High Performance Protection in Comfort

Protective Workwear
Product Catalogue 2007/2008

MICROGARD®

Formerly Orvec, Microgard Ltd was one of the Worlds first manufacturers of limited life protective workwear, introducing new technology and designs to the market to improve wearer protection and comfort for the past 30 years.

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 contact Microgard® to keep you protected.

Microgard® and Microchem® products are manufactured under an ISO 9001 approved quality control system, and meet the European Norms specified in Category III of the PPE directive for chemical protective workwear.

Global Solutions from Microgard®
Microgard® and Microchem® products have been extensively tested to achieve the Japanese Industrial Standards (JIS) and the Korean Occupational Safety & Health Association (KOSHA) guidelines on chemical protective clothing.

For full details visit **www.microgard.com** or contact Microgard Ltd on **+44(0)1482 625444**

MICROGARD®
High Performance Protection in Comfort

Contents

Microgard® Guide to European Norms and Selection Guide

Keeping the dangers out is as simple as choosing the correct garment for the job!

To assist you with the selection of chemical protective clothing the EU has identified six "types" of protective garments within Category III of the PPE directive.

Certification to a particular type offers an indication of your suits 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 type standards, where applicable.

Please be aware however that these type standards do 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, suits are allowed individual leakages of up to 30%, providing the average for the suits tested is less than 15%.

Microgard® manufacture products according to ISO 9001, thus ensuring as far as is reasonably possible they consistently achieve the desired protection level.

Microgard® Guide to Protective Clothing "Types"

EN Type	Type Description	EN Symbol	Microgard Product*
Type 1 EN943-1 EN943-2	**Gas Tight Protective Clothing.** Protective clothing against liquid and gaseous chemicals, aerosols and solid particulates		Contact Microgard to discuss
Type 2 EN943-1	**Non Gas Tight Protective Clothing.** Suits which retain positive pressure to prevent ingress of dusts, liquids and vapours		4000 Saturn
Type 3 EN14605	**Liquid Tight Suits** Suits which can protect against strong and directional jets of liquid chemical		2500 Plus 3000 4000 4000 Apollo
Type 4 EN14605	**Spray Tight Suits** Suits which offer protection against saturation of liquid chemicals.		2000 Plus 2500 Plus 3000 4000 4000 Apollo CFR
Type 5 EN ISO 13982-1 (&2)	**Dry Particle Suits** Suits which provide protection to the full body against airborne solid particulates		1500 Asbestos 1500 Standard 2000 Comfort 2000 Plus 2500 Plus 3000 4000 FR
Type 6 EN13034	**Reduced Spray Suits** Suits which offer limited protection against a light spray of liquid chemicals		1500 Asbestos 1500 Standard 2000 Comfort 2000 Plus 2500 Plus FR

Additional European Norms (EN) achieved by the Microgard® product range

EN	Description	EN Symbol	Microgard Product*
EN1073-2**	Protective clothing against radioactive particulate contamination		2000 Comfort 2000 Plus 2500 Plus 3000 4000
EN14126	Protective clothing against infective agents "Type" prefixed with letter "B" (i.e. Type 3B) indicates approval to this European Norm		2000 Plus 2500 Plus 3000 4000
EN1149-1	Protective clothing with electrostatic properties***		1500 Standard 2000 Comfort 2000 Plus 2500 Plus 3000 4000 Range FR CFR
EN533	Protective Clothing. Limited flame spread materials and assemblies		FR CFR

* Type approvals do not apply to accessories and partial body protection items. Always refer to the garment label, which will indicate the protection level offered.

** Gives no protection against radioactive radiation

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

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. 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.

For full details of the performance of Microgard® products under Type testing please visit **www.microgard.com** or contact our technical hotline on **+44 (0) 1482 625444**

MICROGARD® 1500 Range :-

Microgard® 1500 Asbestos - Protection from particulates and low hazard liquid chemicals. Highly breathable SMS fabric offering Type 5 & 6 protection

Microgard® 1500 – Anti-static SMS fabric for protection against particulates and low hazard liquid chemicals. Highly breathable SMS fabric ensures wearer comfort and protection to Type 5 & 6 and EN1149-1

Designed specifically for workers in the Asbestos contract removal industry

Protection Levels

Available in white, red or navy blue Microgard® 1500 Asbestos coveralls have been designed specifically for workers involved in the stripping, clear up or handling of Asbestos.

- Asbestos fibres, such as Chrysotile, are typically 3-5 microns in size. The SMS fabric used in the construction of Microgard® 1500 Asbestos coveralls have been proven to filter 99.8% of particles larger than 3.5 microns*
- The Microgard® 1500 Asbestos coverall construction ensures that the Total Inward Leakage of particulates is less than 9%** - This is 40% more efficient than what is required to pass the EN13982-2 Type 5 particulate test

Combine the exceptional filtration efficiency with the physical performance of Microgard® 1500 Asbestos coveralls and you can be assured that your workforce will be protected and comfortable.

Applications

- Asbestos stripping, clear-up or handling

Microgard® 1500 Asbestos Hooded Coveralls meet the following European Norms

- **Type 5** EN ISO 13982-1(&2) Dry particle suit
- **Type 6** EN 13034 Reduced spray suit

*Aloxite particle penetration test

Results recorded under laboratory conditions according to EN ISO 13982-1(&2). Visit **www.microgard.com for full details or contact the tech team on **+44 (0) 1482 625444**

MICROGARD® 1500 ASBESTOS - Suit Features

- Breathable SMS fabric
- Hood design compatible with most full face respirators Including powered units
- Elasticated hood, wrist, waist & ankles
- 3-thread overlocked seams

Colour Red, Blue, White

Standard sizes M to XXXL

For details of fabric physical performance see page 30

Microgard® 1500 features a high quality 3-layer anti-static SMS fabric

Protection Levels

TYPE 5

TYPE 6

Additional Properties

EN 1149-1

Our Microgard® 1500 coveralls now feature an improved hood design for universal fit with most full face respirators.

