



About Ansell Microgard Limited



Ansell Microgard Limited is a leading manufacturer of chemical protective clothing, introducing new technology and designs to the market to improve wearer protection and comfort for 40 years

Ansell Microgard Limited was one of the world's first manufacturers of limited life chemical protective clothing. Established in 1975, the company has built its reputation on introducing new technology and designs to the market to improve wearer protection and comfort. Today, millions of MICROGARD® and MICROCHEM® products are worn around the globe, protecting people throughout industry and the public sector.

Protecting people while they work in dirty or hazardous environments has always been our focus. Whether you are working with liquid or solid chemicals, asbestos, paint, oil, grease, viruses and blood borne pathogens, or one of the countless other workplace contaminants in evidence today, trust Ansell Microgard Limited to help keep you protected.

Contents



Page 3	Contents	
Page 4	Experts in Manufacturing and Design	
Page 5	Ethical Trading	
Page 6	Global Distribution	
Page 7	Product Range Overview	
Page 8	Guide to European Norms	
Page 9	Selecting the Correct Chemical Protective Clothing	
Page 10	Protective Clothing for Infective agents	
Page 11	Protective Clothing for Ex-zones use	
Page 12	MICROGARD® 1500	
Page 14	MICROGARD® 1500 PLUS	
Page 16	MICROGARD® 1800	
Page 20	MICROGARD® 2000	
Page 30	MICROGARD® 2300	
Page 36	MICROGARD® 2500	
Page 40	MICROCHEM® 3000	
Page 46	MICROCHEM® 4000	
Page 56	MICROCHEM® 5000	
Page 62	MICROCHEM® 6000	
Page 64	MICROCHEM® 8000	
Page 66	MICROGARD® 1500 PLUS FR	
Page 68	MICROGARD® FR	
Page 70	MICROCHEM® CFR	
Page 72	Guidance on Chemical Permeation	
Page 73	Guidance on Chemical Penetration	
Page 74	MICROGARD® and MICROCHEM® Chemical Permeation Data	

Experts in Manufacturing & Design



MICROGARD® and MICROCHEM® products are manufactured in accordance with the International Quality Standard ISO 9001 at our wholly owned state-of-the-art manufacturing plant in Xiamen (China).

All MICROGARD® and MICROCHEM® products are designed to meet or exceed the requirements of the European PPE Directive 89/686/EEC for chemical protective clothing.

The combination of our ISO 9001 accredited manufacturing facility and the expertise of our UK based design, product development and technical departments mean that users can be assured that all MICROGARD® and MICROCHEM® products achieve the standards they were designed to meet.

The management systems of Ansell Microgard Limited & Ansell Microgard Xiamen Limited are assessed and certified by SGS (notified body 0120) as meeting the requirements of PPE Directive 89/686/EEC (Article 11b) to manufacture personal protective equipment.

Ansell Microgard Ltd
ISO 9001 Certificate
Article 11B Certificate

Ansell Microgard Xiamen Ltd
ISO 9001 Certificate
Article 11B Certificate





A modern company committed to the principles of an ethical manufacturing policy.

It is our policy to protect the general welfare and occupational health and safety of any employee involved in the manufacturing process of the MICROGARD® and MICROCHEM® range of protective garments and allied products.

We are committed to the principles of the Ethical Trading Initiative Base Code. These recommendations conform to the standards of the International Labour Organisation, which states that in particular, no child labour will ever be used in any process and all of our employees enjoy safe, hygienic and comfortable working conditions.

Products are manufactured in Ansell Xiamen Ltd which was opened in 2008 on the modern AEPZ Export Development Zone. The facility was designed and built to the highest standards and allows every employee to enjoy clean, safe and climate controlled working conditions, an excellent canteen and sanitary facilities.

For a copy of the Ansell Microgard Ethical policy please email sales@microgard.com

Global Distribution

MICROGARD® and MICROCHEM® products are now protecting people in most major industrial regions, with a global distribution network covering countries throughout Europe, the Middle East, Asia, North and South America, Australasia and Africa.

Ansell Microgard Limited supplies a select range of specialist distributors. These distributors serve different markets ranging from the agricultural industry to the pharmaceutical sector. Our drive and determination to lead through advances in innovation, and in understanding local conditions, lies behind our fast growing global distribution network supplying companies and organisations in Europe, the Middle East, Asia, North and South America, Australasia and Africa.

To support both our distribution network and end users we have a team of regional Business Development Managers providing technical sales support, customer trials and end user training.

MICROGARD® and MICROCHEM® products have been extensively tested to achieve ASTM, ANSI, European Norms (EN), Japanese Industrial Standards (JIS) and the Korean Occupational Safety and Health Association (KOSHA) guidelines on chemical protective clothing – and we work extensively with our distributors to ensure conformance with all relevant local test methods and standards.

Local language websites have been developed and tailored to regional market requirements.

Websites



www.microgard.com



www.microgard.fr



www.microgard.de



www.microgard.es



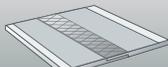
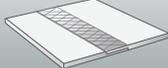
www.microgard.com.cn

Product Range Overview

MICROGARD® / MICROCHEM® Fabric Technology

MICROGARD® 1500	MICROGARD® 1500 utilises the latest in microfibre technology, is highly breathable and has been proven to filter 100% of particles down to 3 microns in size, making it ideal for protecting workers against asbestos and other relatively large hazardous particulates.
MICROGARD® 1500 PLUS	MICROGARD® 1500 PLUS utilises the latest in microfibre technology, is highly breathable and anti-static. It has been proven to filter 99.9% of particles down to 3 microns in size, making it ideal for protecting workers against low hazard pharmaceutical powders and other relatively large hazardous particulates.
MICROGARD® 1800	MICROGARD® 1800 is a lightweight, breathable material and so is particularly suited to warmer working environments. Provides a good barrier to low hazard liquid spray and fine particulates
MICROGARD® 2000	MICROGARD® 2000 provides both protection and comfort with the latest microporous film laminate technology, providing exceptional liquid and particulate protection. Ideal for a wide range of industrial applications where protection from low hazard liquid spray and fine particulates is required
MICROGARD® 2300	MICROGARD® 2300 fabric is comprised of a polyethylene (PE) barrier coating with a bi-component nonwoven inner layer, the combination of which provides an excellent barrier to many harmful chemicals, while being lightweight and yet relatively strong and durable.
MICROGARD® 2500	MICROGARD® 2500 is a unique material offering exceptional mechanical strength, liquid and particulate protection. Achieves the highest classifications for protection from biological agents, in accordance with EN 14126:2003 and ASTM F1671.
MICROCHEM® 3000	MICROCHEM® 3000 is one of the lightest and most comfortable chemical protective fabrics on the market today. This durable 3 layer fabric provides an extremely effective barrier against both inorganic chemicals and biological hazards.
MICROCHEM® 4000	MICROCHEM® 4000 is an exceptional chemical barrier against many concentrated organic chemicals, inorganic chemicals and biological agents. Tested against over 190 chemicals, including chemical warfare agents, this multi layer fabric is renowned for being lightweight yet durable and comfortable.
MICROCHEM® 5000	MICROCHEM® 5000 reaches new levels in chemical protection. This highly visible, innovative, multi-layer fabric is strong, durable and suitable for workers in extremely hazardous areas, including HAZMAT response teams.
MICROCHEM® 6000	MICROCHEM® 6000 GTS & GTB are Type 1a gas-tight suits. The lightweight, flexible and yet incredibly strong material provides an excellent barrier to numerous hazardous chemicals including chemical warfare agents.
MICROCHEM® 8000	MICROCHEM® 8000 is a new and innovative Type 1a fully encapsulated gas-tight suit. It provides excellent protection against numerous hazardous chemicals and biological agents.
MICROGARD® 1500 PLUS FR	MICROGARD® 1500 PLUS FR is a highly breathable, flame-retardant and anti-static SMMS polypropylene nonwoven designed for protection from particulates and light, non-flammable liquid spray or splash
MICROGARD® FR	MICROGARD® FR is a flame-retardant material designed to be worn over woven thermal protective garments such as NOMEX®, offering protection from particulates and light liquid splash without compromising worker protection in the event of a flash fire
MICROCHEM® CFR	MICROCHEM® CFR is a flame-retardant material designed to be worn over woven thermal protective garments such as NOMEX®, offering protection from particulates and pressurised liquid spray without compromising worker protection in the event of a flash fire

MICROGARD® / MICROCHEM® Seam Technology

	Ultrasonically Welded & Taped Seams A feature throughout the MICROCHEM® 4000, 5000 and 6000 ranges, this seam technology is our highest barrier to liquid and particulates.
	Ultrasonically Welded Seams Provides a strong liquid and particle barrier.
	Stitched & Taped Seams Internal stitching which is overtaped to offer increased strength and an effective barrier to liquids and particulates.
	Bound Seams An overlay of material similar to the base fabric is lock-stitched in place. This technology provides superior strength, liquid and particle barrier when compared to a traditional stitched seam.
	Stitched Seams Ansell Microgard Limited utilise 3-thread overlocking technology, which offers an excellent balance of a strong seam with good particle barrier. Internal stitching reduces the risk of any potential linting from the thread.

Guide to European Norms

To assist you with the selection of chemical protective clothing the EU has developed six categories for “types” of chemical protective clothing.

Certification to a particular type offers an indication of your suit’s protection against a particular hazard (gas, liquid or dust). As a manufacturer it is our responsibility to ensure that MICROGARD® and MICROCHEM® products meet the requirements of these standards, where applicable.

Please be aware that conformance to these type standards does not mean that your suit is 100% impervious to your hazard. Under this testing, suits are only required to meet the minimum performance requirements specified. In the case of the Type 5 particulate test for example, suits are allowed individual leakages of up to 30%, providing the average for the suits tested is less than 15%.

Ansell Microgard Limited manufacture products according to ISO 9001, thus ensuring as far as is reasonably possible they consistently achieve the desired protection level. For more information visit www.microgard.com

Current European “Types” of Chemical Protective Clothing

EN “Types”	Definitio	Symbol*
EN 943-1 & 2 “Type 1”	Gas Tight Chemical Protective Clothing Protective clothing against liquid and gaseous chemicals, aerosols and solid particulates	 TYPE 1
EN 943-1 “Type 2”	Non Gas Tight Chemical Protective Clothing Suits which retain positive pressure to prevent ingress of dusts, liquids and vapours	 TYPE 2
EN 14605 “Type 3”	Liquid Tight Suits Suits which can protect against strong and directional jets of liquid chemical	 TYPE 3
EN 14605 “Type 4”	Spray Tight Suits Suits which offer protection against saturation of liquid chemicals	 TYPE 4
EN ISO 13982-1 “Type 5”	Dry Particulate Protection Suits which provide protection to the full body against airborne solid particulates	 TYPE 5
EN 13034 “Type 6”	Reduced Spray Suits Suits which offer limited protection against a light spray of liquid chemicals	 TYPE 6

Disclaimer
MICROGARD®/ MICROCHEM® garments are available for most applications. However please note that a detailed assessment of the nature of the hazard and the working environment should be undertaken prior to the selection of appropriate PPE. Ansell Microgard Ltd provides the information in this product catalogue to assist you with selecting the correct product, but responsibility for the correct choice of PPE remains with the user.

Additional Standards achieved by the MICROGARD® / MICROCHEM® product range

Standard	Definitio	Symbol*
EN 1073-1**	Ventilated protective clothing against radioactive particulate contamination	 EN 1073
EN 1073-2**	Protective clothing against radioactive particulate contamination	
EN 14126	Protective clothing against infective agents (“Type” prefixed with “-B” [i.e. Type 3-B] indicates approval to this European Norm)	 EN 14126
EN 1149-5	Protective Clothing with electrostatic properties***	 EN 1149
DIN 32781	Protective Clothing. Protective suits against pesticides	 DIN 32781
EN ISO 14116	Protective Clothing Limited flame spread materials, material assemblies and clothin	 EN ISO 14116
EN 12941	Respiratory protective devices. Powered filtering devices incorporating a helmet or a hood	 EN 12941
EN 14594	Respiratory Protective Devices Continuous flow compressed airline breathing apparatus	 EN 14594

* Type approvals do not necessarily apply to accessories. Always refer to the garment label and instructions for use document which will indicate the protection level offered.

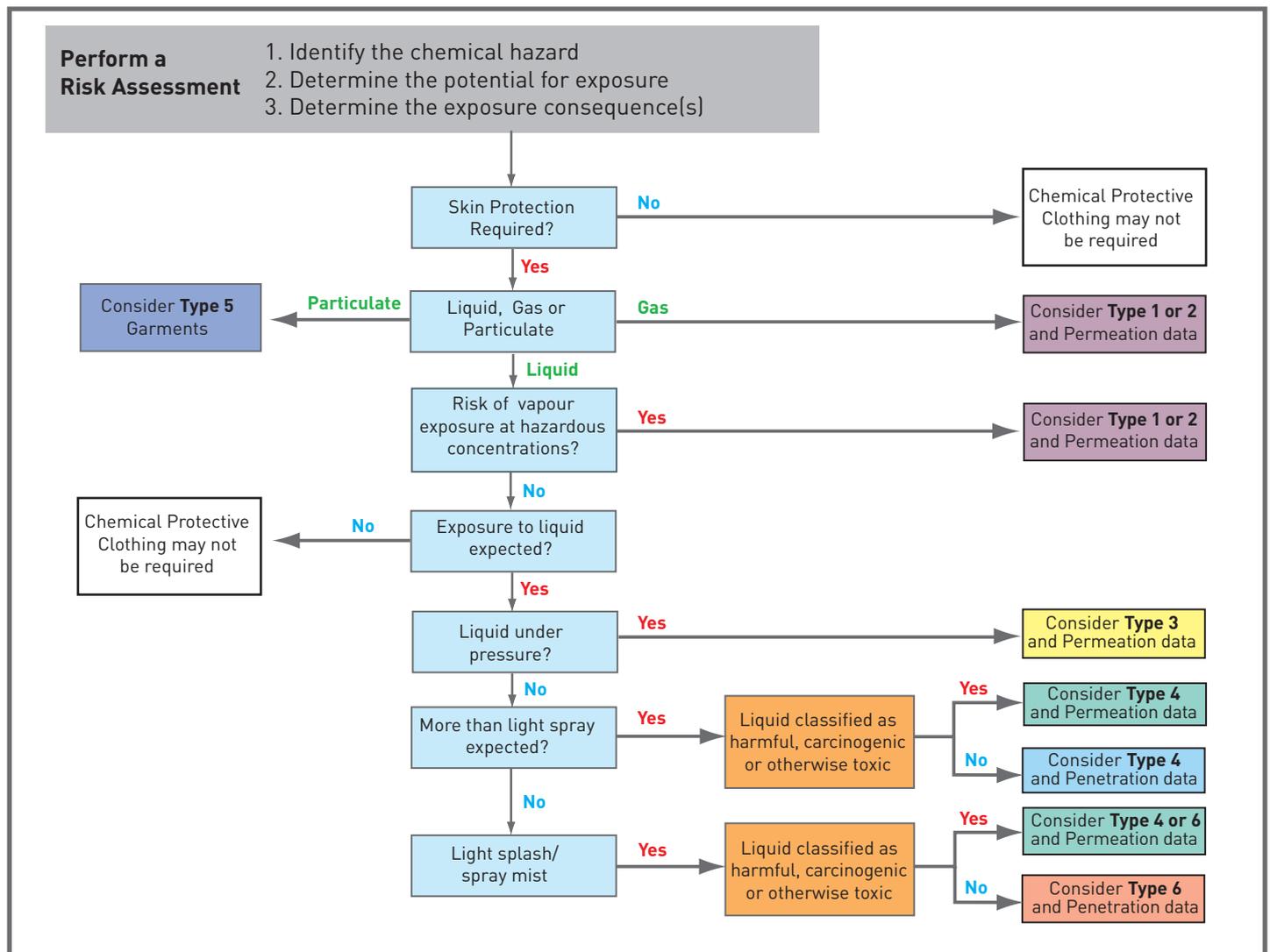
** Gives no protection against ionising radiation

*** Always ensure the garment and wearer are properly grounded

Selecting the Correct Chemical Protective Clothing

Ansell Microgard Limited has devised this simple flowchart as a basic tool to assist users and specifiers in selecting the correct “type” of chemical protective clothing.

It is important that the suitability of protective clothing for a particular use is determined by a trained expert in occupational health & safety. Many chemicals can cause serious and permanent injury to an unprotected or improperly protected user. Therefore special emphasis has to be placed on the careful selection of chemical protective clothing when the potential for exposure to such chemicals has been identified



Factors to Consider

Advice on the suitability of chemical protective clothing for a task is very often based on reported permeation breakthrough times. The standard test methods used for measuring breakthrough time (i.e. EN 374-3, ISO 6529, ASTM F 739) are often regarded as representing the “worst case scenario”, since the chemical is held in direct contact with the barrier material. Intermittent contact or splashes of chemical, in real life, may in fact lengthen the breakthrough time. Also, laboratory generated chemical permeation data may not always reflect conditions in the workplace. Temperature, pressure, flexing etc. could all potentially have an impact on the breakthrough time. When choosing chemical protective clothing consideration has to be given to permeation and penetration, and the physical performance attributes of the product (abrasion, tear, tensile, strength etc.) Other physical properties to consider are the strength of seams and closures (i.e. zips) the flexibility, weight and comfort factors (i.e. thermal insulation, breathability etc.) The best chemically resistant material will be ineffective if torn, cut, punctured or otherwise damaged.

The Ansell Microgard Technical Team can assist in the selection of chemical protective clothing. Visit www.microgard.com for more details or e-mail technical@microgard.com

Important note: This guide is simplified and as such the suitability of chemical protective clothing for a particular use should only be determined by a trained expert in occupational health & safety. It is the responsibility of the user to assess the types of hazards and the risks associated with exposure and to verify the information provided for the product to make a final decision on the appropriate personal protective equipment needed for their specific circumstance

Protective Clothing according to EN 14126:2003 - Protection from Infective Agents



Protective Clothing against infective agents has two main functions...

- to prevent infective agents from reaching the (possibly injured) skin
- to prevent the spreading of infective agents to other people and other situations, e.g. eating or drinking, when the person has taken their protective clothing off

In many work situations, i.e. microbiological laboratories, the infective agents can be contained and the risk of exposure limited to the occurrence of an accident.

However, in other types of work, i.e. sewage & waste water treatment, caring for infected animals, emergency clean-up; the organisms cannot be contained, exposing the worker continuously to the risk of infection by biological agents. In these situations the biological agents the worker is exposed to may not be known.

Applications where workers can be exposed to biological agents

- Waste water treatment works, sewage systems work
- Agriculture
- Food Industry
- Healthcare, hospitals, emergency services
- Clinical, veterinary laboratories
- Refuse disposal plants
- Activities where there is contact with animals and/or products of animal origin

Micro-organisms are a very heterogeneous group in that they come in all shapes and sizes, and their living conditions, survival abilities etc. vary widely. A distinction is made between four risk groups according to the risk of infection for humans. Details of these risk groups, along with their containment measures are found in European Directive 2000/54/EEC (on the protection of workers from the risk related exposure to biological agents at work).

EN 14126:2003

Due to the heterogeneity of micro-organisms, it is not possible to define performance criteria of protective clothing on the basis of risk groups, nor on the type of micro-organism. Also it may not be possible to define exactly the organisms the worker is exposed to. Hence the test methods in EN 14126:2003 focus on the medium containing the micro-organism, such as liquid, aerosol or a solid dust particle.

In accordance with the requirements of EN 14126:2003 protective clothing should be certified as Category III and subjected to 5 test methods specified in the standard. The corresponding protective clothing "Type" is then prefixed with the letter "B" (e.g. Type 3-B) and the biohazard symbol is displayed. (See page 8)

For a copy of the Ansell Microgard Guide to EN 14126:2003 please visit www.microgard.com

EN 14126 Approved Product Range

Microgard Product	Protection against biologically contaminated dust	Protection against biologically contaminated liquids	Tasks	Risk Groups	Risk Group & Task Definition
MICROGARD® 1800 Ts PLUS	✓	✓	A/B	1-2	Risk Group 1. Biological agent unlikely to cause sickness in humans 2. Biological agent that could cause sickness in humans and represent a danger to employees; substance dispersal amongst the population is unlikely; effective preventative measures or treatment is normally possible 3. Biological agent that can cause severe illness in humans and represent a serious risk for employees; a risk of dispersal amongst the population may occur but effective preventive measures or treatment are normally possible 4. Biological agent that causes severe illness in humans and represents a serious risk for employees; the risk of dispersal amongst the population is high under some circumstances; effective preventive measures or treatment are not normally possible. Tasks A. Routine inspection = no contact with contaminated material or objects; B. Handling and disposal of possibly contaminated material, objects or animals; C. Performed tasks require application of cleaning and disinfecting chemicals
MICROGARD® 2000 STANDARD	✓	✓*	A/B	1-2	
MICROGARD® 2000 Ts PLUS	✓	✓	A/B	1-3	
MICROGARD® 2300 PLUS	✓	✓	A/B/C	1-4	
MICROGARD® 2500 STANDARD & PLUS	✓	✓	A/B	1-3	
MICROCHEM® 3000, 4000, 5000 6000 & 8000	✓	✓	B/C	1-4	

*MICROGARD® 2000 STANDARD includes bound seams which carry a higher risk of liquid ingress under pressure than the taped seams of MICROGARD® 2000 Ts PLUS. Therefore this should be taken into consideration when carrying out a risk assessment for PPE usage to ensure that the right garment is selected and is fit for purpose.

It is the user's responsibility to select an appropriate garment, gloves, boots, and other equipment for the particular use and to understand all warnings and information provided. For further information on Microgard products please visit www.microgard.com or e-mail sales@microgard.com

Use of MICROGARD® and MICROCHEM® Chemical Protective Clothing in Ex-Zones



Ex-Zones

The purpose of 'Zoning' is to provide the basis for correct selection of a protection concept. Areas are classified depending on the properties of the flammable vapours, liquids, mists, gases or combustible fibres/dusts that may be present in the environment and the likelihood that a combustible concentration of that gas or dust is present.

Where ignition sources cannot be eliminated and a flammable gas or dust area may be present, it is important to assess the extent and duration of the risk to select the correct equipment. This is normally referred to as 'Zoning' (Ex-Zones).

Zone	Zone Description	MICROGARD® 2000	MICROCHEM® 3000	MICROCHEM® 4000	MICROCHEM® 5000
Zone 0	An area in which a potentially explosive atmosphere, consisting of air and flammable substances – in the form of a gas, vapour or mist – is continuously present or present for a long period.	✓	✓	✓	✓
Zone 1	An area in which a potentially explosive atmosphere, consisting of a mixture of air and flammable substances – in the form of gas, vapour or mist – is likely to occur in normal operation	✓	✓	✓	✓
Zone 2	An area in which a potentially explosive atmosphere, consisting of a mixture of air and flammable substances – in the form of gas, vapour or mist – is not likely to occur in normal operation	✓	✓	✓	✓
Zone 20	An area in which a potentially explosive atmosphere, in the form of a cloud of combustible dust in the air, is continuously present or present for long period.	✓	✓	✓	✓
Zone 21	An area in which a potentially explosive atmosphere, in the form of a cloud of combustible dust in the air, is likely to occur in normal operation	✓	✓	✓	✓

Gas Explosion Groups

Group I: Concerned with underground mining where coal dust and methane are present.

Group II: Concerned with surface industry gases & dust. They are sub-grouped according to volatility - IIA being the least volatile and IIC the most volatile.

Having conducted tests at the Swiss Safety Institute, Basel, the table below shows in which situation MICROGARD® and MICROCHEM® protective clothing may be safely worn*. Ex-Zone definitions as specified by CENELEC/IEC †.

The above MICROGARD® and MICROCHEM® protective clothing meet the requirements of EN 1149-5:2008 (Protective Clothing - Electrostatic Properties - Part 5 : Material Performance and Design Requirements). For more information please visit www.microgard.com

*Ex-Zone testing conducted by the Swiss Safety Institute at 23°C and 30% relative humidity on model 111 coveralls. For Ex-Zone ratings of other models please contact Microgard. The anti-static properties of MICROGARD® and MICROCHEM® protective clothing depends on the take up of moisture from the air. The anti-static treatment is therefore only effective when the relative humidity is above 25%. Please note that only the clothing material is dissipative. In order to prevent the creation of a spark, the garment and the wearer should be properly grounded. According to requirements in relevant standards (i.e. BGR 132), clothes and protective suits must not be changed in Ex-Zones if the minimum ignition energy is <3 mJ. MICROGARD® and MICROCHEM® protective clothing should not be donned or removed in Ex-Zones.

† Sources: European (Cenelec) Standards www.cenelec.org, International (IEC) Standards www.iec.ch

NEC & IEC Zone System Gas & Dust Groups		
Area	Group	Representative Materials
Zones 0, 1 & 2	IIC	Acetylene & Hydrogen (equivalent to NEC Class I, Groups A and B)
	IIB+H2	Hydrogen (equivalent to NEC Class I, Group B)
	IIB	Ethylene (equivalent to NEC Class I, Group C)
	IIA	Propane (equivalent to NEC Class I, Group D)
Zones 20, 21 & 22	IIIC	Conductive dusts, such as magnesium (equivalent to NEC Class II, Group E)
	IIIB	Non-conductive dusts, such as flour, grain, wood and plastic (equivalent to NEC Class II, Groups F & G)
	IIIA	Ignitable fibres/flyings, such as cotton lint, flax & rayon (equivalent to NEC Class III)

MICROGARD® 1500



Features & Benefit

Protection - Proven to filter 100% of particles >3 microns*

Comfort - Air and water vapour permeable ("breathable") to help reduce the risk of heat stress

Silicone Free - Critical in spray painting applications

Optimised body fit - Improves wearer comfort and safety.

*KAKEN particle penetration test

Applications

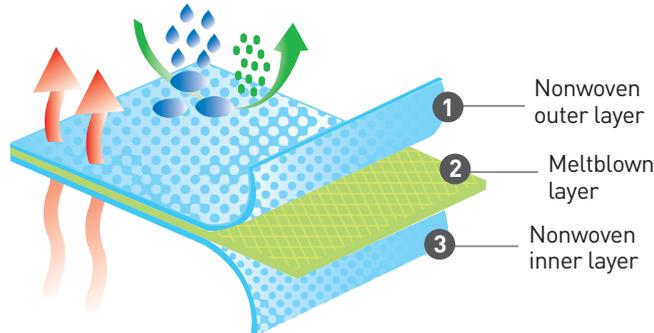
- Asbestos related work
- Handling powders
- General maintenance
- Construction



MICROGARD® 1500 coveralls have been designed for workers involved in the stripping, clear up or handling of asbestos, general maintenance, construction and contract cleaning.

