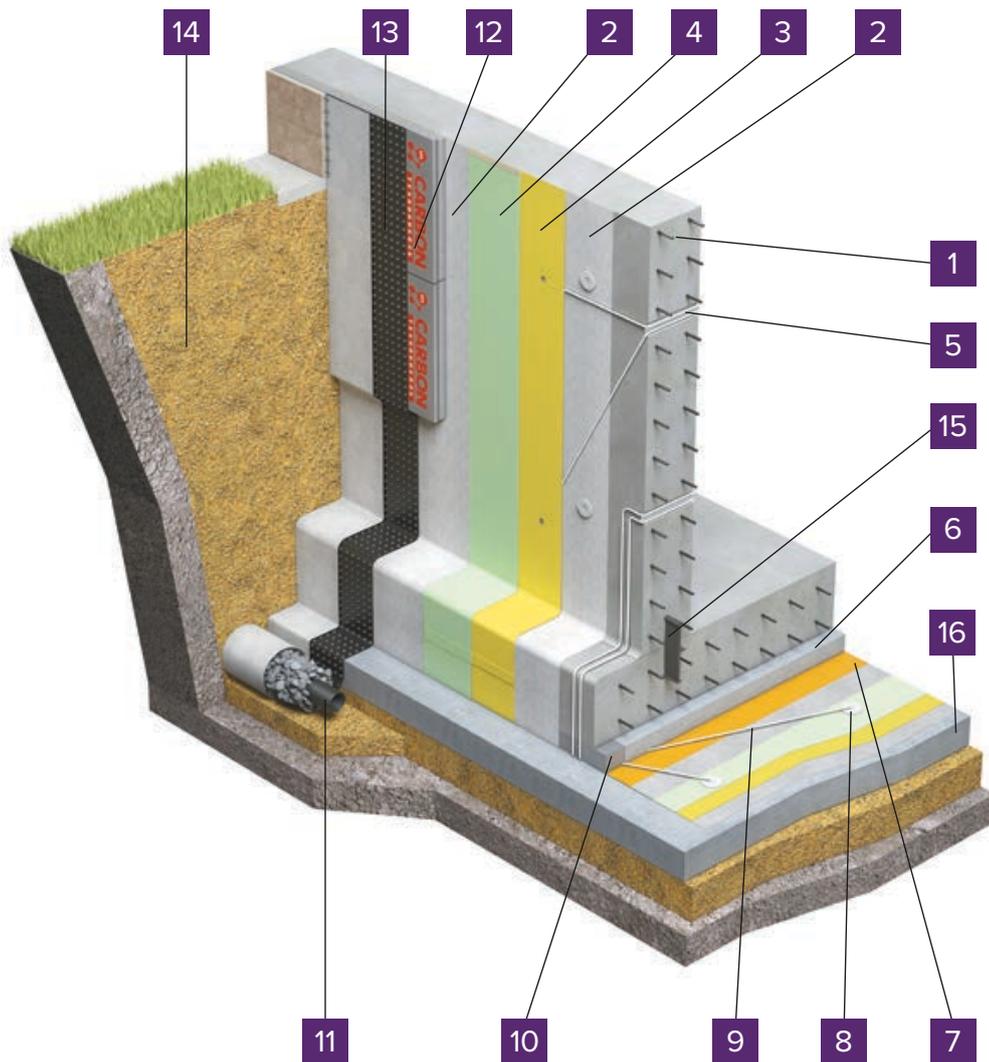
*** Alternative material — PLANTER geo dimpled membrane.

**** Alternative material — IC-240-2 waterstop.

TN-FOUNDATION Expert

FOUNDATION WATERPROOFING SYSTEM

For waterproofing of foundations of complicated and unique buildings and structures with increased level of responsibility, constructed in ditches with backfill in complicated engineering and geologic conditions



1. Reinforced concrete structure
2. TECHNONICOL needle-punched geotextile, 500 g/m²
3. LOGICBASE V-SL PVC membrane
4. LOGICBASE V-ST textured PVC membrane
5. Metal pipe for injection hoses
6. Protective cement-sand screed
7. TECHNONICOL polyethylene film, 200 µm
8. Angular injection flange
9. Injection hose
10. TECHNONICOL CARBON PROF XPS angular compensator
11. Drainage pipe
12. TECHNONICOL CARBON PROF XPS thermal insulation
13. PLANTER extra-geo dimpled membrane
14. Backfilling material
15. IC-240-6 waterstop
16. Base concrete

FIELD OF APPLICATION

- specific soils of wide-spread occurrence with predominant clay and loamy ground .
- ground water formed as a result of accumulation of ice and rain water. Underground water is represented by one or more pressure horizons of variable capacity, located above the foundation plate. Underground water is not homogeneous in terms of chemical composition and contains impurities

SYSTEM FEATURES

TN-FOUNDATION Expert is a two-layer system with vacuum quality control. It consists of two waterproofing materials – LOGICBASE V-SL membrane with signal layer and LOGICBASE V-ST membrane with textured surface.

LOGICBASE V-SL and LOGICBASE V-ST membranes are used to create two waterproofing compartments with area of up to 150 m². The insulation layer of LOGICBASE V-ST membrane is laid on the layer of LOGICBASE V-SL, textured face down. The two layers are joined by all-around welding to form an air-tight compartment with area of up to 150 m². After welding, holes are cut in the upper membrane (LOGICBASE V-ST), and at these points injection flanges are welded. Pipes for vacuum quality control are connected to these flanges.

During vacuum test, air is pumped out of waterproofing compartments (space between two membranes) via these pipes, and vacuum level is measured. Textured surface of LOGICBASE V-ST prevents the membranes from sticking together during the test. Criterion of air-tightness of a compartment is maintenance of vacuum during 5 minutes. If the compartment fails to be air-tight, damages are detected and repaired. If necessary, the waterproofing is repaired by pumping of a special injection compounds into the space between the membranes via the pipes connected. After polymerization, the compound restores the tightness.

Geotextile is used as an underlayer of the vacuum system. Geotextile, polyethylene film and protective screed are used as protective layers on horizontal surfaces. Geotextile and PLANTER geo or PLANTER standard dimpled membrane are used as protective layers on vertical surfaces.

SYSTEM ADVANTAGES



Increased reliability thanks to two waterproofing layers



Possibility of control of the system watertightness at all stages of construction and operation



Repairability within the whole service life of the structure



Localization of potential leaks



Possibility to install at the temperature of down to -10°C



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Open fire is not required

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2.15 x 45 m	2.3
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015*, m ²	Rolls 2.05x20 m	1.15
LOGICBASE V-ST waterproofing membrane STO 72746455-3.4.3-2015**, m ²	Rolls 2.05x20 m	1.15
TECHNONICOL CARBON PROF 300 extruded polystyrene foam STO 72746455-3.3.1-2012, m ³	580 x 1180 mm	as per design
PLANTER extra-geo*** dimpled membrane STO 72746455-3.4.2-2014, m ²	2.0x15 m	1.15
TECHNONICOL CARBON PROF 300 extruded polystyrene foam compensator STO 72746455-3.3.1-2012, m ³	580 x 1180 mm	as per design
TECHNONICOL polyethylene film 200 µm, m ²	Rolls 1.5 — 3.0 m;	as per design
TECHNONICOL elbow injection flange, pcs.	Boxes, 50 pcs.	as per design
IC-240-6 waterstop, r.m.	Bundles, 20 r.m.	as per design
Injection hoses, r.m.	Bundles, 50 r.m.	as per design

* Alternative material — LOGICBASE P-SL TPO based membrane;

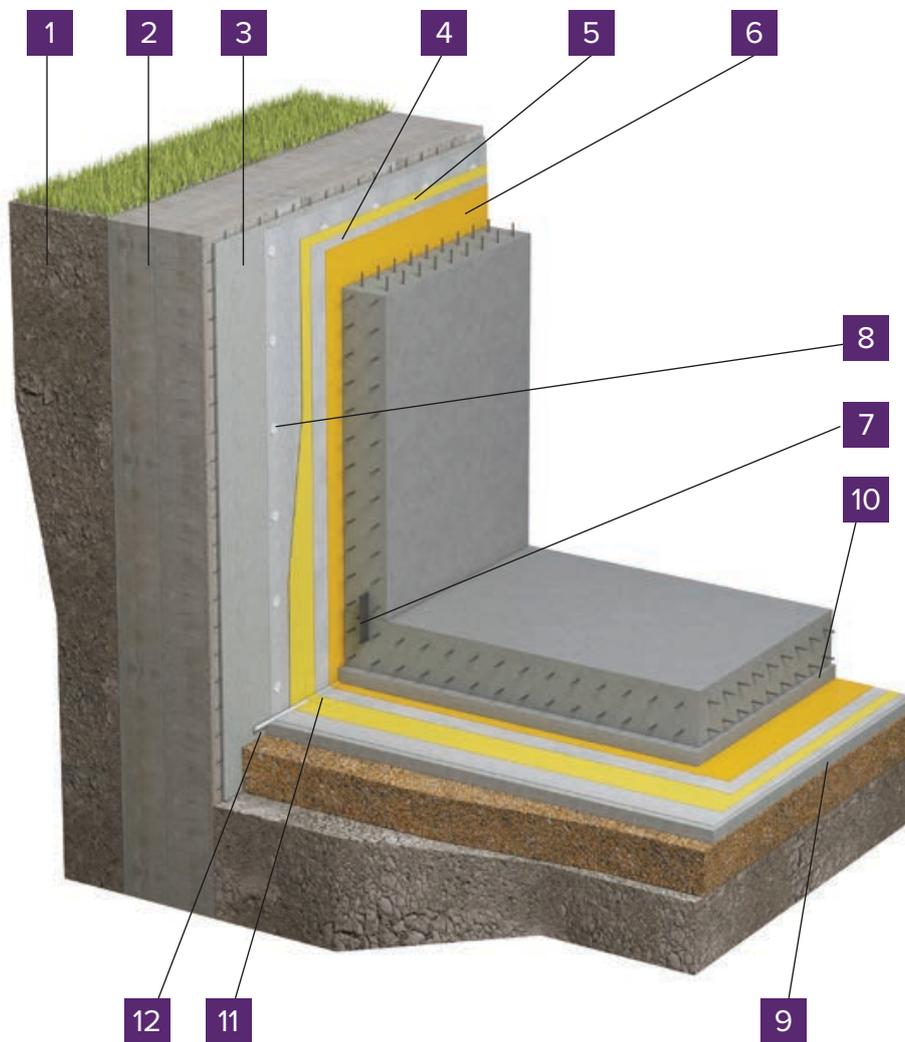
** Alternative material — LOGICBASE P-ST TPO based membrane;