- The SMS fabric used in Microgard® 1500 is tested EN1149-1, for use in areas where static control is necessary
- 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; similar to what you would find in some paint spray environments
- SMS is not suitable for heavy liquid splashes or spray as you would find in industrial paint spray applications, wash-down processes and other wet environments
- The SMS fabric used in Microgard® 1500 is also highly breathable, making it ideal for operatives working in warmer environments

Applications

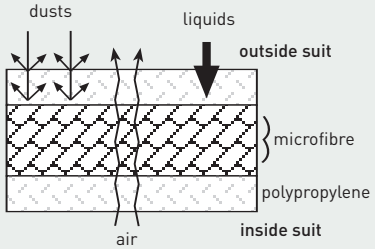
- General Maintenance
- Pharmaceuticals manufacturing
- Insulation laying
- Wood & metal processing
- Touch-up paint spraying
- Sign manufacturing
- Asbestos stripping
- Fibreglass/resin applications/ceramic fibres

Microgard® 1500 Hooded Coveralls meet the following European Norms

- **Type 5** EN ISO 13982-1(&2) Dry particle suit
- **Type 6** EN 13034 Reduced spray suit
- **EN1149-1** Anti-static

Fabric construction

Microgard® 1500 uses the latest developments in micro-fibre, multi-layer spunbond technology



The interface between these layers creates a high particle filtration efficiency and high breathability

MICROGARD® 1500 - Suit Features

- Breathable SMS fabric
- Improved hood design for optimum fit with full face respirators
- Elasticated hood, wrist, waist & ankles
- Optimised body fit for improved wearer comfort
- 3-thread overlocked seams

Colour

White

Light Blue

Standard sizes S to XXXL

For details of fabric physical performance see page 30

MICROGARD®

MICROGARD® 2000 COMFORT

TYPE 5 TYPE 4

EN 1073-2 EN 1149-1

MICROGARD® 2000 Range :-

COMFORT MICROGARD® 2000

MICROGARD® 2000 Comfort – Dirt, low concentrated inorganic chemicals and particulates. Provides Type 5&6 protection for workers in warm environments. Designed in conjunction with one of Europe's largest automobile manufacturers

PLUS MICROGARD® 2000

MICROGARD® 2000 Plus – Dirt, low concentrated inorganic chemicals, particulates, viruses, bacteria & blood borne pathogens. Now with improved hood design and finger loops (also available in Green)

SOCO MICROGARD® 2000

MICROGARD® 2000 SOCO – Dirt, low concentrated inorganic chemicals, particulates, viruses, bacteria & blood borne pathogens. Designed in partnership with Greater Manchester Police

Perform in comfort... Microgard® 2000 Comfort offers high level breathability without compromise

Protection Levels

TYPE 5

TYPE 6

Additional Properties

EN 1073-2

EN 1149-1

A new edition to the market leading Microgard® product range, Microgard® 2000 Comfort has been specifically designed for those working in warmer climates or warm working environments to help reduce heat stress.

- Combines a NEW lightweight Microporous fabric with a high wicking and breathable back panel for moisture management and breathability that is unsurpassed!
- Microporous PE laminate fabric and bound seams ensure a high level of liquid protection. The SMS back panel aids airflow around the wearer without compromising the protection level

Microgard® 2000 Comfort will help keep you safe and comfortable in environments where low hazard liquids and/or particulates are present.

Applications
- Automotive paint spray
- Fibreglass product manufacturers

Microgard® 2000 Comfort coveralls meet the following European Norms
- **Type 5** EN ISO 13982-1(&2) Dry particle suit
- **Type 6** EN 13034 Reduced spray suit
- **EN1073-2** Barrier to radioactive particulates – Class 1
- **EN1149-1** Anti-static

MICROGARD® 2000 COMFORT - Suit Features
- Breathable PE laminate fabric with SMS back panel
- Improved hood design for optimum fit with full face respirators
- Optimised body fit for improved wearer comfort
- Elasticated hood, wrist, waist & ankles
- Bound seams

Colour

White

Standard sizes S to XXXL

For details of fabric physical performance see page 30

Comfort, performance and protection with the NEW Microgard® 2000 Plus coverall

Protection Levels

TYPE 4B

TYPE 5B

TYPE 6B

Additional Properties

EN 1073-2

EN 1149-1

EN 14126

It is widely accepted that to provide a balance between comfort and performance limited life protective clothing should have three key features;

- Good breathability
- Low thermal resistance
- Good mechanical strength

Microgard® 2000 Plus features all three, offering protection without compromising comfort, and is now the product of choice for workers around the World, in industries ranging from Heavy Industrial Paint Spraying to Pharmaceuticals manufacturing.

- The 2 layer microporous fabric used in the manufacture of Microgard® 2000 Plus is designed to be highly breathable (Ret* = <15) yet will withstand saturation of liquid chemicals and filter more than 99% of particulates down to 1.0 micron in size**
- **Now available in Green!** Perfect for local authority, animal health or agriculture workers or those in public view who wish to work without causing alarm with people in white suits!

Applications

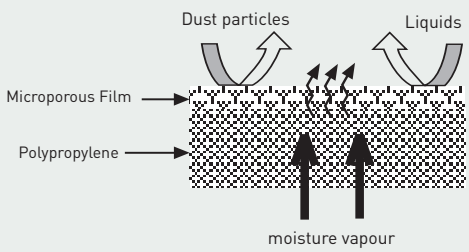
- Pharmaceutical product manufacture
- Low level liquid chemical spray
- Ship building & automobile manufacture
- Agriculture
- Veterinary services
- Local authority applications including park maintenance
- Pest control
- Automotive paint spray
- Fibreglass product manufacturers

Microgard® 2000 Plus coveralls meet the following European Norms

- **Type 4** EN 14605 Spray tight suit
- **Type 5** EN ISO 13982-1(&2) Dry particle suit
- **Type 6** EN 13034 Reduced spray suit
- **EN14126** Barrier to infective agents
- **EN1073-2** Barrier to radioactive particulates – Class 1
- **ISO/9073** Lint free fabric (outside)
- **EN1149-1** Anti-static

Fabric construction

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 PLUS - Suit Features

- Breathable PE laminate fabric
- Improved hood design for optimum fit with full face respirators
- Optimised body fit for improved wearer comfort
- Finger loops to help prevent sleeve movement when working above your head
- Bound seams ensure spray tight protection

Coverall Style 122 with fixed boot ends available to order

Colour

White

Green

Standard sizes S to XXXL

Accessories available see page 29

For details of fabric physical performance see page 30

* Ret is used to record moisture vapours transmission rate (MVTR) through a textile. The lower the value, the more "breathable" the fabric **Aloxite particle penetration test

Designed in partnership with Greater Manchester Police the Microgard® SOCO suit fits the bill for comfort and performance

Protection Levels

TYPE 4B

TYPE 5B

TYPE 6B

Additional Properties

EN 1073-2

EN 1149-1

EN 14126

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 GMP SOCOs the coverall and overboots (sold separately) were designed to fit both male and female officers and is 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.

