British Weather Proof.

Technical		Product	P330	P345	P355	P355 FR	P412	P420	P525
		Colour	White	White	White	White	Unpigmented	Unpigmented	White
		Membrane Type	Microporous	Microporous	Microporous	Microporous	Hydrophilic	Hydrophilic	Hydrophilic
Property	**Unit**	**Test Method**							
Weight	g/sqm	ISO 2286-2	17	22	28	36	15	23	39
Shrinkage	%	In-House	1.0 & 0.5	1.0 & 1.0	1.0 & 1.0	1.0 & 0.5	1.5 & 0.5	1.0 & 0.5	1.0 & 1.0
Breathability	g/sqm/24hr	ASTM E96: 95 Procedure B	850	800	790	730	750	680	570
	g/sqm/24hr	ASTM E96: 95 Procedure BW	5,200	4,200	3,800	2,900	19,000	18,000	16,700
	sqm.Pa/W	ISO 11092	5.1	8.0	10.2	10.6	0.4	4.3	5.3
Waterproofness	cm	BS 3424, Part 26:1990 29A (Modified*)	>700	>700	>700	>700	>1,000	>1,000	>1,000
Waterproofness after 3x60°C	cm	BS 3424, Part 26:1990 29A (Modified*)	>700	>700	>700	>700	>1,000	>1,000	>1,000

*Tested with a gauze covering 47g/sqm polyester

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P525	P540	P525	P540 Black	P525 FR	P540 FR	P330-5	P9 PTFE	P9 FR PTFE	P9 PTFE Lite
Unpigmented	Unpigmented	Black	Black	White	White	White	White	White	White
Hydrophilic	Hydrophilic	Hydrophilic	Hydrophilic	Hydrophilic	Hydrophilic	Bicomponent	Bicomponent	Biocomponent	Biocomponent
31	47	28	49	38	57	22	37	39	26
1.0 & 1.0	1.0 & 1.0	1.0 & 1.0	1.0 & 1.0	1.0 & 1.0	1.0 & 1.0	1.0 & 1.0	1.0 & 1.0	1.0 & 1.0	1.0 & 1.0
600	500	590	490	634	570	750	800	800	830
16,200	11,800	15,700	12,500	18,000	17,900	7,000	15,700	15,400	16,000
5.2	7.2	5.4	7.5	5.1	7.7	5.6	2.3	3.2	2.0
>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000
>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000	>1,000

porelle® membranes

Introduction

Porelle membranes are a range of waterproof breathable films 12 – 55 µm in thickness. The porelle membrane range has been engineered for extreme, high performance outerwear requiring maximum waterproofness, breathability, durability and protection.

Porelle membranes are manufactured by PIL Membranes Ltd with over 30 years' experience in the market place. Probably the world's most diverse membrane manufacturer – with a range of membranes encompassing:

- **microporous polyurethane membranes,**
- **hydrophilic polyurethane membranes,**
- **PTFE bicomponent membranes,**
- **cross-linked polyurethane membranes,**
- **gas/air permeable membranes,**
- **fire retardant membranes.**

Porelle membranes are now used in a multitude of garment applications where performance combined with cost effectiveness is vital. They have been designed for lamination to create high performance fabrics for a range of different market applications that include:

- **Military:** Probably the most extreme performance requirements, Porelle membranes are used by numerous military organisations worldwide.

- **Emergency Services:** The front-line requirements for emergency services are varied. For general use, waterproofness and breathability is important for day-to-day comfort. However, the front-line can face many potential hazards against which the user needs protection. Porelle membranes can be designed with a range of performance benefits including viral and blood borne pathogen resistance, chemical resistance and flame resistance.

- **Fire-fighters:** meet a number of potential hazards. From fighting fires, dealing with chemical spillages, or rescue operations, the requirements are numerous and many. The garments not only have to protect, they also have to withstand the conditions to whichthey are subjected. Porelle membranes have been widely used in fire-fighting apparel to provide additional levels of protection matched by high durability in use.

- **Industrial/Institutional:** Our extensive and adaptable range will meet demanding application requirements, particularly for protection against extreme weather conditions. Used by the postal service, rail service, road contractors, forestry, oil industry, private security and the chemical industry. Porelle membranes are engineered for high performance outerwear.

- **Footwear:** Extensively used throughout the footwear industry to manufacture waterproof and breathable footwear linings.

- **Glove and Hat inserts:** Our extensive high performance range of glove inserts are used globally by leading manufacturers in fire-fighters, military, search & rescue, police and industrial gloves. We also offer a range of inserts for use in hats designed to provide protection against wind, rain and snow in extreme weather conditions.

Global market requirements

The global market for fabric laminates utilising a membrane technology is driven by different customer requirements or testing criteria. These are typically set out in international standards such as those covered by ISO, EN, and NFPA norms. Because of the broad range of global standards and testing criteria, no single membrane technology is able to meet all requirements. The aim of PIL membranes is to help our customers to compete in the global market. We have set out to do this by:

- **developing our core capability in membrane technology,**

- **engineering our own unique polymer systems designed to meet specific membrane performance requirements,**

- **the design and development of purpose built plant and manufacturing facilities for both polymer and membrane production.**

It is this approach that enables us to offer a diverse range of membrane technologies rather than only promoting the benefits of one membrane system. With this background in membrane technology we also have a specialist knowledge of how different membrane systems perform and compare with each other.

Performance benefits

The Porelle range offers membranes with a number of performance benefits that can include a combination of:

- **high flexibility,**
- **soft and quiet,**
- **durability and abrasion resistance,**
- **extremely breathable,**
- **high waterproofness,**
- **windproofness,**
- **viral and blood borne pathogen resistance,**
- **chemical resistance,**
- **flame resistance,**
- **high temperature wash resistance,**
- **steam sterilisable,**
- **dry clean resistance.**

Performance standards

When tested in a laminate Porelle membranes are compliant with a number of performance standards. Examples include:

- **NFPA 1971 – fire-fighter garments and gloves,**
- **EN 469 – fire-fighter garments,**
- **EN 659 – fire-fighter gloves,**
- **EN 368 – resistance penetration by chemical liquids,**
- **ASTM F 903 – resistance penetration by liquid chemicals,**
- **ASTM F 1671 – resistance to penetration by viral & blood borne pathogens,**
- **EN 532/ ISO 15025 – limited flame spread,**
- **EN343 – protection against foul weather,**
- **EN 471 – high visibility,**
- **waterproof in excess of 10,000 mm water column after washing,**
- **Ret breathability data < 1 for membrane,**
- **Ret data breathability < 4 for 2 ply laminate,**
- **Ret breathability data < 8 for 3 ply laminate**

Membrane selection

Whatever your application, it is probable that we have achieved similar specifications and can advise on a membrane system that best meets your requirements. Our global support team can advise on performance standards and many other aspects of performance outerwear. Our QA laboratory is internationally recognised and can carry out a wide range of tests on membranes and laminates for all applications

If you think our technical capabilities might fit your requirements then please contact us.

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Technical Brochure