MICROGARD® 1500

Asbestos fibres, such as Chrysotile, are typically 3-5 microns in size. The SMS fabric used in the construction of MICROGARD® 1500 coveralls has been proven to filter 100% of particles larger than 3 microns*



Protection Levels & Additional Properties



TYPE 5



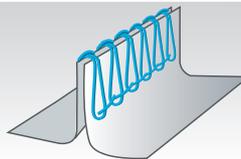
TYPE 6



EN 1073-2

Stitched Seams

Combining strength with particle barrier
White, Red and Navy also available with bound or taped seams



Model 138

Suit Features

- 3-piece hood
- Elasticated hood, wrists, waist and ankles
- 2-way front zipper with resealable storm flap

Sizes: S-5XL

Colours: White, Navy, Red, Orange

(Model 113 available in Red & Orange featuring silver reflective tape for enhanced visibility.)



Model 111

Model 113

MICROGARD® 1500 Range Overview

MICROGARD® 1500

Used for the stripping, clear up or handling of asbestos, general maintenance, construction and contract cleaning.



▲ MICROGARD® 1500

MICROGARD® 1500 (White)	
Fabric Filtration Efficiency	
Particle Size	%
0.3-0.5 µm	98.7
0.5-1.0 µm	99.2
1.0-3.0 µm	99.7
3.0-5.0 µm	100
>5.0 µm	100

*KAKEN Test Method

MICROGARD® 1500 Technical Data

Test Method	Result	EN Class (EN 14325:2004)
EN 530 Abrasion	>10 Cycles	1 of 6
EN ISO 7854 Flex Cracking	>15,000 Cycles	4 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>20 N	2 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>20 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>60 N	1 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>30 N	
EN 863 Puncture Resistance	>5 N	1 of 6
ISO 13935-2 Seam Strength	>75 N	3 of 6
Comfort Test Method		
		SMS White Result
ISO 5636-5 Air Permeability: Gurley Method (s 100 cm ²)		1.27
EN 31092/ISO 11092 Water Vapour Resistance (R _{et}) (m ² ·Pa/W)		1.2
EN 31092/ISO 11092 Thermal Resistance (R _{ct}) (m ² ·K/W)		0.015
Water Vapour Permeability Index (WVPI)		0.765
Clothing Insulation (clo) value		0.099
Fabric Repellence & Penetration Resistance to Liquid Chemicals		
Repellence of Liquids	Result (%)	EN Class (EN 14325:2004)
- 30% Sulphuric Acid	>95	3 of 3
- 10% Sodium Hydroxide	>95	3 of 3
Resistance to penetration by liquids	Result (%)	EN Class (EN 14325:2004)
- 30% Sulphuric Acid	<1	3 of 3
- 10% Sodium Hydroxide	<1	3 of 3

MICROGARD® 1500 PLUS



Features & Benefit

Protection - Proven to filter 99.9% of particles >3 microns*

Comfort - Air and water vapour permeable ("breathable") to help reduce the risk of heat stress

Silicone Free - Critical in spray painting applications

Anti-static - Tested according to EN 1149-5

Optimised Body Fit - Improves wearer comfort and safety

*KAKEN particle penetration test

Applications

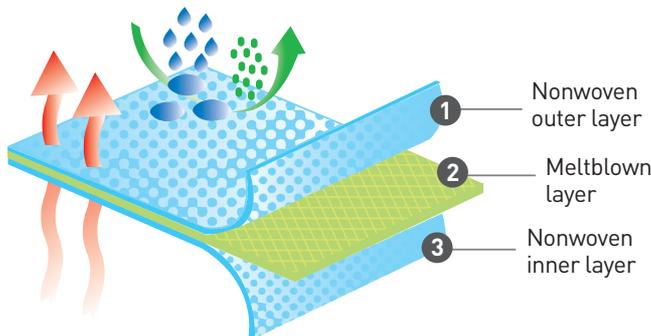
- Asbestos related work
- Handling powders
- General maintenance
- Construction
- Pharmaceutical industries
- Wood and metal processing
- Touch-up paint spraying
- Fibreglass / resin applications / ceramic fibre



MICROGARD® 1500 PLUS is a highly breathable anti-static SMS fabric which utilises the latest developments in micro fibre technology to ensure good filtration efficiency.

MICROGARD® 1500 PLUS

SMS fabrics are a particularly good barrier against particulates such as asbestos, brick dust and cement dust, and will provide protection from light aerosol mists; as found in some paint spray environments.



MICROGARD® 1500 PLUS Range Overview

MICROGARD® 1500 PLUS

Anti-static suit, used for the stripping, clear up or handling of asbestos, general maintenance, construction and contract cleaning.



▲ MICROGARD® 1500 PLUS

MICROGARD® 1500 PLUS (White)	
Fabric Filtration Efficiency	
Particle Size	%
0.3-0.5 µm	97.8
0.5-1.0 µm	98.7
1.0-3.0 µm	99.4
3.0-5.0 µm	99.9
>5.0 µm	99.9

* KAKEN Test Method

Protection Levels & Additional Properties



TYPE 5



TYPE 6



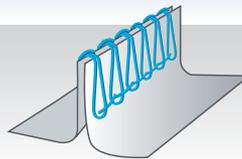
EN 1073-2



EN 1149-5

Stitched Seams

Combining strength with particle barrier



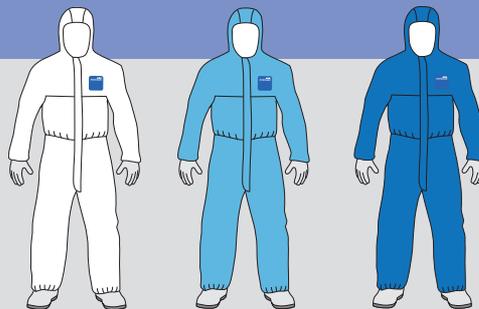
Model 111

Suit Features

- 3-piece hood
- Elasticated hood, wrists, waist and ankles
- 2-way front zipper with resealable storm flap
- Finger loops
- Anti-static treatment

Sizes: S-5XL

Colours: White, Light Blue, Navy



MICROGARD® 1500 PLUS Technical Data

Test Method	Result	EN Class (EN 14325:2004)
EN 530 Abrasion	> 10 Cycles	1 of 6
EN ISO 7854 Flex Cracking	>15,000 Cycles	4 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>20 N	2 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)		
EN ISO 13934-1 Tensile Strength (Machine Direction)	>60 N	1 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>30 N	
EN 863 Puncture Resistance	>5 N	1 of 6
EN 1149-5 Anti-Static	<2.5 x 10 ⁹ Ω	-
ISO 13935-2 Seam Strength	>75 N	3 of 6
Comfort Test Method	White	Pale Blue
ISO 5636-5 Air Permeability: Gurley Method (s 100 cm ²)	1.27	1.27
EN 31092/ISO 11092 Water Vapour Resistance (R _{et}) (m ² ·Pa/W)	2	1.9
EN 31092/ISO 11092 Thermal Resistance (R _{ct}) (m ² ·K/W)	0.019	0.021
Water Vapour Permeability Index (WVPI)	0.582	0.657
Clothing Insulation (clo) value	0.125	0.134

Fabric Repellence & Penetration Resistance to Liquid Chemicals		
Repellence of Liquids	Result (%)	EN Class (EN 14325:2004)
- 30% Sulphuric Acid	>95	3 of 3
- 10% Sodium Hydroxide	>95	3 of 3
Resistance to penetration by liquids	Result (%)	EN Class (EN 14325:2004)
- 30% Sulphuric Acid	<1	3 of 3
- 10% Sodium Hydroxide	<1	3 of 3

MICROGARD® 1800



Features & Benefit

Protection - Proven barrier to low concentration liquid chemicals, liquid & particulate biological hazards

Comfort - Moisture vapour permeable ("breathable") to help reduce the risk of heat stress

Silicone Free - Critical in spray painting applications

Low Linting - Reduced risk of contamination in critical areas

Anti-static - Tested according to EN 1149-5

Optimised Body Fit - Improves wearer comfort and safety

Applications

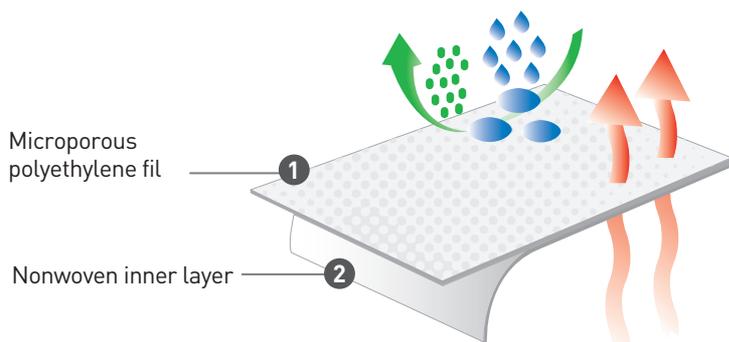
- Pharmaceutical industries
- Paint spraying
- Boat and ship building
- Mining
- General Maintenance
- Powder Handling



MICROGARD® 1800 is a lightweight, breathable material and so is particularly suited to warmer working environments. Provides a good barrier to low hazard liquid spray and fine particulates.

MICROGARD® 1800

MICROGARD® 1800 is a lightweight, breathable material and so is particularly suited to warmer working environments. Provides a good barrier to low hazard liquid spray and fine particulates.



MICROGARD® 1800 STANDARD Coverall Models

Protection Levels & Additional Properties



TYPE 5



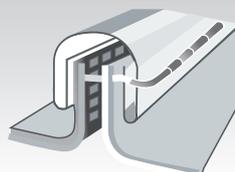
TYPE 6



EN 1149-5

Bound Seams

Superior strength, liquid and particle barrier



Features and benefit

Protection - Low hazard liquid spray, splash and particle protection

Comfort - Moisture vapour permeable ('breathable') to help reduce the risk of heat stress

Silicone Free - Critical in spray painting applications

Anti-static - Tested according to EN1149-5

Low linting - Reduces the risk of fibre contamination in some critical areas

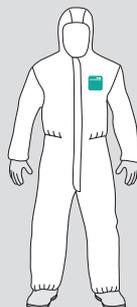
Optimised body fit - Improves wearer comfort and safety

- 3-piece hood
- 2-way front zipper with re-sealable storm flap
- Elasticated wrists, waist and ankles

Sizes: S-5XL

Colour: White

Available model 111



MICROGARD® 1800 Range Overview

MICROGARD® 1800 STANDARD

MICROGARD® 1800 STANDARD is a lightweight, breathable coverall and is particularly suited to warmer working environments. Provides a good barrier to low hazard liquid spray and fine particulates.



▲ MICROGARD® 1800 STANDARD

MICROGARD® 1800 Ts PLUS

MICROGARD® 1800 Ts PLUS provides the wearer with entry level, low hazard liquid and particulate protection. Ideal for a wide range of general industrial applications.



▲ MICROGARD® 1800 Ts PLUS

Applications

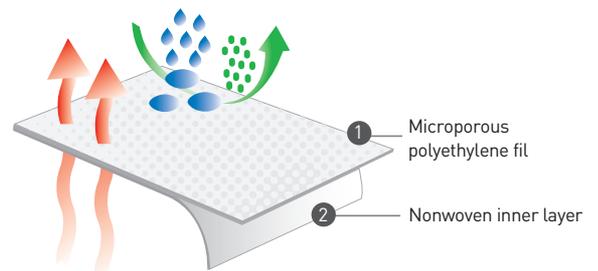
- General Maintenance
- Paint Spraying
- Powder Handling

MICROGARD® 1800 Ts PLUS

MICROGARD®
1800
Ts PLUS

MICROGARD® 1800 Ts PLUS provides the wearer with entry level, low hazard liquid and particulate protection. Ideal for a wide range of general industrial applications.

MICROGARD®1800 is a lightweight, breathable material and so is particularly suited to warmer working environments. With stitched and taped seams. Provides a good barrier to low hazard liquid spray and fine particulates.



MICROGARD® 1800 Ts PLUS Coverall

Protection Levels & Additional Properties



TYPE 4-B



TYPE 5-B



TYPE 6-B



EN 14126



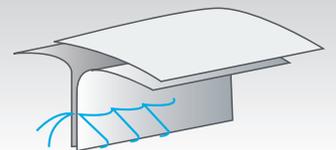
EN 1073-2



EN 1149-5

Stitched & Taped Seams

Internal stitching which is overtaped to offer increased strength and an effective barrier to liquids and particulates.



Features and benefit

- **Protection** - Proven barrier to low concentration liquid chemicals, liquid & particulate biological hazards
- **Comfort** - Moisture vapour permeable ("breathable") to help reduce the risk of heat stress
- **Silicone Free** - Critical in spray painting applications
- **Low Linting** - Reduced risk of contamination in critical areas
- **Anti-static** - Tested according to EN 1149-5
- **Optimised Body Fit** - Improves wearer comfort and safety
- **Tunnelled elasticated wrists, hood and ankles** - Helps to minimize the risk of linting and cross contamination
- **Thumb loops** - Help to prevent sleeve movement when working above your head
- **Chinstrap** - Helps to reduce the risk of cross contamination

Sizes: S-5XL

Colour: White

Available in the following models:
103, 111, 122 & 156

Applications

- Pharmaceutical industries
- Paint spraying
- Boat and ship building
- Mining

MICROGARD® 1800

MICROGARD® 1800 Technical Data

MICROGARD® 1800 is extensively tested in accordance with statutory requirements, including physical performance attributes and barrier to hazardous substances. The following tables outline the results obtained in independent laboratories according to European test methods.

Test Method	EN Class (EN 14325)
EN 530 Abrasion	1 of 6
EN ISO 7854 Flex Cracking	3 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	2 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	
EN ISO 13934-1 Tensile Strength (Machine Direction)	1 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	
EN 863 Puncture Resistance	1 of 6
EN 1149-5 Electrostatic Properties (Surface Resistance)	Pass
ISO 13935-2 Seam Strength 1800 STANDARD	2 of 6
ISO 13935-2 Seam Strength 1800 Ts PLUS	3 of 6
BS EN 20811 Hydrostatic Head (Water Pressure Test)	>100
Comfort Test Method	Result
EN 31092/ISO 11092 Water Vapour Resistance (R_{e1}) [$m^2 \cdot Pa/W$]	<20 $m^2 \cdot Pa/W$
EN 31092/ISO 11092 Thermal Resistance (R_{e1}) [$m^2 \cdot K/W$]	10.8 x 10 ⁻³ $m^2 \cdot K/W$

EN ISO 6529:2001 Chemical Permeation Barrier			
Chemical	CAS Number	EN Class	EN Class (EN 14325:2004)
Doxorubicin HCl	23214-92-8	>480	6 of 6

The following table sets out MICROGARD® 1800 performance for resistance to chemical penetration in accordance with EN ISO 6530.

Fabric Repellence & Penetration - Resistance to Liquid Chemicals	Result (%)	EN Class
Repellence of Liquids - 30% Sulphuric Acid	>95	3 of 3
Repellence of Liquids - 10% Sodium Hydroxide	>95	3 of 3
Repellence of Liquids - o-Xylene	>90	2 of 3
Repellence of Liquids - Butan-1-ol	>95	3 of 3
Resistance to penetration by liquids - 30% Sulphuric Acid	< 1	3 of 3
Resistance to penetration by liquids - 10% Sodium Hydroxide	< 1	3 of 3
Resistance to penetration by liquids - o-Xylene	< 1	3 of 3
Resistance to penetration by liquids - Butan-1-ol	< 1	3 of 3

MICROGARD® 1800 when tested in accordance with EN 14126:2003 demonstrates an excellent barrier to infective agents.
(applicable to Ts PLUS model only)

EN 14126:2003 - Barrier to Infective Agents	Result	EN Class
ISO 16603 Resistance to penetration by blood/fluids under pressur	Pass to 7 kPa	-
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 7 kPa	Class 4 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

MICROGARD® 1800 products have been extensively tested according to European and International requirements, including ASTM, for both physical and barrier performance. More details can be found on our website www.microgard.com

MICROGARD® 2000



Features & Benefit

Protection - Excellent liquid penetration resistance and barrier to fine particulates (>0.01 microns*)

Comfort - Moisture vapour permeable ("breathable") to help reduce the risk of heat stress

Silicone free - Critical in paint spraying applications

Low linting - Reduces the risk of fibr contamination in critical areas

Optimised body fi - Improves wearer comfort and safety

Anti-static - Tested according to EN 1149-5

*EMSL test method

Applications

- Pharmaceutical industries
- Agriculture
- Cleanrooms
- Paint spraying
- Crime scene investigation
- Veterinary services

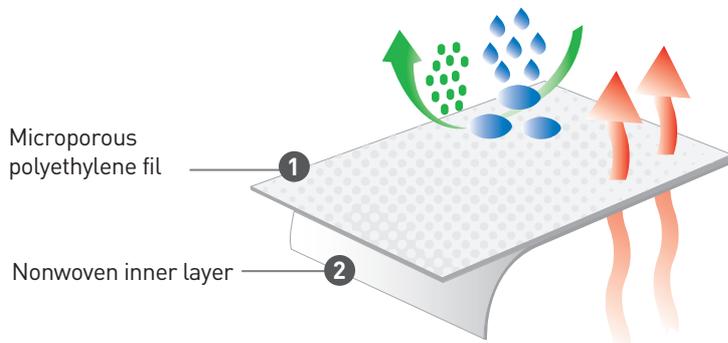


MICROGARD® 2000 provides both protection and comfort with exceptional liquid and particulate protection. Ideal for a wide range of industrial applications.

MICROGARD® 2000

MICROGARD® 2000 is designed to allow water vapour (perspiration) to escape from the suit yet will withstand saturation of liquid chemicals and filter 100% of particulates down to 0.01 microns in size*

The use of a high quality two-way stretch microporous film provides an effective liquid and particle barrier combined with a high water vapour transmission rate from inside to outside.



MICROGARD® 2000 Range Overview

MICROGARD® 2000 STANDARD

Low hazard liquid chemical repellence, particle protection, protection from pesticides and barrier to biological agents. Spray tight and ultra low linting for critical environments.



▲ MICROGARD® 2000 STANDARD - See page 23

MICROGARD® 2000 COMFORT

Low hazard liquid chemical repellence and particle protection. Provides Type 5 & 6 protection for workers in warm environments.



▲ MICROGARD® 2000 COMFORT - See page 24

MICROGARD® 2000 SOCO

Designed to prevent crime scene contamination, as well as providing officer protection, in partnership with Greater Manchester Police.



▲ MICROGARD® 2000 SOCO - See page 25

MICROGARD® 2000 Ts PLUS

Type 4 protection, MICROGARD® 2000 performance. Stitched & taped seams offer a higher level of protection from liquid chemical penetration.



▲ MICROGARD® 2000 Ts PLUS - See page 26

Innovative Design Features



Finger loops to prevent sleeve movement when working above your head



Hoods designed for optimum fit with respirators, particularly full face masks



2-way front zipper with double sided tape (DST) storm flap

Specialist Approvals

MICROGARD® 2000 has passed a range of specialist test methods including:



Biological Agents
EN 14126:2003
See page 10



Suitable for Ex-Zones
See page 11

Technical Support

Technical datasheets & product flyers available to download at:

www.microgard.com or by emailing technical@microgard.com



MICROGARD® 2000

MICROGARD® 2000 Technical Data

MICROGARD® 2000 is extensively tested in accordance with statutory requirements, including physical performance attributes and barrier to hazardous substances. The following tables outline the results obtained in independent laboratories according to European test methods.

Test Method	Result	EN Class (EN14325)
EN 530 Abrasion	>100 Cycles	2 of 6
EN ISO 7854 Flex Cracking	>40,000 Cycles	5 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>40 N	1 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>10 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>60 N	1 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>30 N	
EN 863 Puncture Resistance	>5 N	1 of 6
EN 1149-5 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	-
ISO 13935-2 Seam Strength	>75 N	3 of 6
BS EN 20811 Hydrostatic Head (Water Pressure Test)	>200 cm H ₂ O	-
Comfort Test Method	White Result	
ISO 5636-5 Air Permeability: Gurley Method (s 100 cm ²)	>500	
EN 31092/ISO 11092 Water Vapour Resistance (R _{et}) (m ² ·Pa/W)	19.6	
EN 31092/ISO 11092 Thermal Resistance (R _{ct}) (m ² ·K/W)	0.013	
Water Vapour Permeability Index (WVPI)	0.039	
Clothing insulation (clo) value	0.082	

EN ISO 6529: 2001 Chemical Permeation Barrier*			
Chemical	CAS Number	EN Class	EN Class (EN 14325:2004)
Glycerol	56-81-5	>480	6 of 6
Doxorubicin Hydrochloride	25316-40-9	>480	6 of 6

*For an up to date list of chemicals tested please visit www.microgard.com or email the Ansell Microgard Technical Team at technical@microgard.com

The following table sets out MICROGARD® 2000 performance for resistance to chemical penetration in accordance with EN ISO 6530. For further information on penetration testing see page 73.

Fabric Repellence & Penetration - Resistance to Liquid Chemicals	White Result (%)	EN Class	Green Result (%)	EN Class	Yellow Result (%)	EN Class
Repellence of Liquids - 30% Sulphuric Acid	>95	3 of 3	>95	3 of 3	>90	2 of 3
Repellence of Liquids - 10% Sodium Hydroxide	>95	3 of 3	>95	3 of 3	>95	3 of 3
Repellence of Liquids - o-Xylene	>95	3 of 3	>95	3 of 3	>80	1 of 3
Repellence of Liquids - Butan-1-ol	>90	2 of 3	>90	2 of 3	>95	3 of 3
Resistance to penetration by liquids - 30% Sulphuric Acid	<1	3 of 3	<1	3 of 3	<1	3 of 3
Resistance to penetration by liquids - 10% Sodium Hydroxide	<1	3 of 3	<1	3 of 3	<1	3 of 3
Resistance to penetration by liquids - o-Xylene	<1	3 of 3	<1	3 of 3	<1	3 of 3
Resistance to penetration by liquids - Butan-1-ol	<1	3 of 3	<1	3 of 3	<1	3 of 3

MICROGARD® 2000 when tested in accordance with EN 14126:2003 demonstrates an excellent barrier to infective agents. The specific test results are detailed in the table below and for further information on this European Norm see page 8.

EN 14126:2003 - Barrier to Infective Agents	Result	EN Class
ISO 16603 Resistance to penetration by blood/fluids under pressur	Pass to 20 kPa	n/a
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	Class 6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

MICROGARD® 2000 products have been extensively tested according to European and International requirements, including ASTM, for both physical and barrier performance. More details can be found on our website www.microgard.com

Note: Unless specified, test results and EN 14325 classification apply to all fabric colours.

MICROGARD® 2000 STANDARD Coverall Models

Protection Levels & Additional Properties



TYPE 5-B



TYPE 6-B



EN 14126



DIN 32781



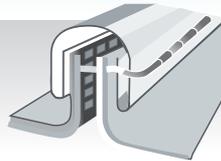
EN 1073-2



EN 1149-5

Bound Seams

Superior strength, liquid and particle barrier



Applications

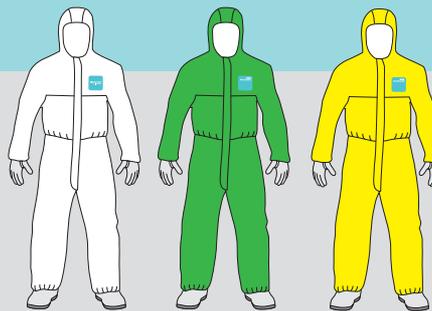
- Pharmaceutical industries
- Agriculture
- Cleanrooms
- Paint spraying
- Crime scene investigation
- Veterinary services

Model 111

Suit Features

- 3-piece hood
- 2-way front zipper with resealable storm fla
- Finger loops
- Elasticated hood, waist, wrists & ankles

Sizes: S-5XL **Colour:** White, Green & Yellow



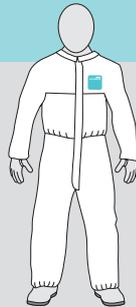
Model 103

Suit Features

- Collar
- 2-way front zipper with resealable storm fla
- Finger loops
- Elasticated waist, wrists & ankles

Sizes: S-5XL

Colour: White

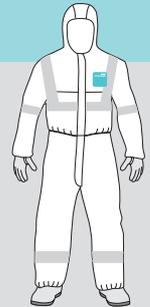


Model 113

Suit Features

- 3-piece hood
- 2-way front zipper with resealable storm fla
- Finger loops
- Elasticated hood, waist, wrists & ankles
- Reflective Hi-Vis tape for enhanced visibilit

Sizes: S-5XL **Colour:** White

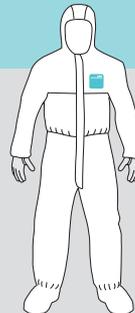


Model 122

Suit Features

- 3-piece hood
- 2-way front zipper with resealable storm flap.
- Finger loops
- Elasticated hood, waist & wrists & ankles
- Attached boot with ankle ties and anti slip soles

Sizes: S-5XL
Colour: White

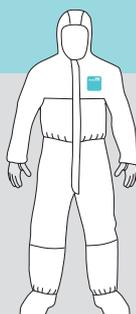


Model 156

Suit Features

- 3-piece hood
- 2-way front zipper with resealable storm fla
- Finger loops
- Elasticated hood, waist, wrists, ankles & overflaps
- Integrated socks with boot overflap

Sizes: S-5XL **Colour:** White

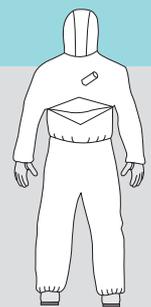


Model 162

Suit Features

- Pass-thru device for use with fall arrest equipment
- 3-piece hood
- 2-way front zipper with resealable storm fla
- Finger loops
- Elasticated hood, waist, wrists & ankles

Sizes: S-5XL **Colour:** White



MICROGARD® 2000 COMFORT



MICROGARD® 2000 COMFORT has been specifically designed for those working in warmer climates or warm working environments to help reduce the risk of heat stress.

The critical areas to the front of the garment (including the hood, arms and legs) are MICROGARD® 2000 offering a high level of liquid and particle protection with a low level of water vapour resistance. Water vapour resistance according to EN 31092 of $R_{et} < 15^*$

The back panel is MICROGARD® 1500 PLUS fabric which is air and water vapour permeable. This panel allows airflow around the suit, increasing wearer comfort. Air permeability result according to EN ISO 9237 of $160 \text{ L/m}^2\text{-s}$ and $R_{et} 2$.

Bound seams ensure spray-tight protection to the front of the garment and excellent overall particle protection.

* R_{et} is a measurement of a material's resistance to moisture vapour transfer. The lower the value the less resistance there is and therefore the more breathable the fabric.