Applications

- Police scene of crime officers (SOCOs)
- Crime scene investigation (CSI)

Microgard® 2000 SOCO coveralls meet the following European Norms

- **Type 4** EN14605 Spray tight suit
- **Type 5** EN ISO 13982-1(&2) Dry particle suit
- **Type 6** EN13034 Reduced spray suit
- **EN1073-2** Barrier to radioactive particulates - Class 1
- **EN14126** Barrier to infective agents
- **ISO/9073** Lint free fabric (outside)
- **EN1149-1** Anti-static

MICROGARD® 2000 SOCO - Suit Features

- Breathable PE laminate fabric
- Hood Compatible with other PPE including goggles and respirators
- Self Adhesive zip flap and chinstrap ensure full suit closure
- Elasticated wrists and ankles reduce risk of crime scene contamination from under garments
- Self adhesive pockets to secure equipment in, can be positioned anywhere on the garment
- Bound seams ensure spray tight protection

SOCO Overboot features

- Fully adjustable to fit most shoe sizes
- Flexiban® anti-slip sole

Colour

White

Standard sizes S to XXXL

For details of fabric physical performance see page 30

MICROGARD® 2500 Plus :-

PLUS MICROGARD® 2500

Microgard® 2500 Plus – Inorganic chemicals, viruses, bacteria & blood borne pathogens.
Protection and comfort for workers dealing with potential contamination from viruses, bacteria and blood borne pathogens

Welded seam construction and unique microporous fabric for liquid tight protection

Protection Levels

TYPE 3B

TYPE 4B

TYPE 5B

TYPE 6B

Additional Properties

EN 1073-2

EN 1149-1

EN 14126

Featuring one of the highest quality breathable microporous films available on the market, Microgard® 2500 Plus coveralls are designed to protect you from heavy liquid spray and particulates. The fabrics physical strength and flexibility ensures you are protected and comfortable in even the harshest environments.

Applications

- Viral contaminated areas (inc. Avian Influenza)
- Part of your Business continuity PPE kit*
- CDC (Centres for Disease Control) applications
- Decontamination processes
- Low hazard chemical spray
- Emergency services first response
- Veterinary services
- Industrial Paint Spraying
- Shipbuilding

Microgard® 2500 Plus coveralls meet the following European Norms

- **Type 3** EN 14605 Liquid tight suit
- **Type 4** EN 14605 Spray tight suit
- **Type 5** EN ISO 13982-1(&2) Dry particle suit
- **Type 6** EN 13034 Reduced spray suit
- **EN14126** Barrier to infective agents
- **EN1073-2** Barrier to radioactive particulates – Class 1
- **EN1149-1** Anti-static

EN14126: 2003 Barrier to Infective Agents – Fabric Performance

- Determination of the resistance of protective clothing materials to penetration by blood and body fluids
  Pass to 20kPa (Class 6 of 6)
- Resistance of protective clothing materials to penetration by blood-borne pathogens
  Pass to 20kPa (Class 6 of 6)
- Determination of resistance to wet bacterial barrier penetration
  No penetration (up to 75 minutes) (Class 6 of 6)
- Resistance to penetration by biologically contaminated aerosols
  No penetration (Class 3 of 3)
- Resistance to dry microbial penetration
  No penetration (Class 3 of 3)

MICROGARD® 2500 PLUS - Suit Features

- Microporous PP laminate fabric
- Improved hood design for optimum fit with full face respirators
- Optimised body fit for improved wearer comfort
- Elasticated hood, wrist, waist & ankles
- Ultrasonically welded seams

Colour White

Standard sizes S to XXXL

Accessories available see page 29

For details of fabric physical performance see page 30

* visit **www.microgard.com** for full details or contact the tech team on **+44 (0) 1482 625444**

MICROGARD®

MICROCHEM® 3000

TYPE 3B TYPE 4B TYPE 5B

EN 1073-2 EN 1149-1 EN 14126

MICROCHEM® 3000 :-

Microchem® 3000 – Concentrated inorganic chemicals, viruses, bacteria & blood borne pathogens. One of the lightest chemical protective fabrics on the market

Microchem® 3000 is one of the lightest and most comfortable chemical protective garments on the market today

Protection Levels

TYPE 3B

TYPE 4B

TYPE 5B

Additional Properties

EN 1073-2

EN 1149-1

EN 14126

Featuring a soft and flexible 3 layer fabric, strong ultrasonically welded seams, and an effective chemical barrier against most inorganic chemicals.

Applications

- Chemical handling or transportation
- Oil based mud protection (i.e. oil drilling rigs)
- Pesticide and insecticide spraying
- Land reclamation and clean up
- Food industry clean downs (Caustic clean down operations)

Microchem® 3000 Plus coveralls meet the following European Norms

- **Type 3** EN 14605 Liquid tight suit
- **Type 4** EN 14605 Spray tight suit
- **Type 5** EN ISO 13982-1(&2) Dry particle suit
- **EN14126** Barrier to infective agents
- **EN1073-2** Barrier to radioactive particulates – Class 1
- **EN1149-1** Anti-static

Chemical permeation testing conducted on Microchem® 3000 fabric against over 100 chemicals according to EN374-3, EN369 or EN ISO 6529.

If we haven't got data on your chemical the tech team will discuss facilitating independent permeation testing of your specific chemical or chemical mixture.