*** Alternative material — PLANTER geo dimpled membrane.

TN-FOUNDATION Barrier Diaphragm Wall

FOUNDATION WATERPROOFING SYSTEM

For waterproofing of foundations of small buildings and structures with low level of responsibility, constructed in ditches with diaphragm wall in the absence of underground water. The foundation abuts the diaphragm wall



1. Ground
2. Diaphragm wall
3. Leveling plaster
4. Needle-punched geotextile
TECHNONICOL, 500 g/m²
5. LOGICBASE V-SL PVC membrane
6. TECHNONICOL polyethylene film, 200 µm
7. IC-240-6 waterstop
8. TECHNONICOL PVC disk fixing element
9. Base concrete
10. Protective screed
11. Strengthening layer of LOGICBASE V-SL membrane
12. Cellular polyethylene compensator

FIELD OF APPLICATION

- absence of specific soils at construction site with predominant sandy soil;
- no underground water or there is only one horizon of it, located below the foundation plate, and the water is homogeneous in terms of chemical composition and degree of aggressiveness.

SYSTEM FEATURES

In conditions of compact planning and in close proximity to existing buildings, construction of foundations is made in ditches, limited by the diaphragm wall – often this is the only technological solution in such conditions. In TN-FOUNDATION Barrier Diaphragm Wall system LOGICBASE V-SL PVC unreinforced membrane is used as waterproofing material. Waterproofing membrane is installed on the horizontal concrete base and vertical leveled diaphragm wall of the ditch before construction of the bearing structure. For preparation of the surface of a diaphragm wall the leveling layer of cement-sand slurry or extruded polystyrene is applied. Rubber granulate mats or, in some cases, PLANTER dimpled sheets can also be used. The system consists of geotextile underlayer, waterproofing membrane, protective geotextile and polyethylene film layer. Moreover, cement-sand screed is applied to the horizontal surface to prevent membrane damage in the course of installation of reinforcement of foundation slab.

SYSTEM ADVANTAGES



Loose-layed system, ensuring efficient compensation of any movements and deformations



Possibility to install at the temperature of down to -10°C



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire



Quick installation of the system

MATERIAL CONSUMPTION

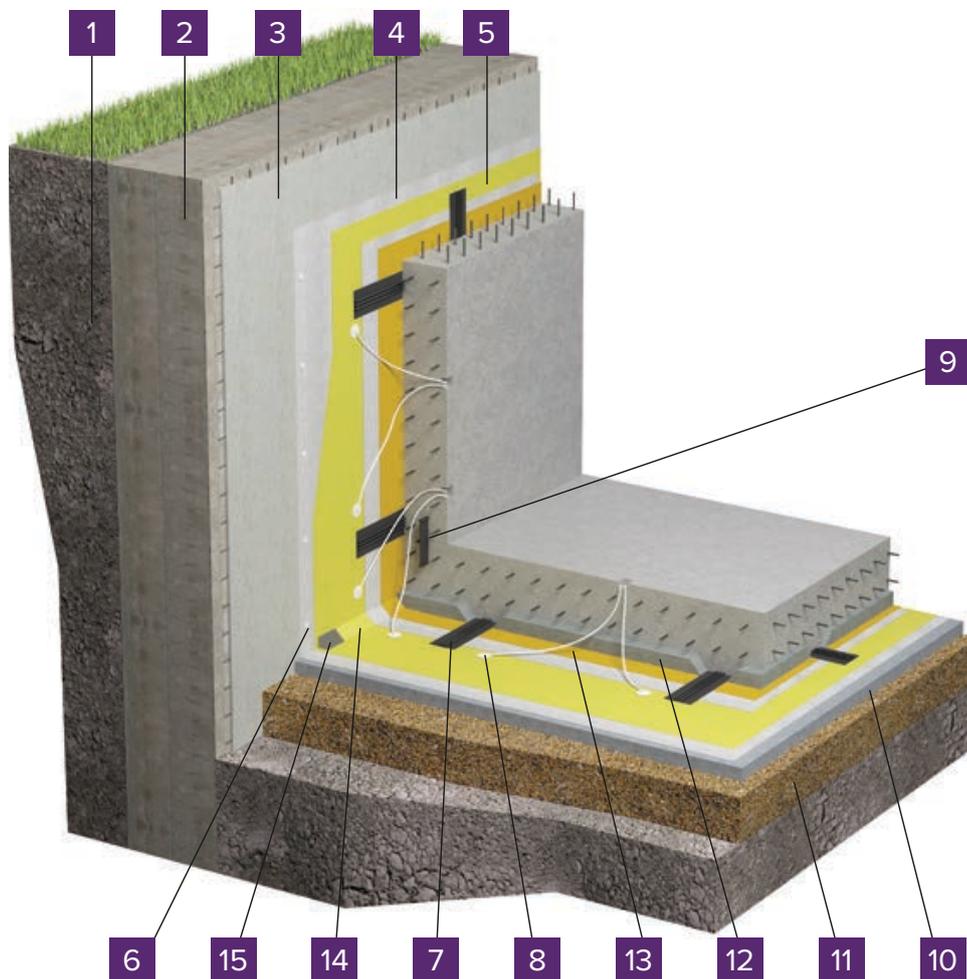
Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2.15 x 45 m	2.3
PVC disk fixing element, pcs.	Boxes, 300 pcs.	as per design
LOGICBASE V-SL waterproofing membrane* STO 72746455- 3.4.3-2015, m ²	Rolls 2.05x20 m	1.15
TECHNONICOL polyethylene film 200 µm, m ²	Rolls 1.5 — 3.0 m wide	1.15
Strengthening layer of LOGICBASE V-SL membrane STO 72746455-3.4.3-2015, m ²	Rolls 2.05x20 m	as per design
Waterstop IC-240-6, r.m.	Bundles, 20 m	as per design

* Alternative material — LOGICBASE P-SL waterproofing membrane based on thermoplastic polymers.

TN-FOUNDATION Prof Diaphragm Wall

FOUNDATION WATERPROOFING SYSTEM

For waterproofing of foundations of mass construction buildings and structures with normal and increased level of responsibility, constructed in complicated engineering and geologic conditions in ditches with diaphragm wall (3-20 m deep). The foundation abuts the diaphragm wall



- | | |
|---|---|
| 1. Ground | 8. Injection flange |
| 2. Ditch envelope – diaphragm wall | 9. IC-240-6 waterstop |
| 3. Leveling plaster or TECHNINICOL
CARBON PROF XPS heat insulation | 10. Base concrete |
| 4. TECHNINICOL needle-punched geotextile, 500 g/m ² | 11. Sand cushion |
| 5. LOGICBASE V-SL PVC membrane | 12. Protective cement-sand screed |
| 6. TECHNINICOL PVC
disk fixing element | 13. TECHNINICOL polyethylene film, 200 µm |
| 7. EC-220-3 PVC waterstop | 14. Strengthening layer of LOGICBASE V-SL
waterproofing membrane |
| | 15. Cellular polyethylene compensator |

FIELD OF APPLICATION

- specific soils of limited expansion with predominant clay and loamy ground.
- ground water formed as a result of accumulation of ice and rain water. Underground water is represented by one or more horizons, located at the level or above the foundation plate. Underground water is not homogeneous in terms of chemical composition and contains impurities.

SYSTEM FEATURES

LOGICBASE V-SL PVC membranes with yellow signal layer are used as waterproofing material. Waterproofing system is loose laid on horizontal base concrete and attached to vertical sheeting by means of PVC disk fixing elements. Membrane sheets are welded with hot air using special equipment. LOGICBASE V-SL PVC membrane is placed between two layers of geotextile for the purpose of protection from mechanical damage. On vertical and horizontal foundation structures polyethylene film is placed above geotextile. Moreover, on the horizontal surface the waterproofing system is protected by cement-sand screed. Distinctive feature of TN-FOUNDATION Prof Diaphragm Wall is the compartmentation of the waterproofing area by waterstops and presence of repair injection system. Repair system includes injection hoses and injection flanges. Waterproofing layer compartmentation is required for the localization of leaks, if any. Thanks to the system of waterstops, the water cannot freely move between waterproofing layer and structure but remains in the restricted section. It is much easier to detect and eliminate such leak than in the absence of sectioning system. During repair, special polymeric compounds are delivered to the damaged section of waterproofing through injection system fill it up, polymerize and restore integrity of waterproofing layer.