MICROGARD® 2000 COMFORT Coverall

Protection Levels & Additional Properties



TYPE 5



TYPE 6



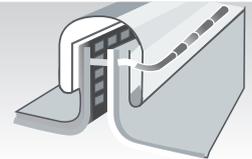
EN 1073-2



EN 1149-5

Bound Seams

Superior strength, liquid and particle barrier



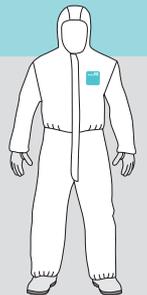
Applications

- Pharmaceutical industry
- Cleanrooms
- Paint spraying
- Veterinary services
- Pest control

Model 129

Features & Benefits

- **Protection** - Hood, arms, legs and front torso in MICROGARD® 2000 fabric
- **Comfort** - Air and water vapour permeable ("breathable") to help reduce the risk of heat stress
- **Silicone Free** - Critical in spray painting applications
- **Anti-static** - Tested according to EN 1149-5
- 3-piece hood
- Elasticated hood, wrists, waist and ankles
- 2-way front zipper with resealable storm flap
- Breathable SMS back panel



Sizes: S-5XL

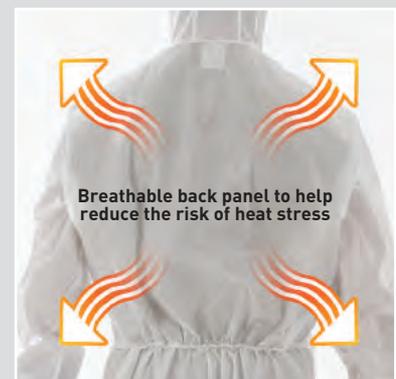
Colour: White



3-piece hood



Finger Loops



Breathable SMS back panel

MICROGARD® 2000 SOCO

MICROGARD®
2000
SOCO

Developed specifically for police forensic Scene of Crime Officers (SOCOs), the MICROGARD® 2000 SOCO suit will provide you with the essential balance of comfort and performance.

Working closely with Greater Manchester Police (UK) SOCOs the coverall and overboots* were designed to fit both male and female officers and are available in a range of sizes.

This ensures that you can get on with the job without worrying about the performance or comfort of your protective clothing.

*sold separately, see page 39

MICROGARD® 2000 SOCO Coverall

Protection Levels & Additional Properties



TYPE 5-B



TYPE 6-B



EN 14126



EN 1073-2



DIN 32781

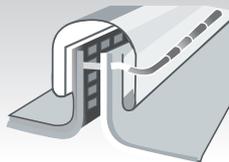


EN 1149-5

Bound Seams

Superior strength, liquid and particle barrier

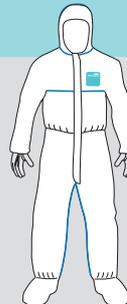
Also available with stitched and taped seams for Type 4 spray-tight applications



Model 128

Features & Benefits

- **Ultra low linting** - Reduces the risk of crime scene contamination
- **Self adhesive pockets** - Can be positioned anywhere on the garment to secure equipment
- **Finger loops** - To prevent sleeve movement when working above your head
- **Protection** - From biological agents in the highest performance class according to EN 14126
- **Anti-static** - Tested according to EN 1149-5
- Elasticated hood, wrists, waist and ankles
- 2-way front zipper with resealable storm flap
- 2-piece hood
- Chinstrap
- Dual finger loops
- Supplied with 2 pockets



Sizes: S-5XL

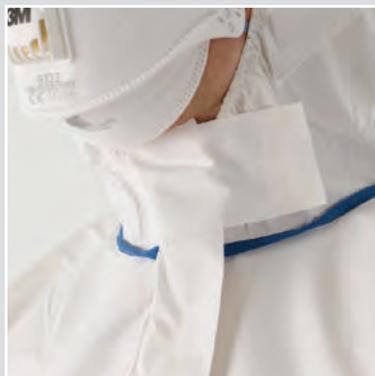
Colour: White



Pocket



Seam



Chinstrap



Applications

- Forensics
- Scene of Crime Officer (SOCOs)
- Crime Scene Investigation (CSI)

MICROGARD® 2000 Ts PLUS



MICROGARD® 2000 Ts PLUS is now the product of choice for many pharmaceutical workers around the world.

MICROGARD® 2000 is designed to allow water vapour (perspiration) to escape from the suit yet will withstand saturation of liquid chemicals and filter 100% of particulates down to 0.01 microns in size*.

With stitched and taped seams, MICROGARD® 2000 Ts PLUS provides an exceptional overall barrier to low hazard liquid spray and fine particulates.

*EMSL test method

MICROGARD® 2000 Ts PLUS Coveralls

Protection Levels & Additional Properties



TYPE 4-B



TYPE 5-B



TYPE 6-B



EN 14126



EN 1073-2



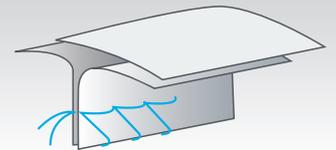
DIN 32781



EN 1149-5

Stitched & Taped Seams

Internal stitching which is overtaped to offer increased strength and an effective barrier to liquids and particulates.



Features and benefit

- **Protection** - Proven barrier to low concentration liquid chemicals, diluted pesticides, liquid & particulate biological hazards
- **Comfort** - Moisture vapour permeable ("breathable") to help reduce the risk of heat stress
- **Silicone Free** - Critical in spray painting applications
- **Ultra Low Linting** - Reduced risk of contamination in critical areas
- **Anti-static** - Tested according to EN 1149-5
- **Optimised Body Fit** - Improves wearer comfort and safety
- **Tunnelled elasticated wrists, hood and ankles** - Helps to minimize the risk of linting and cross contamination
- **Thumb loops** - Help to prevent sleeve movement when working above your head
- **Chinstrap** - Helps to reduce the risk of cross contamination

Sizes: S-5XL

Colours: White, Yellow (111 only), Green (111 only)

**Available in the following models:
103, 111, 122, 128, 156**

Please see page 23 for more details of the model features



Thumb loop



Single zip with resealable flap



Chinstrap

Applications

- Agriculture
- Paint spraying
- Pharmaceutical industries
- Fibreglass product manufacturing
- Boat and ship building
- Mining

MICROGARD® 2000 Accessories

MICROGARD®
2000

MICROGARD® 2000 Accessories



Model 209
Lab Coat

- Front zip fastening
- Left breast pocket
- Lower right pocket
- Bound seams

Sizes: S-3XL
Colour: White



Model 301
Trousers

- Elastication to waist and ankles
- Bound seams

Sizes: S-3XL
Colour: White



Model 407
Overboots - ESD

- Tie fastening
- Elastic to top of boot
- Bound seams
- ESD PVC Sole

Size: One Size (fits size 42-46)
Colour: White



Model 213
Apron

- Tie fastening to waist
- 100 cm long tie fastening

Size: One Size
Colour: White



Model 400
Overshoes

- Elasticated opening
- Bound seams

Size: One Size (fits size 42-46)
Colour: White



Model 417
Overshoes - ESD

- Elasticated opening
- Bound seams
- ESD PVC Sole

Size: One Size (fits size 42-46)
Colour: White



Model 214
Apron with Sleeves

- Rear Velcro fastening
- Elasticated wrists
- Bound seams

Sizes: S-3XL
Colour: White



Model 401
Overshoes

- Elasticated opening
- Bound seams

Size: One Size (fits size 46-48)
Colour: White



Model 503
Cape Hood

- Balaclava Style
- Elasticated face opening
- Bound seams

Size: One Size
Colour: White



Model 219
Jacket & Trouser Set

- Zip fastening jacket
- Elasticated hood and hem on jacket
- Elasticated waist and ankles on trousers
- Bound seams

Sizes: S-5XL
Colour: White



Model 406
Overboots

- Tie fastening
- Elastic to top of boot
- Bound seams

Size: One Size (fits size 42-46)
Colour: White



Model 507
Cape Hood

- Balaclava style cape hood covering part of shoulders
- Velcro fastening to front
- Bound seams

Size: One Size
Colour: White



Model 600
Oversleeves

- Elasticated at both ends
- Bound seams

Size: One Size
Colour: White

MICROGARD® 2000 - Protection from Pesticides



Almost on a daily basis, farm workers are exposed to various chemical and biological hazards. Depending on the level and duration of exposure (and specific effects for these hazards) they may be required to wear Personal Protective Equipment. The PPE required may include respirators, gloves and chemical protective clothing.

DIN 32781 defines the performance criteria for chemical protective clothing to be worn during the handling and application (spraying etc.) of diluted mixtures of pesticides. During spray testing of MICROGARD® 2000 against the 5 pesticides listed in this standard no penetration was detected.

Typical applications where agricultural workers are exposed to chemicals:

- Mixing and loading the undiluted concentrate
- Spraying the highly diluted mixture
- Exposure at work place to a fine aerosol caused by drift
- Exposure by intensive contact with treated foliage

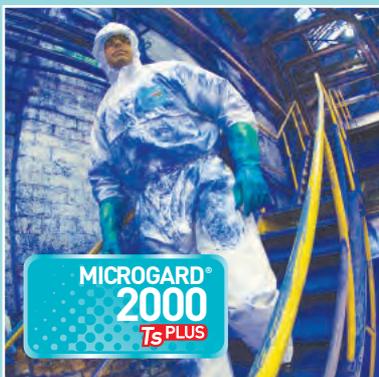
For more information on protecting your work force from pesticides visit www.microgard.com



▲ MICROGARD® 2000 STANDARD - See page 23

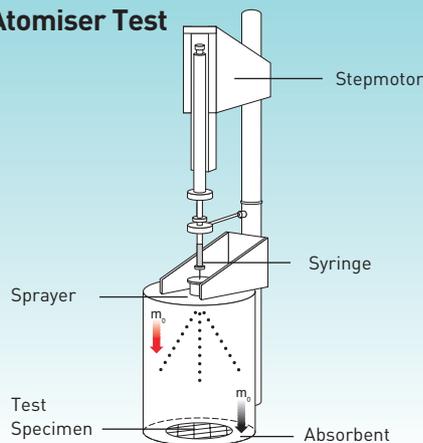


▲ MICROGARD® 2000 SOCO - See page 25



▲ MICROGARD® 2000 Ts PLUS - See page 26

Atomiser Test



EN 14786:2006 Protective Clothing.

Determination of resistance to penetration by sprayed liquid chemicals, emulsions and dispersions. Atomiser test EN 14786 specifies a test method to determine the resistance of textile materials against penetration by atomised liquid chemicals, emulsions and dispersions.

These materials are intended to be used in both limited-use and reusable protective clothing. The penetration is expressed in percent, as a ratio of the amounts of chemical applied and retained by the textile.

Key elements of DIN 32781	MICROGARD® 2000 STANDARD & Ts PLUS Performance
The material shall not cause irritation of skin or other hazards to health	Full compliance with EN 340:2003 (Protective Clothing: General Requirements)
Tear Strength min 10 N	MD 40.7 N, CD 18.6 N (Average 29.7 N)
Tensile Strength min 30 N in both directions	MD 48.3 N, CD 108.1 N
Penetration Index less than or equal to 5% for one of the chemicals specified - Atomiser test according to EN 14786:2006	0% Penetration detected with all 5 chemicals tested
Ergonomic Aspects – Water Vapour resistance according to EN 31092	Tested by EMPA and R_{et} recorded as <15
Resistance to penetration of liquids. Testing according to EN 13034:2005	Certified to EN 13034:2005 (Type 6)
Seam Strength min 30 N	>75 N

DIN 32781 Test Chemicals - EN 14786 Atomiser Test MICROGARD® 2000 Performance		
Brand name & ZA-Nr.	Manufacturer	Test Result [% Penetration]
U46-D-Fluid 0941-00	BASF	None Detected
Pirimor Granulat 2470-00	Syngenta	None Detected
Amistar 5090-00	Syngenta	None Detected
Betanal Expert 4991-00	Bayer CropScience	None Detected
Folicur 4028-00	Bayer CropScience	None Detected

MICROGARD® 2000 - Contamination Control

Cleanrooms are highly specialised working areas used to protect products and processes, as well as personnel from being contaminated. A cleanroom is defined according to ISO 14644-1 as “a room in which the number concentration of airborne particles is controlled, and which is constructed and used in a manner to minimise the introduction, generation and retention of particles inside the room and in which other relevant parameters, e.g. temperature, humidity and pressure are controlled if necessary.”

The air cleanliness in a cleanroom is controlled by passing incoming ventilation air through highly efficient filters and by also dressing the operators in specialised cleanroom garments. Cleanrooms are used in many different industries, for instance, in microelectronics, the pharmaceutical industry and the food and beverage industry. Cleanroom technology is also used when performing certain orthopaedic surgical operations.

ISO 14644-1 Class	Maximum Number of Particles in Air (particles in each cubic metre equal to or greater than the specified size)					
	Particle size					
	>0.1µm	>0.2µm	>0.3µm	>0.5µm	>1µm	>5µm
ISO Class 1	10	2				
ISO Class 2	100	24	10	4		
ISO Class 3	1000	237	102	35	8	
ISO Class 4	10,000	2,370	1,020	352	83	
ISO Class 5	100,000	23,700	10,200	3,520	832	29
ISO Class 6	1,000,000	237,000	102,000	35,200	8,320	293
ISO Class 7				352,000	83,200	2930
ISO Class 8				3,520,000	832,000	29,300
ISO Class 9				35,200,000	8,320,000	293,000

MICROGARD® 2000 coveralls have been subjected to various tests* relevant to cleanroom clothing performance including ISO 9073-10 (control of linting of textiles), EN 13982-2 for inward leakage of particulates and a series of fabric filtration tests. With the information from these results and other relevant data it is possible for us to offer guidance on the suitability of MICROGARD® 2000 by cleanroom class. However, suitability is also dependent on the cleanroom conditions and model features.

For advice please contact the Ansell Microgard technical team on **+44 (0) 1482 625444** or email technical@microgard.com

MICROGARD® 2000 suitability by cleanroom class									
ISO 14644-1 Class 1	1	2	3	4	5	6	7	8	9
MICROGARD® 2000	x	x	x	x	x	✓	✓	✓	✓
US Federal Standard 209E			1	10	100	1,000	10,000	100,000	
MICROGARD® 2000			x	x	x	✓	✓	✓	

Key functions of cleanroom clothing	MICROGARD® 2000 Performance
Protection of product and environment from contamination by personnel	<ul style="list-style-type: none"> Bound seams (MICROGARD® 2000 STANDARD) and high particle barrier fabric reduce particle migration Ultra low linting – tested according to ISO 9073-10
Protection of personnel from solid or liquid hazardous substances and biological agents	<ul style="list-style-type: none"> Approved Category III chemical protective clothing; <ul style="list-style-type: none"> - Type 5 Particle protection - Type 6 Reduced spray-tight EN 14126:2003 Barrier to infective agents
Anti-static	<ul style="list-style-type: none"> Meets the requirements of EN 1149-5 Safe for use in Ex-Zones. See page 11 for details

* All tests conducted with standard unwashed and non-sterilised MICROGARD® 2000 STANDARD coveralls

MICROGARD® 2300



Features & Benefit

Protection - A good barrier to numerous inorganic liquid chemicals including acids and bases

Highly visible - Available in bright yellow for improved worker safety

Comfort - Lightweight yet relatively strong and durable

Anti-static - Tested according to EN 1149-5

Designed to protect - Typical coverall features include respirator fit hood and a zip flap with self-adhesive tape closure

Applications

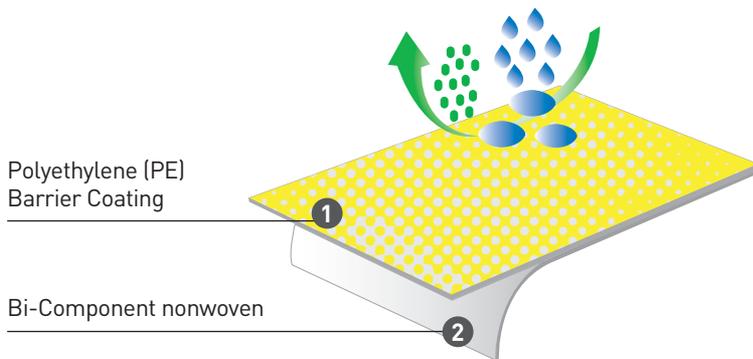
- Environmental clean-up
- Sewage purification installations
- Industrial and Chemical manufacturing
- Composites manufacturing
- Pharmaceutical Industry



MICROGARD® 2300 provides an excellent barrier to harmful chemicals, while being lightweight and relatively strong and durable.

MICROGARD® 2300

MICROGARD® 2300 fabric is comprised of a polyethylene (PE) barrier coating with a bi-component nonwoven inner layer, the combination of which provides an excellent barrier to many harmful chemicals, while being lightweight and yet relatively strong and durable.



**MICROGARD® 2300
Range Overview**

MICROGARD® 2300 STANDARD

Low hazard liquid chemical repellence, particle protection and barrier to biological agents.



▲ MICROGARD® 2300 STANDARD - See page 33

MICROGARD® 2300 COMFORT

Low hazard liquid chemical repellence and particle protection. Provides Type 5 & 6 protection for workers involved in composites manufacturing and related industries.



▲ MICROGARD® 2300 COMFORT - See page 34

MICROGARD® 2300 PLUS

Type 3 protection, MICROGARD® 2300 performance. Stitched & taped seams offer a higher level of protection from liquid chemical penetration.



▲ MICROGARD® 2300 PLUS - See page 35

Innovative Design Features



Finger loops to prevent sleeve movement when working above your head



Hoods designed for optimum fit with respirators, particularly full face masks



2-way front zipper with DST storm flap

Specialist Approvals

MICROGARD® 2300 has passed a range of specialist test methods including:



Biological Agents
EN 14126:2003
See page 10

Technical Support

Technical datasheets & product flyers available to download at:

www.microgard.com or by emailing technical@microgard.com



MICROGARD® 2300

MICROGARD® 2300 Technical Data

MICROGARD® 2300 is extensively tested in accordance with statutory requirements, including physical performance attributes and barrier to hazardous substances. The following tables outline the results obtained in independent laboratories according to European test methods.

Test Method	White Result	EN Class (EN 14325)	Yellow Result	EN Class (EN 14325)
EN 530 Abrasion	>1,000 Cycles	4 of 6	>10 Cycles	1 of 6
EN ISO 7854 Flex Cracking	>100,000 Cycles	6 of 6	>1,000 Cycles	1 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>20 N	1 of 6	>60 N	3 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>60 N		>40 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>60 N	2 of 6	>100 N	2 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>60 N		>60 N	
EN 863 Puncture Resistance	>5 N	1 of 6	>5 N	1 of 6
EN 1149-5 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	-	<2.5 x 10 ⁹ Ω	-
ISO 13935-2 Seam Strength	>75 N	3 of 6	>75 N	3 of 6
Comfort Test Method	White Results		Yellow Results	
ISO 5636-5 Air Permeability: Gurley Method [s 100 cm ²]	>500		>500	
EN 31092/ISO 11092 Water Vapour Resistance (R _{et}) [m ² .Pa/W]	>700		>700	
EN 31092/ISO 11092 Thermal Resistance (R _{et}) [m ² .K/W]	0.015		0.017	
Water Vapour Permeability Index (WVPI)	<0.002		<0.002	
Clothing insulation (clo) value	0.095		0.112	

EN ISO 6529:2001 Chemical Permeation Barrier*			
Chemical	CAS Number	BT at 1.0 µg/cm ² /min	EN Class (EN 14325:2004)
Ferric Chloride (satd.)	7705-08-0	>480	6 of 6
Hexamethylene Diisocyanate	822-06-0	>480	6 of 6
Methanol	7439-97-6	>480	6 of 6
Sodium Hydroxide (40% w/w)	1310-73-2	>480	6 of 6
Sulphuric Acid (96% w/w)	7664-93-9	>480	6 of 6

*For an up to date list of chemicals tested please visit www.microgard.com or email the Ansell Microgard Technical Team at technical@microgard.com.

The following table sets out MICROGARD® 2300 performance for resistance to chemical penetration in accordance with EN ISO 6530. For further information on penetration testing see page 73.

Fabric Repellence & Penetration - Resistance to Liquid Chemicals	White Result (%)	EN Class	Yellow Result (%)	EN Class
Repellence of Liquids - 30% Sulphuric Acid	>95	3 of 3	>95	3 of 3
Repellence of Liquids - 10% Sodium Hydroxide	>90	2 of 3	>95	3 of 3
Repellence of Liquids - o-Xylene	>90	2 of 3	>95	3 of 3
Repellence of Liquids - Butan-1-ol	>95	3 of 3	>95	3 of 3
Resistance to penetration by liquids - 30% Sulphuric Acid	<1	3 of 3	<1	3 of 3
Resistance to penetration by liquids - 10% Sodium Hydroxide	<1	3 of 3	<1	3 of 3
Resistance to penetration by liquids - o-Xylene	<1	3 of 3	<1	3 of 3
Resistance to penetration by liquids - Butan-1-ol	<1	3 of 3	<1	3 of 3

MICROGARD® 2300 when tested in accordance with EN 14126:2003 demonstrates an excellent barrier to infective agents. The specific test results are detailed in the table below and for further information on this European Norm see page 8.

EN14126: 2003 - Barrier to Infective Agents	Result	EN Class
ISO 16603 Resistance to penetration by blood/fluids under pressur	Pass to 20 kPa	n/a
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	Class 6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

MICROGARD® 2300 products have been extensively tested according to European and International requirements, including ASTM, for both physical and barrier performance. More details can be found on our website www.microgard.com

Note: Unless specified, test results and EN 14325 classification apply to all fabric colours.

MICROGARD® 2300 STANDARD

MICROGARD®
2300
STANDARD

MICROGARD® 2300 STANDARD Coverall Models

Protection Levels & Additional Properties



TYPE 5-B



TYPE 6-B



EN 1073-2



EN 14126



EN 1149-5



Bound Seams

Superior strength, liquid and particle barrier

Applications

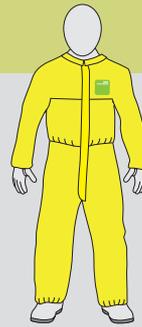
- Environmental clean-up
- Sewage purification installations
- Industrial and Chemical manufacturing

Model 103

Suit Features

- Collar (no hood)
- 2-way front zipper with resealable storm flap
- Finger loops
- Elasticated waist, wrists & ankles

Sizes: S-5XL
Colour: Yellow

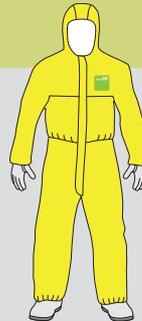


Model 111

Suit Features

- 3-piece hood
- 2-way front zipper with resealable storm flap
- Finger loops
- Elasticated hood, waist, wrists & ankles

Sizes: S-5XL
Colour: Yellow



Model 122

Suit Features

- 3-piece hood
- 2-way front zipper with resealable storm flap
- Finger loops
- Elasticated hood, waist, wrists & ankles
- Boot end with anti-slip soles

Sizes: S-5XL
Colour: Yellow



Model 156

Suit Features

- 3-piece hood
- 2-way front zipper with resealable storm flap
- Finger loops
- Elasticated hood, waist, wrists, ankles & overflaps
- Integrated socks with boot overlap

Sizes: S-5XL
Colour: Yellow



MICROGARD® 2300 COMFORT

MICROGARD®
2300
COMFORT



MICROGARD® 2300 COMFORT has been engineered with workers involved in composites manufacturing and related industries in mind, to offer protection where you need it most and ventilation to help reduce the risk of heat stress.

The critical areas to the front of the garment (including the hood, arms and legs) are MICROGARD® 2300, offering an excellent barrier to resins, fibres and many other hazards associated with composites manufacturing. The construction of the fabric ensures that there is no risk of delamination, and subsequent contamination of the composite, should a wearer make contact with a tacky surface.

The back panel is MICROGARD® 1500 PLUS fabric which is air and water vapour permeable whilst providing a good barrier to fibres and particulates. This panel allows airflow around the suit, increasing wearer comfort. Air permeability result according to EN ISO 9237 of 160 L/m²·s and R_{et} 2.

MICROGARD® 2300 COMFORT Coverall

Protection Levels & Additional Properties



TYPE 5



TYPE 6



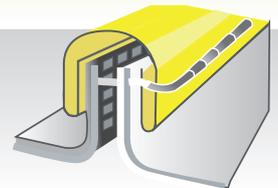
EN 1073-2



EN 1149-5

Bound Seams

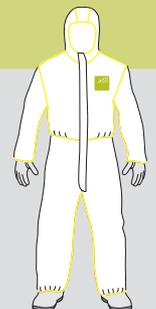
Superior strength, liquid and particle barrier



Model 129

Features & Benefits

- **Protection** - Hood, arms, legs and front torso in MICROGARD® 2300 fabric, which is an excellent barrier to resins and fibre
- **Innovation** - Fabric construction ensures that there is no risk of delamination should a wearer make contact with a tacky surface
- **Comfort** - Air and water vapour permeable ("breathable") back panel ventilates the suit, to help reduce the risk of heat stress
- **Silicone Free** - Critical in spray painting applications
- **Anti-static** - Tested according to EN 1149-5
- 3-piece hood – ensures a good fit with half & full face respirators
- Elasticated hood, wrists, waist and ankles
- Finger loops, prevent sleeve movement whilst working above your head
- 2-way front zipper with resealable storm flap
- Breathable SMS back panel



Sizes: S-5XL
Colour: White

Applications

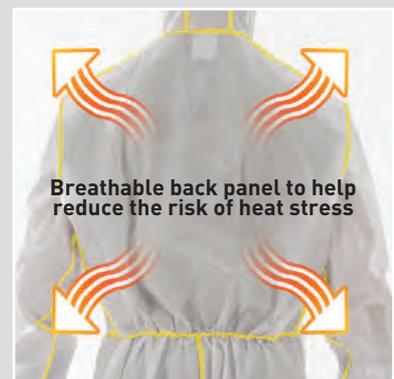
- Composites manufacturing
- Pharmaceutical industry
- General maintenance



3-piece hood



Finger Loops



Breathable SMS back panel

Breathable back panel to help reduce the risk of heat stress

MICROGARD® 2300 PLUS

MICROGARD®
2300
PLUS

MICROGARD® 2300 PLUS is an entry level Type 3 chemical protective coverall for workers involved in environmental clean-up, general industrial and chemical handling applications.

MICROGARD® 2300 fabric is comprised of a polyethylene (PE) barrier coating with a bi-component nonwoven inner layer, the combination of which provides an excellent barrier to many harmful chemicals while being lightweight and yet relatively strong and durable.

MICROGARD® 2300 PLUS Coverall

Protection Levels & Additional Properties



TYPE 3-B



TYPE 4-B



TYPE 5-B



EN 1073-2



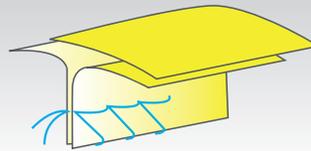
EN 14126



EN 1149-5

Stitched & Taped Seams

Internal stitching which is overtaped to offer increased strength and an effective barrier to liquids and particulates.