All chemical tests and breakthrough times quoted relate to laboratory tests on fabrics only. Seams and closures may have lower breakthrough times – particularly when worn or damaged. The final determination of suitability is the user's responsibility.

For more information on test methods or to discuss permeation testing please visit **www.microgard.com** or contact the tech team on **+44 (0) 1482 625444**

Example of chemical permeation test results for Microchem® 3000 fabric

Chemical Name	CAS Number	Test method & permeation rate	Normalised Breakthrough Time (NBT)
Sulphuric Acid (98%)	7664-93-9	EN ISO 6529 1.0µm/cm²/min	>540 mins
Dimethylformamide (DMF)	68-12-2	EN ISO 6529 1.0µm/cm²/min	>540 mins
Hydrochloric Acid (37%)	7647-01-0	EN ISO 6529 1.0µm/cm²/min	>540 mins
Methanol	67-56-1	EN ISO 6529 1.0µm/cm²/min	>540 mins

MICROCHEM® 3000 - Suit Features

- Double zip system helps ensure a liquid tight seal
- Double cuff design to enable a liquid tight connection with chemical protective gauntlets*
- Hood designed for optimum fit with full face respirators
- Ultrasonically welded seams

Coverall style 122 available to order with fixed boot ends

* taping of wrists required

Colour Yellow

Standard sizes S to XXXL

Accessories available see page 29

See page 25 for additional chemical permeation data or visit www.microgard.com

MICROGARD®

MICROCHEM® 4000 APOLLO

TYPE 3B TYPE 4B

EN 1149-1 EN 14126

MICROCHEM® 4000 Range :-

Microchem® 4000 – Organic and highly concentrated inorganic chemicals, viruses, bacteria & blood borne pathogens. Unique 5-layer fabric combines a comfortable textile feel with high level chemical protection

Microchem® 4000 Apollo - Organic and highly concentrated inorganic chemicals, viruses, bacteria & blood borne pathogens.
Encapsulated Type 3 and 4 suit

Microchem® 4000 Saturn - Organic and highly concentrated inorganic chemicals, viruses, bacteria & blood borne pathogens.
Encapsulated non-gas tight Type 2 suit

Microchem® 4000, when you can't compromise on protection

Protection Levels

TYPE 3B | TYPE 4B | TYPE 5B

Additional Properties

EN 1073-2 | EN 1149-1 | EN 14126

Microchem® 4000 fabric against chemical warfare agents*

Chemical	Breakthrough Time (hrs : mins)
Lewisite (L)	>06:00 <24:00
Mustard Agent (HD)	>24:00
Sarin (GB)	>24:00
VX	>24:00

Example of chemical permeation test results for Microchem® 4000 fabric

Chemical Name	CAS Number	Test method & permeation rate	Normalised Breakthrough Time (NBT)
Methyl Ethyl Ketone (MEK)	78-93-3	EN ISO 6529 1.0µm/cm²/min	>540 mins
Liquid Phenol (90%)	108-95-2	EN ISO 6529 1.0µm/cm²/min	>540 mins
Acetone	67-64-1	EN ISO 6529 1.0µm/cm²/min	>540 mins
Chlorine Gas (99.5%)	7782-50-5	EN ISO 6529 1.0µm/cm²/min	>540 mins
Toluene	108-88-3	EN ISO 6529 1.0µm/cm²/min	>540 mins
3-N, N-Diethylenetriamine	111-40-0	EN 369 1.0µm/cm²/min	>480 mins
Acetonitrile	75-05-8	EN 369 1.0µm/cm²/min	>480 mins
Acrylamide	79-06-1	EN 369 1.0µm/cm²/min	>480 mins
Dimethyl Sulphoxide (99%+)	67-68-5	EN 369 1.0µm/cm²/min	>480 mins
Hydrochloric Acid (36%)	7647-01-0	EN 369 1.0µm/cm²/min	>480 mins
Hydrofluoric Acid (60%)	7663-39-3	EN 369 1.0µm/cm²/min	>480 mins
Nitric Acid Conc. (70%)	7697-37-2	EN 369 1.0µm/cm²/min	>480 mins
Styrene	100-42-5	EN 369 1.0µm/cm²/min	>480 mins
Xylene m	1330-20-7	EN 369 1.0µm/cm²/min	>480 mins

* Tests performed according to TNO test protocol. Contact Microgard for full details.

The unique Microchem® 4000 5-layer fabric is renowned for its lightweight and comfortable textile feel and an exceptional barrier to organic & inorganic chemicals.

Applications
- Chemical manufacturing, handling or transportation
- Industrial hazardous waste handling
- Land reclamation and clean up
- Emergency services first response chemical spill

Microchem® 4000 coveralls meet the following European Norms
- **Type 3** EN 14605 Liquid tight suit
- **Type 4** EN 14605 Spray tight suit
- **Type 5** EN ISO 13982-1(&2) Dry particle suit
- **EN14126** Barrier to infective agents
- **EN1073-2** Barrier to radioactive particulates – Class 1
- **EN1149-1** Anti-static

We haven't got data on your chemical?
Contact the tech team to discuss facilitating independent permeation testing of your specific chemical or chemical mixture.

Chemical permeation testing conducted on Microchem® 4000 fabric against over 100 chemicals according to EN374-3, EN369 or EN ISO 6529.

All chemical tests and breakthrough times quoted relate to laboratory tests on fabrics only. Seams and closures may have lower breakthrough times – particularly when worn or damaged. The final determination of suitability is the user's responsibility.

For more information on test methods or to discuss permeation testing please visit **www.microgard.com** or contact the tech team on **+44 (0) 1482 625444**

Style 122 with fixed boot ends

MICROCHEM® 4000 - Suit Features
- Double zip system helps ensure a liquid tight seal every time
- Double cuff design to enable a liquid tight connection with chemical protective gauntlets*
- Internal sleeve cuff features knitted wrist for wearer comfort
- Hood designed for optimum fit with full face respirators
- Ultrasonically welded and taped seams

Coverall style 122 with fixed boot ends available to order!