SYSTEM ADVANTAGES



Repairability during the whole service life of the structure



Loose layered system, ensuring efficient compensation of any movements and deformations



Possibility to install at the temperature of down to -10°C



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2.15x45 m	1.15
LOGICBASE V-SL waterproofing membrane* STO 72746455-3.4.3-2015, m ²	Rolls 2.05x20 m	1.15
TECHNONICOL polyethylene film 200 µm, m ²	Rolls 1.5 - 3.0 m wide	1.15
TECHNONICOL injection flange, pcs.	Boxes, 50 pcs.	as per design
Strengthening layer of LOGICBASE V-SL membrane STO 72746455-3.4.3-2015, m ²	Rolls 2.05x20 m	as per design
EC-220-3 waterstop**, r.m.	Bundles, 20 m	as per design
IC-240-6 waterstop, r.m.	Bundles, 20 m	as per design
PVC disk fixing element, pcs.	Boxes, 300 pcs.	as per design
Injection hoses, r.m.	Bundles, 50 m	as per design

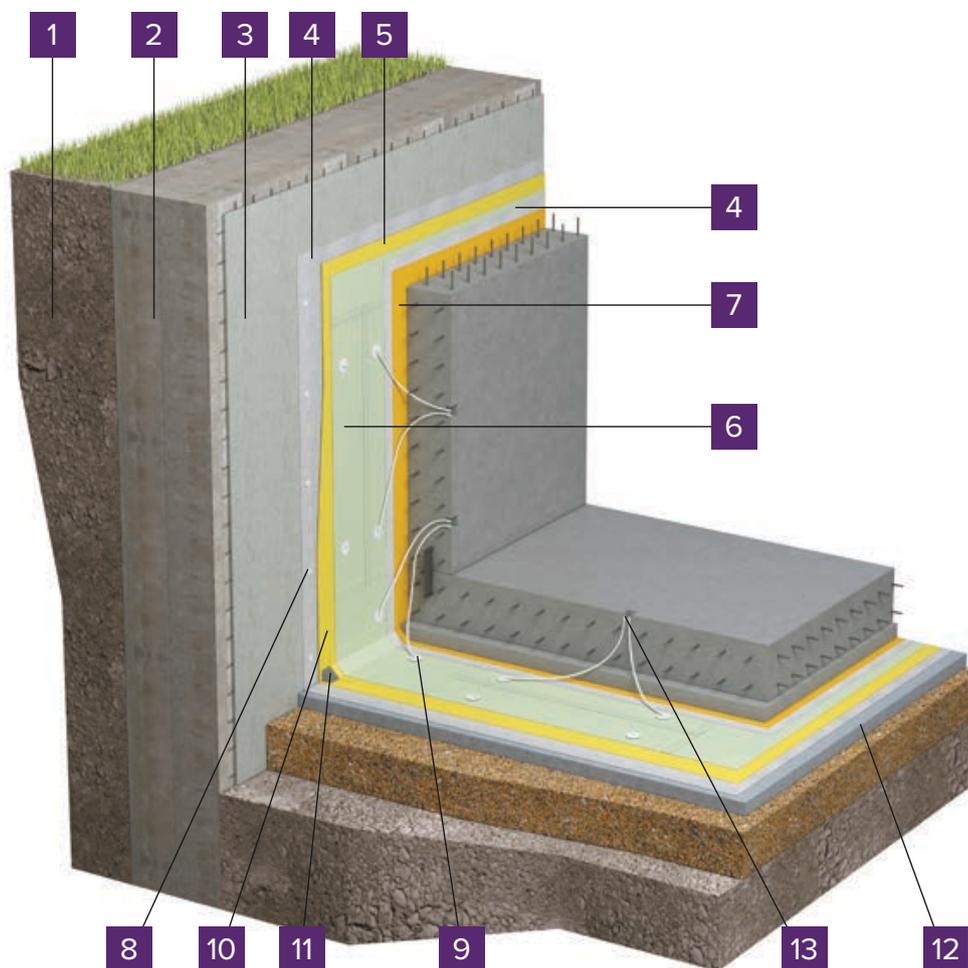
* Alternative material — LOGICBASE P-SL waterproofing membrane based on thermoplastic polyolefines.

** Alternative material — EC-320-4 PVC waterstop

TN-FOUNDATION Expert Diaphragm Wall

FOUNDATION WATERPROOFING SYSTEM

For waterproofing of foundations of complicated and unique buildings and structures with increased level of responsibility, constructed in complicated engineering and geologic conditions in ditches with diaphragm wall (3-50 m deep). The foundation abuts the diaphragm wall



1. Ground
2. Diaphragm wall
3. Leveling plaster or TECHNONICOL CARBON PROF XPS
4. TECHNONICOL needle-punched geotextile, 500 g/m²
5. LOGICBASE V-SL PVC membrane
6. LOGICBASE V-ST PVC membrane
7. TECHNONICOL polyethylene film, 200 µm
8. TECHNONICOL PVC disk fixing element
9. Injection flange
10. Strengthening layer of LOGICBASE V-SL waterproofing PVC membrane
11. TECHNONICOL CARBON PROF XPS corner compensator
12. Base concrete
13. Niche for injection hoses

FIELD OF APPLICATION

- specific soils of wide-spread occurrence with predominant clay and loamy ground.
- ground water formed as a result of accumulation of ice and rain water. Underground water is represented by one or more pressure horizons of variable capacity, located above the foundation plate. Underground water is not homogeneous in terms of chemical composition and contains impurities.

SYSTEM FEATURES

TN-FOUNDATION Expert Diaphragm Wall is a two layer system with vacuum quality control. The system includes two waterproofing materials – LOGICBASE V–SL membrane with signal layer and LOGICBASE V–ST structured membrane. LOGICBASE V–SL and LOGICBASE V–ST membranes are used for construction of waterproofing compartments of up to 150 m². Waterproofing layer of LOGICBASE V–ST is placed on LOGICBASE V–SL with textured surface downwards. Then two layers are welded along the perimeter forming a waterproof compartment of up to 150 m². Upon welding of the two waterproofing layers, holes are made in the upper LOGICBASE V–ST membrane and injection flanges with connected hoses are welded on these spots. During the vacuum test, air is pumped out from the waterproofing cell (space between two waterproofing membranes) through connected hoses and the vacuum level is measured. LOGICBASE V–ST relief prevents membranes sticking together during vacuum test. Tightness criterion is the preservation of vacuum in the cell within 5 minutes. In the absence of tightness the damages are detected and eliminated. If necessary, the waterproofing layer repair is carried out by means of injection of a special injection compound into the space between two membranes through the connected hoses. After polymerization repair compound into the space between two membranes restores tightness of waterproofing layer. Protective layer of vacuum system is geotextile and polyethylene film. On the horizontal surface the waterproofing layer is also protected by protective screed. For additional reliability the system may include sectioning of the waterproofing into isolated compartments by means of waterstops with provision of additional repair injection system. Such design of waterproofing system ensures availability of two repair loops: between two waterproofing membranes and between the membrane and reinforced concrete structure.

SYSTEM ADVANTAGES



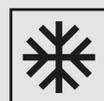
Possible control of the system watertightness at all stages of construction and operation;



Loose layered system, ensuring efficient compensation of any movements and deformations



Localization of potential leaks



Possibility to install at the temperature of down to -10°C



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2.15x45 m	2.3
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015, m ²	Rolls 2.05x20 m	1.15
LOGICBASE V-ST waterproofing membrane STO 72746455-3.4.3.-2015**, m ²	Rolls 2.05x20 m	1.15
TECHNONICOL CARBON PROF 300 extruded polystyrene foam STO 72746455-3.3.1-2012, m ²	580 x 1180 mm	as per design
TECHNONICOL CARBON PROF 300 extruded polystyrene foam compensator STO 72746455-3.3.1-2012, m ³	580 x 1180 mm	as per design
TECHNONICOL polyethylene film 200 µm, m ²	Rolls 1.5 - 3.0 m	1.15

* Alternative material — LOGICBASE P-SL TPO based membrane;

** Alternative material — LOGICBASE P-ST TPO or LOGICBASE V-ST-T PVC membrane.



Roki road tunnel
Republic of North Ossetia-Alania, 2015
Waterproofing of the tunnel, 40 000 m²
LOGICBASE V-SL 1.5 mm

WATERPROOFING SYSTEMS FOR TUNNELS

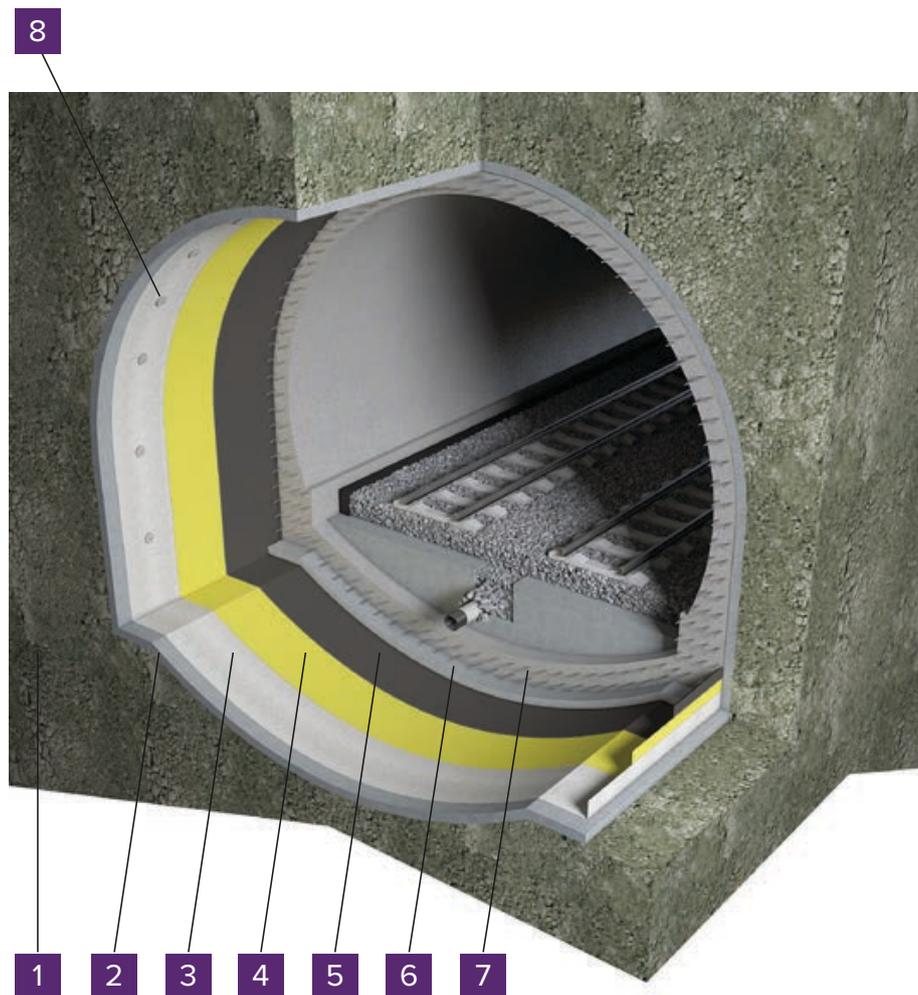


Tunnel complexes 6, 7, 8
Sochi, Adler-Tuapse railroad, 2011-2012
Waterproofing of tunnels, 35 000 m²
LOGICBASE V-SL 2.0 mm