Model 132

Features & Benefits

- **Protection** - Polycoated bi-component barrier resists permeation of numerous liquid chemicals
- **Highly visible** - Bright yellow for improved worker safety
- **Comfort** - Lightweight yet relatively strong and durable
- **Anti-static** - Tested according to EN 1149-5
- **Designed to protect** - Typical coverall features include respirator fit hood and a zip flap with self-adhesive tape closure
- 3-piece hood
- Elasticated hood, wrists, waist and ankles
- 2-way front zipper with resealable storm flap
- Finger loops



Sizes: S-5XL

Colour: Yellow



3-piece hood



Finger Loops



2-way front zip



Applications

- Environmental clean-up
- Sewage purification installations
- Industrial and Chemical manufacturing
- Industrial Cleaning

MICROGARD® 2500



Features & Benefit

Protection - Achieves the highest classification for protection from biological agents in accordance with EN 14126:2003 and ASTM F 1671 for penetration of blood, body fluids and blood-borne pathogens

Comfort - Moisture vapour permeable ("breathable") to help reduce the risk of heat stress

Anti-static - Tested according to EN 1149-5

Ultra Low linting - Reduced risk of contamination in critical areas

Applications

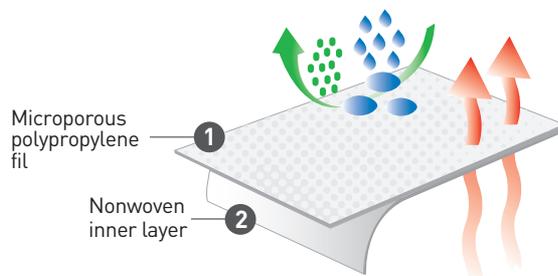
- Viral contaminated areas (including Avian Influenza)
- Biological protection
- Emergency medical response
- Medical research
- Chemical and pharmaceutical industries
- Low pressure industrial cleaning
- Industrial paint spraying
- Nuclear industry



MICROGARD® 2500 is a unique material offering exceptional mechanical strength, liquid and particulate protection.

MICROGARD® 2500

MICROGARD® 2500 is a durable microporous polypropylene laminate which provides an excellent barrier to chemical spray and infective agents. This specialist fabric is also breathable to help ensure user comfort. The fabric's physical strength and flexibility ensures protection and comfort even in the harshest environments.



Protection Levels & Additional Properties



TYPE 4-B



TYPE 5-B



TYPE 6-B



EN 1073-2



EN 1149-5



EN 14126

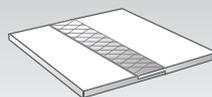


TYPE 3-B

MICROGARD® 2500 PLUS in addition is approved to Type 3-B certification

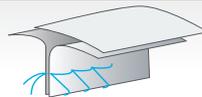
Ultrasonically Welded Seams (STANDARD)

Provides a strong liquid and particle barrier



Stitched & Taped Seams (PLUS)

Increased strength and an effective liquid & particle barrier



Innovative Design Features



Finger loops to prevent sleeve movement when working above your head

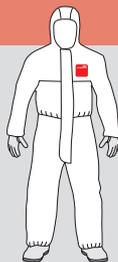


Hoods designed for optimum fit with respirators, particularly full face masks

Model 111

Suit Features

- 3-piece hood
- Elasticated hood, wrist, waist & ankles
- Finger loops
- Red single zip with resealable storm flap (STANDARD)
- White 2-way zip with resealable storm flap (PLUS)



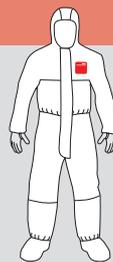
Sizes: S-5XL

Colour: White

Model 122

Suit Features

- 3-piece hood
- Elasticated hood, wrists & waist
- Finger loops
- Red single zip with resealable storm flap (STANDARD)
- Bootends and anti-slip sole (STANDARD)
- White 2-way zip with resealable storm flap (PLUS)
- Integrated socks with boot overlap (PLUS)



Sizes: S-5XL

Colour: White

Specialist Approvals

MICROGARD® 2500 has passed a range of specialist test methods including:



Biological Agents

EN 14126:2003
See page 10

Technical Support

Technical datasheets & product flyers available to download at:

www.microgard.com or by emailing technical@microgard.com



MICROGARD® 2500 Range Overview

MICROGARD® 2500 STANDARD & PLUS

Low concentration liquid chemical repellence, particle protection and barrier to biological agents.



▲ MICROGARD® 2500 STANDARD - See page 37

MICROGARD® 2500 PLUS AIRline

One-piece suits designed for use in combination with belt-mounted, continuous flow airline regulator



▲ MICROGARD® 2500 PLUS AIRline- See page 53

MICROGARD® 2500 PLUS PAPP

Encapsulated suit provides respiratory and full body protection.



▲ MICROGARD® 2500 PLUS PAPP - See page 54

MICROGARD® 2500

MICROGARD® 2500 Technical Data

MICROGARD® 2500 is extensively tested in accordance with statutory requirements, including physical performance attributes and barrier to hazardous substances. The following tables outline the results obtained in independent laboratories according to European test methods.

Test Method	Result	EN Class (EN 14325)
EN 530 Abrasion	>100 Cycles	2 of 6
EN ISO 7854 Flex Cracking	>40,000 Cycles	5 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>20 N	2 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>20 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>100 N	3 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>100 N	
EN 863 Puncture Resistance	>100 N	2 of 6
EN ISO 13938-1 Burst Resistance	>80 kPa	2 of 6
EN 1149-5 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	-
ISO 13935-2 Seam Strength	>125 N	4 of 6
Comfort Test Method	Result	
ISO 5636-5 Air Permeability: Gurley Method (s 100 cm ²)	>500	
EN 31092/ISO 11092 Water Vapour Resistance (R _{et}) (m ² ·Pa/W)	23	
EN 31092/ISO 11092 Thermal Resistance (R _{ct}) (m ² ·K/W)	0.019	
Water Vapour Permeability Index (WVPI)	0.050	
Clothing insulation (clo) value	0.125	

MICROGARD® 2500 has been tested against numerous chemicals. For further information on permeation testing and a more extensive list of chemicals see page 74 onwards.

EN ISO 6529 Chemical Permeation Test Results			
Chemical Name	CAS Number	BT at 1.0µg/cm ² /min (min)	EN Class (EN 14325)
Sodium Hydroxide (10% w/w)	1310-73-2	>480	6 of 6
Sulphuric Acid (96% w/w)	7664-93-9	>480	6 of 6

The following table sets out MICROGARD® 2500 performance for resistance to chemical penetration in accordance with EN ISO 6530. For further information on penetration testing see page 73.

Fabric Repellence & Penetration - Resistance to Liquid Chemicals	Result (%)	EN Class
Repellence of Liquids - 30% Sulphuric Acid	>95	3 of 3
Repellence of Liquids - 10% Sodium Hydroxide	>95	3 of 3
Repellence of Liquids - n-heptane (undiluted)	>80	1 of 3
Repellence of Liquids - Isopropanol	>90	2 of 3
Resistance to penetration by liquids - 30% Sulphuric Acid	<1	3 of 3
Resistance to penetration by liquids - 10% Sodium Hydroxide	<1	3 of 3
Resistance to penetration by liquids - n-heptane (undiluted)	<1	3 of 3
Resistance to penetration by liquids - Isopropanol	<1	3 of 3

MICROGARD® 2500 when tested in accordance with EN 14126:2003 demonstrates an excellent barrier to infective agents. The specific test results are detailed in the table below and for further information on this European Norm see page 8.

EN 14126 Fabric Barrier to Infective Agents	Result	EN Class
ISO 16603 Resistance to penetration by blood/fluids under pressure	Pass to 20 kPa	n/a
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	Class 6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

MICROGARD® 2500 products have been extensively tested according to European and International requirements, including ASTM, for both physical and barrier performance. More details can be found on our website www.microgard.com

MICROGARD® 2500 Accessories

MICROGARD®
2500

MICROGARD® 2500 Accessories



Model 400 Overshoes

- Elasticated opening
- Bound seams

Size: One Size
(fits size 42-46)
Colour: White



Model 406 Overboots

- Elastic to top of boot
- Tie fastening

Size: One Size
(fits size 42-46)
Colour: White



Model 407 Overboots - ESD

- Elasticated opening
- Anti-slip sole
- Adjustable Shoe Tie
- Bound seams
- ESD PVC Sole

Size: 42-46 **Colour:** White



Model 409 SOCO Overboots

- Tie fastening
- Blue binding to seams
- Reinforced Surestep non-slip soles
- Adjustable shoe tie

Size: One Size
(fits size 42-46)
Colour: White



Model 213 Apron

- Tie fastening to waist
- 100 cm long tie fastening

Size: One Size **Colour:** White



Model 203 Lab Coat

- Collar
- Stud front fastening
- Left breast pocket
- Lower right pocket
- Bound seams

Size: S-3XL **Colour:** White



Model 503 Cape Hood

- Balaclava Style
- Elasticated face opening
- Bound seams

Size: One Size
Colour: White



Model 507 Cape Hood

- Balaclava style cape hood covering part of shoulders
- Velcro fastening to front
- Bound seams

Size: One Size
Colour: White



Model 600 Oversleeves

- Elasticated at both ends
- Bound seams

Size: One Size
Colour: White

MICROGARD® SURE STEP Overshoes

The MICROGARD® SURE STEP Overshoes feature a revolutionary monofilament coating that offers excellent anti-slip properties (confirmed by independent laboratory tests). This unique coating also makes MICROGARD® SURE STEP™ stronger and more durable than traditional CPE overshoes, resulting in a safer yet more economical product.

Features include

- Liquid resistant material
- Low linting
- Generous sizing to accommodate shoe size 42-48
- Anti-static to EN 1149-1
- Available in white or blue



MICROCHEM® 3000



Features & Benefit

Protection - Multi-layer barrier fabric effective against numerous chemicals

Highly visible - Bright yellow for improved worker safety

Comfort - Lightweight yet durable

Anti-static - Tested according to EN 1149-5

Designed to protect - Typical coverall features include dual zip systems and double cuffs

Applications

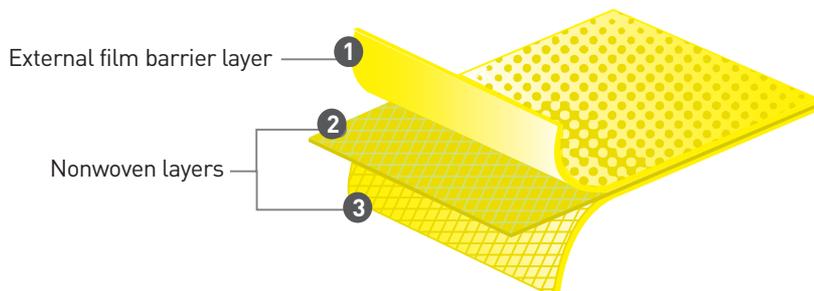
- Chemicals
- Oil and petrochemicals
- Pharmaceutical
- Food industry (caustic clean downs)
- Sewage purification installations
- Industrial and tank cleaning
- Mining



MICROCHEM® 3000 is one of the lightest and most comfortable chemical protective materials on the market today. This durable multi-layer fabric provides an extremely effective barrier against both inorganic chemicals and biological hazards.

MICROCHEM® 3000

One of the lightest and most comfortable chemical protective garments on the market today this durable multi-layer fabric provides an extremely effective barrier against both inorganic chemicals and biological hazards.

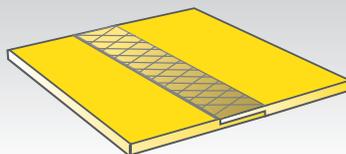


Protection Levels & Additional Properties

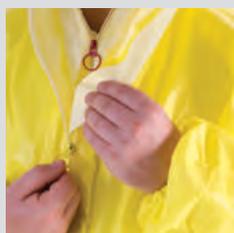


Ultrasonically Welded Seams

Provides a strong liquid and particle barrier



Innovative Design Features



Double zip system helps ensure a liquid tight seal without the need for additional taping



Double cuff design to enable a spray-tight connection with chemical protective gauntlets (additional taping or Glove Link is required)

Specialist Approvals

MICROCHEM® 3000 has passed a range of specialist test methods including:



Biological Agents
EN 14126:2003
See page 10



Suitable for Ex-Zones
See page 11

Technical Support

Contact the Ansell Microgard technical team to discuss facilitating independent permeation testing of your specific chemical or chemical mixture

Email: technical@microgard.com

Technical datasheets & product flyers available to download at: www.microgard.com



MICROCHEM® 3000 Range Overview

MICROCHEM® 3000

Protection against concentrated inorganic chemicals & biological agents.



▲ MICROCHEM® 3000

MICROCHEM® 3000 PAPR

Encapsulated suit provides respiratory and full body protection.



▲ MICROCHEM® 3000 PAPR - See page 45

MICROCHEM® 3000 AIRline

One piece suit designed for use in combination with belt mounted, continuous flow airline regulators



▲ MICROCHEM® 3000 AIRline- See page 53

MICROCHEM® 3000

MICROCHEM® 3000 Technical Data

MICROCHEM® 3000 is extensively tested in accordance with statutory requirements, including physical performance attributes and barrier to hazardous substances. The following tables outline the results obtained in independent laboratories according to European test methods.

Test Method	Result	EN Class (EN14325)
EN 530 Abrasion	>500 Cycles	3 of 6
EN ISO 7854 Flex Cracking	>100,000 Cycles	6 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>20 N	2 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>20 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>100 N	2 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>60 N	
EN 863 Puncture Resistance	>10N	2 of 6
EN ISO 13938-1 Burst Resistance	>80 kPa	2 of 6
EN 13274-4 Resistance to ignition	Pass	-
EN 1149-5 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	-
ISO 13935-2 Seam Strength	>125 N	4 of 6

MICROCHEM® 3000 has been tested against over 125 chemicals. For further information on permeation testing and a more extensive list of chemicals see page 74 onwards.

EN ISO 6529 Chemical Permeation Test Results			
Chemical Name	CAS Number	BT at 1.0 µg/cm ² /min (min)	EN Class (EN 14325)
Acetic Acid (Glacial)	64-19-7	>480	6 of 6
Ethylene Glycol	107-21-1	>480	6 of 6
Ferric Chloride (45% w/w)	7705-08-0	>480	6 of 6
Formic Acid (90%)	64-18-6	>480	6 of 6
Hexamethylene Diisocyanate	822-06-0	>480	6 of 6
Hydrazine Monohydrate (98%, containing Hydrazine, 64-65% w/w)	7803-57-8	>480	6 of 6
Hydrochloric Acid (36-37% w/w)	7647-01-0	>480	6 of 6
Hydrofluoric Acid (49% w/w)	7664-39-3	>480	6 of 6
Hydrogen Peroxide (35% w/w)	7722-84-1	>480	6 of 6
Isopropyl Alcohol	67-63-0	>480	6 of 6
Mercury	7439-97-6	>480	6 of 6
Methanol	67-56-1	>480	6 of 6
Nitrobenzene	98-95-3	>480	6 of 6
Perchloric Acid (30% w/w)	7601-90-3	>480	6 of 6
Sodium Hydroxide (40% w/w)	1310-73-2	>480	6 of 6
Sodium Hypochlorite Solution (14.5% available chlorine)	7681-52-9	>480	6 of 6
Sulphuric Acid (96% w/w)	7664-93-9	>480	6 of 6
Tetramethylammonium Hydroxide (20% w/w)	75-59-2	>480	6 of 6

MICROCHEM® 3000 when tested in accordance with EN 14126:2003 demonstrates an excellent barrier to infective agents. The specific test results are detailed in the table below and for further information on this European Norm see page 8.

EN 14126 Barrier to Infective Agents	Result	EN Class
ISO 16603 Resistance to penetration by blood/fluids under pressure	Pass to 20 kPa	n/a
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	3 of 3

MICROCHEM® 3000 products have been extensively tested according to European and International requirements, including ASTM, for both physical and barrier performance. More details can be found on our website www.microgard.com

MICROCHEM® 3000 Coverall Models

Model 103

Suit Features

- Collar
- Double zip closure
- Double cuffs
- Elasticated waist, double cuffs & ankles

Sizes: S-5XL
Colour: Yellow



Model 111

Suit Features

- 2-piece hood
- Double zip closure
- Double cuffs
- Elasticated hood, waist, double cuffs & ankles

Sizes: S-5XL
Colour: Yellow

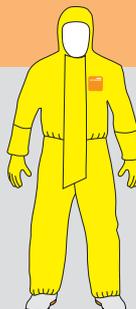


Model 121

Suit Features

- 2-piece hood
- Double zip closure
- Elasticated hood, waist, ankles & sleeve over cuffs
- Attached Ansell Barrier Gloves

Sizes: S-5XL
Colour: Yellow



Model 122

Suit Features

- 2-piece hood
- Double zip closure
- Elasticated hood, double cuffs & waist
- Integrated socks with boot overlap

Sizes: S-5XL
Colour: Yellow

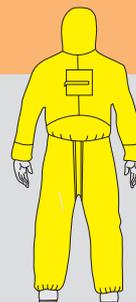


Model 162

Suit Features

- Pass-thru device for use with fall arrest equipment
- 2-piece hood
- Double zip closure
- Double cuffs
- Elasticated hood, waist, double cuffs & ankles
- Ultrasonically Welded & Taped Seams

Sizes: S-5XL
Colour: Yellow



MICROCHEM® 3000 Accessories

MICROCHEM®
3000

MICROCHEM® 3000 Accessories



Model **201** Jacket

- 2-piece hood
- Single zip closure
- Elasticated hood, wrists and hem
- Welded seams

Sizes: S-3XL Colour: Yellow



Model **214** Apron with Sleeves

- Rear velcro fastening
- Elasticated wrists
- Welded seams

Sizes: S-3XL Colour: Yellow



Model **400** Overshoes

- Elasticated opening
- Welded seams

Size: One Size (fits size 42-46)
Colour: Yellow



Model **406** Overboots

- Elastic to top of boot
- Tie fastening
- Welded seams

Size: One Size (fits size 42-46)
Colour: Yellow



Model **213** Apron

- Tie fastening to waist
- 100 cm long tie fastening

Size: One Size Colour: Yellow



Model **301** Trousers

- Elastication to waist and ankles
- No pockets
- Welded seams

Sizes: S-3XL Colour: Yellow



Model **507** Cape Hood

- Balaclava style cape hood covering part of shoulders
- Velcro fastening to front
- Welded seams

Size: One Size
Colour: Yellow



Model **508** Cape Hood with visor

- Balaclava style cape hood covering part of shoulders
- Welded seams
- Visor to face opening

Size: One Size
Colour: Yellow



Model **600** Oversleeves

- Elasticated at both ends
- Welded seams

Size: One Size
Colour: Yellow

PAPR

MICROGARD®
2500
PLUS PAPR

MICROCHEM®
3000
PAPR

MICROCHEM®
4000
PAPR

Providing complete protection from liquid and particulate hazards!

Ventilated suits with filtered air and MICROGARD®/MICROCHEM® technology providing head and body protection from hazardous substances.

Features & Benefit

- **Double elasticated cuffs** - Enables a liquid tight connection with chemical protective gloves (additional taping or Glove Link is required)
- **Air permeable SMS collar** - Maintains sufficient air in the breathing zone whilst allowing excess air to flow into the body of the suit
- **Four exhalation valves** - Exhalation valves fitted to the rear of the suit allows CO₂ to escape and equalises pressure within the suit, allowing a full range of movement without risk of excessive pressure causing harm to the suit or the wearer
- **Model 700, 701 & 704 - Attached socks with elasticated boot overlap** - Socks are designed to be worn inside chemical protective boots with the leg overlap worn outside to reduce the potential for chemical ingress.
Model 705 - Attached boot ends with anti-slip PVC sole version also available.
- **Panoramic visor design** - Ensures a good field of vision for the wearer
- **Emergency rip cord** - Permits rapid doffing of the suit in cases of emergency or undue distress to the wearer



Ventilated Chemical Protective Clothing Catalogue

AVAILABLE
www.microgard.com



TYPE 3-B



TYPE 4-B



TYPE 5-B



EN 1073-2



EN 1149-5



EN 14126



EN 12941

Respiratory protective device

Approved to EN 12941 TH3 with an Assigned Protection Factor (APF) of 40*

*UK APF according to Annex C of EN 529:2005. The APF means the factor by which the hazard is reduced, i.e. how many times cleaner the air is inside the hood than outside

MICROGARD® & MICROCHEM® PAPR coveralls are certified for use in combination with the below fan units and filters.

Sundström



SR500 / SR500EX PAPR fan units & filters**

Model 700

SCOTT
SAFETY



Proflow SC / EX fan units and filters**

Model 701

CleanAIR®



Chemical 2F Plus fan unit and filters**

Model 704 & 705

** Please note: Sundström, Scott and CleanAIR fan units, breathing hoses and filters sold separately. For advice please contact your distributor.

MICROCHEM® 4000



Features & Benefit

Protection - Permeation tested against over 190 chemicals, including chemical warfare agents

Comfort - Textile like inner improves wearer acceptance

Anti-static - Tested according to EN 1149-5

Designed to protect - Typical coverall features include dual zip systems and double cuffs

Applications

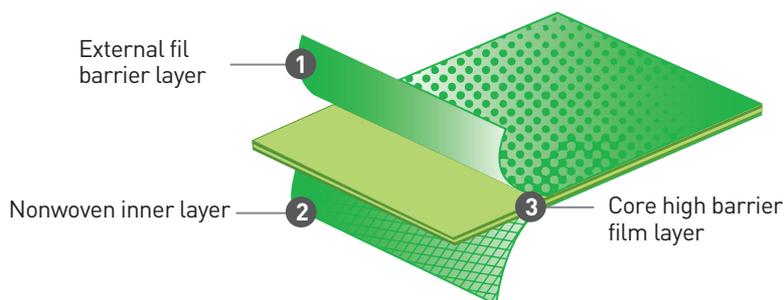
- Chemical handling / transportation
- Oil-based mud protection
- Hazardous waste remediation
- Sewage purification installations
- Industrial / tank cleaning
- HAZMAT Emergency Response (i.e. Level B)
- Pharmaceutical
- Mining
- Agriculture



MICROCHEM® 4000 is designed to provide an exceptional barrier against organic and inorganic chemicals and biological agents.

MICROCHEM® 4000

A unique multi-layer barrier fabric renowned for its lightweight, yet robust textile feel and exceptional barrier to organic & inorganic chemicals.



MICROCHEM® 4000 Range Overview

MICROCHEM® 4000

Protection against concentrated organic and inorganic chemicals.



▲ MICROCHEM® 4000

MICROCHEM® 4000 APOLLO

Encapsulated Type 3 suit developed in conjunction with the UK Fire & Rescue Services.



▲ MICROCHEM® 4000 APOLLO - See page 50

MICROCHEM® 4000 Model 151

Developed for the HAZMAT response. Rubber face seal for use with full face respirators.



▲ MICROCHEM® 4000 151 - See page 51

MICROCHEM® 4000 PAPR & AIRline

Encapsulated suit provides respiratory and full body protection.



▲ MICROCHEM® 4000 PAPR - See page 45

Protection Levels & Additional Properties



TYPE 3-B



TYPE 4-B



TYPE 5-B



EN 14126



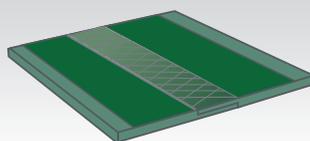
EN 1073-2



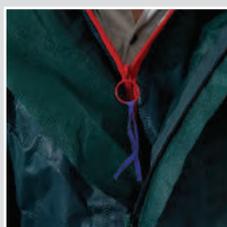
EN 1149-5

Ultrasonically Welded & Taped Seams

A feature throughout the MICROCHEM® 4000 range, this seam technology is our highest barrier to liquid and particulates.



Innovative Design Features



Double zip system helps ensure a liquid tight seal without the need for additional taping



Double cuff design to enable a spray-tight connection with chemical protective gauntlets (additional taping or Glove Link is required)

Specialist Approvals

MICROCHEM® 4000 has passed a range of specialist testing methods including:



Biological Agents
EN 14126:2003
See page 10



Suitable for Ex-Zones
See page 11

Technical Support

Contact the Ansell Microgard technical team to discuss facilitating independent permeation testing of your specific chemical or chemical mixture

Email: technical@microgard.com

Technical datasheets & product flyers available to download at: www.microgard.com



MICROCHEM® 4000

MICROCHEM® 4000 Technical Data

MICROCHEM® 4000 is extensively tested in accordance with statutory requirements, including physical performance attributes and barrier to hazardous substances. The following tables outline the results obtained in independent laboratories according to European test methods.

Test Method	Result	EN Class (EN 14325)
EN 530 Abrasion	>2,000 Cycles	6 of 6
EN ISO 7854 Flex Cracking	>40,000 Cycles	5 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>60 N	3 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>40 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>100 N	2 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>60 N	
EN 863 Puncture Resistance	>10 N	2 of 6
EN ISO 13938-1 Burst Resistance	>80 kPa	2 of 6
EN 13274-4 Resistance to ignition	Pass	-
EN 13274-4 Resistance to flam	Pass	1 of 3
EN 1149-5 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	-
ISO 13935-2 Seam Strength	>125 N	4 of 6

MICROCHEM® 4000 has been tested against over 190 chemicals. For further information on permeation testing and a more extensive list of chemicals see page 74 onwards.

EN ISO 6529 Chemical Permeation Test Results			
Chemical Name	CAS Number	BT at 1.0µg/cm ² /min	EN Class (EN 14325)
Acetone	67-64-1	>480	6 of 6
Acetonitrile	75-05-8	>480	6 of 6
Chlorine (Gas, 1 atmos.)	7782-50-5	>480	6 of 6
Chromium Trioxide (50% w/w)	1333-82-0	>480	6 of 6
Ethyl Acetate	141-78-6	>480	6 of 6
Heptane, n-	142-82-5	>480	6 of 6
Hydrofluoric Acid (71-75% w/w)	7664-39-3	>480	6 of 6
Hydrogen Chloride (Gas, 1 atmos.)	7647-01-0	>480	6 of 6
Hydrogen Peroxide (35% w/w)	7722-84-1	>480	6 of 6
Methanol	67-56-1	>480	6 of 6
Methyl Ethyl Ketone	78-93-3	>480	6 of 6
Nitric Acid (70% w/w)	7697-37-2	>480	6 of 6
Sodium Hydroxide (40% w/w)	1310-73-2	>480	6 of 6
Sulphuric Acid (96% w/w)	7664-93-9	>480	6 of 6
Toluene	108-88-3	>480	6 of 6

FINABEL 0.7.C – Resistance to permeation of Chemical Warfare Agents			
Chemical	Detection Limit	Temperature (°C)	Breakthrough Time (hh:mm)
Mustard (HD)	0.1 µg/cm ² (pinpoint BT) or 4 µg/cm ² (continuous and homogeneous BT)	37	>24:00
Lewisite (L)	Approx. 0.5 µg/cm ²	37	>05:00<06:00
Sarin (GB)	Approx. 0.05 µg/cm ²	37	>24:00
VX	Approx. 0.05 µg/cm ²	37	>24:00

MICROCHEM® 4000 when tested in accordance with EN 14126:2003 demonstrates an excellent barrier to infective agents. The specific test results are detailed in the table below and for further information on this European Norm see page 8.

