

**LMPOLYMER**

**CHYC**<sup>®</sup>

## Textile Waterproof/ Oil-proof Agent and Application Technology Solution

**CHYC**<sup>®</sup>



**LMPOLYMER**

provides waterproof agent for various fabrics

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- Products: Environmental friendly, stable and remarkable performance.
- Service: Professional, timely and efficient.
- Value: Enhancing customer product quality and improving competitiveness.
- Future: Working hard in the field of textile and further developing super hydrophobic field.

## Company profile

Leman(Suzhou) Polymer Technology Co.,Ltd.(LMPOLYMER) is a high-tech enterprise with main bussine of R&D, production and sales of textile chemicals such as waterproof and oil-proof agent. We are committed to cutting-edge application technology in textile chemical industry (e.g. fluorine waterproof/oil-proof agent and fluorine free waterproof agent) in order to promote the industrialization.

LMPOLYMER focuses on the special characteristics of fluorine waterproof agent and fluorine free waterproof agent, which are widely used in different textiles such as casual clothing, ties, shoes and hats, jackets, outdoor sports clothing, umbrella fabrics, tents, knitted fabrics, home textiles, automobile interior decoration, work suits, non-woven fabrics, filter cloth and surgical clothing. LMPOLYMER also provides perfect water/oil/stain repellent solutions for textile customers.

In order to further develop waterproof agent synthesis technology, the company continuously summarizes and innovates the applications of waterproof and oil-proof agent, and builds a systematic application system according to different application development.

LMPOLYMER has been adhering to the tenet of "keep up with the market and create value for customers" since the establishment. Apart from providing high-quality products, we always pay attention to the problems and demands of customers, and serve customers with the best products and services.

LMPOLYMER holds the principle of "environmental friendly and sustainable development", and works hard in the fields of fluorine, silicon and textile chemistry. We hope to exceed the expectations of customers and grow together with them through continuous efforts.

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Scope of application	Traditional	Waterproof requirements: Initial waterproof performance, continuous performance, durability and versatility	
	Home textiles	Waterproof requirements: Triple-proofing performance and easy release performance	
	Tents	Waterproof requirements: Water pressure resistance and strong waterproof performance	
	Carpets	Waterproof requirements: Dissolvable performance with anionic substances	
	Work suits/ protective clothing	Waterproof requirements: Triple-proofing performance and washing resistance	
	Non-woven fabrics for automobile industry	Waterproof requirements: Triple-proofing performance and stain release performance	
	Medical textiles	Waterproof requirements: Alcohol/blood/stain resistance	
	Yarn waterproof	Waterproof requirements: Friction resistance and washing resistance	
	Down spray cotton	Waterproof requirements: Anionic-nonionic waterproof agent	
Common waterproof fabrics	Pongee fabric, peach skin velvet	Waterproof requirements: Excellent sustainability of cost advantage and strong versatility	
	Memory fabric, simulated memory fabric	Waterproof requirements: Low temperature setting and waterproof agent not sensitive to impurities	
	Nylon taffeta, Taslon	Waterproof requirements: Good permeability and excellent waterproof effect with low liquid carrying rate	
	High-density taffeta, taffeta	Waterproof requirements: Strong permeability and not sensitive to impurities on surface	
Fiber structure	Extinction cotton brocade, cotton brocade, polyester cotton, polyester cotton brocade	Waterproof requirements: Oil resistance	
	Cellulose fiber	Waterproof principle	Compounds cover the fiber surface to form a continuous and dense thin film. As the fluorocarbon structure in the one with the lowest surface tension among the solid compounds in the world, it has excellent triple-repellent performance and easy release performance
	TC / CVC, cotton, chemical fiber blending		
	Polyester fiber		
	Nylon		
	Protein fiber		
	Glass fiber		
	Aramid, spandex, polypropylene		
Non-wovens, spunlace, SMS			
Type of waterproof agent	Traditional waterproof agent	Cost advantage, high versatility, no APEO, PFOS, waterproof, triple-proofing and easy release	
	6C waterproof agent	No PFOA, PFOS, APEO, waterproof, triple-proofing and easy release	
	Fluorine free waterproof agent	No 33 perfluoride compounds and waterproof	
Processing type	No PFOA, PFOS, APEO, waterproof, triple-proofing and easy release	Pre-drying under 120°C and accompany drying under 150°C-180°C	
	Ayering factory: Rolling	Pre-drying under 120°C and accompany drying under 150°C-180°C	
	Garment factory: Dipping	Drying under 120°C-180°C	
	Others	Spraying	Air drying without heating
Roll coating		Air drying without heating	

