

# Specialist Geomembranes



## Technical Data Sheet

### Landflex Titanflex™ Hydrocarbon Barrier



A multi layer polyethylene Gas and Hydrocarbon membrane. Landflex™ Titanflex is specifically designed and manufactured to perform as a Methane, Carbon Dioxide, Radon, Ground Gas, VOC, Air, Moisture and Hydrocarbon protection system.

Complies with the latest codes of practise as published by BRE, CIRIA (C748) and BSI (BS 8485:2015). Suitable for use as Ground Gas / Hydrocarbon protection for NHBC Green, Amber 1, Amber 2 and Red site characterisations.

Characteristic	Test Method	Unit	Landflex™ Titanflex
<b>Physical Properties</b>			
Thickness	EN 1849-2	mm	0.5
Width	EN 1849-2	M	2
Length	EN 1849-2	M	50
Weight	EN 1849-2	g/m <sup>2</sup>	500
<b>Hydraulic Properties</b>			
Water vapour transmission rate	ASTM E96	g/m <sup>2</sup> /day	0.93-0.95
Watertightness	EN 1928	-	PASS
<b>Mechanical Properties</b>			
Resistance to static load	EN 12730-B	kg	>20
Tensile strength (MD)	EN 12311-2 (A)	N/50mm	>550
Tensile strength (CMD)	EN 12311-2 (A)	N/50mm	>400
Tensile elongation (MD/CMD)	EN 12311-2 (A)	%	>550
Tear resistance (MD/CMD)	EN 12310-1	N	>300
Resistance to impact	EN 12691-B	mm	650
Reaction to fire	EN ISO 11925-2	Class	E
Resistance to artificial ageing	EN 1296	-	PASS
Resistance to chemicals	EN 1847	-	PASS
<b>Vapour Permeability - 100% Concentration</b>			
Transmission rate of Benzene	EN ISO 15105-2	mg/m <sup>2</sup> /day	2250
Transmission rate of Toluene	EN ISO 15105-2	mg/m <sup>2</sup> /day	2370
Transmission rate of Ethyl Benzene	EN ISO 15105-2	mg/m <sup>2</sup> /day	400
Transmission rate of Xylene (m,p,o)	EN ISO 15105-2	mg/m <sup>2</sup> /day	690
Transmission rate of Hexane	EN ISO 15105-2	mg/m <sup>2</sup> /day	0.58
Transmission rate of Vinyl Chloride	EN ISO 15105-2	mg/m <sup>2</sup> /day	0.112
Transmission rate of 1,1,2 Trichloroethene (TCE)	EN ISO 15105-2	mg/m <sup>2</sup> /day	54.67
Transmission rate of 1,1,2,2, Tetrachloroethane (PCE)	EN ISO 15105-2	mg/m <sup>2</sup> /day	25.91
Transmission rate of Napthalene	EN ISO 15105-2	mg/m <sup>2</sup> /day	0.00057



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Spec. 16.3 Rev.E

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Characteristic	Test Method	Unit	Landflex™ Titanflex
<b>Gas Permeability</b>			
Methane permeability	EN ISO 15105-1	ml/m <sup>2</sup> /day/atm	0.13
Methane permeability (welded joint)	EN ISO 15105-1	ml/m <sup>2</sup> /day/atm	1.00
Carbon dioxide permeability	EN ISO 15105-1	ml/m <sup>2</sup> /day/atm	3.01
Transmission rate of Vinyl chloride gas	EN ISO 15105-1	ml/m <sup>2</sup> /day/atm	0.04
Radon permeability	K124/02/195	m <sup>2</sup> /s	1.0 x 10 <sup>-12</sup>
<b>Compliance and Certification</b>			
CE Mark EN13967:2012			
NHBC standards compliant			
CIRIA C748 compliant			
BS 8485:2015 compliant			
<b>Durability and Chemical Resistance</b>			
Chemical Resistance - Sulfuric Acid (10% solution of Sulfuric Acid (H <sub>2</sub> SO <sub>4</sub> )) 50°C for 56 days	EN 14414-A	Tensile strength retained	100%
		Result	PASS
Chemical resistance - Basic (Calcium Hydroxide saturated suspension) 50° for 56 days	EN 14414-B	Tensile strength retained	100%
		Result	PASS
Chemical resistance - Solvents (35% Diesel, 35% Paraffin, 30% Oil HD30 (vol)) 50°C for 56 days	EN 14414-C	Tensile strength retained	>80%
		Result	PASS
Chemical resistance - Synthetic Leachate (mixture of 14 acids, chlorides, sulphates & phosphate) 50°C for 56 days	EN 14414-D	Tensile strength retained	100%
		Result	PASS
Resistance to Leaching - Hot water (Deionised water) 50°C for 56 days	EN 14415-A	Tensile strength retained	100%
		Result	PASS
Resistance to Leaching - Aqueous Alkaline (saturated Calcium Hydroxide) 50°C for 56 days	EN 14415-B	Tensile strength retained	100%
		Result	PASS
Resistance to Leaching - Organic Alcohol (30% Methanol, 30% Isopropanol, 40% Glycol) 50°C for 56 days	EN 14415-C	Tensile strength retained	100%
		Result	PASS



