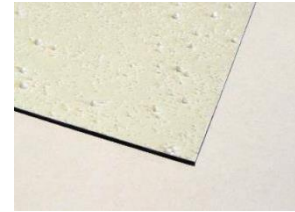


Protan InfraPlan TF12/TF20/TF15

According to Handbook N500



Product Description

Protan InfraPlan TF N500 portfolio is a group of polyethylene (PE) tunnel membranes, tested and validated according to EN 13491 – Geosynthetic barriers. In line with the requirements in the Norwegian handbook N500 (March 2022).

Application Areas:

Geosynthetic barriers – Characteristics required for use in the construction of tunnels and associated underground structures.

Characteristics:

- In accordance with EN 13491
- Compatible with Protan InfraPlan TF series.
- The product meets the requirement for reaction to fire class E according to EN 13501-1 and EN ISO 11925-2.

Characteristics	Test Method	Unit	TF12 TF12SL TF12TSL (Type I)	TF20SL (Type II)	TF15 TF15SL TF15TSL (Type III)
Material	DCS analysis	Polyethylene (PE)			
Surface		2-layer tunnel membrane SL – both side smooth (black/white) TSL – the white side textured (black/white)			
Visible defects	EN 1850-2		Complies		
Width	EN 1848-2	m	2,0 – 8,0 (to be specified by the customer)		
Length	EN 1848-2	m	To be specified by the customer		
Physical properties					
Thickness (nom.) - Minimum average - Lowest individual value	EN 1849-2	mm	1,2 ≥ 1,0 ≥ 1,0	2,0 ≥ 2,0 ≥ 2,0	1,5 ≥ 1,5 ≥ 1,5
Dimensional stability (6 h / 80 °C)	EN 1107-2	%	≤ 2,0		
Hydraulic properties					
Permeability to liquids	EN 14150	m ³ /(m ² .d)	< 1,0 E-06 (watertight)		
Mechanical properties					
Max. tensile strength MD/CMD	EN ISO 527-1,3	N/mm ²	32/32 (26/26)	32/32 (26/26)	35/35 (30/30)
Elongation MD/CMD	Specimen Type 5 Velocity 100 mm/min	%	850/850 (700/700)	850/850 (700/700)	850/850 (700/700)
Puncture resistance	EN ISO 12236	N	3500 (3000)	4500 (4000)	4000 (3500)
Resistance to tearing MD/CMD	ISO 34-1 method B	N	95/95 (91/91)	130/130 (120/120)	205/205 (200/200)
Thermal properties					
Foldability at low temperature	EN 495-5	°C	-25		
Durability and chemical resistance					
Resistance to weathering	EN 12224		To be covered within 3 days		
Resistance to oxidation	EN 14575		Reduction of tensile strength and elongation: <25% of original values (complies)		

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Microbiological resistance	EN 12225		Complies (Resistant)
Others			
Reaction to fire	EN 13501-1 EN ISO 11925-2	Class	E
Peel resistance of seams MD/CMD	EN 12316-2	N/50 mm	>100 Complies
Shear resistance of seams MD/CMD	EN 12317-2	N/50 mm	>500 Complies

Above mentioned data are nominal values, the values in brackets are minimum/maximum values. The manufacturer reserves the right to alter the specifications without prior notice. It is the responsibility of all customers to assure themselves that the above specifications are correct.

MD = machine direction, CMD = cross machine direction

Health & Safety

There is no requirement for a material safety data sheet according to EC-regulation 1907/2006, article 31. The product does not harm the environment when used as specified.

Environment

Protan InfraPlan TF series contains no substances which are listed on REACH/ECHA's (European Chemicals Agency) candidate list. The product contains no priority environmental pollutants or other relevant substances in quantities considered to be hazardous to health and the environment.

Storage

Protan InfraPlan TF should be kept dry with the rolls placed on pallets and protected on site with tarpaulins or similar, and should always be covered within 3 days.



Protan Legal Notice

The details provided in this document, especially the recommended application and utilisation for the products and their system accessories, are based on Protan's current knowledge and experience of the products when properly stored, handled and installed under normal conditions according to Protan's recommendations. A warranty in respect of merchantability or of fitness for a particular utilisation, nor any liability arising out of any legal relationship whatsoever, cannot be inferred either from this information, or from any written or verbal recommendations, due to the differences in materials, substrates and actual site conditions in practice. The user of the product is responsible for the product's suitability for the intended application. Protan reserves the right to change product specifications without notice. Additionally, Protan's current sales and delivery terms are valid and applicable for all orders. It is necessary for the user to always refer to the latest version of the relevant Product Data Sheet, which can be requested directly from Protan. All information provided, as well as technical and drawing data, complies with current technical standards and is based on Protan's knowledge and experience. In addition, national standards and regulations must be observed where appropriate.