*taping of wrists required

Colour Green

Standard sizes S to XXXL

Accessories available see page 29

See page 27 for additional chemical permeation data or visit www.microgard.com

Trusted by fire and rescue crews around the world

Protection Levels

Additional Properties

Developed with the UK Fire & Rescue services Microchem® 4000 Apollo is a fully encapsulated chemical suit designed for use in conjunction with self contained breathing apparatus (SCBA).

Microgard® 4000 Apollo coveralls meet the following European Norms

- **Type 3** EN14605 Liquid tight suit
- **Type 4** EN14605 Spray tight suit
- **EN14126** Barrier to infective agents
- **EN1149-1** Anti-static

Applications

- Chemical manufacturing, handling or transportation
- Industrial hazardous waste handling
- Land reclamation and clean up
- Emergency services first response chemical spill (inc. Fire Service Appliances)

May also be suitable for use in Type B applications (according to US Environmental Protection Agency (EPA) & NFPA guidelines). Contact the Microgard tech team for full details on **+44 (0) 1482 625444**

Microchem® 4000 fabric against chemical warfare agents*

Chemical	Breakthrough Time (hrs : mins)
Lewisite (L)	>06:00 <24:00
Mustard Agent (HD)	>24:00
Sarin (GB)	>24:00
VX	>24:00

For Apollo chemical permeation test results please refer to Microchem® 4000 on page 27 or visit **www.microgard.com**

MICROGARD® 4000 Apollo - Suit Features

- Rear entry double zip system
- Rear mounted BA pouch (universal fit with most BA)
- Fixed boot ends with boot overflap
- Attached Ansell Barrier® Gloves
- Mylar 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

Colour

Green

Standard sizes M - XXL

Accessories Available see page 29

* Tests performed according to TNO test protocol. Contact Microgard for full details.

Comfort and protection, with Microchem® 4000 chemical barrier

Protection Levels

TYPE 2B

Additional Properties

EN 1149-1

EN 14126

Encapsulated suit designed for use in conjunction with airline breathing apparatus, either full face or half mask face piece with breathing hose, belt mounted flow control or pressure reducer valve*.

Microgard® 4000 Saturn coveralls meet the following European Norms

- **Type 2** EN943-1 positive pressure (non-gas tight) suit
- **EN14126** Barrier to infective agents
- **EN1149-1** Anti-static

May also be suitable for use in Type B applications (according to US Environmental Protection Agency (EPA) & NFPA guidelines). Contact the Microgard tech team for full details on **+44 (0) 1482 625444**

Applications

- Chemical manufacturing, handling
- Industrial hazardous waste handling

MICROGARD® 4000 Saturn - Suit Features

- Fixed boot ends with boot overflap
- Attached Ansell Barrier® Gloves
- Rear zip entry
- Air hose tail attachment
- Exhalation Valves
- Mylar Visor
- Ultrasonically welded and taped seams
- Compatible with most airline breathing apparatus*

Colour Green

Standard sizes L - XXL

Accessories Available see page 29

*Developed with the Sundstrom SR90 Airline respirator with filter back-up

MICROGARD® FR and CFR :-

Microgard® FR – Flame resistant and barrier to dirt and low concentrated inorganic chemical spray. Proven to provide secondary protection in a flash fire situation

Microgard® CFR – Flame resistant and barrier to organic & inorganic chemicals. Protection from hazardous chemicals without compromising on safety

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

Protection Levels

TYPE 5

TYPE 6

Additional Properties

EN533 INDEX 1

EN 1149-1

* Microgard® FR should never be worn in isolation for flame retardant protection. Always wear over the top of garments which achieve EN533 Index 2 or above. Mannequin testing conducted using DuPont™ NOMEX® workwear which achieves at least EN533 Index 3 and EN531 for workers exposed to heat & flames.

Microgard® FR offers wearers protection from liquid chemicals to EN Type 6 and particulates to EN Type 5. Microgard® FR also offers peace of mind to workers in potential explosive/flammable environments, by decreasing the risk of burn injury when worn over their thermal protective workwear*.

Applications

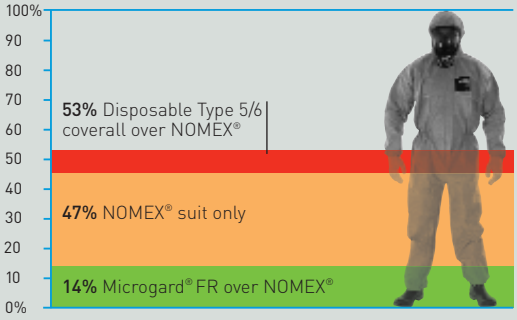
- Oil & Gas, Petrochemical applications
- Utilities Contractors
- All applications where there is the need for particulate or limited chemical splash protection without compromising on wearer protection in the event of a flash fire

Microgard® FR coveralls meet the following European Norms

- **Type 5** Dry particle suit
- **Type 6** Reduced spray suit
- **EN533** Limited flame spread materials & assemblies – **Pass to Index 1**
- **prEN 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 13506:2004)
- **EN1149-1** Anti-static

Microgard® FR EN368 Resistance to chemical penetration and repellency		
Chemical Name	**Repellency**	**Penetration**
Sulphuric Acid (30%)	95.2%	1.15%

BODY BURN PREDICTION



Our Thermal Mannequin tests predict that:

1. Wearing just a NOMEX® coverall and underwear when exposed to the flash fire, the wearer would suffer 47% body burn
2. Wearing a standard disposable coverall over the NOMEX® to provide it with Type 6 chemical protection, will actually reduce the coverall flame retardant effectiveness and increase body burns from 47% to 53% under similar flash fire conditions
3. Wearing Microgard FR over NOMEX® to provide the wearer with Type 6 chemical protection, will INCREASE the overall flame retardant effectiveness and decrease body burns from 47% to 14%

MICROGARD® FR - Suit Features

- Flame retardant treated Sontara/wood pulp/polyester fabric
- Elasticated hood, waist, wrist and ankles
- 3-thread overlocked seams

Colour

Light Blue

Standard sizes S to XXXL

In high risk areas Microgard® CFR is proven to protect

Protection Levels

TYPE 4

Additional Properties

EN533 INDEX 1

EN 1149-1

* Microgard® CFR should never be worn in isolation for flame retardant protection. Always wear over the top of garments which achieve EN533 Index 2 or above. Mannequin testing conducted using DuPont™ NOMEX® workwear which achieves at least EN533 Index 3 and EN531 for workers exposed to heat & flames.