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Characteristic	Test Method	Unit	Landflex™ Titanflex
<b>Durability and Chemical Resistance</b>			
Chemical Resistance - Benzene 100% saturated concentration	EN 14414-D (mod)	Tensile strength retained	95% (MD) 102% (CMD)
		Result	PASS
Chemical Resistance - Toluene 100% saturated concentration	EN 14414-D (mod)	Tensile strength retained	94% (MD) 91% (CMD)
		Result	PASS
Chemical Resistance - Ethyl Benzene 100% saturated concentration	EN 14414-D (mod)	Tensile strength retained	99% (MD) 97% (CMD)
		Result	PASS
Chemical Resistance - Xylenes 100% saturated concentration	EN 14414-D (mod)	Tensile strength retained	91% (MD) 106% (CMD)
		Result	PASS
Chemical Resistance - TCE 100% saturated concentration	EN 14414-D (mod)	Tensile strength retained	99% (MD) 93% (CMD)
		Result	PASS
Chemical Resistance - PCE 100% saturated concentration	EN 14414-D (mod)	Tensile strength retained	93% (MD) 93% (CMD)
		Result	PASS
Chemical Resistance - Napthalene 100% saturated concentration	EN 14414-D (mod)	Tensile strength retained	101% (MD) 93% (CMD)
		Result	PASS
Chemical Resistance - Hexane 100% saturated concentration	EN 14414-D (mod)	Tensile strength retained	99% (MD) 104% (CMD)
		Result	PASS

Values are typical, with the exception of thickness, which is nominal. Typical indicates the mean value derived from the samples taken for any one test as defined in the BS EN ISO standard - usually the mean of five samples. Nominal is a guide value.



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## Landflex™ Titanflex Hydrocarbon



Site preparation underway in advance of Landflex™ Titanflex installation



Landflex™ Titanflex in position

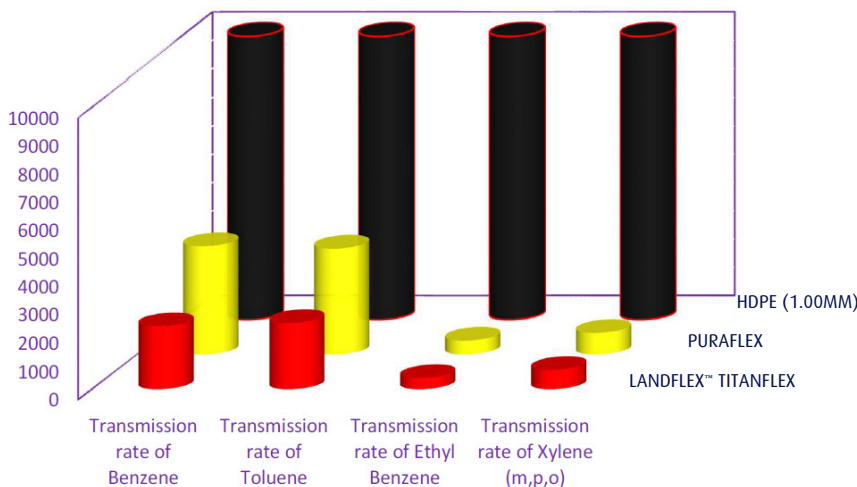
Landflex™ Titanflex Hydrocarbon Barrier is a multi-layer flexible membrane, with a unique core compound which is designed and manufactured to provide a barrier to the most aggressive chemicals and to comply with current guidance on Hydrocarbons. Manufactured using the latest extrusion technology and drawing on our extensive knowledge and expertise in gas protection, the new membrane is suitable in all applications that are affected by Hydrocarbons.

Landflex™ Titanflex offers a safe solution for the protection of buildings and occupiers against all levels of hydrocarbons, methane, carbon dioxide and radon ingress. Typically these sites have been previously used as petrol stations, coalfields, landfill sites or industrial areas and fracking sites.

Landflex™ Titanflex is designed to withstand the most aggressive environments.

### ISO 15105-2 Permeation Rates

(mg/m<sup>2</sup>/day)



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