Product		Ionicity	PH Value	Water Repellent	Oil Repellent	Durability	Low Temperature Performance	Stain Repellent	Solid Content	
Waterproof agent	High concentration product	4600	Weak cation	3-5	★★★	★★★	★★★	★★	★★	36%
		4700	Weak cation	3-9	★★★	★★★	★★★	★★	★★	36%
		6500	Weak cation	5-6	★★★	★★★	★★★	★★★	★★	30%
		6600	Non	3-5	★★	★★	★★	★★★	★★	30%
	Finished product	210	Weak cation	3-5	★★★	★★	★★★	★★	★★	20%
		310	Weak cation	3-5	★★★	★★★	★★★	★★	★★★	20%
		Super anti-splash	711	Weak cation	3-5	★★★	★★	★★★	★★★	★★
	712		Weak cation	3-5	★★★	★★	★★★	★★★	★★	18%
	Easy release	SR-801	Weak cation	3-5	★★★	★★★	★★	★★	★★★	20%
6C waterproof agent	High concentration product	5800	Weak cation	3-5	★★★	★★★	★★★	★★	★★	30%
		8300	Weak cation	3-5	★★★	★★★	★★★	★★	★★	30%
	Finished product	510	Weak cation	3-5	★★★	★★★	★★★	★★★	★★	20%
		810	Weak cation	3-5	★★★	★★★	★★★	★★	★★	20%
	Easy release	601	Weak cation	3-5	★★★	★★★	★★	★★★	★★★	20%
Fluorine free	PEP	Weak cation	3-5	★★	*	★★	★★★	★★	30%	
	RFP	Weak cation	3-5	★★	*	★★	★★★	★★	30%	
	RGP	Weak cation	3-5	★★	*	★★	★★★	★★	30%	
Special	Coating adhesive added with 101	cation	6-7	★★	★★	★★	★★★	★★	30%	
	High water pressure resistant waterproof agent 102	Weak cation	3-5	★★	★★★	★★	★★★	★★	30%	
	Flame retardant waterproof agent 103	Weak cation	3-5	★★	★★	★★★	★★	★★	30%	
Solvent type	M-200	Weak cation	5-6	★★★	★★★	★★★	★★★	★★★	60%	