Microgard® CFR offers wearers protection from liquid chemicals to EN Type 4 and particulates to EN Type 5. Microgard® CFR also offers piece of mind to workers in potential explosive/flammable environments, by decreasing the risk of burn injury when worn over their thermal protective workwear*.

Applications

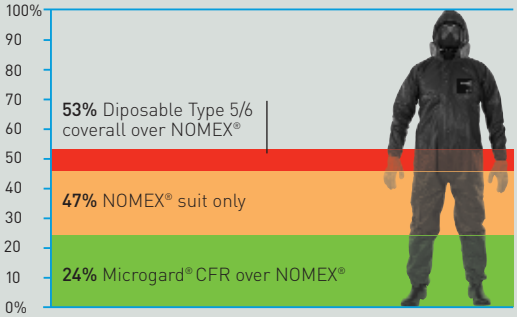
- Oil & Gas, Petrochemical applications
- Utilities Contractors
- All applications where there is the need for particulate or limited chemical splash protection without compromising on wearer protection in the event of a flash fire

Microgard® CFR coveralls meet the following European Norms

- **Type 4** Spray tight suit
- **EN533** Limited flame spread materials & assemblies – **Pass to Index 1**
- **prEN 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 13506:2004)
- **EN1149-1** Anti-static

Microgard® CFR chemical testing			
Chemical Name	**EN374-3 (mins)**	**ASTM F903 (Penetration) (mins)**	**ASTM F739 (Permeation) (mins)**
Acetone	Not tested	>60	12
Carbon Disulfide	Not tested	>60	7
Dichloromethane	Not tested	>60	4
Dimethylformamide	<1	>60	>480
Ethyl Acetate	Not tested	>60	16
n-Hexane	Not tested	>60	>480
Hydrochloric Acid (conc.)	>480	Not tested	Not tested
Sulphuric Acid (95%)	16	>60	10
Tetrachlorethylene	Not tested	>60	>480
Toluene	Not tested	>60	6

BODY BURN PREDICTION



Our Thermal Mannequin tests predict that:

1. Wearing just a NOMEX® coverall and underwear when exposed to the flash fire, the wearer would suffer 47% body burn
2. Wearing a standard disposable coverall over the NOMEX® to provide it with Type 6 chemical protection, will actually reduce the coverall flame retardant effectiveness and increase body burns from 47% to 53% under similar flash fire conditions
3. Wearing Microgard CFR over NOMEX® to provide the wearer with Type 4 chemical protection, will INCREASE the overall flame retardant effectiveness and decrease body burns from 47% to 24%

MICROGARD® CFR - Suit Features

- Flame retardant treated Sontara/wood pulp/polyester fabric with PVC barrier film
- Elasticated hood, waist, wrist and ankles
- 3-thread overlocked and taped seams

Colour Grey

Standard sizes S to XXXL

Microgard®/Microchem® Chemical Permeation Chart

Versatile Chemical Protection Starts with Microchem®

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

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

The resistance of Microchem fabric 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 to EN ISO 6529, EN369, EN374-3.

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

Microgard® 2000				
Chemical	**CAS No.**	**Synonyms**	**Normalised Breakthrough Time (NBT)**	**Classification according to EN14325: 2004**
Sodium Hydroxide 10%	1310-73-2	Soda Lye, Caustic Soda,	>480	6
Sodium Hydroxide 30%	1310-73-2	Soda Lye, Caustic Soda	>480	6
Microgard® 2500 Plus				
Carbon Disulfide	75-15-0		5	0
Sodium Hydroxide 50%	1310-73-2	Soda Lye, Caustic Soda,	>480	6
Sulphuric Acid 98+%	7664-93-9	Oil of Vitriol, Oleum (98%), Nordhausen Acid (98%), BOV	>480	6
Microchem® 3000				
2-(Dimethyl Amino) Pyridine 99+%	n/a		57	2
2, Ethyhexanoic Acid	149-57-5		>480	6
2-2 (Amino Ethoxy Ethanol)	n/a		>480	6
2-Chloroethanol 99%	107-07-3		>480	6
Acetic Acid Glacial	64-19-7	Pyroligneous Acid (crude)	>480	6
Acetic Anhydride	108-24-7		>480	6
Acetone	67-64-1	2-Propanone, Pyroacetic Ether, Dimethyl Ketone,	21	0
Acetonitrile	75-05-8	Ethanenitrile, Methyl Cyanide,Cyanomethane,	5	0
Acrylamide	79-06-1		>480	6
Acrylic Acid	79-10-7		>480	6
Ammonia (liquid - 33°c)	1336-21-6		2	0
Ammonia Gas	7664-41-7		2	0
Ammonium Hydrogen Fluoride	1341-49-7		>480	6
Aniline	62-53-3	Aminobenzene, Aniline Oil, Phenylamine, Kyanol,	>480	6
Aqueous bacteria, staphylococcus aureus	n/a		>480	6
Benlate	n/a		>480	6
Benzene	71-43-2	Cyclohexatriene, Benzol,	2	0
Benzene Sulphonyl Chloride (99%)	98-09-9		>480	6
Benzyl Chloride (99w%)	100-44-7		16	1
Butanol n	71-36-3	Propyl Carbinol, Butyl Alcohol,	>480	6
Butyl Acrylate n	141-32-2		15	1
Carbon Disulfide	75-15-0		5	0
Chlorine Water (sat'd 99.9+%)	7782-50-5		2	0
Chloroacetyl Chloride	79-04-9		36	2
Chloroform	67-66-3		Imm	0
Cresol m	100-84-5		>480	6
Dichloroethane 1,2	107-06-2		4	0
Dichloroethylene trans 1,2	n/a		2	0
Dichloromethane	75-09-2	Methylene Bichloride, Methylene Chloride,	Imm	0
Diesel	68334-30-5		15	1
Di-Ethyl Ether	60-29-7		Imm	0
Diethylamine	109-89-7		Imm	0
Difluoroaniline 2,4	367-25-9		>480	6
Dimethyl Sulphate	77-78-1		>480	6
Dimethylamine 40%	124-40-3		>480	6
Dimethylformamide	68-12-2	DMF, DMFA,	>480	6
Epichlorohydrin (99%)	106-89-8		>480	6
Epoxy Hardener WH-6 (960223)	n/a		>480	6
Ethyl Acetate	141-78-6	Acetic Acid Ethyl Ester, Vinegar Naphtha, Acetic Ester,	2	0
Ethylene Chlorohydrin 99%	107-07-3		>480	6
Ethylene Glycol	107-21-1	2-Ethanediol, Glycol,	>480	6
Formaldehyde 37%	50-00-0	Formol, Formalin,	>480	6
Formic Acid 90%	64-18-6		>480	6
Furfural	98-01-1	Pyroligneous Aldehyde, Artificial Oil of Ants,	>480	6
Hexamethylene Diamine	124-09-4		>480	6
Hexane n	110-54-3		Imm	0
Hydrazine monohydrate 98%	n/a		>540	6
Hydrobromic Acid	10035-10-6		>480	6
Hydrochloric Acid 36%	7647-01-0	Muriatic Acid, Hydrogen Chloride,	>480	6