TN-TUNNEL Barrier NATM

WATERPROOFING SYSTEMS FOR TUNNELS CONSTRUCTED BY NATM

Single-layer waterproofing system based on PVC membranes and intended for application in NATM tunnels in simple engineering and geological conditions. The system protects the concrete lining structure from adverse impact of underground waters



1. Ground
2. Primary lining
3. TECHNONICOL needle-punched geotextile, 500 g/m²
4. LOGICBASE V-SL waterproofing membrane
5. LOGICBASE V-PT protective PVC membrane
6. Protective cement-sand screed
7. Final lining
8. TECHNONICOL PVC disk fixing element

FIELD OF APPLICATION

The system can be applied in tunnels related with rock mass as follows:

- Engineering and geologic properties of the mass: hard rocks, with high hardness ratio and low porosity prevail at the construction site;
- Hydrogeologic characteristic of the mass: absence of water-bearing horizons in vicinity of the tunnel or presence of water-bearing horizon with insignificant capacity, and the water is homogeneous in terms of chemical composition and degree of aggressiveness.

SYSTEM FEATURES

TN-TUNNEL Barrier system is made in form of closed loop. LOGICBASE V-SL PVC membrane is used as waterproofing layer, which is attached to the internal surface of concrete lining above preliminary fastened geotextile layer. Shotcreting method is used for concrete lining construction. It artificially increases the stability of rock until completion of the permanent lining. Temporary concrete lining forms the base for installation of waterproofing system. PVC waterproofing is not continuously adhered to the base, therefore it is highly resistant to differential settlements and ground pressure. Waterproofing layer is attached to the walls and arch of the tunnels on a spot basis by means of welding to PVC disk fixing elements, which, in return, are mechanically fastened to the concrete lining. Attachment and sealing of seams of LOGICBASE V-SL membranes is performed by automatic equipment by means of hot air welding. For waterproofing layer protection special protective PVC membrane LOGICBASE V-PT is used. It is welded to the waterproofing membrane at certain points along the whole area. Protective membrane sheets are welded together by hot air using automatic or manual welding equipment.

SYSTEM ADVANTAGES



Loose layered system, ensuring efficient compensation of any movements and deformations



Possibility of installation on damp base



Reliable protection during the whole service life of the tunnel



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire



Quick installation of the system

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2.15x45 m	1.15
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015*, m ²	Rolls 2.05x20 m	1.15
LOGICBASE V-PT protective PVC membrane STO 72746455-3.4.3.-2015**, m ²	Rolls 2.05x20 m	1.15

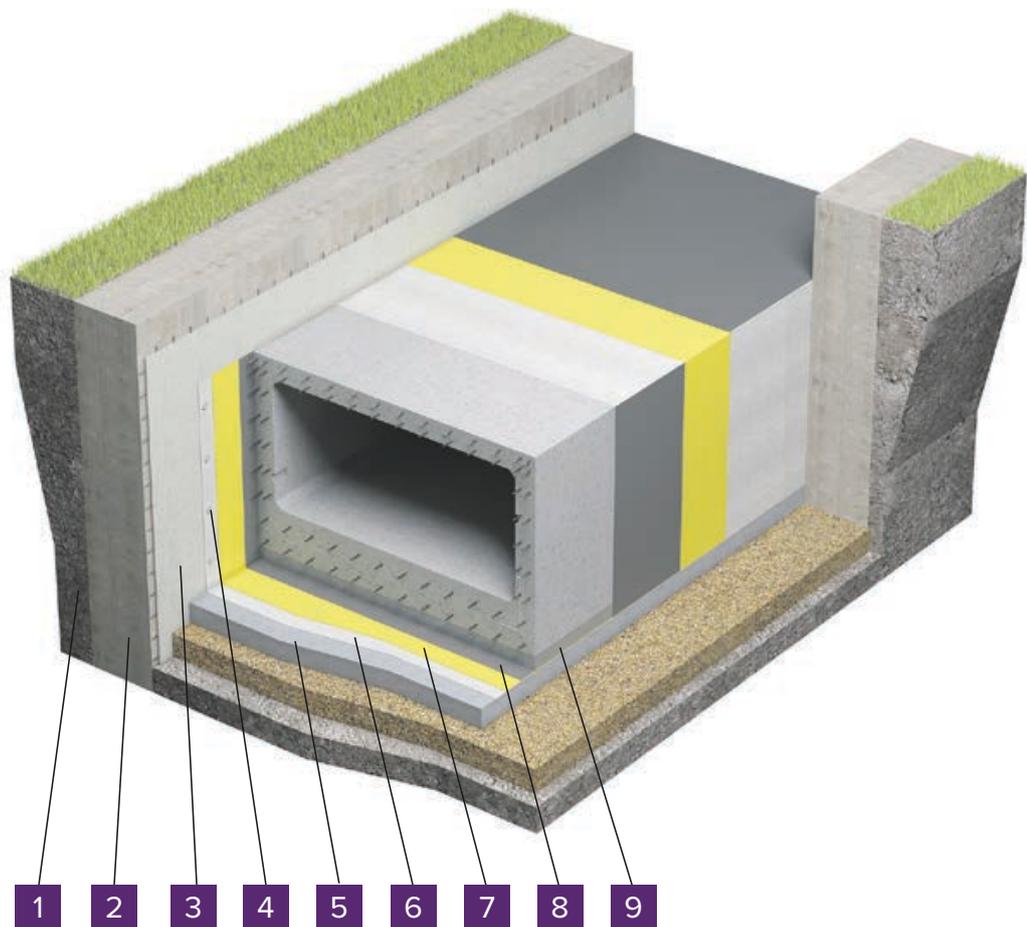
* Alternative material — LOGICBASE P-SL TPO based membrane;

** Alternative material — LOGICBASE P-PT TPO membrane.

TN-TUNNEL Barrier

WATERPROOFING SYSTEM FOR CUT-AND-COVER TUNNELS

Single-layer waterproofing system intended to protect bearing structures of shallow tunnels made of monolithic reinforced concrete from adverse impact of surface precipitated waters, capillary and temporary perched waters, as well as from temporary impacts of hydrostatic head of underground waters



1. Ground
2. Diaphragm wall
3. Leveling plaster
4. TECHNONICOL PVC disk fixing element
5. Base concrete
6. TECHNONICOL needle-punched geotextile, 500 g/m²
7. LOGICBASE V-SL waterproofing membrane
8. LOGICBASE V-PT protective waterproofing membrane
9. Protective screed

FIELD OF APPLICATION

The system can be applied in tunnels related with rock mass as follows:

- Engineering and geologic properties of the mass: predominant hard rock with high hardness ratio and low porosity at construction site;
- Hydrogeologic characteristic of the mass: absence of water-bearing horizons in the supposed place of tunnel construction or presence of water-bearing horizon with insignificant capacity, and the water is homogeneous in terms of chemical composition and degree of aggressiveness.

SYSTEM FEATURES

Depending on arrangement of the tunnel bearing structures relative to the diaphragm wall, there are two options of the system installation on vertical structures:

- If the tunnel bearing structure abuts to the diaphragm wall, the waterproofing membrane is mounted on the later, above a layer of geotextile or the PLANTER geo dimpled membrane. To protect the LOGICBASE V-SL waterproofing membrane from mechanical damages, a layer of the LOGICBASE V-PT protective membrane is spot welded to it. In the same purposes, geotextile can be used with density of 500 g/m². The material must, in turn, be protected by means of 200 µm thick polyethylene film.
- If there is a gap between the diaphragm wall and tunnel structure, the waterproofing membrane is mounted on the tunnel wall. In such cases the system must include a layer of the LOGICBASE V-PT protective membrane, PLANTER extra dimpled membrane or TECHNINICOL CARBON XPS heat insulation plates. The way the system is installed on horizontal structures (plates, coverings) does not depend on arrangement of the tunnel bearing structures relative to the diaphragm wall. All layers of the system, starting from an underlayer of geotextile, are laid on the prepared concrete surface. To protect the waterproofing covering, in addition to the LOGICBASE V-PT protective membrane, the system includes at least 40 mm thick cement-sand screed B 12.5.