## Waterproof agent

### Triple-proofing Finishing Agent Solution FU-6500

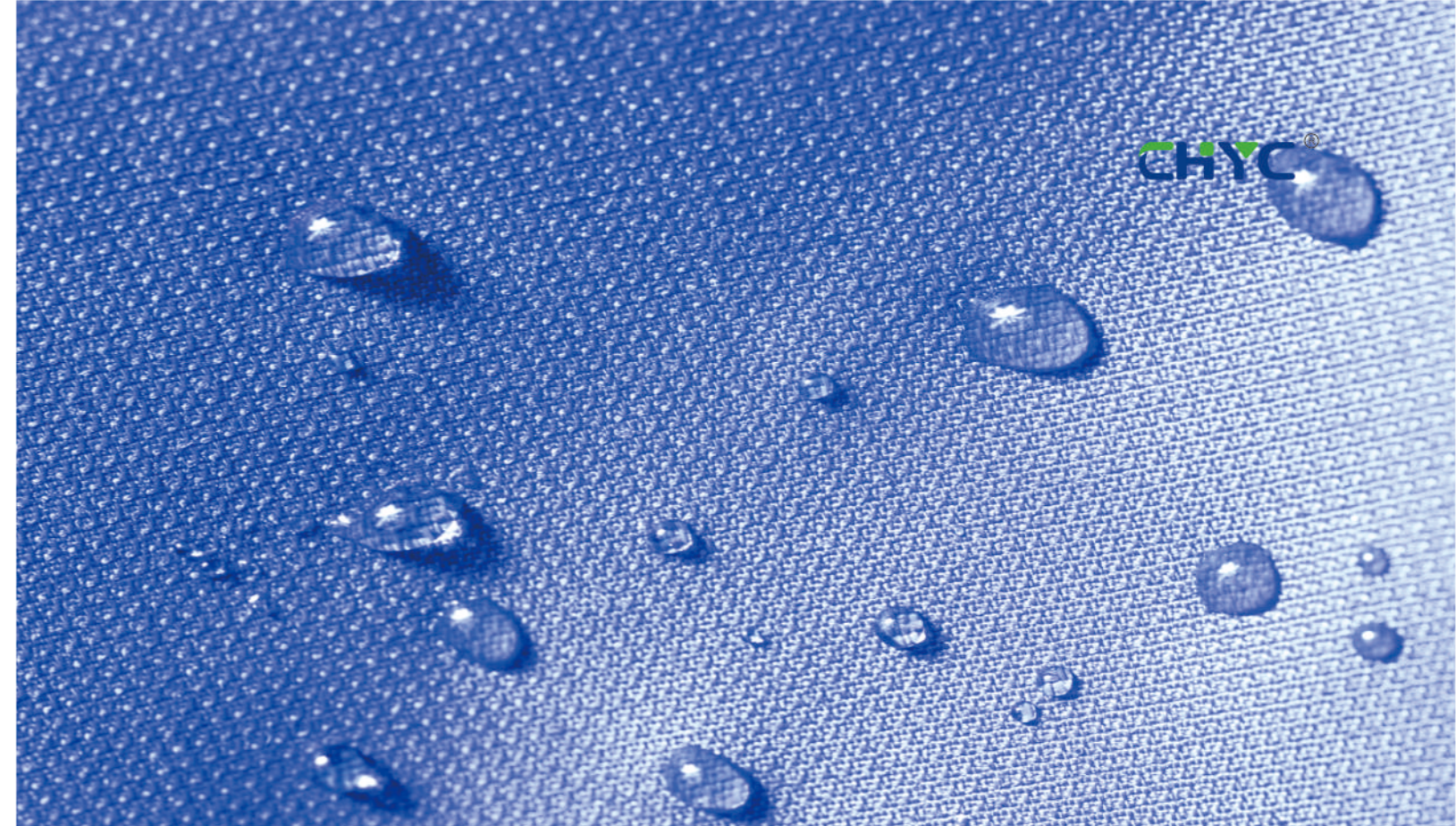
- Suitable for triple-proofing of various fiber fabrics
- High oil proof grade and excellent low temperature setting
- Wide applications and strong performance improvement
- Excellent water washing resistance
- Excellent adaptability to working fluid
- No APEO or PFOS

### Waterproof Agent Solution FH-4700

- Suitable for water/oil proof processing of various fabrics
- Good versatility, excellent initial waterproof and durability
- Excellent waterproof effect with a little amount
- High cost performance for chemical fiber fabrics
- No APEO or PFOS

### Super Anti-Splash Agent FM-711

- Super anti-splash water/oil agent is the fluorocarbon resin solution
- Excellent water/oil proof effect with a little amount
- Pass Bundesmann rain-shower test
- Super waterproof performance
- No APEO or PFOS



