

PERMEABILITY LABORATORY TEST REPORT

Laboratory Report Number: LR2370A.5
Customer Reference: Hydroprufe 6000
Issue Date: 2 June 2025

Prepared For: Premcrete
44 Macadam Way
West Portway
Andover
Hampshire
SP10 3XW

Contact: Clive Tuffin

PRIVATE AND CONFIDENTIAL

Versaperm Limited, 10 Rawcliffe House, Howarth Road, Maidenhead, Bucks, SL6 1AP, UK
Tel +44 1628 777668
www.versaperm.com

Report History	LR2370A	Original
	LR2370A.1	Added data for Toluene omitted from original.
	LR2370A.2	Added challenge vapour mass concentrations.
	LR2370A.3	Added data for Octane
	LR2370A.4	Added data for Decane and 1-methyl naphthalene
	LR2370A.5	Updated company name.

Sample Identification

Samples of black membrane labeled Hydroprufe 6000 Batch SHB21024 sampled 12/1/21 were received for testing.

Equipment used

Versaperm Permeability Meter MK IV, configured to run ISO15105-2 equal pressure method with calibrated quantitative mass spectrometer, Hidden QPR-20, as sensor

Test Conditions

Sample Conditioning: Samples were stored for 2 days in a desiccator at 23°C.

Test Gas: Analytical grade solvent liquids were injected or solids placed to generate an organic vapour.

Carrier Gas and for Baseline: Zero grade N2

Atmospheric Pressure: Tested over several days pressure ranged 999-1030 mbar.

Test Date: Completed 02/06/2025

Sample Dimensions

Trade Name/ Identification	Minimum Thickness / μm	Maximum Thickness / μm	Mean Thickness / μm
Hydroprufe 6000 Batch SHB21024	565	565	565

Test Methods

Organic Vapour Transmission Rate.

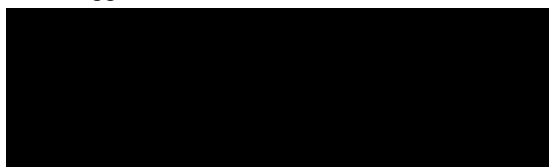
This test was carried out using the method ISO 15105-2 *Plastics — Film and sheeting —*

Determination of gas-transmission rate - Part 2: Equal-pressure method. The sample was clamped into the measuring area cell, and dry nitrogen passed over both sides at 100ml/min. The measuring chamber area was 50cm² (diameter 80mm). After 24 hours, the atmospheric content had been removed from the sample and chamber and a stable base line was reached. The test liquid was then injected into the chamber below the sample, ensuring that no liquid is in direct contact with the sample. The organic vapour is thus presented to the sample at the saturated vapour pressure of the solvent, with the overall pressure at atmospheric pressure. There is no overall differential pressure across the sample. Dry nitrogen continued to flow at 100ml/min over the other side of the sample. As the gas permeated through the sample, it was swept by the carrier gas to the mass spectrometer. The carrier gas was sampled daily until a stable reading was obtained, typically between 3 and 7 days.

Test Results

Trade Name / Identification	Vapour Tested	Gas Transmission Rate (GTR)	Challenge Vapour Concentration*
		Liquid mg/(m ² .day)	g/m ³
Hydroprufe 6000 Batch SHB21024	Hexane	0.113	707
Hydroprufe 6000 Batch SHB21024	Benzene	0.721	403
Hydroprufe 6000 Batch SHB21024	Toluene	0.640	142
Hydroprufe 6000 Batch SHB21024	Ethyl Benzene	0.636	55
Hydroprufe 6000 Batch SHB21024	Xylene	0.644	48
Hydroprufe 6000 Batch SHB21024	Vinyl Chloride	0.318	2573
Hydroprufe 6000 Batch SHB21024	Tetrachlorethene	3.073	163
Hydroprufe 6000 Batch SHB21024	Trichloroethylene	4.773	529
Hydroprufe 6000 Batch SHB21024	Naphthalene	0.007	0.5
Hydroprufe 6000 Batch SHB21024	Octane	39.00	86.4
Hydroprufe 6000 Batch SHB21024	n-Decane	4.00	11.276
Hydroprufe 6000 Batch SHB21024	1-methyl naphthalene	0.001	0.284

*See Appendix 1 for derivation of these values.



Appendix 1 Derivation of Challenge Vapour Concentration

The saturated vapour pressures of the solvents were found in the “CRC Handbook of Chemistry and Physics” Ed 79 at the closest temperature of 25°C, which may indicate a slightly higher pressure than at 23°C. From these ideal gas law was used to calculate the molar concentration, and from the molar masses of the compounds, from the same text, the mass concentrations were calculated.

	Temp /K	Pressure / Pa	Molar Mass /g	Molar Conc mol/m ³	Mass Conc g/m ³
Hexane	296	20200	86.18	8.208	707.385
Benzene	296	12700	78.11	5.161	403.096
Toluene	296	3790	92.14	1.540	141.901
Ethyl Benzene	296	1280	106.17	0.520	55.222
Xylene	296	1105	106.17	0.449	47.672
Vinyl Chloride	296	101325	62.5	41.173	2573.327
Tetrachlorethene	296	2420	165.83	0.983	163.071
Trichloroethylene	296	9910	131.39	4.027	529.096
Naphthalene	296	9	128.1	0.004	0.468
Octane	296	1860	114.23	0.756	86.336
n-decane	296	195	142.3	0.079	11.276
1-methylnaphthalene	296	4.91	142.2	0.002	0.284