SYSTEM ADVANTAGES



Loose layered system, ensuring efficient compensation of any movements and deformations



Possibility of installation on damp base



Reliable protection during the whole service life of the tunnel



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire



Quick installation of the system

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2.15x45 m	1.15
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015**, m ²	Rolls 2.05x20 m	1.15
LOGICBASE V-PT protective waterproofing membrane STO 72746455-3.4.3-2015***, pcs.	Rolls 2.05x20 m	1.15
PVC disk fixing element, pcs.	Boxes, 300 pcs.	as per design

* Alternative material: PLANTER extra-geo dimpled membrane;

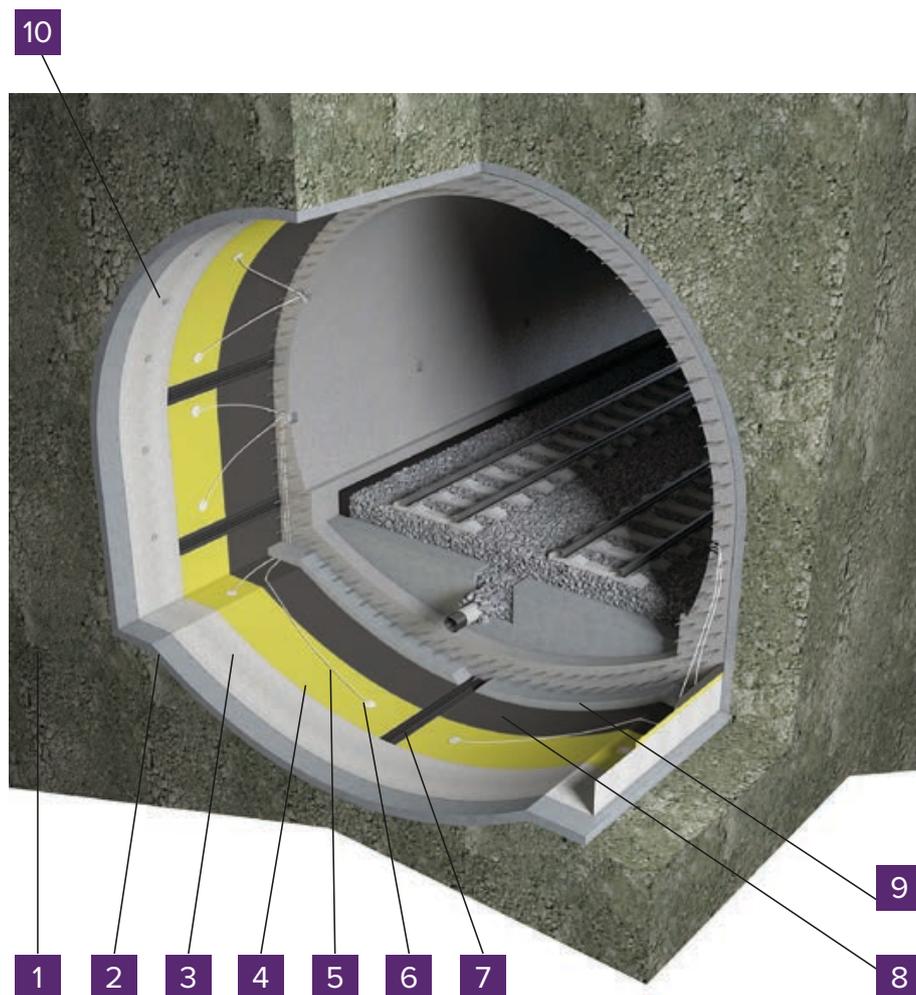
** Alternative material: LOGICBASE P-SL waterproofing membrane;

*** Alternative materials: LOGICBASE P-PT protective waterproofing membrane TECHNINICOL needle-punched geotextile, 500 g/m².

TN-TUNNEL Prof NATM

WATERPROOFING SYSTEMS FOR TUNNELS CONSTRUCTED BY NATM

For waterproofing of NATM tunnels in severe hydraulic and geological conditions. The system protects the lining structure from adverse impact of underground waters



1. Ground
2. Primary lining
3. TECHNONICOL needle-punched geotextile, 500 g/m²
4. LOGICBASE V-SL waterproofing membrane
5. Injection hoses
6. Angular injection flange
7. EC-220-3 waterstop
8. Protective PVC membrane LOGICBASE V-PT
9. Protective cement-sand screed
10. TECHNONICOL PVC disk fixing element

FIELD OF APPLICATION

The system can be applied in tunnels related with rock mass as follows:

- Engineering and geologic properties of the mass: predominant hard rock with high hardness ratio and low porosity;
- Hydrogeologic characteristic of the mass: presence of one or more water-bearing horizons with medium capacity and insignificant hydraulic pressure and the water is homogeneous in terms of chemical composition and degree of aggressiveness.

SYSTEM FEATURES

TN-TUNNEL Prof waterproofing system ensures tunnel protection from water ingress and protection of tunnel structure from corrosion. The membrane is attached to walls and arches of primary lining by means of PVC disk fixing elements and is loose laid on horizontal surfaces.

Waterproofing area is divided into 100-150 m² sections by PVC waterstops, which are welded to the membrane and concreted into the bearing structure of final concrete liner. In case of damage of the waterproofing layer, waterstop anchors integrated in the concrete do not allow water spreading between the structure and waterproofing membrane and localizes the leak within the damaged section. In addition to sectioning by waterstops the waterproofing system also includes the injection repair system. The injection system consists of injection flanges with injection hoses. In case of any leak, repair polymeric compounds are injected into the damaged section of waterproofing through the injection system, polymerize with formation of dense watertight gel, thus restoring integrity of waterproofing layer. For protection of waterproofing layer special protective PVC membrane LOGICBASE V-PT is used. It is placed in sections between the waterstops and welded to the waterproofing membrane at certain points along the whole area. Protective membrane sheets are welded together by hot air using automatic or manual welding equipment.

SYSTEM ADVANTAGES



Repairability during the whole service life of the structure



Loose layered system, ensuring efficient compensation of any movements and deformations



Localization of potential leaks



Possibility to install at the temperature of down to -10°C



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
Needle-punched geotextile TECHNOMICOL, 500 g/m ² , m ²	Rolls 2.15x45 m	1.15
LOGICBASE V-SL waterproofing membrane STO 72746455- 3.4.3-2015, m ²	Rolls 2.05x20 m	1.15
LOGICBASE V-PT protective PVC membrane STO 72746455-3.4.3-2015**, m ²	Rolls 2.05x20 m	1.15
TECHNOMICOL injection	Boxes, 50 pcs.	as per design
EC-220-3 waterstop***, r.m.	Bundles, 20 m	as per design
PVC disk fixing element, pcs.	Boxes, 300 pcs.	as per design
Injection hoses, r.m.	Bundles, 50 m	as per design

* Alternative material — LOGICBASE P-SL TPO based membrane;

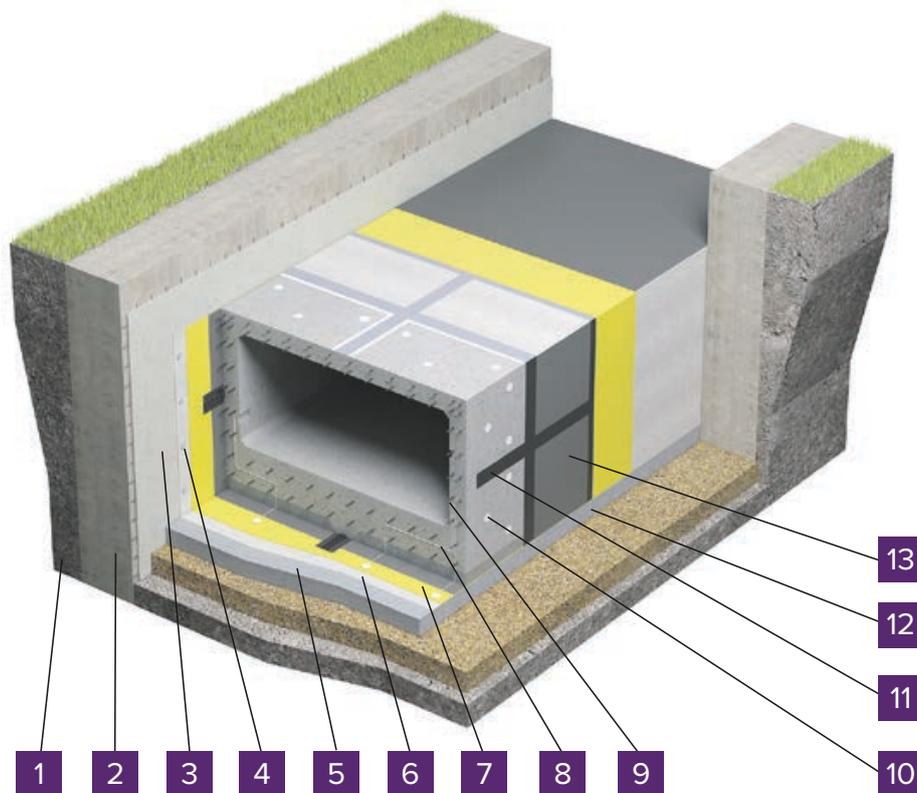
** Alternative material — LOGICBASE P-PT protective TPO membrane;

*** Alternative material — EC-320-4 waterstop.

TN-TUNNEL Prof

WATERPROOFING SYSTEM FOR CUT-AND-COVER TUNNELS

Single-layer waterproofing system intended to protect bearing structures of shallow tunnels made of monolithic reinforced concrete from adverse impact of surface precipitated waters, capillary and temporary perched waters, as well as from temporary and continuous impacts of hydrostatic head of underground waters



1. Ground
2. Diaphragm wall
3. Leveling plaster
4. TECHNOMICOL PVC disk fixing element
5. Base concrete
6. TECHNOMICOL needle-punched geotextile, 500 g/m²
7. LOGICBASE V-SL waterproofing membrane
8. Injection hoses
9. Cavity for injection hoses assembly
10. TechnoNICOL injection flange
11. PVC waterstop TechnoNICOL EC-220-3
12. Protective concrete and sand screed
13. LOGICBASE V-PT protective PVC membrane

FIELD OF APPLICATION

The system can be applied in tunnels related with rock mass as follows:

- Engineering and geologic properties of the mass: predominant hard rock with high hardness ratio and low porosity;
- Hydrogeologic characteristic of the mass: presence of one or more water-bearing horizons with medium capacity and insignificant hydraulic pressure and the water is homogeneous in terms of chemical composition and degree of aggressiveness.

SYSTEM FEATURES

Waterproofing material of the system can be applied in both cases: when the tunnel bearing structure (casing) abuts to the diaphragm wall and when there is a gap between diaphragm wall and a tunnel structure. Among specific features of the system is its reparability ensured by dividing of the whole LOGICBASE V-SL waterproofing membrane into separate sections limited by TECHNOMICOL EC-220-3 waterstops and TECHNOMICOL elastic PVC bands. All sections are provided with injection systems. Dividing of the waterproofing covering into separate independent sections makes it possible, in case of a leak, to confine ingress of water within one section only. By means of the injection system of the section, it is possible to find the damage and restore water-tightness by pumping polymeric injection materials between the structure and the membrane.