EN14126 Barrier to Infective Agents	Result	EN Class
ISO 16603 Resistance to penetration by blood/fluids under pressure	Pass to 20 kPa	n/a
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	Class 6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

MICROCHEM® 4000 products have been extensively tested according to European and International requirements, including ASTM, for both physical and barrier performance. More details can be found on our website www.microgard.com

MICROCHEM® 4000 Coverall Models

Model 103

Suit Features

- Collar
- Double zip closure
- Double cuffs with knitted inner cuff
- Elasticated outer cuffs, waist & ankles

Sizes: S-5XL
Colour: Green



Model 111

Suit Features

- 2-piece hood
- Double zip closure
- Double cuffs with knitted inner cuff
- Elasticated hood, outer cuffs, waist & ankles

Sizes: S-5XL
Colour: Green



Model 121

Suit Features

- 2-piece hood
- Double cuffs
- Double zip closure
- Elasticated hood, waist and ankles
- Attached Ansell Barrier Gloves

Sizes: S-5XL
Colour: Green



Model 122

Suit Features

- 2-piece hood
- Double zip closure
- Double cuffs with knitted inner cuff
- Elasticated hood, outer cuffs, waist & boot overflap
- Integrated socks with boot overflap

Sizes: S-5XL
Colour: Green



Model 125

Suit Features

- 2-piece hood
- Double cuffs
- Double zip closure
- Elasticated hood, waist & boot overflap
- Integrated socks with boot overflap
- Attached Ansell Barrier Gloves

Sizes: S-5XL Colour: Green



Model 162

Suit Features

- Pass-thru device for use with fall arrest equipment
- 2-piece hood
- Double zip closure
- Double cuffs with knitted inner cuff
- Elasticated hood, outer cuffs, waist & ankles

Sizes: S-5XL Colour: Green



MICROCHEM® 4000 APOLLO

MICROCHEM®
4000
APOLLO



Trusted by fire and rescue crews around the world

Developed with the UK Fire & Rescue services, MICROCHEM® 4000 APOLLO is a fully encapsulated liquid tight chemical suit designed for use in conjunction with self-contained breathing apparatus (SCBA)

MICROCHEM® 4000 APOLLO

Protection Levels & Additional Properties



TYPE 3-B



TYPE 4-B



EN 14126

Applications

- Chemicals
- Oil and petrochemicals
- Pharmaceutical
- Agriculture
- Sewage purification installations
- Industrial and tank cleaning
- Emergency Services (HAZMAT, CBRN)

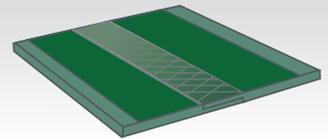
...may also be suitable for use in Level B applications

(according to US Environmental Protection Agency (EPA) & NFPA guidelines).

Contact the Ansell Microgard technical team for full details or email technical@microgard.com

Ultrasonically Welded & Taped Seams

A feature throughout the MICROCHEM® 4000 range, this seam technology is our highest barrier to liquid and particulates.



Model 126

Suit Features

- Rear entry double zip system
- Rear mounted BA (breathing apparatus) pouch – universal fit with most BA
- Attached socks with boot overflap
- Attached Ansell Barrier® Gloves
- Exhalation valves
- Clear face visor
- Ultrasonically welded and taped seams
- Bat-wing design enables air gauge checking within the suit
- Chest strap for DSU (Distress Signal Unit)
- Adjustable internal support braces



Sizes: M-2XL

Colour: Green



Decontamination process example



SCBA rear pouch



Rear mounted BA pouch

Specialist Approvals



Biological Agents
EN 14126:2003
See page 10



Suitable for Ex-Zones
See page 11

MICROCHEM® 4000 Model 151

MICROCHEM®
4000

Developed for first responders and the emergency services

Rear entry suit, with neoprene rubber face seal for a close fit to full face respirators. Ideal for use in hazardous areas where protection against concentrated chemicals and biological agents is required.

MICROCHEM® 4000 Model 151

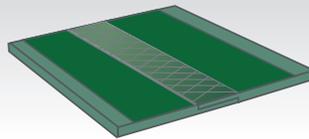


Protection Levels & Additional Properties



Ultrasonically Welded & Taped Seams

A feature throughout the MICROCHEM® 4000 range, this seam technology is our highest barrier to liquid and particulates.



Model 151 - G00 & G02

Suit Features

- Neoprene rubber face seal
- Rear horizontal zip entry
- Attached socks with boot overfla
- Ultrasonically welded and taped seams

151-G02

- Includes attached Ansell Barrier Gloves, with oversleeves and finger loops



Sizes: S-5XL

Colour: Green

Model 151 also available in...

MICROCHEM®
5000



Socks with boot overfla



Rear entry double zip system



Neoprene rubber face seal

Applications

- Chemicals
- Oil and petrochemicals
- Pharmaceutical
- Agriculture
- Sewage purification installations
- Industrial and tank cleaning
- Emergency Services (HAZMAT, CBRN)

Specialist Approvals



Biological Agents
EN 14126:2003
See page 10



Suitable for Ex-Zones
See page 11

MICROCHEM® 4000 Accessories



MICROCHEM® 4000 Accessories



Model 212 Apron

- Tie fastening to waist
- 100 cm long tie fastening

Size: One Size **Colour:** Green



Model 230 Jacket

- 2-piece hood
- Double zip closure
- Elasticated hood, wrists and hem
- Welded and taped seams
- Double cuff with knitted inner cuff

Sizes: S-3XL **Colour:** Green



Model 406 Overboots

- Elastic to top of boot
- Tie fastening
- Welded seams

Size: One Size (fits size 42-46)
Colour: Green



Model 507 Cape Hood

- Balaclava style cape hood covering part of shoulders
- Velcro fastening to front
- Welded seams

Size: One Size
Colour: Green



Model 215 Apron with Sleeves

- Velcro fastening to neck
- Tie fastening at the waist
- Double cuff with knitted inner cuff
- Welded and taped seams

Sizes: S-3XL **Colour:** Green



Model 301 Trousers

- Elastication to waist and ankles
- No pockets
- Welded & taped seams

Sizes: S-2XL **Colour:** Green



Model 516 Cape Hood with visor

- Hood with visor and 3 inch velcro body panel
- Welded & taped seams

Size: One Size
Colour: Green



Model 600 Oversleeves

- Elasticated at both ends
- Welded seams

Size: One Size
Colour: Green

AIRline



Complete protection from respiratory and skin hazards!

Ventilated / Air-Supplied suits compatible with continuous flow compressed airline breathing apparatus for protection from hazardous liquids and particulates.

Features & Benefit

- **Double elasticated cuffs** - Enables a liquid tight connection with chemical protective gloves (additional taping or Glove Link is required)
- **Air permeable SMS collar** - Maintains sufficient air in the breathing zone whilst allowing excess air to flow into the body of the suit
- **Four exhalation valves** - Exhalation valves fitted to the rear of the suit allows CO₂ to escape and equalises pressure within the suit, allowing a full range of movement without risk of excessive pressure causing harm to the suit or the wearer
- **Model 750 - Attached socks with elasticated boot overflap** - Socks are designed to be worn inside chemical protective boots with the leg overflap worn outside to reduce the potential for chemical ingress. Model 752 - Attached boot ends with anti-slip PVC sole version also available.
- **Panoramic visor design** - Ensures a good field of vision for the wearer
- **Emergency rip cord** - Permits rapid doffing of the suit in cases of emergency or undue distress to the wearer



Ventilated Chemical Protective Clothing Catalogue

AVAILABLE
www.microgard.com



CE marked to EN 1073-1:1998 with a nominal protection factor of 50,000 (Class 5 of 5)



Respiratory protective device

Please Note: Type 3 applies to MICROCHEM® 3000 and 4000 versions only.

AIRline suits are certified for use in combination with the below belt-mounted, continuous flow airline regulators.

Sundström

Sundstrom SR507

Features:

- Flow meter
- Warning whistle
- Belt-mounted control valve
- Airflow rate 175 to 260 L/min
- Working pressure 5-7 bar (500-700 kPa)
- Working temperature: -10 °C to +50 °C

www.srsafety.com



Model 750 & 752

SCOTT SAFETY

SCOTT T-A-LINE

Features:

- Very quiet in use
- Comfortable belt-mounted lightweight ergonomic design
- Easily connected with disconnection protection

www.scottsafety.com



Model 750 & 752

AVANT AIRline



Complete protection from respiratory and skin hazards!

Ventilated/air-supplied suits with an integral air-distribution system providing exceptional protection and comfort to the wearer.

The AVANT AIRline range is designed for use in combination with the MICROCHEM® AVANT STS continuous flow airline regulator with a series of options available to meet the specific requirements of your workplace.

Features & Benefit

- **Sleeve options** - A range of sleeve options available, including double cuffs and permanently attached chemical protective gloves.
- **Model 755 - Attached socks with elasticated boot overflap** - Socks are designed to be worn inside chemical protective boots with the leg overflap worn outside to reduce the potential for chemical ingress.
Model 754 - Attached boot ends with anti-slip PVC sole version also available.
- **Panoramic visor design** - Ensures a good field of vision for the wearer
- **Emergency rip cord** - Permits rapid doffing of the suit in cases of emergency or undue distress to the wearer
- **Internal distribution channels** - HEPA filter provides secondary protection from airline contamination and a SMC silencer ensures the noise inside the suit is always below 70 dB (even at maximum airflow)
- **Suit/Belt-Mounted Regulator** - Complete with low flow warning whistle the AVANT STS regulator can be mounted on the suit and removed for reuse providing cleaning and decontamination is permissible.



Respiratory protective device



TYPE 3



EN 1073-1



EN 1149-5

CE marked to EN 1073-1:1998 with a nominal protection factor of 50,000 (Class 5 of 5)



EN 14594

Please Note: Type 3 applies to MICROCHEM® 3000 and 4000 versions only.



SOLD SEPARATELY

Continuous Flow Airline Regulator /Pass-Thru Device

Features:

- Affixed by the wearer and detachable for reuse when appropriate
- Air flow adjustable from 340 L/min to 590 L/min at a working pressure of 3,5 to 5 bar
- Polyester webbing belt with YKK buckle for an assured connection should the airline be snagged or pulled
- Low flow warning whistle
- External connector mount swivels 360°
- A range of external airline connector options are available (contact Ansell Microgard Ltd or your distributor for details)

www.microgard.com

AVANT₂ AIRline



Complete protection from respiratory and skin hazards!

Ventilated/air-supplied suits with an integral suit mounted airline regulator and an air-distribution system for optimum protection and comfort.

AVANT₂ AIRline suits are supplied complete with a permanently attached airline regulator and are available with a series of optional extras to meet the specific requirements of your workplace.

Features & Benefit

- **Sleeve options** - A range of sleeve options available, including double cuffs and permanently attached chemical protective gloves.
- **Four exhalation valves** - Exhalation valves fitted to the rear of the suit allows CO₂ to escape and equalises pressure within the suit, allowing a full range of movement without risk of excessive pressure causing harm to the suit or the wearer
- **Model 757 - Attached socks with elasticated boot overlap** - Socks are designed to be worn inside chemical protective boots with the leg overlap worn outside to reduce the potential for chemical ingress. Model 756 - Attached boot ends with anti-slip PVC sole version also available.
- **Panoramic visor design** - Ensures a good field of vision for the wearer
- **Emergency rip cord** - Permits rapid doffing of the suit in cases of emergency or undue distress to the wearer
- **Internal distribution channels** - HEPA filter provides secondary protection from airline contamination and a SMC silencer ensures the noise inside the suit is always below 70 dB (even at maximum airflow)



Respiratory protective device



TYPE 3



EN 1073-1



EN 1149-5

CE marked to EN 1073-1:1998 with a nominal protection factor of 50,000 (Class 5 of 5)



EN 14594

Please Note: Type 3 applies to MICROCHEM® 3000 and 4000 versions only.



INCLUDED WITH THE SUIT

Continuous Flow Airline Regulator /Pass-Thru Device

Features:

- Permanently attached
- Air flow adjustable from 340 L/min to 590 L/min at a working pressure of 3.5 to 5 bar
- Polyester webbing belt with YKK buckle for an assured connection should the airline be snagged or pulled
- External connector mount swivels 360°
- A range of external airline connector options is available (contact Ansell Microgard Ltd or your distributor for details)

www.microgard.com



MICROCHEM® 5000



Features & Benefit

Performance - Barrier to numerous organic and inorganic chemicals and biological hazards

Comfort - Multi-layer material which is lightweight, yet strong and durable

Highly visible - Bright orange colour for improved worker safety

Protection - >480 minutes breakthrough time against 14 of 15 chemicals listed in EN ISO 6529

Anti-static - Tested according to EN 1149-5

Designed to protect - Innovative design features include liquid-tight dual zip designs without the need for additional taping

Applications

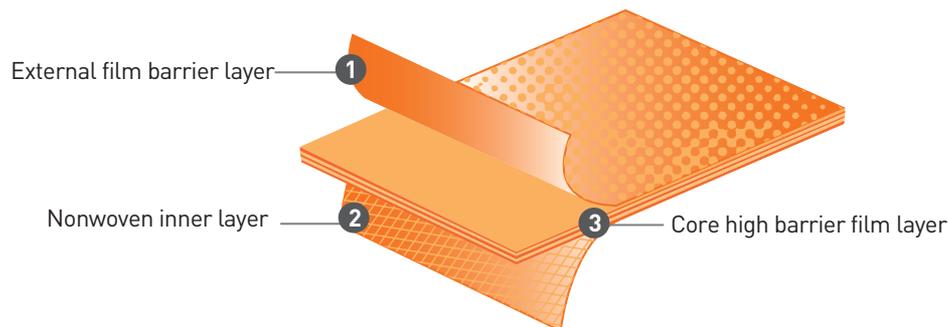
- Chemicals
- Oil and petrochemicals
- Pharmaceuticals
- Mining
- Agriculture
- First response
- Fire service
- Industrial and tank cleaning
- Sewage purification installations



MICROCHEM® 5000 reaches new levels in chemical protection and has been engineered to protect. The highly visible multi-layer fabric is strong, durable and suitable for workers in extremely hazardous areas, including HAZMAT response teams.

MICROCHEM® 5000

This highly visible innovative material is strong, durable and suitable for workers in extremely hazardous areas, including HAZMAT response teams.

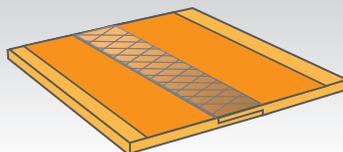


Protection Levels & Additional Properties



Ultrasonically Welded & Taped Seams

A feature throughout the MICROCHEM® 5000 range, this seam technology is our highest barrier to liquids and particulates.



Innovative Design Features



Double zip system helps ensure a liquid tight seal without the need for additional taping



Double cuff design to enable a spray-tight connection with chemical protective gauntlets (additional taping or Glove Link is required)

Specialist Approvals

MICROCHEM® 5000 has passed a range of specialist testing methods including:



Biological Agents
EN 14126:2003
See page 10



Suitable for Ex-Zones
See page 11

Technical Support

Contact the Ansell Microgard technical team to discuss facilitating independent permeation testing of your specific chemical or chemical mixture

Email: technical@microgard.com

Technical datasheets & product flyers available to download at: www.microgard.com



MICROCHEM® 5000 Range Overview

MICROCHEM® 5000

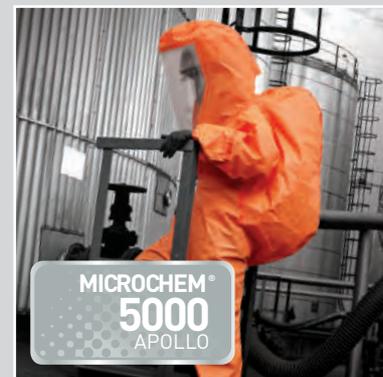
Protection against organic and inorganic chemicals and biological hazards



▲ MICROCHEM® 5000

MICROCHEM® 5000 APOLLO

Developed for fire and rescue crews around the world. A fully encapsulated liquid tight chemical suit



▲ MICROCHEM® 5000 APOLLO - See page 60

MICROCHEM® 5000 model 151

Developed for the emergency services. Rubber face seal for use with full face respirators



▲ MICROCHEM® 5000 151 - See page 61

MICROCHEM[®] 5000

MICROCHEM[®] 5000 Technical Data

MICROCHEM[®] 5000 is extensively tested in accordance with statutory requirements, including physical performance attributes and barrier to hazardous substances. The following tables outline the results obtained in independent laboratories according to European test methods.

Test Method	Result	EN Class (EN 14325)
EN 530 Abrasion	>2,000 Cycles	6 of 6
EN ISO 7854 Flex Cracking	>5,000 Cycles	3 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>60 N	4 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>60 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>100 N	3 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>100 N	
EN 863 Puncture Resistance	>10 N	2 of 6
EN ISO 13938-1 Burst Resistance	>80 kPa	2 of 6
EN 13274-4 Resistance to ignition	Pass	-
EN 13274-4 Resistance to Flame	Pass	2 of 3
EN 1149-5:2006 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	-
ISO 13935-2 Seam Strength	>125 N	4 of 6

MICROCHEM[®] 5000 has been tested against numerous chemicals. For further information on permeation testing and a more extensive list of chemicals see page 74 onwards.

EN ISO 6529 Chemical Permeation Test Results			
Chemical Name	CAS Number	BT at 1.0µg/cm ² /min	EN Class (EN 14325)
Acetone	67-64-1	>480	6 of 6
Acetonitrile	75-05-8	>480	6 of 6
Ammonia (Gas, 1 atmos.)	7664-41-7	>480	6 of 6
Carbon Disulphide	75-15-0	>480	6 of 6
Chlorine (Gas, 1 atmos.)	7782-50-5	>480	6 of 6
Diethylamine	109-89-7	>480	6 of 6
Ethyl Acetate	141-78-6	>480	6 of 6
Hexane n-	110-54-3	>480	6 of 6
Hydrogen Chloride (Gas, 1 atmos)	7647-01-0	>480	6 of 6
Methanol	67-56-1	>480	6 of 6
Sodium Hydroxide (50% w/w)	1310-73-2	>480	6 of 6
Sulphuric Acid (96% w/w)	7664-93-9	>480	6 of 6
Tetrahydrofuran	109-99-9	>480	6 of 6
Toluene	108-88-3	>480	6 of 6

FINABEL 0.7.C – Resistance to permeation of Chemical Warfare Agents			
Chemical	Detection Limit	Temperature (°C)	Breakthrough Time (hh:mm)
Mustard (HD)	Approx. 0.5 µg/cm ²	37	>17:40
Lewisite (L)	Approx. 0.5 µg/cm ²	37	>06:30<09:30
Sarin (GB)	Approx. 0.05 µg/cm ²	37	>24:00
VX	Approx. 0.05 µg/cm ²	37	>24:00

MICROCHEM[®] 5000 when tested in accordance with EN 14126:2003 demonstrates an excellent barrier to infective agents. The specific test results are detailed in the table below and for further information on this European Norm see page 8.

EN14126 Barrier to Infective Agents	Result	EN Class
ISO 16603 Resistance to penetration by blood/fluids under pressure	Pass to 20 kPa	n/a
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	Class 6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

MICROCHEM[®] 5000 products have been extensively tested according to European and International requirements, including ASTM, for both physical and barrier performance. More details can be found on our website www.microgard.com

MICROCHEM® 5000 Coverall Models

Model 103

Suit Features

- Collar
- Double zip closure
- Double cuffs with knitted inner cuff
- Elasticated outer cuffs, waist & ankles

Sizes: S-5XL
Colour: Orange



Model 111

Suit Features

- 2-piece hood
- Double zip closure
- Double cuffs with knitted inner cuff
- Elasticated hood, outer cuffs, waist & ankles

Sizes: S-5XL
Colour: Orange

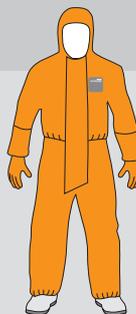


Model 121 - G02

Suit Features

- 2-piece hood
- Double cuffs
- Double zip closure
- Elasticated hood, waist & ankles
- Attached Ansell Barrier Gloves

Sizes: S-5XL
Colour: Orange



Model 122

Suit Features

- 2-piece hood
- Double zip closure
- Double cuffs with knitted inner cuff
- Elasticated hood, outer cuffs, waist & boot overflap
- Integrated socks with boot overflap

Sizes: S-5XL
Colour: Orange

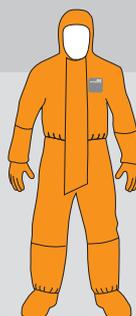


Model 125 - G02

Suit Features

- 2-piece hood
- Double cuffs
- Double zip closure
- Elasticated hood, waist & boot overflap
- Integrated socks with boot overflap
- Attached Ansell Barrier Gloves

Sizes: S-5XL
Colour: Orange



MICROCHEM® 5000 APOLLO

MICROCHEM®
5000
APOLLO



Developed for fire and rescue crews around the world

MICROCHEM® 5000 APOLLO is a fully encapsulated liquid tight chemical suit designed for use in conjunction with self contained breathing apparatus (SCBA)

MICROCHEM® 5000 APOLLO

Protection Levels & Additional Properties



TYPE 3-B



TYPE 4-B



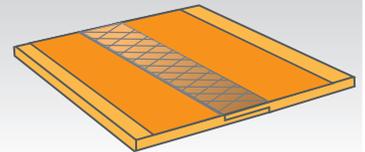
EN 14126



EN 1149-5

Ultrasonically Welded & Taped Seams

A feature throughout the MICROCHEM® 5000 range, this seam technology is our highest barrier to liquids and particulates.



Applications

- Chemicals
- Oil and petrochemicals
- Pharmaceutical
- Industrial and tank cleaning
- Emergency Services (HAZMAT, CBRN)
- May also be suitable for Level B HAZMAT response in accordance with US Environmental Protection Agency (EPA) & NFPA guidelines)

Contact the Ansell Microgard technical team for full details or email technical@microgard.com

Model 186

Suit Features

- Side entry Double Zip fla
- Expanded back for internal wearing of self-contained breathing apparatus
- Rear positioned exhalation valves
- Attached socks with static dissipative sole & leg overfla
- Attached Ansell Barrier™ gloves with sleeve overflap
- Semi-rigid multi-layer visor
- Ultrasonically welded and taped seams
- Rubber conductive sole

Sizes: M-3XL

Colour: Orange



Specialist Approvals



Biological Agents
EN 14126:2003
See page 10



Suitable for Ex-Zones
See page 11



Socks with boot overfla



Semi-rigid multi-layer visor



Attached Ansell Barrier™ gloves with sleeve overflap

MICROCHEM® 5000 Model 151

MICROCHEM®
5000



Developed for first responders and the emergency services

Rear entry suit, with neoprene rubber face seal for a close fit to full face respirators. Ideal for use in hazardous areas where protection against concentrated chemicals and biological agents is required.

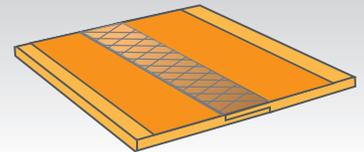
MICROCHEM® 5000 Model 151

Protection Levels & Additional Properties



Ultrasonically Welded & Taped Seams

A feature throughout the MICROCHEM® 5000 range, this seam technology is our highest barrier to liquids and particulates.



Applications

- Chemicals
- Oil and petrochemicals
- Pharmaceutical
- Agriculture
- Sewage purification installations
- Industrial and tank cleaning
- Emergency Services (HAZMAT, CBRN)

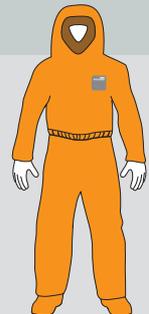
Model 151 - G00 & G02

Suit Features

- Neoprene rubber face seal
- Rear horizontal zip entry
- Attached socks with boot overflap
- Ultrasonically welded and taped seams

151-G02

- Includes attached Ansell Barrier Gloves, with oversleeves and finger loops



Sizes: S-5XL
Colour: Orange

Model 151 also available in...



Socks with boot overflap



Neoprene rubber face seal



Rear entry double zip system

Specialist Approvals



Biological Agents
EN 14126:2003
See page 10



Suitable for Ex-Zones
See page 11

MICROCHEM® 6000 Gas-Tight

MICROCHEM® 6000 GTS & GTB are Type 1a gas-tight suits. The lightweight, flexible and yet incredibly strong material provides an excellent barrier to numerous hazardous chemicals including chemical warfare agents.

This highly visible innovative material is strong, durable and meets or exceeds the minimum requirements for EN 943-1 and EN 943-2 limited-use suits.

This suit can only be worn with self-contained breathing apparatus

GTS - Gas-tight suit with socks and boot overlap

GTB - Gas-tight suit with attached wellington boots



Type 1a-B
EN 943-1:2002

Type 1a-ET-B
EN 943-2:2002
(Limited use)

EN 14126:2003

Wide range of glove, boot and pass-thru options available Please contact customer services for further details

Sizes available: Small to 2XL



DYNAT/YKK Gas-Tight zipper
Provides protection and performance in the most hostile of chemical environments. The zip has an outer zip flap made of the same material as the suit.



Two MICROCHEM® exhalation valves fitted in the hood

Visor

Provides a wide field of vision with free head movement and enough head room for use with a safety helmet.

SCBA Pass-Thru device optional

For connection to second man attachment or switch over device.

GLOVE OPTIONS

1. Interchangeable locking cuff for dual glove system (e.g. Ansell Barrier + Neoprene)



2. Permanently attached Ansell Barrier Gloves with sleeve over-cuffs
An overglove should be worn to provide mechanical strength.



BOOT OPTIONS



1. Permanently attached boots
Etche wellington boots available.



2. Attached socks with boot overlap
Must be worn with a suitable wellington boot.



MICROCHEM® 6000 Technical Data

MICROCHEM® 6000 is extensively tested in accordance with statutory requirements, including physical performance attributes and barrier to hazardous substances. The following tables outline the results obtained in independent laboratories according to European test methods.