### Nonionic Triple-proofing Finishing Agent FU-6600

- Nonionic fluorocarbon resin solution
- Can be used together with waterborne polyurethane and acrylate
- Low influence on water and oil resistance of anions
- Excellent water/oil/stain proof effect
- No APEO or PFOS

### Waterproof Agent FE-310

- Economical agent widely used in textile fabrics
- Good continuity and initial water resistance
- Good stability and strong versatility
- No APEO or PFOS

### Waterproof Agent FT-210

- Suitable for waterproof pretreatment before coating
- Do not affect adhesion fastness of following coatings
- Excellent solvent resistance
- Excellent dry cleaning resistance
- No APEO or PFOS





## C6 Waterproof Agent

### ■ C6 Triple-proofing Finishing Agent Solution EU-8300

- Suitable for water/oil/stain proof of various fiber fabrics
- High oil proof grade and excellent low temperature setting
- Wide applications and strong performance improvement
- Excellent water washing resistance
- Excellent adaptability to working fluid
- No APEO, PFOS or PFOA

### ■ C6 Waterproof Agent Solution EH-5800

- Suitable for water/oil proof processing of various fabrics
- Good versatility, excellent initial waterproof and durability
- Excellent waterproof effect with a little amount
- High cost performance for chemical fiber fabrics
- No APEO, PFOS or PFOA

### ■ C6 Super Anti-Splash Agent EM-811

- Super anti-splash water/oil agent is the fluorocarbon resin solution
- Excellent water/oil proof effect with a little amount
- Pass Bundesmann rain-shower test
- Super waterproof performance
- No APEO, PFOS or PFOA



### ■ Nonionic Triple-proofing Finishing Agent EU-8600

- Nonionic fluorocarbon resin solution
- Can be used together with waterborne polyurethane and acrylate
- Low influence on water and oil resistance of anions
- Excellent water/oil/stain proof effect
- No APEO, PFOS or PFOA

### ■ Waterproof Agent EE-550

- Economical agent widely used in textile fabrics
- Good continuity and initial water resistance
- Good stability and strong versatility
- No APEO, PFOS or PFOA

### ■ Waterproof Agent ET-610

- Suitable for waterproof pretreatment before coating
- Do not affect adhesion fastness of following coatings
- Excellent solvent resistance
- Excellent dry cleaning resistance
- No APEO, PFOS or PFOA



## Fluorine Free Waterproof Agent

### Ecological Fluorine Free Waterproof Agent EO-RFP

- Excellent rolling and bouncing effect of water droplets
- Excellent waterproof effect with a little amount
- Stable processing with little operation problem
- Suitable for general coating and fit processing
- No APEO or PFCS

### Ecological Fluorine Free Waterproof Agent EO-RFP

- Excellent initial and durable (Air drying/drying) waterproof performance
- Soft fabric surface after processing
- Less fabric seam slip after processing
- Little problem of chalkmark on fabric
- No APEO or PFCS



## Supporting Products of Waterproof Agent

### Surfactant Remover CHY-FP-10

- Effectively remove residual surfactant and improve waterproof processing effect
- Improve color fastness without affecting water/oil repellent effect after washing the fabric again

### Waterproof Stabilizer CHY-WD-09

- Solve roller sticking problem in waterproof processing
- No influence on triple-proofing effect with appropriate amount

### Special Waterproof Penetrant CHY-FP-688

- Increase liquid carrying rate of fabric
- No influence on triple-proofing of finishing agent
- Reduce triple-proofing processing defect

### Strong Protective Agent CHY-FP-712

- Non silicon
- Significantly improve tearing strength of fabric
- No influence on triple-proofing effect of finishing agent





**Waterproof Softener CHY-MIN-228**

- Excellent smooth feel
- Can be used together with triple-proofing finishing agent
- Little influence on triple-proofing effect of finishing agent
- Improve tearing strength of fabric