SYSTEM ADVANTAGES



Repairability during the whole service life of the structure



Loose layered system, ensuring efficient compensation of any movements and deformations



Localization of potential leaks



Possibility to install at the temperature of down to $\text{до } -10\text{ }^{\circ}\text{C}$



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire

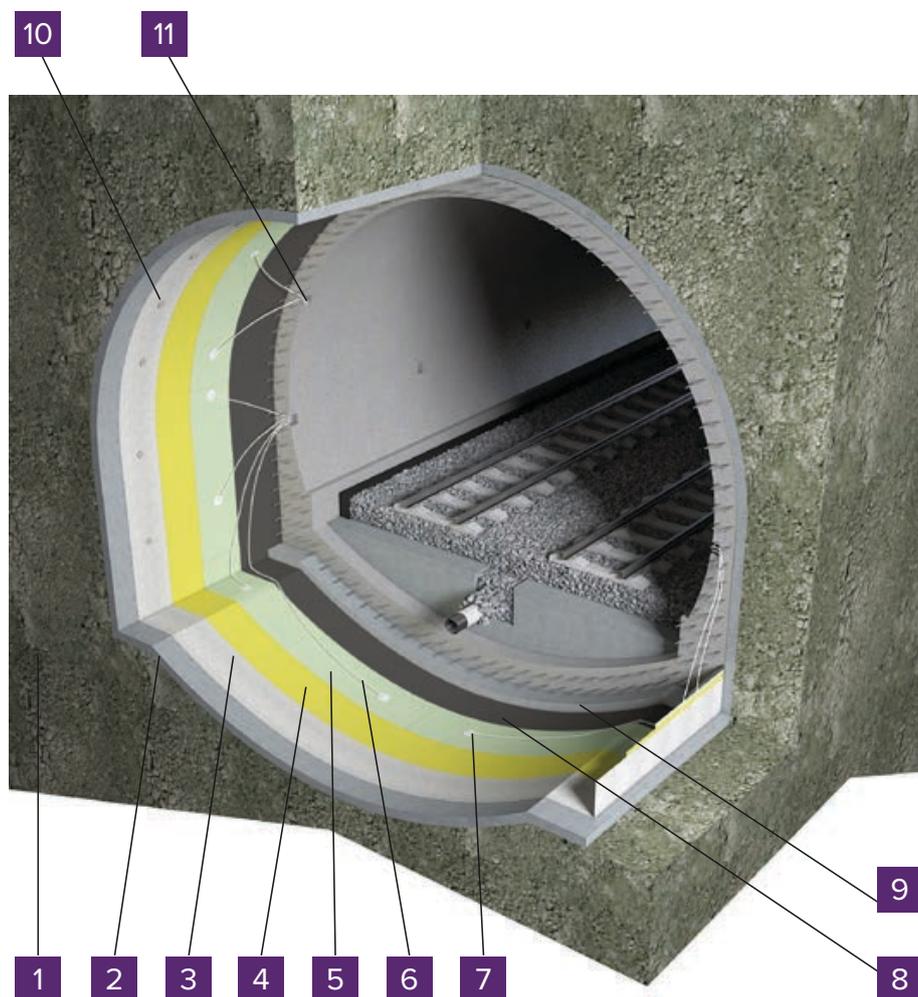
MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2,15×45 m	1,15
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015, m ²	Rolls 2,05×20 m	1,15
TechnoNICOL EC-220-3 PVC waterstop STO 72746455-3.4.4-2015, m	Bundles, 20 m	as per design
LOGICBASE V-PT protective waterproofing membrane STO 72746455-3.4.3-2015, m ²	Rolls 2,05×20 m	1,15
TECHNONICOL injection flange, pcs.	Boxes, 50 pcs.	as per design
Injection hoses, r.m.	Bundles, 50 m	as per design
PVC disk fixing element, pcs.	Boxes, 300 pcs.	as per design

TN-TUNNEL Expert NATM

WATERPROOFING SYSTEMS FOR TUNNELS CONSTRUCTED BY NATM

Two-layer waterproofing system with vacuum quality control is intended to be used in NATM tunnels, in severe hydraulic and geological conditions. The system protects the lining structure from adverse impact of underground waters



1. Ground
2. Primary lining
3. TECHNONICOL needle-punched geotextile, 500 g/m²
4. LOGICBASE V-SL waterproofing membrane
5. LOGICBASE V-ST waterproofing membrane
6. Injection hoses
7. Angular injection flange
8. LOGICBASE V-PT protective PVC membrane
9. Protective cement-sand screed
10. TECHNONICOL PVC disk fixing element
11. Niche for injection hoses

FIELD OF APPLICATION

The system can be applied in tunnels related with rock mass as follows:

- Engineering and geologic properties of the mass: predominant hard rock with high hardness ratio, low porosity and high water content at construction site;
- Hydrogeologic characteristic of the mass: presence of one or more water-bearing horizons with high capacity and hydraulic pressure and the water is not homogeneous in terms of chemical composition and degree of aggressiveness.

SYSTEM FEATURES

The most reliable solution for waterproofing of technically complex structures constructed in the ground with high water content is the two layer waterproofing system with vacuum quality control. The system includes two waterproofing materials – LOGICBASE V–SL membrane with signal layer and LOGICBASE V–ST structured membrane. LOGICBASE V–SL and LOGICBASE V–ST membranes are used for construction of waterproofing compartments of up to 150 m². Waterproofing layer of LOGICBASE V–ST is placed on LOGICBASE V–SL with textured surface downwards. Two layers are welded along the perimeter making up waterproof cell of up to 150 m². LOGICBASE V–ST relief prevents membranes sticking together during vacuum test. During waterproofing of arches the first layer is welded to PVC disk fixing elements, the second, in addition to welding along the perimeter, is welded to the first layer at certain points along the whole compartment area. After welding of the two waterproofing layers, holes are made in LOGICBASE V–ST membrane in order to weld flanges and connect hoses for vacuum quality control. During vacuum test the air is pumped out from the waterproofing compartment (space between two waterproofing membranes) through connected hoses and vacuum level is measured. Tightness criterion is the preservation of vacuum in the cell within 5 minutes. In the absence of tightness the damages are detected and eliminated. If necessary, the waterproofing layer repair is carried out by means of injecting into the space between the two membranes of a special injection compound through the injection hoses. After polymerization repair compound restores tightness of waterproofing layer. Protective layer of the system with vacuum quality control is special protective membrane LOGICBASE V-PT. On the horizontal surface the waterproofing layer is also protected by protective screed.

SYSTEM ADVANTAGES



Increased reliability thanks to two waterproofing layers



Possibility to check water-tightness of the system at all stages of construction and operation



Loose layered system, ensuring efficient compensation of any movements and deformations



Localization of potential leaks



Possibility to install at the temperature of down to -10°C



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2,15×45 m	1,15
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015*, m ²	Rolls 2,05×20 m	1,15
LOGICBASE V-ST waterproofing membrane STO 72746455-3.4.3-2015**, m ²	Rolls 2,05×20 m	1,15
LOGICBASE V-PT protective PVC membrane***, m ²	Rolls 2,05×20 m	1,15
TECHNONICOL injection flange, pcs.	Boxes, 50 pcs.	as per design
PVC disk fixing element, pcs.	Boxes, 300 pcs.	as per design
Injection hoses, r.m.	Bundles, 50 m	as per design

* Alternative material – LOGICBASE P-SL TPO based membrane;

** Alternative material – LOGICBASE P-ST TPO or LOGICBASE V-ST-T PVC membrane;

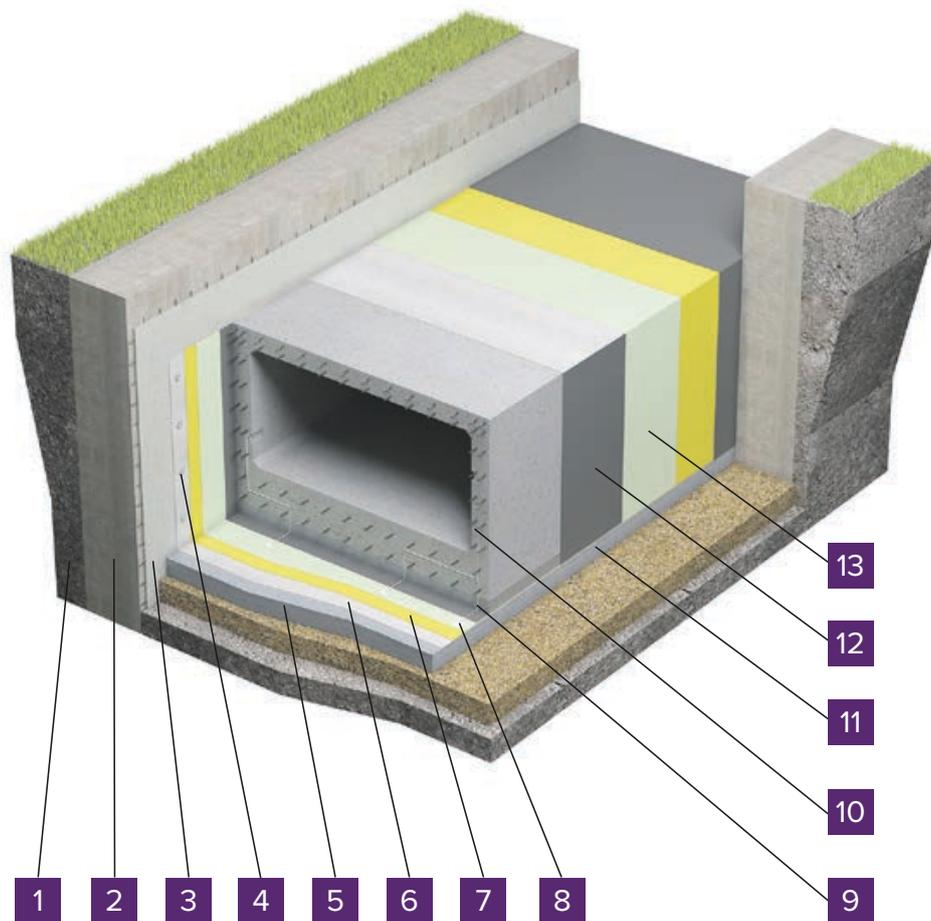
*** Alternative material – LOGICBASE P-PT protective TPO membrane.