EN Class	Normalised Breakthrough Time in minutes
0	Immediate (no class)
1	≥ 10
2	≥ 30
3	≥ 60
4	≥ 120
5	≥ 240
6	≥ 480 (or >540)

For more information or guidance on specific chemicals, and details of test methods used for permeation testing, visit **www.microgard.com** or contact the Microgard tech team on **+44 (0) 1482 625444.**

All chemical tests and breakthrough times quoted relate to laboratory tests on fabrics only. Seams and closures may have lower breakthrough times – particularly when worn or damaged. The final determination of suitability is always the user's responsibility.

Microchem® 3000				
Chemical	CAS No.	Synonyms	Normalised Breakthrough Time (NBT)	Classification according to EN14325: 2004
Hydrofluoric Acid 40%	7664-39-3	Fluohydric Acid	>480	6
Hydrogen Peroxide 35%	7722-84-1	Albone, Peroxide, Hydrogen Dioxide, Hydroperoxide,	>480	6
Isopropyl Alcohol	67-63-0	2-Propanol, IPA, Isopropanol, Petrohol, Dimethyl Carbinol	>480	6
Mercury	7439-97-6		>480	6
Methanol	67-56-1	Methyl Alcohol, Wood Alcohol, Wood Naphtha, Wood Spirit	>480	6
Methyl Iodide	74-88-4		>480	6
N. Methyl Pyrrolidone	872-50-4		>480	6
Nitric Acid Conc (70%)	7697-37-2	Aquafortis,	>480	6
Nitrobenzene	98-95-3	Oil of Mirbane, Nitrobenzol,	>480	6
Octave	n/a		>480	6
Paraffin	8002-74-2		25	1
Petrol (unleaded)	8006-61-9	Gasoline, Benzin,	2	0
Phenol liquid@45°c	108-95-2		>480	6
Phenol/Benzyl Alcohol 25/5	n/a		>480	6
Phosphoric Acid o 85+%	7664-38-2	Orthophosphoric Acid	>480	6
Phosphoric Pentachloride	10026-13-8		>480	6
Phosphorous Oxychloride	10025-87-3		9	0
Phthalic Anhydride (135°c)	85-44-9		>480	6
Pivalic Acid	3377-92-2		>480	6
Polyethylene Glycol 200	n/a		>480	6
Pro-set 125M Resin (960217)	n/a		>480	6
Pro-set 226pf Hardener (960228)	n/a		>480	6
Propionitrile	107-12-0		70	3
Reglone	85-00-7		>480	6
Ripcord	52315-07-8		>480	6
Round-Up	38641-94-0		>480	6
Sodium Bisulphate 40%	7681-38-1		>480	6
Sodium Cyanide (satd soln)	143-33-9		>480	6
Sodium Fluoride (satd)	7681-49-4		>480	6
Sodium Hydroxide 50%	1310-73-2	Soda Lye, Caustic Soda,	>480	6
Sodium Hypochlorite	7681-52-9	Bleach	>480	6
Sodium Methylate 30%	124-41-4		>480	6
Sodium Monochloride	n/a		>480	6
Sodium Silicofluoride (sat'd)	16893-85-9		>480	6
Styrene	100-42-5	Cinnamol, Styrol, Vinylbenzene, Ethylbenzene, Styrolene,	2	0
Sulphuric Acid 98+%	7664-93-9	Oil of Vitriol, Oleum (98%), Nordhausen Acid (98%), BOV	>480	6
SUVA HCFC-123 (1,1 Dichloro-2,2,2 Trifluoroethane)	n/a		251	5
TEGO 51	n/a		>480	6
Tetrahydrofuran (THF)	109-99-9		Imm	0
Thionyl Chloride	7/9/19		Imm	0
Thiourea Dioxide (sat'd)	1758-73-2		>480	6
Titanium Chloride	10049-06-6		2	0
Toluene	108-88-3	Toluol, Methacide, Phenylmethane, Methyl Benzene,	3	0
Toluene 2,4 Diisocyanate	584-84-9	TDI, Nacconate 100	>480	6
Toluidine o	95-53-4		>480	6
Transformer Oil	n/a		60	3
Trichloroacetic Acid 98%	76-03-9		>480	6
Trichloroethylene	79-01-6	Algylen, Westrosol, Trimar, Trilene, Triline, Trielene,	2	0
Triethylamine	121-44-8		Imm	0
Xylene m	1330-20-7	Xylol, Diethyl Benzene,	2	0
Zinc Bromide (sat'd soln)	7699-45-8		>480	6