**Antiskid Agent CHY-FP-20**

- Excellent joint slip resistance
- Good versatility and suitable for all kinds of fibers
- Soft compared with the traditional antiskid agent
- Improve pilling phenomenon of fabric

**Water/Oil Proof Synergist CHY-FP-25**

- Suitable for chemical fiber, cotton, blended fabrics, etc.
- Enhance washing resistance of waterproof agent
- Good compatibility with other additives and stable working fluid
- Low yellowing or no yellowing during processing



**Topics on Waterproof Agent**

**Waterproof spraying of water based solvent**

- Dilution spraying with ether solvent
- No smell or white mark
- Widely used for surface water/oil proof of shoes, leather, PU and stones
- Excellent waterproof effect for air drying at room temperature

**Waterproof/Water Absorption of Fabric**

- Moisture absorption of fabric lining
- Water removal of outer layer and easy to handle
- Moisture absorption of inner layer and waterproof of outer layer, suitable for sports
- Polo shirt, woven and knitted functional shirt

**Anti Acid and Alkali Finishing**

- Polymer emulsion with ether fluorocarbon polymer structure
- Used for anti acid and alkali protective clothing
- Excellent water/oil repellent performance
- Acid and alkali liquor and other chemicals not easy to penetrate after anti acid and alkali finishing
- Excellent washing resistance
- Effectively meet the requirements of GB24540-2009
- Effectively meet the requirements of EN13034
- Good versatility for all kinds of fabrics

**Triple-proofing Finishing Agent for Wool**

- Wool fabric is relatively difficult to penetrate evenly
- Easier to damage waterproof with solvent cleaner
- Lower setting temperature

**3D Waterproof Agent for Fly Knit Fabric**

- Waterproof of fly knit shoe surface is an important part of 3D fly knit shoe material processing.
- Choose different waterproof agent and technology according to different materials
- Avoid irritating solvent smell and excellent water/oil proof effect without drying

**Triple-repellent Finishing Agent**

- Fluorocarbon polymer emulsion with C6 structure
- Excellent water, oil and plasma repellent; alcohol resistant, hydrostatic pressure resistant and antistatic
- Used for medical non-woven fabrics

**LAD Air Drying and Wear Resistant**

- Fluorocarbon polymer emulsion with C6 structure
- Washable products with excellent water washing resistance and dry cleaning effect
- Excellent water/oil repellent effect after air drying
- 80-90 min of water repellent effect after air drying
- 5 level of oil repellent effect
- Excellent waterproof effect even after drying at room temperature or air drying

**High Water Pressure Resistant Waterproof HH**

- Super anti splash and strong water pressure resistance
- Widely used in the processing of various coated fabrics
- Suitable for fabrics with high water pressure requirements



### Industrial Washing of Triple-proofing Finishing Agent

- Ewaterproof performance is reduced after waterproof agent is used with stiffening agent, softener and antiskid agent
- Low setting temperature
- 60°C industrial water washing with over 80 points for waterproof after 5 times of washing and over 4 level for oil proof
- Different additives used together to ensure water/oil proof performance.

### Hot Water Resistant Waterproof Test

- Ehot water resistance test under 80°C with over 90 points
- Hot water/coffee resistant and no influence on waterproof effect in high temperature liquid
- Suitable for special fabrics with water/oil proof requirements for hot water

### Pre-Waterproof before Coating

- No influence on peel strength and excellent solvent resistance
- Excellent continuity
- Excellent processing stability
- Polymer emulsion with fluorocarbon polymer structure
- Can be used for outdoor tent fabric and high-grade luggage fabric\*
- It is required for over 90 points before coating and over 80 points after coating
- No influence on peel strength

### Durable Water/Oil Proof Tool Processing

- 140 points or 7 grades of initial oil proof
- Resistant to water washing for 30 times with over waterproof level 3 and oil proof level 5
- Excellent triple-proofing effect under low temperature processing
- Dry wet grinding with color fastness improved 0.5 to 1 level

