

Lubrizol



WATER-BASED TEXTILE

COATINGS ONLY FOR POLYESTER

**Water-based
Textile Coatings**
Breathable Series



Permax™ A "Breathable" Textile Coating

Lubrizol has developed "breathable" textile coating products **Permax™** to meet the special needs of the textile industry where PUD is coated onto a fabric to provide breathability, protection, comfort and aesthetics to the user or wearer.



Excellent Breathability & Impermeability

Applying aliphatic polyether PUD as the main component, it helps to block or minimize fabric interspaced into some extent for impermeability. Meanwhile, the apertures under 0.01 micron and the hydrophilic group polymerized with PUD latex help to absorb water vapor from body, and migrate to outside, in order for breathability.



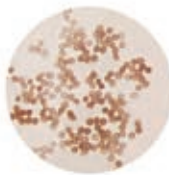
Environmental Friendly

Based on decades of experience in water based polymerization and compounding, **Permax™** can satisfy multi-functions without adding any additives for VOC minimization.

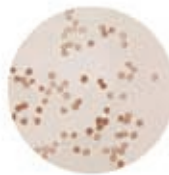
Naturally Protection from Stain and Bacterium



Chinlon(Nylon)



Terylen(Polyester)



Polypropylene



Cotton



Permax™ Coating

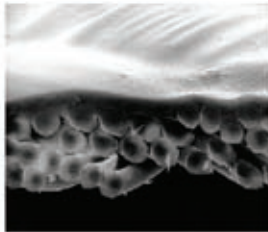
The excellent performance in breathability and impermeability for **Permax™** is the best natural way to protect fabric from bacterium. When sweating, **Permax™** coating will absorb sweat, and transferred by hydrophilic group to the fabric surface and vaporized, so that body can feel dry and comfortable, and can be protected from bacterium.

Permax™ Breathable Series Products

Mechanism

Breathability and impermeability fabric indicates a performance which can stand for certain water pressure, while sweat can transfer outside the fabric as vapor, so that any sweat condensation inside fabric will be avoided. It is a specialty functional fabric need high technology.

In this kind of coating no micro porosity will be formed. Breathability is given by incorporating hydrophilic groups during PU synthesis. These hydrophilic groups will absorb water vapor molecules and transport them towards that side of the compact layer where the partial "water vapor" pressure is lower. This transport mechanism is called the adsorption process. This means that the water vapor transmission is depending on the coating thickness. Coating is essentially spreading a polymer in the form of a thickened solution to a fabric to form the continuous layer. Direct coating is mainly used for fabric produced from smooth continuous filament yarns such as nylon or polyester.



Permax™ waterbased polyurethane base coat and top coat provide key benefits as:

- A. High Moisture Vapor Transmission Rates (HMVTR)
- B. Excellent adhesion to nylon and cotton
- C. Environmental friendly - no cosolvent, non-flammable, very low VOC
- D. Coater ready - no additional primers, mixing or crosslinker needed
- E. Self-crosslinking
- F. Good hydrolytic stability
- G. High hydrostatic resistance

Application:



- A. Military uniform
- B. Outdoor fabric
- C. Ski wear
- E. Windproof and breathable apparel
- F. Medical fabric



Permax™ 1127/1128

Water Based Aliphatic Breathable

Application Recommendation:

Permax™1127/1128 breathable series products can be used to make waterproof, windproof & breathable fabric constructions for sports wear, protective apparel, military gear, tents, construction products and footwear applications.

Permax™1128 is used as a thin top coat to give a dry, tacky-free feel with a non-glossy surface to the fabric surface. Suggested dry coating application weights of the Permax™1127 base coat are from 20-40 grams/sq.meter (0.7-1.4 oz./sq.yd.). Permax™1128 top coat is typically applied at a rate of 10-15 grams/sq.meter (0.3-0.50 oz./sq.yd) using a knife coating application method.

Suggested drying temperatures are 130°C to 150°C.

Suggested cure temperatures are 150°C to 177°C.

For best wash durability performance, fluorochemical water repellent finishes should be applied after the Permax™ coatings have been applied.

Typical Physical Properties:

Total Solids	38%
Viscosity	20,000 cps (RVT6 @ 20 RPM)
pH	8.5
Flash Point	None
Weight/gal.	8.6 lbs.
VOC%	<0.2%
Regulatory Status	TSCA / DSL compliant
Appearance	white viscous liquid

Performance:

Hydrostatic Head ISO 811	5000mm
Breathable ASTM E 96 BW	5000 (g/m ² ·24h)
Breathable JIS L1099A1	2000 (g/m ² ·24h)
Breathable ISO 11092	10~20
Breathable BS 7209	50~60%
Washing Resistance ISO 6330 5A	No film delaminating after 3 times washing
Peeling Strength	6~10N/2.5cm
PU/PVC Tapeability	PU

Depending on the substrate and add on, the above performance will be different



Permax™ 2300/2301

Water Based Aromatic Breathable

Application Recommendation :

Permax™ 2300/2301 breathable series products can be used to make waterproof, windproof & breathable fabric constructions for sports wear, protective apparel, military gear, tents, construction products and footwear applications.