TN-TUNNEL Expert

WATERPROOFING SYSTEMS FOR CUT-AND-COVER TUNNELS

Two layer repairable waterproofing system is designed to protect tunnel structures from pressure waters.

The system allows to control the tightness of the waterproofing during installation and the whole operation period



1. Ground
2. Diaphragm wall
3. Leveling plaster
4. TECHNINICOL PVC disk fixing element
5. Base concrete
6. TECHNINICOL needle-punched geotextile, 500 g/m²
7. LOGICBASE V-SL waterproofing membrane
8. TechnoNICOL injection flange
9. Injection hoses
10. Niche for injection hoses
11. Protective concrete and sand screed
12. LOGICBASE V-PT protective PVC membrane
13. LOGICBASE V-ST protective PVC membrane

FIELD OF APPLICATION

The system can be applied in tunnels related with rock mass as follows:

- Engineering and geologic properties of the mass: predominant hard rock with high hardness ratio, low porosity and high water content at construction site;
- Hydrogeologic characteristic of the mass: presence of one or more water-bearing horizons with high capacity and hydraulic pressure and the water is not homogeneous in terms of chemical composition and degree of aggressiveness.

SYSTEM FEATURES

The system consists of the following components:

- main waterproofing layer – LOGICBASE V-SL nonreinforced membrane made of plasticized polyvinylchloride;
- the second waterproofing layer – LOGICBASE V-ST non-reinforced membrane made of plasticized polyvinylchloride;
- protective waterproofing layer – LOGICBASE V-PT non-reinforced membrane made of plasticized polyvinylchloride;
- geotextile with surface density of 500 g/m²;
- injection flanges and hoses.

The system is based on the same principle as TNTunnel Expert NATM.

The main advantage of the system is its increased reliability, as well as possibility to check integrity of the waterproofing by vacuum test, which can be performed at any phase of construction and operation of the structure.

The system can be used when the tunnel is built in an excavation with backfilling, as well as when its wall is directly connected to the diaphragm wall.

In both cases waterproofing of the foundation and covering slab is installed in the same way. The first waterproofing layer is laid on the prepared surface covered with geotextile. The second waterproofing layer is welded to it to form separated waterproofing compartments. For protection of waterproofing geotextile covered with PE film, or protective PVC membrane are used. Then the waterproofing is protected by means of at least 40 mm thick cement-sand screed.

In case of a backfilled ditch, vertical part of the waterproofing is mounted on the tunnel walls. The corresponding concrete surface must be preliminary covered with geotextile or protective membrane. Upon completion of installation, the waterproofing must be protected from potential damages by means of protective membrane and PLANTER dimpled sheet. Instead of the protective membrane, it is possible to use geotextile with density of at least 500 g/m².

In case of an excavation with diaphragm wall connected to the tunnel wall, the waterproofing must be mounted on the diaphragm wall covered with geotextile. To protect waterproofing, LOGICBASE V-PT protective membrane is used.

SYSTEM ADVANTAGES



Increased reliability thanks to two waterproofing layers



Possibility to check water-tightness of the system at all stages of construction and operation



Loose layered system, ensuring efficient compensation of any movements and deformations



Localization of potential leaks



Possibility to install at the temperature of down to -10 °C



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
TECHNONICOL needle-punched geotextile, 500 g/m ² , m ²	Rolls 2,15×45 m	1,15
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015*, m ²	Rolls 2,05×20 m	1,15
LOGICBASE V-ST waterproofing membrane STO 72746455-3.4.3-2015**, m ²	Rolls 2,05×20 m	1,15
LOGICBASE V-PT protective PVC membrane***, m ²	Rolls 2,05×20 m	1,15
TECHNONICOL injection flange, pcs.	Boxes, 50 pcs.	as per design
PVC disk fixing element, pcs.	Boxes, 300 pcs.	as per design
Injection hoses, r.m.	Bundles, 50 m	as per design

* Alternative material — LOGICBASE P-SL TPO based membrane;

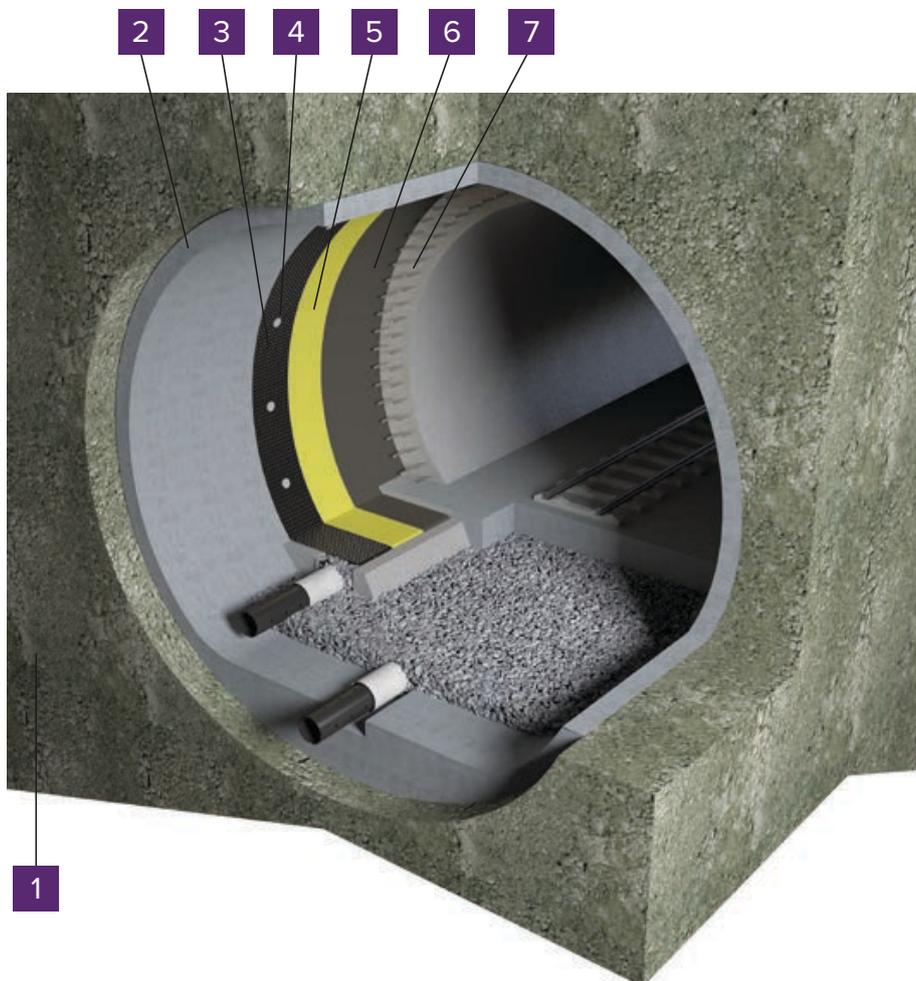
** Alternative material — LOGICBASE P-ST TPO based membrane;

*** Alternative material — LOGICBASE P-PT protective TPO membrane.

TN-TUNNEL Drainage NATM

WATERPROOFING SYSTEMS FOR TUNNELS CONSTRUCTED BY NATM

Single-layer waterproofing umbrella system with a drainage intended for application in new constructed or reconstructed tunnels. The system protects the lining structure from adverse impact of underground waters



1. Ground
2. Primary lining
3. PLANTER extra-geo dimpled membrane
4. TECHNONICOL PVC disk fixing element
5. LOGICBASE V-SL waterproofing membrane
6. LOGICBASE V-PT protective membrane
7. Final lining

FIELD OF APPLICATION

The system can be applied in tunnels related with rock mass as follows:

- Engineering and geologic properties of the mass: hard rocks, with high hardness ratio and water content, as well as low porosity prevail at the construction site;
- Hydrogeologic characteristic of the mass: there are no water horizons in vicinity of the tunnel or there is a low thickness water horizon with homogeneous chemical composition and degree of aggressivity.

SYSTEM FEATURES

The TN-TUNNEL Drainage NATM waterproofing system ensures effective protection from underground waters that ingress through defects in the primary lining.

The problem of collection and removal of infiltrated water is solved by means of the primary drainage made of the PLANTER geo or extra-geo dimpled membrane. The dimpled surface of the membrane forms an air gap. Water that flows from the rock mass runs freely into drain pipes laid along the tunnel in its lower part. PLANTER geo is laid on primary lining on tunnel walls and crown.

Reliability of waterproofing provided by the TN-TUNNEL Drainage NATM is ensured by LOGICBASE V-SL membrane with signal layer and LOGICBASE V-PT protective membrane. LOGICBASE V-SL waterproofing membrane is spot welded to disk fixing elements that fix PLANTER geo or extra-geo drainage membrane. Availability of the special signal layer makes it possible to detect and timely eliminate material damages in the course of the installation. The LOGICBASE V-SL membrane features high chemical and biological resistance.

The LOGICBASE V-PT PVC membrane is spot welded to the surface of the LOGICBASE V-SL membrane. it protects the waterproofing layer from damages during concrete casting of final lining. The material features high impact strength and excellent weldability. The protective membrane can be easily installed on vertical surfaces and tunnel crown.