## Analysis of Common Problems of Waterproof Agent

### Waterproof spots and strips

- With or without other additives: Check the stability of working fluid before processing.
- External mechanical force: High speed mixing or strong pumping power is easy to demulsificate the waterproof agent.
- Liquid rolling rate: Changing the amount of liquid will make the fabric surface uneven after drying
- Big foam: When the foam is larger or more, it is easy to form insoluble bubbles, which attach to the fabric and form spots or strips after drying.
- Fabric residue: During the processing, the residual additives on the surface fall off to cause the instability of the working fluid to form insoluble bubbles or demulsificate the working fluid

### Color change

- Darkening: Waterproof processing often causes darkening phenomenon
- Yellowish or reddish: High temperature setting will cause dye oxidation. Reducing the drying temperature or adjusting the PH value to be weak acid can alleviate this phenomenon.

### Poor waterproof effect

- Compared with what: Confirm whether it is the batch difference or compare with other company products
- No working fluid concentration: When critical concentration is used for wet feeding or high feeding, improper operation will also lead to substandard waterproof effect.
- Fabric type and color: Modified polyester, polypropylene and wool need special waterproof agent or specific formula
- Liquid rolling rate: Fast setting speed and poor permeability are easy to cause uneven liquid on fabric.
- With or without other additives: Hydrophilic and anionic substances will reduce the waterproof effect
- Whether setting conditions are sufficient: If not, the waterproof effect will be affected
- With or without calendering: Calendering will damage the film-forming performance of waterproof agent and reduce the waterproof effect
- PH value of working fluid: The fixed fabric potential is affected by the pH value of working fluid, which will affect the waterproof effect





## Attention during processing

- Control the PH value of working fluid at weak acid 4-6.
- Clean the fabric surface without alkali and other surfactants.
- High speed mixing or strong pumping power is easy to demulsificate the waterproof agent.
- Compatible with cationic and nonionic additives. Test and confirm before use.
- The working fluid concentration for wet feeding is higher than that in dry feeding.
- Fast setting speed and poor permeability are easy to cause uneven liquid on fabric and reduce waterproof effect.
- Water/oil repellent effect is reduced when the drying (accompany drying) temperature is below 140°C for conventional waterproof agent.
- When the pressure is too high during calendaring and the emulsifier in the waterproof agent seeps out, the waterproof effect will be reduced.
- Too much foam is easy to form insoluble bubbles, which attach to the fabric and form the spots after drying.
- Uneven liquid for coating after drying will cause unevenness of uncoated layer.
- PP type non-woven fabric is not resistant to high temperature and requires low temperature waterproof agent.
- Color is darkened during the waterproof processing.

## Improve customer satisfaction

- **Improve permeability of fabric**  
Adding special waterproof agent has little influence on waterproof effect
- **Reduce working fluid foam**  
Add special antifoam agent  
Wet feeding
- **Avoid waterproof spots or strips**  
Add special waterproof penetrant  
Add special waterproof antifoam agent  
Smooth processing without shaking of fabric surface
- **Improve processing sustainability**  
Adjust PH value of working fluid  
The pH value is about 4 in polyester processing  
The pH value is 5-7 in undyed, light or medium dark nylon processing  
The pH value is 3-5 in dark nylon processing
- **Improve hand feel**  
Choose suitable waterproof agent  
For soft feeling, use softener which has little effect on waterproof  
For hard feeling, ethyl acetate emulsion is recommended
- **Improve washing resistance**  
Add special crosslinking agent to improve washing resistance
- **Improve tearing strength of fabric**  
Add special strong protective agent
- **Waterproof and antistatic**  
Use special antistatic agent



## Common Test Standards

### Spray Test

Standard No.	Standard Name
● GB/T 4745-2012	Textiles - Testing and Evaluation of Water Resistance-Spray Test
● AATCC 22-2014	Water Repellency: Sprinkle Test
● ISO 4920:2012	Textile Fabrics- Determination of Surface Moisture Resistance- Spray Test
● AATCC 193	Wet Resistance: Waterproof /Alcohol Solution Test