Property	Test Method	Minimum Performance Class Required For EN 943-2:2002	MICROCHEM® 6000 Performance Class
Abrasion resistance	EN 530	4 of 6	6 of 6
Flex cracking resistance	EN ISO 7854	1 of 6	1 of 6
Flex cracking resistance at low temperatures (-30 °C)	EN ISO 7854 (-30 °C)	2 of 6	2 of 6
Trapezoidal tear resistance	EN ISO 9073-4	3 of 6	3 of 6
Tensile Strength	EN ISO 13934-1	4 of 6	4 of 6
Puncture resistance	EN 863	2 of 6	2 of 6
Resistance to Ignition	EN 13274-4	Pass	Pass
Resistance to flam	EN 13274-4	1 of 3	2 of 3
Seam strength	EN ISO 13935-2	5 of 6	5 of 6

MICROCHEM® 6000 Fabric EN 14126:2003 Results		
Test Method	Results	EC Class
ISO 16603 Resistance to penetration by blood/fluids under pressure	Pass to 20 kPa	-
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	Class 6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

Chemical permeation testing (Permeation Resistance) EN ISO 6529		MICROCHEM® 6000	GAG Visor	Ansell Barrier Glove*	ETCHE Boot*
Chemical Name	CAS Number	Breakthrough Time (1.0 µg/cm ² /min)			
Acetone	67-64-1	>480	>480	>480	>60
Acetonitrile	75-05-8	>480	>480	>480	>60
Ammonia (Gas, 1 atmos.)	7664-41-7	>480	>480	8**	>480
Butadiene 1,3-	106-99-0	>480	>480		
Carbon Disulphide	75-15-0	>480	>480	>480	>60
Chlorine (Gas, 1 atmos.)	7782-50-5	>480	>480	>480	>480
Chloromethane	74-87-3	>480	>480		
Dichloromethane	75-09-2	>480	149	59	114
Diethylamine	109-89-7	>480	>480	>480	>60
Dimethylformamide, N,N-	68-12-2	>480	>480	>480	
Ethyl Acetate	141-78-6	>480	>480	>480	>60
Ethylene Oxide (Gas, 1 atmos.)	75-21-8	>480	>480		
Heptane, n-	142-82-5	>480	>480	>480	>60
Hexane, n-	110-54-3	>480	>480		
Hydrogen Chloride (Gas, 1 atmos.)	7647-01-0	>480	>480	246	>480
Hydrogen Cyanide	74-90-8	>480	>480		
Methanol	67-56-1	>480	>480	>480	>60
Nitrobenzene	98-95-3	>480	>480		
Sodium Hydroxide (40% w/w)	1310-73-2	>480	>480	>480	>60
Sodium Hydroxide (50% w/w)	1310-73-2	>480	>480	>480	
Sulphuric Acid (95-96% w/w)	7664-93-9	>480	242	>480	>60
Tetrachloroethylene	127-18-4	>480	>480	>480	
Tetrahydrofuran	109-99-9	>480	>480	>480	>60
Toluene	108-88-3	>480	>480	>480	>60

* Gloves and Boots tested according to EN 374-3. Note: For information on the permeation resistance and mechanical performance of the outer glove please refer to the glove manufacturers instruction for use document, a copy is provided with each suit.

** ATTENTION! According to EN 943-2, as Class 2 of 6 was not achieved the glove is not suitable for use against this chemical under continuous exposure. Wearers are therefore advised that if continuous exposure to this chemical is expected, an additional outer glove should be selected which achieves at least Class 2 according to EN 943-2 requirements. For advice please contact Ansell Microgard Ltd.

MICROCHEM® 8000 Gas-Tight

MICROCHEM® 8000-GTB is a new and innovative Type 1a fully encapsulated reusable gas-tight suit. It provides excellent protection against numerous hazardous chemicals and biological agents. Certified to EN 943-1 and EN 943-2 (ET).

MICROCHEM® 8000 material consists of a polymer barrier film coated on either side with a flexible and durable synthetic rubber. Seams stitched with taping both inside and out providing a continuous barrier.



Type 1a-B
EN 943-1:2002

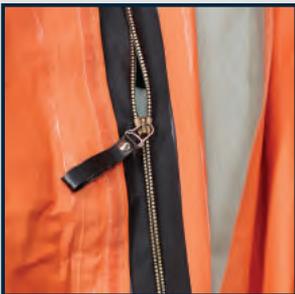
Type 1a-ET-B
EN 943-2:2002
(Re-usable)

EN 14126:2003
EN 1149-5

FEATURES AND BENEFITS

1 Anti-Fog Double layer visor provides clear undistorted vision, with a wide field of view for the wearer.

2 DYNAT/YKK Gas-Tight Zipper



- Provides protection and performance in the most hostile of chemical environments.
- The zip has an outer zip flap made of the same material as the suit and velcro fastening.
- The zip is 130 cm long, opening at the top, allowing easier and faster access to the wearer in the event of an emergency.

3 MICROCHEM® interchangeable locking cuff system

Provided as standard with double glove system consisting of an Ansell Barrier® inner plus a durable neoprene outer glove.

4 Fixed Etche FIREMAN safety boots

CE Certified to EN ISO 20345, EN 15090 & EN 13832-3

5



Two **MICROCHEM® Exhalation Valves** fit ed in the hood.

6

Optional **MICROCHEM® Ventilation System** (includes Pass-Thru as standard). Provides a constant level of overpressure inside the suit. The MICROCHEM® regulating valve has 3 ventilation rates; 3, 30 and 100 L/min) plus a zero/off position.

7

Optional **MICROCHEM® Pass-Thru** fit ed to the suit, to allow an airline connection to a second-man attachment on the wearer's breathing apparatus.

8

Reinforced knees for added durability and an extended service life.

Applications

- Chemicals
- Petrochemicals
- Pharmaceuticals
- First response
- Fire service
- Industrial and tank cleaning
- Sewage purification installations
- Health service
- Nuclear
- Shipping

Sizes available: Small to 3XL

TECHNICAL DATA

Physical performance of MICROCHEM® 8000

Property	Test Method	Minimum Performance Class Required For EN 943-2:2002	MICROCHEM® 8000 Performance Class
Abrasion resistance	EN 530	6 of 6	6 of 6
Flex cracking resistance	EN ISO 7854	4 of 6	5 of 6
Flex cracking resistance at low temperatures [-30 °C]	EN ISO 7854 [-30 °C]	2 of 6	4 of 6
Trapezoidal tear resistance	EN ISO 9073-4	3 of 6	3 of 6
Tensile Strength	EN ISO 13934-1	6 of 6	6 of 6
Puncture resistance	EN 863	3 of 6	3 of 6
Resistance to Ignition	EN 13274-4	Pass	Pass
Resistance to flame	EN 13274-4	3 of 3	3 of 3
Seam strength	EN ISO 13935-2	5 of 6	6 of 6
Electrostatic Properties (anti-static)	EN 1149-5	-	Pass

MICROCHEM® 8000 Fabric EN 14126:2003 Results

Test Method	Results	EC Class
ISO 16603 Resistance to penetration by blood/fluids under pressure	Pass to 20 kPa	-
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	Class 6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

Chemical permeation testing (Permeation Resistance) EN ISO 6529

Chemical Name	CAS Number	MICROCHEM® 8000	M8000 Visor	Ansell Barrier Glove*	Neoprene Glove *	ETCHE Boot*
		Breakthrough Time (1.0 µg/cm²/min)				
Acetone	67-64-1	>480	>480	>480	14	>60
Acetonitrile	75-05-8	>480	>480	>480	62	>60
Ammonia (Gas, 1 atmos.)	7664-41-7	>480	>480	8**		>480
Butadiene 1,3-	106-99-0	>480	>480			
Carbon Disulphide	75-15-0	>480	>480	>480		>60
Chlorine (Gas, 1 atmos.)	7782-50-5	>480	>480	>480		>480
Chloromethane	74-87-3	>480	>480			
Dichloromethane	75-09-2	>480	>480	59	5	114
Diethylamine	109-89-7	>480	>480	>480		>60
Dimethylformamide, N,N-	68-12-2	>480	>480	>480	60	
Ethyl Acetate	141-78-6	>480	>480	>480	19	>60
Ethylene Oxide (Gas, 1 atmos.)	75-21-8	>480	>480			
Heptane, n-	142-82-5	>480	>480	>480	54	>60
Hexane, n-	110-54-3	>480	>480	>480		
Hydrogen Chloride (Gas, 1 atmos.)	7647-01-0	>480	>480	246		>480
Hydrogen Cyanide	74-90-8	>480	>480			
Methanol	67-56-1	>480	>480	>480	114	>60
Nitrobenzene	98-95-3	>480	>480	>480		
Sodium Hydroxide (40% w/w)	1310-73-2	>480	>480	>480	>480	>60
Sodium Hydroxide (50% w/w)	1310-73-2	>480	>480	>480	>480	
Sulphuric Acid (95-96% w/w)	7664-93-9	>480	>480	>480	123	>60
Tetrachloroethylene	127-18-4	>480	>480	>480		
Tetrahydrofuran	109-99-9	>480	>480	>480	9	>60
Toluene	108-88-3	>480	>480	>480	10	>60

* Gloves and Boots tested according to EN 374-3. Note: For information on the permeation resistance and mechanical performance of the outer glove please refer to the glove manufacturers instruction for use document, a copy is provided with each suit.

** ATTENTION! According to EN 943-2, as Class 2 of 6 was not achieved the glove is not suitable for use against this chemical under continuous exposure. Wearers are therefore advised that if continuous exposure to this chemical is expected, an additional outer glove should be selected which achieves at least Class 2 according to EN 943-2 requirements. For advice please contact Ansell Microgard Ltd.

MICROGARD® 1500 PLUS FR



Features & Benefit

Protection - Flame retardant and anti-static SMMS nonwoven provides a good barrier to particulates and low hazard liquid sprays or splashes

Comfort - Air and water vapour permeable ("breathable") to help reduce the risk of heat stress

Anti-static - Tested according to EN1149-5

Optimised Body Fit - Ensures full freedom of movement when worn over heat and flame protective clothing (EN ISO 14116 Index 2 or above).

Applications

- Petrochemical Industry
- Industrial Cleaning
- Utilities
- General Maintenance

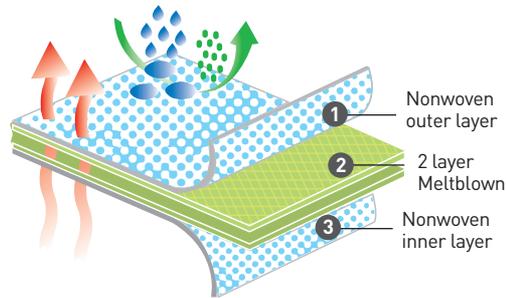


MICROGARD® 1500 PLUS FR is a highly breathable, flame retardant and anti-static SMMS polypropylene nonwoven designed for protection from particulates and light, non-flammable liquid spray or splash*.

*Must be worn over thermal protective garments, such as NOMEX®, and never be worn next to the skin.

MICROGARD® 1500 PLUS FR

Intended to be worn over heat and flame protective clothing, MICROGARD® 1500 PLUS FR offers wearers protection from particulates (Type 5) and non-flammable non-pressurised liquid sprays or splashes (Type 6)*

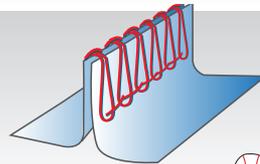


Protection Levels & Additional Properties



Stitched Seams

Combining strength with particle barrier

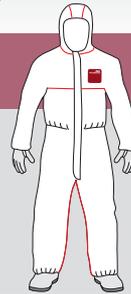


Model 111

Suit Features

- 3-piece hood
- 2-way front zipper with resealable storm fl
- Finger loops
- Elasticated hood, wrists, waist & ankles
- Red stitching for ease of identificatio

Sizes: M-5XL
Colour: White



*MICROGARD® 1500 PLUS FR should never be worn in isolation for flame retardant protection. Always wear over the top of garments which achieve EN ISO 14116 Index 2 or above.

MICROGARD® 1500 PLUS FR Technical Data

MICROGARD® 1500 PLUS FR is extensively tested in accordance with statutory requirements, including physical performance attributes.

Test Method	Result	EN Class (EN 14325:2004)
EN 530 Abrasion Resistance Method 2	>10 Cycles	1 of 6
EN ISO 7854 Flex Cracking Method B	>100,000 Cycles	6 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>40 N	2 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>20 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>100 N	2 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>60 N	
EN 863 Puncture Resistance	>5 N	1 of 6
EN ISO 13937-2 Tear Resistance	>10 N	-
EN 1149-5 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	
EN ISO 15025 Flammability Testing Procedure A	Index 1/0/0	

Fabric Repellence & Penetration - Resistance to Liquid Chemicals	Result (%)	EN Class
Repellence of Liquids - 30% Sulphuric Acid	>90	2 of 3
Repellence of Liquids - 10% Sodium Hydroxide	>95	3 of 3
Resistance to penetration by liquids - 30% Sulphuric Acid	<1	3 of 3
Resistance to penetration by liquids - 10% Sodium Hydroxide	<1	3 of 3

MICROGARD® Flame-retardant Range Overview

MICROGARD® 1500 PLUS FR

A highly breathable, flame-retardant and anti-static SMMS polypropylene nonwoven designed for protection from particulates and light liquid sprays or splashes.



▲ MICROGARD® 1500 PLUS FR

MICROGARD® FR

Offers wearers protection from liquid chemicals to EN Type 6 and particulates to EN Type 5, and peace of mind to workers in potentially explosive/flammable environments.



▲ MICROGARD® FR - See page 68

MICROCHEM® CFR

Offers wearers protection from liquid chemicals to EN Type 3 & 4 and particulates to EN Type 5, and peace of mind to workers in potentially explosive/flammable environments.



▲ MICROCHEM® CFR - See page 70

MICROGARD® FR



Features & Benefit

Protection - Flame retardant treated Sontara/ wood pulp/polyester fabric with good barrier to particulates and low level liquid spray

Comfort - Air and water vapour permeable ('breathable') to help reduce the risk of heat stress

Optimised Body Fit - Improves wearer comfort and safety

Applications

- Oil and petrochemicals
- Petroleum distribution and processing
- Utilities



MICROGARD® FR is a flame retardant material designed to be worn over woven thermal protective garments such as NOMEX®, offering protection from particulates and light liquid splash without compromising worker protection in the event of a flash fire*.

*Must be worn over thermal protective garments, such as NOMEX®, and never be worn next to the skin.

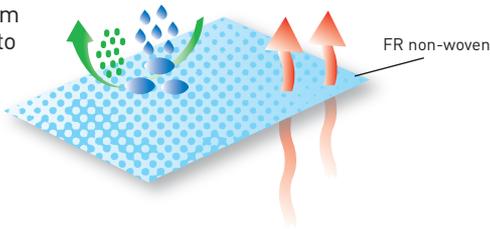


MICROGARD® FR

MICROGARD® FR will not compromise wearer protection in the event of a flash fire

MICROGARD® FR offers wearers protection from liquid chemicals to EN Type 6 and particulates to EN Type 5, and peace of mind to workers in potentially explosive/flammable environments. To decrease the risk of burn injury wear over thermal protective workwear.*

Wear over a thermal protective garment (EN ISO 14116 Index 2 or above) in areas with a risk of flash fire and where protection from low level liquid spray and particulates is required.



MICROGARD® FR

Simulated flash fire test data

EN ISO 13506

Draft standard for protective clothing against heat and flame – test method for complete garments – prediction of burn injury using an instrumented mannequin (ISO/DIS 13506:2014)

Body Burn Prediction

Flame Exposure Time: 3.5 seconds
(data acquisition time 30 seconds)*
Mean heat flux: 2 cal/cm²-sec

Protection Levels & Additional Properties



TYPE 5



TYPE 6



EN 1073-2



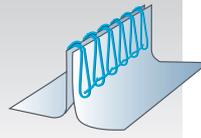
EN ISO 14116
INDEX 1/0/0



EN 1149-5

Stitched Seams

Combining strength with particle barrier



Model 111

Suit Features

- 2-piece hood
- Elasticated hood, wrists, waist & ankles
- External overlapped seams

Sizes: M-5XL
Colour: Denim Blue



*MICROGARD® FR should never be worn in isolation for flame retardant protection. Always wear over the top of garments which achieve EN ISO 14116 Index 2 or above.

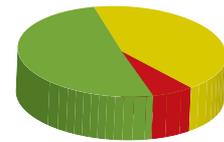
MICROGARD® FR Technical Data

MICROGARD® FR is extensively tested in accordance with statutory requirements, including physical performance attributes.

Test Method	Result	EN Class
EN 530 Abrasion (visual assessment)	>500 Cycles	3 of 6
EN ISO 7854 Flex Cracking (visual assessment)	>100,000	6 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>20 N	2 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>20 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>100 N	2 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>60 N	
EN 863 Puncture Resistance	>10 N	2 of 6
EN ISO 13938-1 Burst Resistance	>80 kPa	2 of 6
EN 13274-4 Resistance to ignition	Pass	-
EN 1149-5 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	-
ISO 13935-2 Seam Strength	>125 N	4 of 6
EN ISO 14116 Limited Flame Spread	Index 1/0/0	-

Fabric Repellence & Penetration - Resistance to Liquid Chemicals	Result (%)	EN Class
Repellence of Liquids - 30% Sulphuric Acid	>95	3 of 3
Repellence of Liquids - 10% Sodium Hydroxide	>95	3 of 3
Resistance to penetration by liquids - 30% Sulphuric Acid	<1	3 of 3
Resistance to penetration by liquids - 10% Sodium Hydroxide	<1	3 of 3

Clothing System A

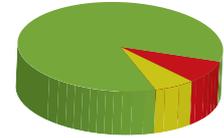


- 2nd degree burns = 43.44%
- 3rd degree burns = 6.56%
- No burn

% Total burn = 50%

Nomex® IIIA only

Clothing System B



- 2nd degree burns = 8.74%
- 3rd degree burns = 6.56%
- No burn

% Total burn = 15.3%

MICROCHEM® FR coverall over Nomex® IIIA

*MICROGARD® FR should never be worn in isolation for flame retardant protection. Always wear over the top of garments which achieve EN ISO 14116 Index 2 or above.

Note: The burn injury results are expressed by calculating the percentage burn injury based on the total area of mannequin covered by the garments under test being 100%. For these tests the head, hands and feet were therefore not included in the calculations.

Technical Support

To test MICROGARD® FR with your flame retardant workwear, contact our technical team on +44 (0) 1482 625444 or email technical@microgard.com

MICROCHEM® CFR



Features & Benefit

Protection - Flame retardant treated fabric with PVC barrier film offering wearers protection from liquid chemicals to EN Type 3 & 4

Versatile - In most applications where there is the need for protection from chemical spray without compromising wearer protection in the event of a flash fire

Optimised Body Fit - Improves wearer comfort and safety

Highly visible - Highly visible bright red colour to improve worker safety

Applications

- Oil and petrochemicals
- Petroleum distribution and processing
- Utilities



MICROCHEM® CFR is a flame retardant material designed to be worn over woven thermal protective garments such as **NOMEX®**, offering protection from particulates and pressurised liquid spray without compromising worker protection in the event of a flash fire*.

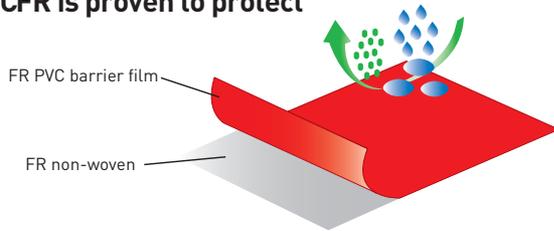
*Must be worn over thermal protective garments, such as **NOMEX®**, and never be worn next to the skin.



MICROCHEM® CFR

In high risk areas MICROCHEM® CFR is proven to protect

MICROCHEM® CFR offers wearers protection from liquid chemicals to EN Types 3 & 4 and peace of mind to workers in potentially explosive/flammable environments, by decreasing the risk of burn injury when worn over thermal protective workwear*



Wear over a thermal protective garment (EN ISO 14116 Index 2 or above) to provide chemical spray protection according to Types 3 and 4.

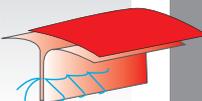
*MICROCHEM® CFR should never be worn in isolation for flame retardant protection. Always wear over the top of garments which achieve EN ISO 14116 Index 2 or above.

Protection Levels & Additional Properties



Stitched & Taped Seams

Increased strength and an effective liquid & particle barrier



Model 111

Suit Features

- 2-piece hood
- Elasticated hood, wrists & ankles
- Double zip closure

(Model 113 available featuring silver reflective tape for enhanced visibility)

Sizes: S-5XL
Colour: Red



MICROCHEM® CFR Technical Data

MICROCHEM® CFR is extensively tested in accordance with statutory requirements, including physical performance attributes.

Test Method	Result	EN Class
EN 530 Abrasion (visual assessment)	>2,000 Cycles	6 of 6
EN ISO 7854 Flex Cracking (visual assessment)	>15,000 Cycles	4 of 6
EN ISO 9073-4 Tear Resistance (Machine Direction)	>20 N	2 of 6
EN ISO 9073-4 Tear Resistance (Cross Direction)	>20 N	
EN ISO 13934-1 Tensile Strength (Machine Direction)	>100 N	2 of 6
EN ISO 13934-1 Tensile Strength (Cross Direction)	>60 N	
EN 863 Puncture Resistance	>10 N	2 of 6
EN 1149-5 Electrostatic Properties (Surface Resistance)	<2.5 x 10 ⁹ Ω	-
EN ISO 14116 Limited Flame Spread	Index 1/0/0	-

EN ISO 6529 Chemical Permeation Test Results

Chemical Name	CAS Number	BT at 1.0 µg/cm ² /min	EN Class (EN 14325)
Hydrofluoric Acid (48% w/w)	7664-39-3	199	6 of 6
Phosphoric Acid (≥ 85% w/w)	7664-38-2	> 480	6 of 6
Sodium Hydroxide (40% w/w)	1310-73-2	>480	6 of 6

MICROCHEM® CFR when tested in accordance with EN 14126:2003 demonstrates an excellent barrier to infective agents. The specific test results are detailed in the table below and for further information on this European Norm see page 8.

EN14126 Barrier to Infective Agents	Result	EN Class
ISO 16603 Resistance to penetration by blood/fluids under pressure	Pass to 20 kPa	n/a
ISO 16604 Resistance to penetration by blood borne pathogens	Pass to 20 kPa	Class 6 of 6
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)	No penetration (up to 75 min)	Class 6 of 6
ISO/DIS 22611 Resistance to biologically contaminated aerosols	No penetration	Class 3 of 3
ISO 22612 Resistance to dry microbial penetration	No penetration	Class 3 of 3

MICROCHEM® CFR

Simulated flash fire test data

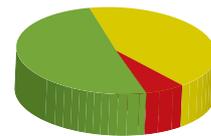
ASTM F1930

Standard test method for evaluation of flame resistant clothing for protection against flash fire simulations using an instrumented mannequin.

Body Burn Prediction

Flame Exposure Time: 3.5 seconds
(data acquisition time 30 seconds)*
Mean heat flux: 2 cal/cm²-sec

Clothing System A

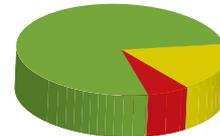


- 2nd degree burns = 43.44%
- 3rd degree burns = 6.56%
- No burn

% Total burn = 50%

Nomex® IIIA only

Clothing System B



- 2nd degree burns = 17.76%
- 3rd degree burns = 6.56%
- No burn

% Total burn = 24.32%

MICROCHEM® CFR coverall over Nomex® IIIA

Note: The burn injury results are expressed by calculating the percentage burn injury based on the total area of mannequin covered by the garments under test being 100%. For these tests the head, hands and feet were therefore not included in the calculations.

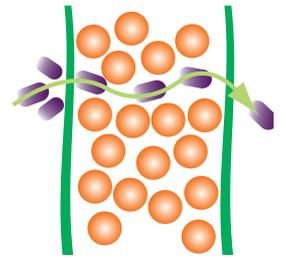
Technical Support

To test MICROCHEM® CFR with your flame retardant workwear, contact our technical team on +44 (0) 1482 625444 or email technical@microgard.com

Guidance on Chemical Permeation and Penetration

What is permeation?

Permeation is the process by which a hazardous chemical moves through a material on a molecular level. Molecules of chemical adsorb onto the outer surface of the material. They then enter and diffuse across the material and are released or desorbed from the inner surface.



Measuring Permeation

The resistance of a protective clothing fabric to permeation by a potentially hazardous chemical is determined by measuring the breakthrough time and the permeation rate of the chemical through the fabric.

Permeation Test Methods

There are various permeation test methods in use today. Which one to use depends on a number of factors including the country of use for the protective clothing, and the type of chemical (i.e. gas or liquid).

Permeation Rate (PR)

This is the rate at which the hazardous chemical permeates through the test fabric and is expressed as a mass of hazardous chemical flowing through a given fabric area per unit of time i.e. $1.0 \mu\text{g}/\text{cm}^2/\text{min}$ or one millionth of a gram per square centimetre per minute.

Breakthrough Detection Time (BDT)

The average time elapsed between initial contact of the chemical with the outside surface of the fabric and the detection of the chemical at the inside surface by the analytical device.

A breakthrough detection time of >480 min and a permeation rate below the minimum detectable permeation rate (MDPR) does not mean permeation has not occurred. It means that permeation was not detected after an observation time of eight hours. Permeation may have occurred, but at a rate less than the minimum detectable permeation rate (MDPR). MDPR can vary depending on the chemical or the analytical device/test method.

Breakthrough Time (BT)

This is the average time between initial contact of the chemical with the outside surface of the fabric and the time at which the chemical is detected at the inside surface of the fabric at the permeation rate specified by the appropriate standard.

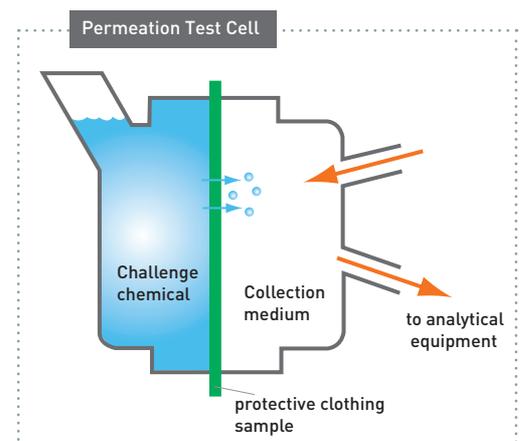
The key test methods and the normalised permeation rates required are listed below;

- 1) EN 374-3 specifies a normalised permeation rate of $1.0 \mu\text{g}/\text{cm}^2/\text{min}$, with the lowest BT to be recorded.
- 2) ISO 6529 specifies BT to be reported at the normalised permeation rate of $1.0 \mu\text{g}/\text{cm}^2/\text{min}$ or $0.1 \mu\text{g}/\text{cm}^2/\text{min}$, with the mean BT to be recorded.
- 3) ASTM F739 specifies results to be recorded a breakthrough time (BT) at $0.1 \mu\text{g}/\text{cm}^2/\text{min}$.

In Europe (as specified in EN 14325:2004) either EN 374- or EN ISO 6529:2001 can be used for permeation testing, and the normalised breakthrough time is recorded at the permeation rate of $1.0 \mu\text{g}/\text{cm}^2/\text{min}$.

The resistance of MICROCHEM® garments to permeation by a hazardous chemical is determined by measuring the breakthrough time and permeation rate of the chemical through the fabric. Permeation tests are performed by independent, accredited laboratories in accordance with EN ISO 6529, EN374-3 or ASTM F739.

For further information on MICROCHEM® resistance to permeation see pages 74-83 or visit www.microgard.com



What is penetration?