SYSTEM ADVANTAGES



Primary collection and removal of infiltrating water



Preparation of a gunite bed for installation of the waterproofing without usage of expensive equipment



The drainage membrane prevents hydrostatic pressure from affecting the waterproofing



Loose layered system, ensuring efficient compensation of any movements and deformations



Possibility to install at low temperatures



Possibility of installation on damp base



Use of membrane with signal layer for prompt detection of damages



Laying process is fire-safe as it does not require application of open fire

MATERIAL CONSUMPTION

Material	Size, package	Consumption per m ²
PLANTER extra-geo dimpled membrane STO 72746455-3.4.2-2014*, m ²	Rolls 2,05×15 m	
LOGICBASE V-SL waterproofing membrane STO 72746455-3.4.3-2015**, m ²	Rolls 2,05×20 m	1,15
LOGICBASE V-PT protective membrane STO 72746455-3.4.3-2015***, m ²	Rolls 2,05×20 m	1,15
PVC disk fixing element, pcs.	Boxes, 300 pcs.	as per design

* Alternative material: PLANTER extra-geo dimpled membrane;

** Alternative material: LOGICBASE P-SL waterproofing membrane;

*** Alternative materials: LOGICBASE P-PT protective membrane.

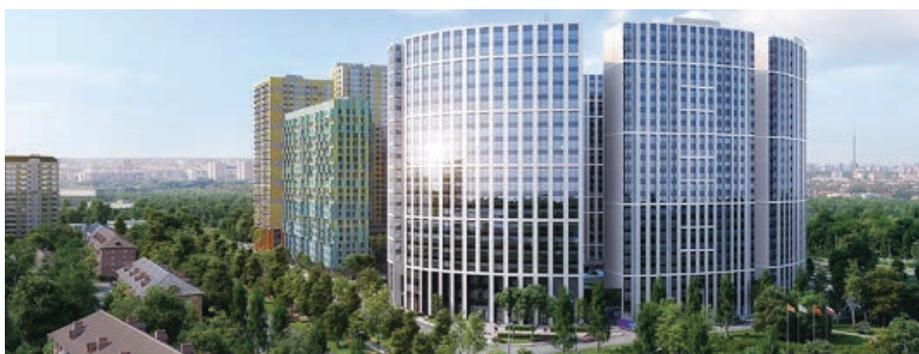
REGIONBUILDINGS AND STRUCTURES CONSTRUCTED WITH APPLICATION OF LOGICBASE SYSTEMS



HighwayMoscow International Business Center»
Moscow-City», Moscow



Leningrad NPP-2, Leningrad Region



The «Phili Grad» residential complex, Moscow



«Worker and Kolkhoz Woman» monument, Moscow



Dzheba tunnel, Krasnoyarsk



Kursk NPP, Kursk



«Moscow» subway station, Astana (Kazakhstan)



The «ZILART» residential complex, Moscow



Tunnels on the Armavir-Tuapse segment of the North Caucasus RailwayRoki



Great Moscow State Circus at Vernadsky prospect, Moscow



P.I. Tchaikovsky Moscow State Conservatory, Moscow



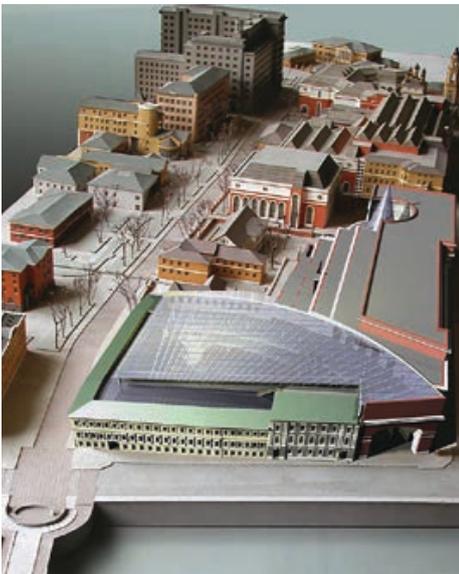
Roki road tunnel between North and South Ossetia, 93d km of the Transcaucasian HighwayMoscow



M. Gorky Moscow Art Academeical Theater, Moscow



Sheremetyevo airport, Moscow



The State Tretyakov Gallery, Moscow



The «Tushino» residential complex, Moscow

Technical support: Assistance and Training

Improvement of customer service is one of our priorities. Leadership of echnoNICOL on the market of waterproofing is conditioned not only by high quality and innovativeness of the manufactured products, but also by the high level of technical support.

Reliability of underground waterproofing system directly depends not only on the applied materials but on the qualified technical support and quality of installation works. TechnoNICOL believes that not only their own employees but also specialists of contracting organizations should have the required skills and experience in application of the company products. Therefore every year the company arranges training for more than 18,000 employees in the construction industry held in 11 training centres.

The experts of TechnoNICOL in the field of waterproofing of foundations and tunnels have the necessary skills and competences to ensure individual approach to each customer and solve any problem. Our technical specialists and 5 research and development centres are ready for cooperation

TechnoNICOL renders the following types of technical support:

- training of construction industry specialists in the field of application of TechnoNICOL materials and systems in form of seminars, master classes and practical training;
- technical support of installation process of TechnoNICOL on-site;- technical consultations on the issues of application of TechnoNICOL materials and systems;
- development of design solutions in the field of underground waterproofing with application of TechnoNICOL materials and systems;
- implementation of on-site contract supervision;
- assistance in selection of a contractor, having required equipment and qualification for installation of waterproofing systems based on TechnoNICOL materials.



Assurance of high-quality installation is the task of our Quality Control Service

Taking care of durability and reliability of structures, constructed with application of TechnoNICOL materials, the company pays much attention to the systematic approach and offers not only comprehensive solutions for underground waterproofing but a unique service in Russia making the customers be sure of outstanding characteristics of the products selected. We have created the Quality Control Service – a team of qualified engineers all over Russia and CIS countries.

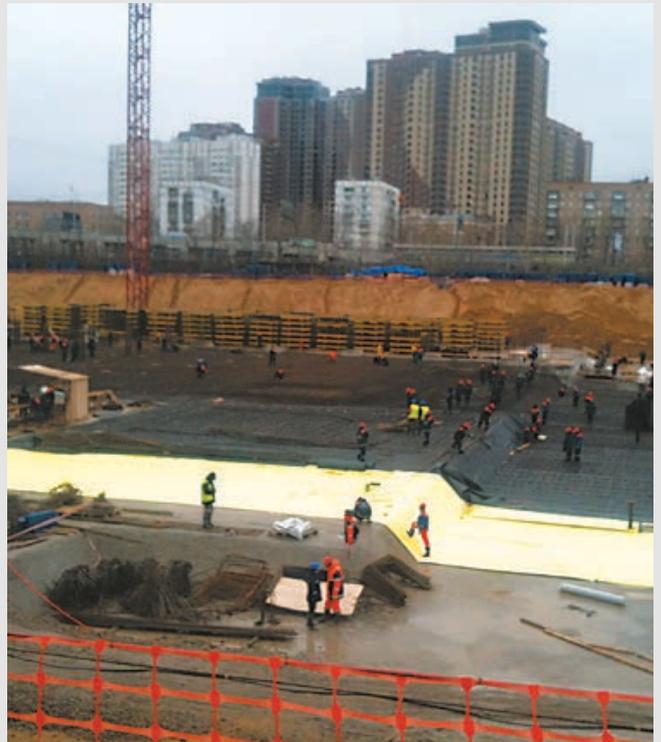
Quality Control Service is free support and monitoring of your project at all stages of underground waterproofing installation. This includes manufacturer's support, special insurance conditions, free inspection of underground waterproofing with application of LOGICBASE polymeric membranes and minimization of possible errors of installation works.

The task of Quality Control Service engineers is to create optimal conditions for efficient installation as well as easy and long-term operation of underground waterproofing systems, made of LOGICBASE advanced premium-class polymeric membranes. Our specialists are ready to assist on the construction site and render the necessary services to our customers.

The TECHNOMICOL Quality Control Service is:

- qualified and free technical support during installation of LOGICBASE waterproofing materials at construction site with recommendations on elimination of defects;
- training in the field of installation of systems based on LOGICBASE polymeric membranes.

High quality of TechnoNICOL products, monitoring of installation process by engineers from Quality Control Service make investors and contractors be sure of reliability, durability and safety of constructed structures.



Reference list

The catalogue describes the facilities where TechnoNICOL's membranes and systems were applied: sales centers, office buildings, residential complexes, tunnels, nuclear power plants. Our engineers developed and used premium-class LOGICBASE polymeric membranes for construction of buried and underground structures of any complexity.

Pocket installation manual for a foundation waterproofing system

This installation manual contains detailed information on operations to be performed in order to install a foundation waterproofing system. All descriptions are accompanied with photos. This manual contains all you need to know about installation of repairable waterproofing system: from proper algorithm intended to select welding parameters to component selection necessary to create a complete system.

TECHNONICOL waterstop catalogue

TECHNONICOL waterstops are intended to seal construction and movement joints of concrete structures. The waterstop catalogue contains all necessary data on this type of components: description, types, principle of operation, technical specifications and installation diagrams.

Glued waterstop brochure

An innovative product of our company – glued waterstop – can be used for compartmentalization of waterproofing systems made of PVC membranes. The waterstop consists of a TECHNONICOL PVC band glued to the structure surface by means of TECHNONICOL two-component epoxy glue. The brochure describes component parts of the waterstop, fields of its application, primary functions and advantages, as well as step-by-step installation process.

Company standard

The standards set technical requirements for materials and structure of waterproofing systems for transport tunnels and underground subway facilities to be made of TECHNONICOL roll-fed waterproofing polymeric materials: LOGICBASE V-SL and LOGICBASE T-PL. The standard also sets order of manufacturing, quality control of waterproofing works, requirements for equipment to be used, insulated surfaces and environment.

Design materials / Portfolio of technical solutions

The portfolio is intended to be used by designers, architectures, technical personnel of construction and repair companies. This document contains drawings of various components of TECHNONICOL waterproofing systems, as well as detailed description of the later. It also describes the materials necessary to construct the waterproofing systems, their physical and mechanical properties.





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8 800 200 05 65
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