### Rain Test

Standard No.	Standard Name
● GB/T 14577-1993	Determination of Water Repellency of Fabrics - Bundesmann Rain-shower Test
● ISO 9865:1991	Textiles; Determination of Water Repellency of Fabrics by Bundesmann Rain-shower Test
● JIS L 1092:2009	Test Method for Water Resistance of Textiles
● AATCC 35-2013	Water Repellency: Rain Test

### Hydrostatic pressure

Standard No.	Standard Name
● GB/T 4744-2013	Textiles - Testing and Evaluation of Water Resistance- Hydrostatic Method

### Anti-stain property

Standard No.	Standard Name
● AATCC 130-2010	Stain Release Performance: Oil Stain Removal Method
● FZ/T 01118-2012	Textiles - Testing and Evaluation of Textile Properties- Easy release Performance

### Anti-acid and alkali chemicals property

Standard No.	Standard Name
● AATCC 130-2010	Protective Clothing - Protective Clothing for Acid and Alkali Chemicals
● FZ/T 01118-2012	Protective Clothing Against Liquid Chemicals - Performance Requirements for Chemical Protective Clothing offering Limited Protective Performance Against Liquid Chemicals (Type 6 Equipment)



## Tag of Waterproof Agent

### Product Model

### Performance Overview



Tenon<sup>®</sup>  
Cation

Water/oil repellent and stain proof finishing agent for chemical fiber and blended fabrics (including wool and silk)  
Excellent protective effect and oil repellent stains infiltrate into the fabric  
Excellent rain proof and soluble stain repellent  
Apply for Teflon products  
No APEO, PFOA or PEOS and meet OKO-TEX standard



3M Scotchgard<sup>®</sup>  
Triple-proofing  
finishing agent C4  
Cation

Long-lasting dual protection (water/oil repellent and easy release)  
Better washing and dry cleaning fastness  
Apply for Scotchgard brand  
Good compatibility of additives and soft feeling  
No PEOA(PFOS) and active ingredient does not contain Freon (CFC), which will not damage the ozone layer.



3M scotchgard<sup>®</sup>  
Triple-proofing  
finishing agent C4  
Cation

Suitable for all fiber fabrics, including microfiber  
Excellent water/oil resistance and good washing resistance  
No PEOA(PFOS) and do not decompose into PEOA(PFOs).  
Free sample fabric adjustment



RUCO-GUARD<sup>®</sup>C6  
RUCO-BAC MED  
C6 triple-proofing  
finishing agent  
Cation

Suitable for water/oil proof of natural and synthetic fibers  
No PFOA, PEOS or PFOA  
Low carbon and environmental friendly product  
Water washing and dry cleaning resistance  
Sample fabric test and BIONICFINISH tag can be applied



ecrepe1<sup>®</sup>

Suitable for cotton, polyester cotton, chemical fiber and polyester fiber  
Waterproof and anti splash  
Excellent washing resistance with 30 times of washing  
Environmental friendly product and meet New European and American standards  
Apply for tag for clothes  
No APEO, PFOA or PEOS



Repel water  
Fluorine free  
waterproof agent  
Weak cation

Completely fluorine free  
Suitable for waterproof finish of cotton chemical fiber, nylon and blended fabric  
Excellent feeling of fabric  
Excellent washing resistance and dry cleaning effect  
No APEO, PFOA or PEOS



Fluorine free  
waterproof agent  
Weak cation  
BONIC FINISH  
Fluorine free  
ecological  
waterproof agent  
RUCO-DRY ECO

Completely fluorine free  
Suitable for waterproof finish of cotton chemical fiber, nylon and blended fabric  
Excellent feeling of fabric  
Excellent washing resistance and dry cleaning effect  
No APEO, PFOA or PEOS