Penetration is a process by which a chemical flows through holes (i.e. pores) or essential openings in a material on a non-molecular level.



Penetration Test Methods

There are various penetration test methods in use today. Which one to use depends on a number of factors, including the country of use for the protective clothing and the task for which the chemical protective clothing will be used. Recognised penetration test methods include:

EN ISO 6530 "Gutter Test"

Test method for the measurement of indices of penetration, absorption and repellence for protective clothing materials against liquid chemicals, mainly chemicals of low volatility. Specified in EN 13034 for "Type 6" chemical protective clothing, this test involves 10 mL of liquid chemical being applied in 10 s (+/- 1 s) onto the surface of a protective clothing material, which is laid in an inclined gutter at an angle of 45°. Results are taken 1 minute after initial exposure, simulating a light splash of liquid chemicals, and expressed in percentages (%).

Example of MICROGARD® Fabric Resistance to Penetration in accordance with EN ISO 6530			
Chemical	CAS Number	MICROGARD® 1500 PLUS*	
		Repellence (%)	Penetration (%)
Sulphuric Acid (30% w/w)	7664-93-9	>95	<1
Sodium Hydroxide (10% w/w)	1310-72-2	>95	<1

*Test results for white fabric only. For test results on other colours and chemicals tested visit www.microgard.com or contact the Technical Team, e-mail technical@microgard.com

ISO 13994 "Penetration under Pressure Test"

ISO 13994 describes a series of test methods that enable the determination of the resistance of materials used in protective clothing to visible penetration under the conditions of continuous liquid contact and pressure. Protective clothing "pass/fail" determinations are based on visual detection of liquid penetration. As specified in ISO 14605 for "Type 4" spray tight chemical protective clothing, ISO 13994 test procedure D involves the continuous exposure of a material to a liquid chemical with pressure maintained at 0 kPa for 5 minutes. This is followed by increasing the pressure in increments of 3.5 kPa every 15 s until failure is observed or a maximum of 35 kPa is reached.

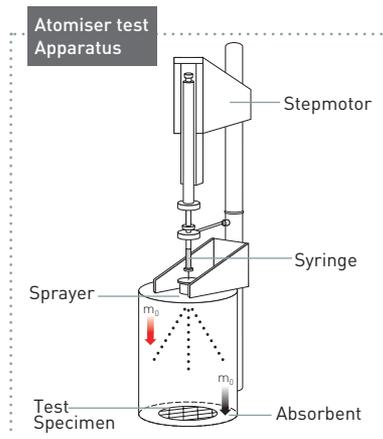
Example of MICROGARD® 2000 Resistance to Penetration Under Pressure ISO 13994, Procedure D		
Chemical	CAS Number	Result (kPa)
Sulphuric Acid (96% w/w)	7664-93-9	>14
Sodium Hydroxide (30% w/w)	1310-72-2	>14
Methanol	67-56-1	10.5
Toluene	108-88-3	7

ASTM F903

The US equivalent of ISO 13994 procedure C1. Specified in NFPA 1992 (Liquid tight protective clothing for emergency responders), this involves the continuous exposure of a material to a liquid chemical with pressure maintained at 0 psi for 5 min followed by 2 psi [13.8 kPa] for 1 min followed by 0 psi for 54 min. For details of MICROGARD® performance in accordance with this method please contact the Ansell Microgard Technical Team, e-mail technical@microgard.com

EN 14786 "Atomiser Test"

Test method to determine the resistance of protective clothing materials against penetration by atomised liquid chemicals, emulsions and dispersions. Specified in DIN 32781 and ISO/FDI 27065 for protective clothing worn by operators applying liquid pesticides, this test involves a specimen being contaminated by a small quantity of liquid chemical, emulsion or dispersion. After 30 minutes of exposure the specimen is analysed using a suitable technique (e.g. high performance liquid chromatography (HPLC)) to measure the quantity of liquid which has penetrated.



MICROGARD® and MICROCHEM® Chemical Permeation Data

Versatile chemical protection starts with MICROCHEM®

Working with chemicals, you and your colleagues face hazards every day. Everything from an accidental spill or splash exposure to industrial chemicals, warfare agents and radioactive processes.

The resistance of MICROCHEM® garments to permeation by a hazardous chemical is determined by measuring the breakthrough time and permeation rate of the chemical through the fabric. Permeation tests are carried out by independent, accredited laboratories in accordance with relevant standards (for example ASTM F739, ISO 6529 etc.)

For more information on test methods or to discuss permeation testing of your specific chemical, or chemical mixture please visit www.microgard.com contact the technical team on +44 (0) 1482 625444 or email technical@microgard.com

EN Class/ CP Class	Normalised breakthrough times	Time to cumulative permeation of 150 µg/cm ²
0	Immediate (no class)	Immediate (no class)
1	>10	≥10
2	>30	≥30
3	>60	≥60
4	>120	≥120
5	>240	≥240
6	>480	≥480

CHEMICAL PERMEATION DATA

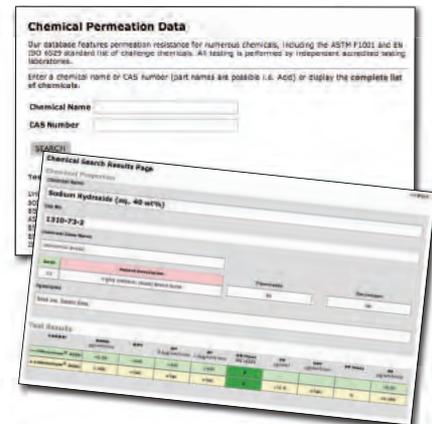
SEARCH BY...
>Chemical Name >CAS No.

The Microgard chemical database is available online and features permeation resistance for a wide range of chemicals, including the ASTM F1001 and EN ISO 6529 recommended list of challenge chemicals. All testing is performed by independent, accredited testing laboratories.

Key features of the chemical database include

- Instant access to over 240 chemicals with permeation data for MICROCHEM® 3000, 4000, 5000 & 6000.
- Easy to use navigation
- Allows you to compare MICROCHEM® fabric performance

For up to the minute chemical permeation data visit:
www.microgard.com



ACRONYMS KEY

–	Not Reported
MDPR	Minimum detectable permeation rate
BDT	Breakthrough detection time (first appearance after the MDPR)
BT _{0.1}	Normalised breakthrough detection time at 0.1 µg/cm ² /min
BT _{1.0}	Normalised breakthrough detection time at 1.0 µg/cm ² /min
EN Class	Based on the mean BT at 1.0 µg/cm ² /min
CP	Cumulative Permeation for the test duration. If no permeation is detected, then it is often reported as <(MDPR x 480) µg/cm ²
CPT	Time to cumulative permeation of 150 µg/cm ²
CP Class	Based on the time to cumulative permeation of 150 µg/cm ² , in accordance with ISO 16602
PR	Steady state permeation rate. If it is not reached then the maximum permeation rate for the duration of the test is reported. If no permeation is detected then it is reported as <MDPR µg/cm ² /min

Safety Note: All chemical tests and breakthrough times given relate to laboratory tests on fabrics only. Seams and closures may have lower breakthrough times, particularly when worn or damaged. It is the user's responsibility to select an appropriate garment, gloves, boots and other equipment for the particular use. The user shall be responsible for determining how long the garment can be worn for the particular use and whether it can be suitably cleaned for reuse. Ansell Microgard Limited does not give any warranties or make any representations about its garments other than those contained in the official literature supplied by Microgard Limited with each garment.



MICROGARD® 2300 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Acetone	67-64-1	0.02	Imm	Imm	Imm	0	-	30	2	5.87
Cresols, mixed	1319-77-3	0.06	>480	>480	>480	6	<28.8	>480	6	<0.06
Ferric Chloride (satd.)	7705-08-0	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Ferrous Chloride (satd.)	7758-94-3	0.06	>480	>480	>480	6	<28.8	>480	6	<0.06
Formaldehyde (10% w/w)	50-00-0	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Hexamethylene Diisocyanate	822-06-0	0.008	3	42	>480	6	155	>458	5	0.323
Hydrofluoric Acid (48-51% w/w)	7664-39-3	0.04	87	227	>480	6	63.1	>480	6	0.32
Isopropyl Alcohol	67-63-0	0.01	Imm	1	>480	6	-	383	5	0.43
Mercury	7439-97-6	<0.1	>480	>480	>480	6	<48	>480	6	<0.1
Methanol	67-56-1	0.04	Imm	Imm	>480	6	-	357	5	0.54
Potassium Permanganate (satd.)	7722-64-7	0.09	>480	>480	>480	6	<43.2	>480	6	<0.09
Sodium Hydroxide (50% w/w)	1310-73-2	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Sodium Hypochlorite Solution (14.5% available chlorine)	7681-52-9	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Sulphuric Acid (≥98% w/w)	7664-93-9	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Sulphuric Acid (95-96% w/w)	7664-93-9	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02

MICROGARD® 2500 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Acetone	67-64-1	-	Imm	Imm	Imm	0	-	-	-	High
Acetonitrile	75-05-8	-	Imm	Imm	Imm	0	-	-	-	High
Carbon Disulphide	75-15-0	-	-	5	30>45	2	181.4	>360	5	-
Dichloromethane	75-09-2	-	Imm	Imm	Imm	0	-	-	-	High
Diethylamine	109-89-7	-	Imm	Imm	Imm	0	-	-	-	High
Dimethylformamide, N,N-	68-12-2	-	Imm	Imm	Imm	0	-	-	-	High
Ethyl Acetate	141-78-6	-	Imm	Imm	Imm	0	-	-	-	High
Hexane, n-	110-54-3	-	Imm	Imm	Imm	0	-	-	-	High
Hydrochloric Acid (36-37% w/w)	7647-01-0	≤0.05	Imm	Imm	Imm	0	-	-	-	-
Methanol	67-56-1	-	Imm	Imm	Imm	0	-	-	-	High
Nitrobenzene	98-95-3	-	Imm	Imm	Imm	0	5639	<30	1	-
Sodium Hydroxide (50% w/w)	1310-73-2	-	>480	>480	>480	6	-	-	-	<0.1
Sodium Hypochlorite Solution (5% available chlorine)	7681-52-9	0.041	>480	>480	>480	6	<19.7	>480	6	<0.041
Sulphuric Acid (95-96% w/w)	7664-93-9	-	>480	>480	>480	6	6.1	>480	6	-
Tetrachloroethylene	127-18-4	-	Imm	Imm	Imm	0	-	-	-	High
Tetrahydrofuran	109-99-9	-	Imm	Imm	Imm	0	-	-	-	High
Toluene	108-88-3	-	Imm	Imm	Imm	0	-	-	-	High

MICROCHEM® 3000 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
3-Chloropropionic Acid (Liquid, 50 °C)	107-94-8	0.02	10	37	>480	6	237	318	5	0.6
Acetic Acid (Glacial)	64-19-7	≤0.05	-	-	>480	6	-	-	-	<1.0
Acetic Anhydride	108-24-7	≤0.05	-	-	>480	6	-	-	-	<1.0
Acetone	67-64-1	≤0.08	4	4	28	1	-	-	-	-
Acetonitrile	75-05-8	≤0.08	Imm	Imm	7	0	-	-	-	-
Acrylamide	79-06-1	-	-	-	>480	6	-	-	-	<1.0
Acrylic Acid	79-10-7	-	-	-	>480	6	-	-	-	<1.0
Allyl Alcohol	107-18-6	0.02	7	77	>480	6	51.2	>480	6	0.13
Ammonia (Gas, 1 atmos.)	7664-41-7	≤0.05	Imm	1	3	0	-	-	-	-
Ammonium Hydrogen Fluoride	1341-49-7	-	-	-	>480	6	-	-	-	<1.0
Aniline	62-53-3	-	-	-	>480	6	-	-	-	<1.0
Benlate®	17804-35-2	-	-	-	>480	6	-	-	-	<1.0
Benzene	71-43-2	-	-	-	2	0	-	-	-	-
Benzene Sulphonyl Chloride	98-09-9	-	-	-	>480	6	-	-	-	<1.0

Important: Breakthrough time alone is not sufficient to determine how long a garment may be worn once the garment has been contaminated. Safe wear time may be longer or shorter depending on numerous other factors, including the toxicity, exposure conditions and permeation behaviour of the substance.

Key: ND - Not determined NR - Not required Imm - Immediate

MICROCHEM® Chemical Permeation Data

MICROCHEM® 3000 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Benzyl Chloride	100-44-7	-	-	-	16	1	-	-	-	-
Bromine	7726-95-6	-	-	-	2	0	-	-	-	-
Butanol n-	71-36-3	-	-	-	>480	6	-	-	-	<1.0
Butyl Acrylate n-	141-32-2	-	-	-	16	1	-	-	-	-
Carbon Disulphide	75-15-0	-	-	Imm	Imm	0	-	-	-	-
Chlorine (Gas, 1 atmos.)	7782-50-5	≤0.05	9	9	10	1	-	-	-	-
Chlorine Water (satd.)	7782-50-5	-	-	-	2	0	-	-	-	-
Chloroacetic Acid (79% w/w)	79-11-8	0.076	>480	>480	>480	6	<37	>480	6	<0.076
Chloroacetyl Chloride	79-04-9	-	-	-	36	2	-	-	-	-
Chloroethanol, 2-	107-07-3	-	-	-	>480	6	-	-	-	<1.0
Chloroform	67-66-3	-	-	-	Imm	0	-	-	-	-
Chromium Trioxide (50% w/w)	1333-82-0	0.09	>480	>480	>480	6	<43.2	>480	6	<0.09
Cresols, mixed	1319-77-3	<1.0	-	-	>480	6	-	-	-	<1.0
Dichloroethane, 1,2-	107-06-2	-	-	-	4	0	-	-	-	-
Dichloroethylene, trans-1,2-	156-60-5	-	-	-	2	0	-	-	-	-
Dichloromethane	75-09-2	≤0.08	Imm	Imm	Imm	0	-	-	-	-
Diesel	68334-30-5	-	-	-	15	1	-	-	-	-
Diethyl Ether	60-29-7	-	-	-	Imm	0	-	-	-	-
Diethylamine	109-89-7	≤0.08	Imm	Imm	Imm	0	-	-	-	-
Difluoroaniline, 2,4-	367-25-9	-	-	-	>480	6	-	-	-	<1.0
Dimethyl Sulphate	77-78-1	-	-	-	>480	6	-	-	-	<1.0
Dimethylamine (40% w/w)	124-40-3	-	-	-	>480	6	-	-	-	<1.0
Dimethylaminopyridine, 2-	5683-33-0	-	-	-	57	2	-	-	-	-
Dimethylformamide, N,N-	68-12-2	-	-	-	>480	6	-	-	-	<1.0
Epichlorohydrin	106-89-8	-	-	-	>480	6	-	-	-	<1.0
Ethanolamine	141-43-5	0.07	>480	>480	>480	6	<33.6	>480	6	<0.07
Ethyl Acetate	141-78-6	≤0.08	Imm	Imm	Imm	0	-	-	-	-
Ethylene Glycol	107-21-1	-	-	-	>480	6	-	-	-	<1.0
Ethylhexanoic Acid, 2-	149-57-5	-	-	-	>480	6	-	-	-	<1.0
Ferric Chloride (45% w/w)	7705-08-0	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Formaldehyde (37%)	50-00-0	-	-	-	>480	6	-	-	-	<1.0
Formic Acid	64-18-6	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Formic Acid (90%)	64-18-6	-	-	-	>480	6	-	-	-	<1.0
Furfural	98-01-1	-	-	-	>480	6	-	-	-	<1.0
Gardoclean S 5174 (Analysis of potassium hydroxide component)	1310-58-3	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Heptane, n-	142-82-5	≤0.08	Imm	Imm	Imm	0	-	-	-	-
Hexamethylene Diamine, 1,6-	124-09-4	-	-	-	>480	6	-	-	-	<1.0
Hexamethylene Diisocyanate	822-06-0	<0.1	-	>480	>480	6	<48	>480	6	<0.1
Hexane, n-	110-54-3	0.09	Imm	Imm	Imm	0	-	-	-	-
Hydrazine monohydrate (98%, containing hydrazine, 64-65% w/w)	7803-57-8	<1.0	>480	-	>480	6	-	-	-	<1.0
Hydrobromic Acid (48% w/w)	10035-10-6	-	-	-	>480	6	-	-	-	<1.0
Hydrochloric Acid (36-37% w/w)	7647-01-0	0.05	14	193	>480	6	-	>480	6	<1.0
Hydrofluoric Acid (49% w/w)	7664-39-3	0.06	378	407	>480	6	33.7	>480	5	0.17
Hydrofluoric Acid (62-64% in urea)	7664-39-3	-	-	-	41	2	-	-	-	-
Hydrogen Chloride (Gas, 1 atmos.)	7647-01-0	≤0.05	Imm	Imm	Imm	8	-	-	-	-
Hydrogen Cyanide	74-90-8	0.01	3	<3	<3	0	-	113	3	>1.0
Hydrogen Peroxide (35% w/w)	7722-84-1	-	-	-	>480	6	-	-	-	<1.0
Hydrogen Peroxide (50% w/w)	7722-84-1	-	-	-	>480	6	-	-	-	<1.0
Iodine	7553-56-2	-	-	-	>480	6	-	-	-	<1.0
Isopropyl Alcohol	67-63-0	-	-	-	>480	6	-	-	-	<1.0
Mercury	7439-97-6	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Methanol	67-56-1	0.05	Imm	4	>480	6	-	364	5	0.59
Methoxyacetic Acid, 2-	625-45-6	-	-	-	>480	6	-	-	-	<1.0
Methyl Iodide	74-88-4	-	-	-	>480	6	-	-	-	<1.0
Methyl-2-pyrrolidone, N-	872-50-4	-	-	-	>480	6	-	-	-	<1.0
Nitric Acid (70% w/w)	7697-37-2	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Nitrobenzene	98-95-3	-	-	-	>480	6	-	-	-	<1.0
Octave®	75747-77-2	-	-	-	>480	6	-	-	-	<1.0
Oxalic Acid (10%)	144-62-7	0.06	>480	>480	>480	6	-	>480	6	<0.06



MICROCHEM® 3000 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Oxilan 9810 (Analysis of ethanol component)	64-17-5	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Oxilan Additive 9905 (Mixture)	N/A	0.09	>480	>480	>480	6	<43.2	>480	6	<0.09
Paraffin	92062-35-6	-	-	-	25	1	-	-	-	-
Perchloric Acid (30% w/w)	7601-90-3	≤0.05	>480	>480	>480	6	-	-	-	≤0.05
Petrol (unleaded)	8006-61-9	-	-	-	2	0	-	-	-	-
Phenol (Liquid, 45 °C)	108-95-2	0.01	Imm	Imm	4	0	-	152	4	2.75
Phenol (liquified, approx. 90% w/w with water)	108-95-2	0.021	>480	>480	>480	6	<10	>480	6	<0.021
Phenol/Benzyl Alcohol 25/5	108-95-2 (in 100-51-6)	-	-	-	>480	6	-	-	-	<1.0
Phosphoric Acid (≥85%)	7664-38-2	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Phosphorus Oxychloride	10025-87-3	-	-	-	9	0	-	-	-	-
Phosphorus Pentachloride	10026-13-8	-	-	-	>480	6	-	-	-	<1.0
Phthalic Anhydride (Liquid, 135 °C)	85-44-9	-	-	-	>480	6	-	-	-	<1.0
Piranha solution (sulphuric acid 96% w/w:hydrogen peroxide 30% w/w, 20:1 ratio)	7722-86-3	0.02	Imm	1	>480	6	-	-	-	-
Pivalic Acid	75-98-9	-	-	-	>480	6	-	-	-	<1.0
Polyethylene Glycol 200	25322-68-3	-	-	-	>480	6	-	-	-	<1.0
Potassium Hydroxide (30%)	1310-58-3	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Potassium Hydroxide (80-86% w/v)	1310-58-3	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Propionaldehyde	123-38-6	-	-	-	70	3	-	-	-	-
Reglone®	85-00-7	-	-	-	>480	6	-	-	-	<1.0
Ripcord®	52315-07-8	-	-	-	>480	6	-	-	-	<1.0
Roundup®	38641-94-0	-	-	-	>480	6	-	-	-	<1.0
Sodium Bisulphate (40%)	7681-38-1	-	-	-	>480	6	-	-	-	<1.0
Sodium Chloride	7647-14-5	-	-	-	>480	6	-	-	-	<1.0
Sodium Cyanide (satd.)	143-33-9	-	-	-	>480	6	-	-	-	<1.0
Sodium Fluoride (satd.)	7681-49-4	-	-	-	>480	6	-	-	-	<1.0
Sodium Hydroxide (40% w/w)	1310-73-2	0.068	>480	>480	>480	6	<32.6	>480	6	<0.068
Sodium Hydroxide (50% w/w, 80 °C)	1310-73-2	0.031	>480	>480	>480	6	<26	>480	6	<0.031
Sodium Hydroxide (50% w/w)	1310-73-2	0.068	>480	>480	>480	6	<33	>480	6	<0.068
Sodium Hypochlorite Solution (14.5% available chlorine)	7681-52-9	0.041	>480	>480	>480	6	<19.7	>480	6	<0.041
Sodium Hypochlorite Solution (5% available chlorine)	7681-52-9	0.041	>480	>480	>480	6	<19.7	>480	6	<0.041
Sodium Methlyate (30%)	124-41-4	-	-	-	>480	6	-	-	-	<1.0
Sodium Silicofluoride (satd.)	16893-85-9	-	-	-	>480	6	-	-	-	<1.0
Styrene	100-42-5	0.04	Imm	Imm	Imm	0	-	3	0	199
Sulphuric Acid (≥98% w/w)	7664-93-9	<0.1	-	-	>480	6	-	-	-	<0.1
Sulphuric Acid (50% w/w, 80 °C)	7664-93-9	0.021	>480	>480	>480	6	<10	>480	6	<0.021
Sulphuric Acid (95-96% w/w)	7664-93-9	≤0.05	>480	>480	>480	6	<24.5	>480	6	<0.05
SUVA HCFC-123 (1,1-Dichloro-2,2,2-trifluoroethane)	306-83-2	-	-	-	251	5	-	-	-	-
t-Butyl Methyl Ether	1634-04-4	<0.1	-	-	1	0	-	-	-	-
Tetrahydrofuran	109-99-9	≤0.08	Imm	Imm	Imm	0	-	-	-	-
Tetramethylammonium Hydroxide (20% w/w)	75-59-2	0.07	>480	>480	>480	6	<33.6	>480	6	<0.07
Thionyl Chloride	7719-09-7	-	-	-	Imm	0	-	-	-	-
Thiourea Dioxide (satd.)	1758-73-2	-	-	-	>480	6	-	-	-	<1.0
Titanium Tetrachloride	7550-45-0	0.02	Imm	Imm	7	0	*	35	2	11.1
Toluene	108-88-3	≤0.08	Imm	Imm	Imm	0	-	-	-	-
Toluene-2,4-diisocyanate	584-84-9	-	-	-	>480	6	-	-	-	<1.0
Toluidine, o-	95-53-4	-	-	-	>480	6	-	-	-	<1.0
Trichloroacetic Acid	76-03-9	-	-	-	>480	6	-	-	-	<1.0
Trichloroethylene	79-01-6	-	-	-	2	0	-	-	-	-
Triethylamine	121-44-8	-	-	-	Imm	0	-	-	-	-
Trifluoroacetic Acid	76-05-1	-	-	-	>480	6	-	-	-	<1.0
Vinyl Acrylate	2177-18-6	-	-	-	3	0	-	-	-	-
Xylene, m-	108-38-3	-	-	-	2	0	-	-	-	-
Xylene, p-	106-42-3	0.01	Imm	Imm	Imm	0	-	Imm	0	218
Zinc Bromide (satd. soln.)	7699-45-8	-	-	-	>480	6	-	-	-	<1.0

Important: Breakthrough time alone is not sufficient to determine how long a garment may be worn once the garment has been contaminated. Safe wear time may be longer or shorter depending on numerous other factors, including the toxicity, exposure conditions and permeation behaviour of the substance.