Permax™ 2301 is used as a thin top coat to give a dry, tack-free feel with a non-glossy surface to the fabric surface. Suggested dry coating application weights of the Permax™ MVT-2300 base coat are from 20-40 grams/sq.meter (0.7-1.4 oz./sq.yd.). Permax™ 2301 top coat is typically applied at a rate of 10-15 grams/sq.meter (0.3-0.50 oz./sq.yd) using a knife coating application method.

Suggested drying temperatures are 130°C to 150°C.

Suggested cure temperatures are 150°C to 177°C.

For best wash durability performance, fluorochemical water repellent finishes should be applied after the Permax™ coatings have been applied.

Typical Physical Properties:

Total Solids	40%
Viscosity	20,000 cps (RVT6 @ 20 RPM)
pH	8.5
Flash Point	None
Weight/gal.	8.6 lbs.
VOC%	<0.2%
Regulatory Status	TSCA / DSL compliant
Appearance	brown viscous liquid

Performance:

Hydrostatic Head ISO 811	5000mm
Breathable ASTM E 96 BW	5000 (g/m ² -24h)
Breathable JIS L1099A1	1500 (g/m ² -24h)
Breathable ISO 11092	10~20
Breathable BS 7209	50~60%
Washing Resistance ISO 6330 5A	No film delaminating after 3 times washing
Peeling Strength	6~10N/2.5cm
PU/PVC Tapeability	PU

Depending on the substrate and add on, the above performance will be different

Permax™ 88111 Water Based Breathable FR

Application Recommendation:

Permax™ 88111 is a breathable and flame retardancy product, and also can be used to make waterproof, windproof & breathable fabric constructions for sports wear, protective apparel, military gear, tents, construction products and footwear applications.

Permax™ 88111 is used as a top coat to give flame retardancy effect. Suggested dry coating application weights of 40-80 grams/sq.meter (1.4-2.8 oz/sq.yd.).

Suggested drying temperatures are 130°C to 150°C.

Suggested cure temperatures are 150°C to 177°C.

Typical Physical Properties:

Total Solids	50%
Viscosity	10,000 cps (RVT5 @ 20 RPM)
pH	9.5
Flash Point	None
Weight/gal.	8.6 lbs.
VOC%	<0.2%
Regulatory Status	TSCA / DSL compliant
Appearance	white semi-viscous liquid

Performance:

Hydrostatic Head ISO 811	2000mm
Breathable ASTM E 96 BW	3000 (g/m ² -24h)
Breathable JIS L1099A1	1000 (g/m ² -24h)
Breathable ISO 11092	10~20
Breathable BS 7209	50~60%
Peeling Strength	6~10N/2.5cm
PU/PVC Tapeability	PU
FR	NPFA 701, CPAI 84, EN 533

Depending on the substrate and add on, the above performance will be different



Permax™ T1202 / T1202F

Water Based Breathable Lamination Adhesive

Application Recommendation:

Permax™ T1202 is a cosolvent free waterborne polyurethane adhesive designed for use as a soft tie coat for TPU film lamination.

Permax™ T1202 tie coat is typically applied at a rate of 10-15 grams/sq.meter (0.3-0.50 oz./sq.yd) using a knife coating application method.

Suggested drying temperatures are 130°C to 150°C.

Suggested cure temperatures are 150°C to 177°C.

For best wash durability performance, fluorochemical water repellent finishes should be applied after the Permax™ coatings have been applied.

Typical Physical Properties:

Total Solids	35%
Viscosity	10,000 cps (RVT5 @ 20 RPM)
pH	8.5
Flash Point	None
Weight/gal.	8.6 lbs.
VOC%	<0.2%
Regulatory Status	TSCA / DSL compliant
Appearance	white semi-viscous liquid

Performance:

Hydrostatic Head ISO 811	5000mm
Breathable ASTM E 96 BW	5000 (g/m ² ·24h)
Breathable JIS L1099A1	2000 (g/m ² ·24h)
Breathable ISO 11092	<13
Breathable BS 7209	60~70%
Washing Resistance ISO 6330 5A	No film delaminating after 3 times washing
Peeling Strength	6N-10N/2.5cm

Depending on the substrate and add on, the above performance will be different

Comparison of Different Breathable System

	Hydrophilic Waterborne	Hydrophilic Solvent	Transfer solvent	Micro porous	Wet Coagulation
Hydrostatic Head mm ISO 811	5000	>5000	>5000	2000	2000
Breathability ASTM E 96 BW (g/m ² ·24h)	5000	5000	5000	5000	5000
Breathability JIS (g/m ² ·24h)	2000	2000	3000	4000	4000
Breathability Ret ISO 11092	10~20	10~20	10~20	6~10	6~10
Breathability % BS 7209	50~60	50~60	60~70	70~80	60~70
Peeling Strength	+	++	++	+	+
Washing Resistance	+	++	++	+	+
Handle	+	+	++	++	++
PU/PVC Tapeability	PU	PU/PVC	PU/PVC	PU	PU

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