Key: ND - Not determined NR - Not required Imm - Immediate

MICROCHEM® Chemical Permeation Data

MICROCHEM® 4000 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
3-Chloropropionic Acid (Liquid, 50 °C)	107-94-8	0.02	111	160	>480	6	97	>480	6	0.2
Acetic Acid (Glacial)	64-19-7	≤0.05	-	-	>480	6	-	-	-	<1.0
Acetic Anhydride	108-24-7	≤0.05	-	-	>480	6	-	-	-	<1.0
Acetone	67-64-1	≤0.08	43	127	>480	6	-	-	-	<1.0
Acetonitrile	75-05-8	≤0.08	>480	>480	>480	6	-	-	-	<0.08
Acrylamide	79-06-1	-	-	-	>480	6	-	-	-	<1.0
Acrylic Acid	79-10-7	-	-	-	>480	6	-	-	-	<1.0
Acrylonitrile	107-13-1	-	-	-	>480	6	-	-	-	<1.0
Allyl Alcohol	107-18-6	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Ammonia (Gas, 1 atmos.)	7664-41-7	<0.08	7	11	>480	6	71	>480	6	0.34
Ammonia (Liquid, -34 °C)	7664-41-7	0.01	180	>480	>480	6	-	>480	6	0.02
Ammonium Hydrogen Fluoride	1341-49-7	-	-	-	>480	6	-	-	-	<1.0
Ammonium Hydroxide (28%)	1336-21-6	-	-	-	>480	6	-	-	-	<1.0
Ammonium Hydroxide (35% w/w)	1336-21-6	0.02	5	13	356	4	-	268	5	1.04
Amyl Acetate	628-63-7	-	-	-	>480	6	-	-	-	<1.0
Aniline	62-53-3	-	-	-	>480	6	-	-	-	<1.0
Benlate®	17804-35-2	-	-	-	>480	6	-	-	-	<1.0
Benzene	71-43-2	<0.05	21	157	>480	6	-	-	-	0.15
Benzyl Chloride	100-44-7	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Bromine	7726-95-6	-	-	-	10	1	-	-	-	-
Butadiene 1,3-	106-99-0	0.011	>480	>480	>480	6	<5.4	>480	6	<0.011
Butanol n-	71-36-3	-	-	-	>480	6	-	-	-	<1.0
Butyl Acrylate n-	141-32-2	-	-	-	>480	6	-	-	-	<1.0
Carbon Disulphide	75-15-0	-	Imm	Imm	2	0	-	-	-	-
Chlorine (Gas, 1 atmos.)	7782-50-5	0.020	196	402	>480	6	24	>480	6	0.11
Chlorine Water (satd.)	7782-50-5	-	-	-	>480	6	-	-	-	<1.0
Chloro-5-(chloromethyl)pyridine, 2-	70258-18-3	0.5	-	-	>480	6	-	-	-	<1.0
Chloroacetic Acid (79% w/w)	79-11-8	-	-	-	>480	6	-	-	-	<1.0
Chloroacetic Acid Ethyl Ester	105-39-5	-	-	-	>480	6	-	-	-	<1.0
Chloroacetyl Chloride	79-04-9	0.05	272	342	>480	6	<41	>480	6	0.2
Chloroacrylonitrile, 2-	920-37-6	<0.1	-	-	>480	6	-	-	-	<1.0
Chloroaniline, 4- (75 °C)	106-47-8	-	-	-	>480	6	-	-	-	<1.0
Chlorobenzene	108-90-7	-	-	-	>480	6	-	-	-	<1.0
Chloroform	67-66-3	-	-	-	11	1	-	-	-	-
Chloromethane	74-87-3	0.023	>480	>480	>480	6	<11	>480	6	<0.023
Chlorosulphonic Acid	7790-94-5	-	-	-	69	3	-	-	-	-
Chlorotoluene, o-	95-49-8	-	-	-	>480	6	-	-	-	<1.0
Chlorotoluene, p-	106-43-4	-	-	-	>480	6	-	-	-	<1.0
Chromium Trioxide (50% w/w)	1333-82-0	0.09	>480	>480	>480	6	<43.2	>480	6	<0.09
Cresol, m- in water solution (20 g/L)	108-39-4	<0.1	-	-	>480	6	-	-	-	<1.0
Cresol, o- in water solution (20 g/L)	95-48-7	<0.1	-	-	>480	6	-	-	-	<1.0
Cresol, p- in water solution (20 g/L)	106-44-5	<0.1	-	-	>480	6	-	-	-	<1.0
Crude Coal Tar	65996-89-6	<1.0	-	-	>480	6	-	-	-	<1.0
Cumene	98-82-8	0.016	>480	>480	>480	6	<7.7	>480	6	<0.016
Cyclohexylamine	108-91-8	0.05	49	55	82	3	-	-	-	-
Di-tert-butyl peroxide	110-05-4	<0.05	>480	>480	>480	6	-	-	-	<0.05
Dichloro-4-(trifluoromethyl)benzene, 1,2-	328-84-7	-	-	-	>480	6	-	-	-	<1.0
Dichloroacetone, 1,1-	513-88-2	-	-	-	>480	6	-	-	-	<1.0
Dichloroacetone, 1,3-	534-07-6	-	-	-	>480	6	-	-	-	<1.0
Dichlorodiethyl Ether, 2,2'-	111-44-4	-	-	-	>480	6	-	-	-	<1.0
Dichloroethane, 1,2-	107-06-2	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Dichloromethane	75-09-2	0.08	Imm	Imm	9	0	-	93	3	2.88
Dichloromethylsilane	75-54-7	-	-	-	20	1	-	-	-	-
Diesel	68334-30-5	-	-	-	>480	6	-	-	-	<1.0
Diethanolamine	111-42-2	-	-	-	>480	6	-	-	-	<1.0
Diethyl Ether	60-29-7	-	-	-	2	0	-	-	-	-
Diethylamine	109-89-7	0.019	Imm	Imm	Imm	0	-	8	0	90.1
Diethylenetriamine	111-40-0	-	-	-	>480	6	-	-	-	<1.0
Diffuoroaniline, 2,4-	367-25-9	-	-	-	>480	6	-	-	-	<1.0
Dimethyl Dicarboxylate	4525-33-1	<1.0	-	-	>480	6	-	-	-	<1.0
Dimethyl Sulphate	77-78-1	-	-	-	>480	6	-	-	-	<1.0
Dimethyl Sulphide	75-18-3	0.02	Imm	Imm	3	0	-	34	2	8.56
Dimethyl Sulphoxide	67-68-5	-	-	-	>480	6	-	-	-	<1.0
Dimethylacetamide, N,N-	127-19-5	-	-	-	>480	6	-	-	-	<1.0
Dimethylamine (40% w/w)	124-40-3	-	-	-	>480	6	-	-	-	<1.0

MICROCHEM® 4000 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Dimethyldichlorosilane	75-78-5	0.03	137	171	234	4	-	286	5	-
Dimethylformamide, N,N-	68-12-2	0.0094	>480	>480	>480	6	<4.5	>480	6	<0.0094
Dioxane, 1,4-	123-91-1	0.05	180	>426	>480	6	<26	>480	6	0.1
Dipropylene Glycol Methyl Ether	34590-94-8	-	-	-	>480	6	-	-	-	<1.0
Dipropylenetriamine	56-18-8	<1.0	-	-	>480	6	-	-	-	<1.0
Epichlorohydrin	106-89-8	-	-	-	>480	6	-	-	-	<1.0
Ethanol	64-17-5	<0.1	>480	>480	>480	6	-	-	-	<0.1
Ethanolamine	141-43-5	-	-	-	>480	6	-	-	-	<1.0
Ethion	563-12-2	<1.0	-	-	>480	6	-	-	-	<1.0
Ethyl Acetate	141-78-6	≤0.08	28	40	>480	6	-	-	-	<1.0
Ethyl Parathion	56-38-2	<1.0	-	-	>480	6	-	-	-	<1.0
Ethylbenzene	100-41-4	-	-	-	>480	6	-	-	-	<1.0
Ethylene Dibromide	106-93-4	0.06	376	408	>480	6	66.9	>480	6	0.33
Ethylene Glycol	107-21-1	-	-	-	>480	6	-	-	-	<1.0
Ethylene Oxide (Gas, 1 atmos.)	75-21-8	<0.1	>480	>480	>480	6	-	-	-	<0.1
Ethylene Oxide (Liquid, ≤10 °C)	75-21-8	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Ethylenediamine	107-15-3	-	-	-	>480	6	-	-	-	<1.0
Ethylhexanoic Acid, 2-	149-57-5	-	-	-	>480	6	-	-	-	<1.0
Fluorobenzene	462-06-6	-	-	-	105	3	-	-	-	-
Formaldehyde (37%)	50-00-0	0.0003	>480	>480	>480	6	-	>480	6	<0.0003
Formic Acid (90%)	64-18-6	-	-	-	>480	6	-	-	-	<1.0
Furfural	98-01-1	-	-	-	>480	6	-	-	-	<1.0
Fyfanon	121-75-5	<1.0	-	-	>480	6	-	-	-	<1.0
Gas Oil (SHELL "Heizöl HVS 300 CST")	68476-33-5	-	-	-	>480	6	-	-	-	<1.0
Heptane, n-	142-82-5	≤0.08	49	73	>480	6	-	-	-	0.12
Hexachloro-1,3-butadiene	87-68-3	0.09	>480	>480	>480	6	-	-	-	<0.09
Hexamethyldisilazane	999-97-3	-	-	-	>480	6	-	-	-	<1.0
Hexane, n-	110-54-3	0.09	>480	>480	>480	6	-	-	-	<0.09
Hexene, 1-	592-41-6	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Hydrazine monohydrate (98%, containing hydrazine, 64-65% w/w)	7803-57-8	<1.0	>480	-	>480	6	-	-	-	<1.0
Hydrobromic Acid (48% w/w)	10035-10-6	<0.1	>480	>480	>480	6	-	-	-	<0.1
Hydrochloric Acid (36-37% w/w)	7647-01-0	0.01	-	-	>480	6	-	-	-	<1.0
Hydrofluoric Acid (37% w/w)	7664-39-3	<0.1	-	-	>480	6	-	-	-	<1.0
Hydrofluoric Acid (71-75% w/w)	7664-39-3	<0.05	8	175	>480	6	-	-	-	0.89
Hydrofluorosilicic Acid (34.5% w/w)	16961-83-4	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Hydrogen Chloride (Gas, 1 atmos.)	7647-01-0	≤0.05	8	125	>480	6	-	-	-	<1.0
Hydrogen Cyanide	74-90-8	0.01	48	159	>480	6	54	>480	6	0.16
Hydrogen Fluoride (Gas, anhydrous)	7664-39-3	0.001	-	-	42	2	-	-	-	-
Hydrogen Fluoride (Liquid, 17 °C)	7664-39-3	0.01	90	110	190	4	-	350	5	1.82
Hydrogen Peroxide (35% w/w)	7722-84-1	-	-	-	>480	6	-	-	-	<1.0
Hydrogen Sulphide	7783-06-4	0.04	>480	>480	>480	6	-	-	-	<0.04
Isopropyl Alcohol	67-63-0	-	-	-	>480	6	-	-	-	<1.0
Maleic Anhydride	108-31-6	-	-	-	>480	6	-	-	-	<1.0
Mercury	7439-97-6	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Methanesulphonyl Chloride	124-63-0	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Methanol	67-56-1	≤0.08	21	>480	>480	6	-	-	-	<0.1
Methyl Chloroformate	79-22-1	<0.5	-	-	>480	6	-	-	-	<1.0
Methyl Ethyl Ketone	78-93-3	<0.1	9	53	>480	6	-	-	-	<1.0
Methyl Methacrylate	80-62-6	<0.05	>480	>480	>480	6	-	-	-	<0.05
Methyl Parathion	298-00-0	<1.0	-	-	>480	6	-	-	-	<1.0
Methyl-2-pyrrolidone, N-	872-50-4	0.05	-	-	>480	6	-	-	-	<1.0
Methyltrichlorosilane	75-79-6	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Nicotine	54-11-5	0.6	>480	-	>480	6	<288	>250	5	<0.6
Nitric Acid (≥99.5%, white fuming)	7697-37-2	<0.06	>480	>480	>480	6	-	-	-	<0.06
Nitric Acid (70% w/w)	7697-37-2	<0.05	>480	>480	>480	6	-	-	-	<0.05
Nitric Oxide	10102-43-9	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Nitrobenzene	98-95-3	0.024	>480	>480	>480	6	<11	>480	6	<0.024
Nitrochlorobenzene, p- (88 °C)	100-00-5	<0.5	-	-	>480	6	-	-	-	<1.0
Octyltrichlorosilane	5283-66-9	0.08	-	-	198	4	-	-	-	-
Oxalyl Chloride	79-37-8	0.05	>445	>480	>480	6	<24	>480	6	0.05
Paraffin	92062-35-6	-	-	-	>480	6	-	-	-	-
Petrol (unleaded)	8006-61-9	-	-	-	>480	6	-	-	-	<1.0
Phenol (Liquid, 45 °C)	108-95-2	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Phenol (Liquid, 60 °C)	108-95-2	0.05	4	7	36	2	NR	111	3	2.5
Phenol (liquified, approx. 90% w/w with water)	108-95-2	<0.1	>480	>480	>480	6	-	-	-	<0.1
Pheno/Benzyl Alcohol 25/5	108-95-2 (in 100-51-6)	-	-	-	>480	6	-	-	-	<1.0

Key: ND - Not determined NR - Not required Imm - Immediate

MICROCHEM® Chemical Permeation Data



MICROCHEM® 4000 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Phenyltrichlorosilane	98-13-5	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Phosgene	75-44-5	0.05	-	-	387	5	-	-	-	-
Phosphoric Acid (≥85%)	7664-38-2	-	-	-	>480	6	-	-	-	<1.0
Phosphorus Oxichloride	10025-87-3	0.005	>480	>480	>480	6	<2.4	>480	6	<0.005
Phosphorus Pentachloride	10026-13-8	-	-	-	>480	6	-	-	-	<1.0
Phosphorus Trichloride	7719-12-2	-	-	-	>480	6	-	-	-	<1.0
Pinane Hydroperoxide	28324-52-9	0.09	>480	>480	>480	6	<2.7	>480	6	<0.09
Pivalic Acid	75-98-9	-	-	-	>480	6	-	-	-	<1.0
Polyethylene Glycol 200	25322-68-3	-	-	-	>480	6	-	-	-	<1.0
Propene	115-07-1	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Propionaldehyde	123-38-6	-	-	-	>480	6	-	-	-	<1.0
Propionic Acid	79-09-4	-	-	-	>480	6	-	-	-	<1.0
Propionitrile	107-12-0	-	-	-	>480	6	-	-	-	<1.0
Propyl Bromide, n-	106-94-5	0.05	47	51	89	3	-	170	4	2.97
Propylene Oxide	75-56-9	<0.05	3	3	17	1	-	-	-	-
Quinoline	91-22-5	0.08	>480	>480	>480	6	<38.4	>480	6	<0.08
Reglone®	85-00-7	-	-	-	>480	6	-	-	-	<1.0
Ripcord®	52315-07-8	-	-	-	>480	6	-	-	-	<1.0
Roundup®	38641-94-0	-	-	-	>480	6	-	-	-	<1.0
Sodium Chloride	7647-14-5	-	-	-	>480	6	-	-	-	<1.0
Sodium Cyanide (satd.)	143-33-9	-	-	-	>480	6	-	-	-	<1.0
Sodium Fluoride (satd.)	7681-49-4	-	-	-	>480	6	-	-	-	<1.0
Sodium Hydroxide (40% w/w)	1310-73-2	≤0.05	>480	>480	>480	6	-	-	-	<0.05
Sodium Hydroxide (50% w/w, 80 °C)	1310-73-2	0.031	>480	>480	>480	6	<26	>480	6	<0.031
Sodium Hydroxide (50% w/w)	1310-73-2	0.068	>480	>480	>480	6	<33	>480	6	<0.068
Sodium Hypochlorite Solution (14.5% available chlorine)	7681-52-9	0.041	>480	>480	>480	6	<19.7	>480	6	<0.041
Sodium Hypochlorite Solution (5% available chlorine)	7681-52-9	0.041	>480	>480	>480	6	<19.7	>480	6	<0.041
Sodium Silicofluoride (satd.)	16893-85-9	-	-	-	>480	6	-	-	-	<1.0
Styrene	100-42-5	0.04	159	189	299	5	-	310	5	5.4
Sulphur Dioxide	7446-09-5	0.001	-	-	>480	6	-	-	-	<1.0
Sulphur Trioxide	7446-11-9	0.06	8	8	18	1	NR	40	2	16.7
Sulphuric Acid (≥98% w/w)	7664-93-9	<0.1	-	-	>480	6	-	-	-	<0.1
Sulphuric Acid (50% w/w, 80 °C)	7664-93-9	0.021	>480	>480	>480	6	<10	>480	6	<0.021
Sulphuric Acid (50% w/w)	7664-93-9	<0.05	>480	>480	>480	6	-	-	-	<0.05
Sulphuric Acid (95-96% w/w)	7664-93-9	≤0.05	>480	>480	>480	6	-	-	-	<0.05
SUVA HCFC-123 (1,1-Dichloro-2,2,2-trifluoroethane)	306-83-2	-	-	-	380	5	-	-	-	-
t-Butyl Methyl Ether	1634-04-4	<0.1	-	-	>480	6	-	-	-	<1.0
tert-Dodecyl Mercaptan	25103-58-6	0.05	>480	>480	>480	6	<0.5	>480	6	<0.05
Tetrachloroethylene	127-18-4	0.030	30	218	>480	6	42	>480	6	0.17
Tetraethyl Lead	78-00-2	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Tetrahydrofuran	109-99-9	≤0.08	Imm	Imm	5	0	-	-	-	-
Tetramethylammonium Hydroxide (satd.)	75-59-2	-	-	-	>480	6	-	-	-	<1.0
Thionyl Chloride	7719-09-7	-	-	-	2	0	-	-	-	-
Thiourea Dioxide (satd.)	1758-73-2	-	-	-	>480	6	-	-	-	<1.0
Titanium Tetrachloride	7550-45-0	0.08	159	173	>480	6	-	>480	6	0.43
Toluene	108-88-3	0.042	3	69	>480	6	65	>480	6	0.17
Toluene-2,4-diisocyanate	584-84-9	-	-	-	>480	6	-	-	-	<1.0
Toluidine, o-	95-53-4	-	-	-	>480	6	-	-	-	<1.0
Triacetonediamine	36768-62-4	-	-	-	>480	6	-	-	-	<1.0
Trichloroacetic Acid	76-03-9	<1.0	-	-	>480	6	-	-	-	<1.0
Trichloroethylene	79-01-6	-	-	-	7	0	-	-	-	-
Triethylamine	121-44-8	-	-	-	5	0	-	-	-	-
Trifluoromethanesulphonic Acid	1493-13-6	0.06	>480	>480	>480	6	<28.8	>480	6	<0.06
Vinyl Acetate	108-05-4	0.022	>480	>480	>480	6	<11	>480	6	<0.022
Vinyl Acrylate	2177-18-6	-	-	-	>480	6	-	-	-	<1.0
Vinylbenzyl Chloride 4-	1592-20-7	-	-	-	>480	6	-	-	-	<1.0
Xylene, m-	108-38-3	-	-	-	>480	6	-	-	-	<1.0
Xylylenediamine, m-	1477-55-0	-	-	-	>480	6	-	-	-	<1.0

Important: Breakthrough time alone is not sufficient to determine how long a garment may be worn once the garment has been contaminated. Safe wear time may be longer or shorter depending on numerous other factors, including the toxicity, exposure conditions and permeation behaviour of the substance.

MICROCHEM® Chemical Permeation Data



MICROCHEM® 5000 Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Acetone	67-64-1	0.02	>480	>480	>480	6	-	>480	6	<0.02
Acetonitrile	75-05-8	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Ammonia (Gas, 1 atmos.)	7664-41-7	0.03	38	41	>480	6	62.7	>480	6	0.37
Ammonia (Liquid, -34 °C)	7664-41-7	0.01	>480	>480	>480	6	-	>480	6	<0.01
Aniline	62-53-3	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Bromine	7726-95-6	0.05	10	11	12	1	ND	ND	ND	High
Butadiene 1,3-	106-99-0	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Carbon Disulphide	75-15-0	0.1	ND	277	>480	6	15	>480	6	0.1
Chlorine (Gas, 1 atmos.)	7782-50-5	0.001	>480	>480	>480	6	<0.48	>480	6	<0.001
Chloroform	67-66-3	0.07	45	53	101	3	-	184	4	2.26
Chloromethane	74-87-3	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Cyclohexylamine	108-91-8	0.099	>480	>480	>480	6	<47.5	>480	6	<0.099
Dichloromethane	75-09-2	0.04	19	23	59	2	-	114	3	6.99
Diethyl Ether	60-29-7	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Diethylamine	109-89-7	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Dimethylethylamine	598-56-1	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Dimethylformamide, N,N-	68-12-2	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Ethyl Acetate	141-78-6	0.1	>480	>480	>480	6	<2.5	>480	6	<0.1
Ethylene Oxide (Gas, 1 atmos.)	75-21-8	0.04	41	69	>385	4	-	273	5	1.04
Ethylenediamine	107-15-3	0.06	>480	>480	>480	6	<28.8	>480	6	<0.06
Heptane, n-	142-82-5	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Hexane, n-	110-54-3	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Hydrofluoric Acid (71-75% w/w)	7664-39-3	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Hydrogen Chloride (Gas, 1 atmos.)	7647-01-0	0.03	ND	>480	>480	6	<3.5	>480	6	<0.03
Hydrogen Fluoride (Liquid, 17 °C)	7664-39-3	0.01	120	>480	>480	6	<4.8	>480	6	0.05
Hydrogen Sulphide	7783-06-4	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Methanol	67-56-1	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Nitric Oxide	10102-43-9	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Nitrobenzene	98-95-3	0.1	ND	>480	>480	6	<2.5	>480	6	<0.1
Phosphorus Oxychloride	10025-87-3	0.005	>480	>480	>480	6	<2.4	>480	6	<0.005
Propyl Bromide, n-	106-94-5	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Propylamine, n-	107-10-8	0.02	145	163	>480	6	114	390	5	0.86
Propylene Oxide	75-56-9	0.08	90	90	114	3	-	171	4	4.38
Sodium Hydroxide (30% w/w)	1310-73-2	0.05	ND	>480	>480	6	<6	>480	6	<0.05
Sodium Hydroxide (50% w/w)	1310-73-2	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Sulphuric Acid (95-96% w/w)	7664-93-9	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Tetrachloroethylene	127-18-4	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Tetrahydrofuran	109-99-9	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Tetramethylethylenediamine, N,N,N',N'-	110-18-9	0.07	>480	>480	>480	6	<33.6	>480	6	<0.07
Thionyl Chloride	7719-09-7	0.02	15	15	17	1	-	27	1	High
Toluene	108-88-3	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Trichloroethylene	79-01-6	0.06	>480	>480	>480	6	<28.8	>480	6	<0.06
Triethylamine	121-44-8	0.01	>480	>480	>480	6	<4.8	<9.6	6	<0.01
Trifluoromethanesulphonic Acid	1493-13-6	0.06	265	277	>480	6	66.5	>480	6	0.43

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Key: ND - Not determined NR - Not required Imm - Immediate

MICROCHEM® Chemical Permeation Data



MICROCHEM® 6000 - Permeation Data

Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Acetaldehyde	75-07-0	0.05	290	>480	>480	6	<25	>480	6	0.06
Acetone	67-64-1	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Acetonitrile	75-05-8	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Acetyl Chloride	75-36-5	0.05	109	126	>431	5	<239	406	5	1.2
Ammonia (Gas, 1 atmos.)	7664-41-7	0.01	39	75	>480	6				
Ammonia (Liquid, -34 °C)	7664-41-7	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Benzene	71-43-2	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Bromine	7726-95-6	0.02	8	12	14	1	ND	ND	ND	High
Bromine (Saturated Vapour)	7726-95-6	0.05	8	8	12	1	ND	ND	ND	High
Butadiene 1,3-	106-99-0	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Carbon Disulphide	75-15-0	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Chlorine (Gas, 1 atmos.)	7782-50-5	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Chlorine (Liquid, -32 °C)	7782-50-5	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Chloroacetyl Chloride	79-04-9	0.05	366	413	>480	6	<33	>480	6	0.2
Chloromethane (Gas, 1 atmos.)	74-87-3	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Cyanogen Chloride (Gas, 1 atmos.)	506-77-4	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Cyclohexane	110-82-7	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Dichloroethane, 1,2-	107-06-2	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Dichloromethane (Methylene Chloride)	75-09-2	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Diethylamine	109-89-7	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Dimethyl Sulphide	75-18-3	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Dimethylformamide, N,N-	68-12-2	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Ethyl Acetate	141-78-6	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Ethyl Isocyanate	109-90-0	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Ethylene Oxide (Gas, 1 atmos.)	75-21-8	0.036	>480	>480	>480	6	<17.28	>480	6	<0.036
Heptane, n-	142-82-5	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Hexane, n-	110-54-3	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Hydrofluoric Acid (71-75% w/w)	7664-39-3	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Hydrogen Chloride (Gas, 1 atmos.)	7647-01-0	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Hydrogen Cyanide	74-90-8	0.05	167	211	>480	6	71	>480	6	0.35
Hydrogen Fluoride (Gas, anhydrous)	7664-39-3	0.05	406	>468	>480	6	<24	>480	6	0.11
Methanol	67-56-1	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Nitrobenzene	98-95-3	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Phenol (Liquid, 60 °C)	108-95-2	0.05	27	34	70	3	ND	ND	ND	High
Propane (Liquid, -32 °C)	74-98-6	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Propane (Liquid, -50 °C)	74-98-6	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Pyrrolidine	123-75-1	0.05	72	85	234	4	476	288	5	2.0
Sodium Hydroxide (40% w/w)	1310-73-2	0.08	>480	>480	>480	6	<38.4	>480	6	<0.08
Sodium Hydroxide (50% w/w)	1310-73-2	0.03	>480	>480	>480	6	<14.4	>480	6	<0.03
Sulphuric Acid (93.1% w/w)	7664-93-9	0.04	>480	>480	>480	6	<19.2	>480	6	<0.04
Sulphuric Acid (95-96% w/w)	7664-93-9	0.02	>480	>480	>480	6	<9.6	>480	6	<0.02
Tetrachloroethylene	127-18-4	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Tetrahydrofuran	109-99-9	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Thionyl Chloride	7719-09-7	0.1	16	16	18	1	ND	ND	ND	High
Toluene	108-88-3	0.01	>480	>480	>480	6	<4.8	>480	6	<0.01
Vinylpyridine, 4-	100-43-6	0.05	>480	>480	>480	6	<24	>480	6	<0.05

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MICROCHEM® Chemical Permeation Data



MICROCHEM® 8000 - Permeation Data										
Chemical Name	CAS Number	MDPR µg/cm ² /min	BDT	BT 0.1 µg/cm ² /min	BT 1.0 µg/cm ² /min	EN Class EN 14325	CP µg/cm ²	CPT µg/cm ² /min	CP Class	PR µg/cm ² /min
Acetaldehyde	75-07-0	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Acetone	67-64-1	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Acetonitrile	75-05-8	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Acetyl Chloride	75-36-5	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Ammonia (Gas, 1 atmos.)	7664-41-7	0.05	>423	>480	>480	6	<25	>480	6	<0.07
Bromine	7726-95-6	0.05	23	23	25	1	ND	ND	ND	High
Bromine (Saturated Vapour)	7726-95-6	0.05	22	22	23	1	ND	ND	ND	High
Butadiene 1,3-	106-99-0	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Carbon Disulphide	75-15-0	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Chlorine (Gas, 1 atmos.)	7782-50-5	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Chloroacetyl Chloride	79-04-9	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Chloromethane (Gas, 1 atmos.)	74-87-3	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Cyanogen Chloride (Gas, 1 atmos.)	506-77-4	0.05	31	39	62	3	ND	187	4	1.8
Dichloromethane (Methylene Chloride)	75-09-2	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Diethylamine	109-89-7	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Dimethyl Sulphide	75-18-3	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Dimethylformamide, N,N-	68-12-2	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Ethyl Acetate	141-78-6	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Ethyl Isocyanate	109-90-0	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Ethylene Oxide (Gas, 1 atmos.)	75-21-8	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Heptane, n-	142-82-5	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Hexane, n-	110-54-3	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Hydrogen Chloride (Gas, 1 atmos.)	7647-01-0	0.05	>480	>480	>480	6		>480	6	<0.05
Hydrogen Cyanide	74-90-8	0.05	134	139	173	4	ND	249	5	High
Hydrogen Fluoride (Gas, anhydrous)	7664-39-3	0.05	70	72	77	3	ND	ND	ND	High
Methanol	67-56-1	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Nitrobenzene	98-95-3	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Phenol (Liquid, 60 °C)	108-95-2	0.05	45	50	55	2	ND	ND	ND	High
Pyrrolidine	123-75-1	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Sodium Hydroxide (40% w/w)	1310-73-2	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Sodium Hydroxide (50% w/w)	1310-73-2	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Sulphuric Acid (95-96% w/w)	7664-93-9	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Tetrachloroethylene	127-18-4	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Tetrahydrofuran	109-99-9	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Thionyl Chloride	7719-09-7	0.1	>480	>480	>480	6	<48	>480	6	<0.1
Toluene	108-88-3	0.05	>480	>480	>480	6	<24	>480	6	<0.05
Vinylpyridine, 4-	100-43-6	0.05	>480	>480	>480	6	<24	>480	6	<0.05

Important: Breakthrough time alone is not sufficient to determine how long a garment may be worn once the garment has been contaminated. Safe wear time may be longer or shorter depending on numerous other factors, including the toxicity, exposure conditions and permeation behaviour of the substance.

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