Microchem® 4000 Chemical Permeation Chart

Microchem® 4000				
Chemical	CAS No.	Synonyms	Normalised Breakthrough Time (NBT)	Classification according to EN14325: 2004
2-(2 Amino Ethoxy Ethanol)	n/a		>480	6
2, Ethyhexanoic Acid	149-57-5		>480	6
2,4 Difluoroaniline	367-25-9		>480	6
2-2 (Amino Ethoxy Ethanol)	n/a		>480	6
2-Aminoethanol (98wt%)	96-80-0		>480	6
2-Chloro-Acryl-Nitrile	n/a		>480	6
3,4-Dichlorobenzotrifluoride (Liquid)	526-84-7		>480	6
3-N, N-Diethylenetriamine	111-40-0		>480	6
4-Cloroaniline 75°C	106-47-8		>480	6
Acetic Acid Glacial	64-19-7	Pyroligneous Acid (crude)	>480	6
Acetic Anhydride	108-24-7		>480	6
Acetone	67-64-1	2-Propanone, Pyroacetic Ether, Dimethyl Ketone,	>480	6
Acetonitrile	75-05-8	Ethanenitrile, Methyl Cyanide,Cyanomethane,	>480	6
Acrylamide	79-06-1		>480	6
Acrylic Acid	79-10-7		>480	6
Acrylonitrile	75-05-8		>480	6
Ammonia (liquid - 33°c)	1336-21-6		2	0
Ammonia Gas	7664-41-7		2	0
Ammonium Hydrogen Fluoride	1341-49-7		>480	6
Ammonium Hydroxide 20% v/v	1336-21-6		145	4
Amylacetate	628-63-7	Isoamyl Acetate, Banana Oil, Amylacetic Ester,	>480	6
Aniline	62-53-3	Aminobenzene, Aniline Oil, Phenylamine, Kyanol,	>480	6
Aqueous bacteria, staphylococcus aureus	n/a		>480	6
Arsenic Dust	7440-38-2		>480	6
Benlate	n/a		>480	6
Benzene	71-43-2	Cyclohexatriene, Benzol,	>480	6
Benzyl Chloride (99w%)	100-44-7		>480	6
Bromine (Pure, Liquid)	7726-95-6		2	0
Bromine Soln. (Sat'd)	n/a		10	1
Butanol n	71-36-3	Propyl Carbinol, Butyl Alcohol,	>480	6
Butyl Acrylate n	141-32-2		>480	6
Chlorine (gas)	7782-50-5		>480	6
Chlorine Water (sat'd 99.9+%)	7782-50-5		>480	6
Chloroacetic Acid (99wt%) (Solid-vap perm.)	79-11-8		>480	6
Chloroacetic Acid Ethyl Ester (99wt%)	n/a		>480	6
Chloroacetyl Chloride	79-04-9		>480	6
Chlorobenzene	108-90-7		>480	6
Chloroform	67-66-3		11	1
Chlorosulphonic Acid	7790-94-5		69	3
Chlorotoluene o	n/a		>480	6
Chlorotoluene p	106-43-4		>480	6
Cresol-m in Water Solution (20g/l)	108-39-4		>480	6
Cresol-o in Water Solution (20g/l)	95-48-7		>480	6
Cresol-p in Water Solution (20g/l)	106-44-5		>480	6
Cyclohexylamine (>99.5% wt%)	n/a		83	3
Di (aminopropyl) Amine	n/a		>480	6
Dichloroacetone 1,1	n/a		>480	6
Dichloroacetone 1,3	n/a		>480	6
Dichloroethane 1,2	107-06-2		>480	6
Dichloromethane	75-09-2	Methylene Bichloride, Methylene Chloride,	12	1
Diesel	68334-30-5		>480	6
Diethanolamine (99wt%)	111-42-2		>480	6
Di-Ethyl Ether	60-29-7		2	0
Diethylamine	109-89-7		4	0
Diethylenetriamine	111-40-0		>480	6
Dimethyl Sulphate	77-78-1		>480	6
Dimethyl Sulphoxide (99+%)	67-68-5	DMSO	>480	6
Dimethylamine 40%	124-40-3		>480	6
Dimethylformamide	68-12-2	DMF, DMFA,	>540	6
Dipropylene Glycol Methyl Ether	34590-94-8		>480	6
Di-tert-butyl peroxide (98 wt%)	n/a		>540	6
Epichlorohydrin (99%)	106-89-8		>480	6
Epoxy Hardener WH-6 (960223)	n/a		>480	6
Ethanol	64-17-5	Absolute Alcohol, methylated spirits, ethyl alcohol	>480	6
Ethanolamine (98wt%)	141-43-5		>480	6
Ethyl Acetate	141-78-6	Acetic Acid Ethyl Ester, Vinegar Naphtha, Acetic Ester,	>480	6
Ethyl Benzene	100-41-4		>480	6
Ethyl Chloroacetate (99wt%)	105-39-5		>480	6
Ethylene Diamine	n/a		>480	6
Ethylene Dibromide	106-93-4		>480	6
Ethylene Glycol	107-21-1	2-Ethanediol, Glycol,	>480	6
Ethylene Oxide (gas at ca.1 Atmos)	75-21-8		>480	6

EN Class	Normalised Breakthrough Time in minutes
0	Immediate (no class)
1	≥ 10
2	≥ 30
3	≥ 60
4	≥ 120
5	≥ 240
6	≥ 480 (or >540)

For more information or guidance on specific chemicals, and details of test methods used for permeation testing, visit **www.microgard.com** or contact the Microgard tech team on **+44 (0) 1482 625444.**

All chemical tests and breakthrough times quoted relate to laboratory tests on fabrics only. Seams and closures may have lower breakthrough times – particularly when worn or damaged. The final determination of suitability is always the user's responsibility.

Microchem® 4000 Chemical Permeation Chart

Microchem® 4000				
Chemical	CAS No.	Synonyms	Normalised Breakthrough Time (NBT)	Classification according to EN14325: 2004
Fluorobenzene	462-06-6		105	3
Formaldehyde 37%	50-00-0	Formol, Formalin,	>480	6
Formic Acid 90%	64-18-6		>480	6
Furfural	98-01-1	Pyroligneous Aldehyde, Artificial Oil of Ants,	>480	6
Hexamethylene Disilazane (1,1,1,3,3,3)	n/a		>480	6
Hexane n	110-54-3		>480	6
Hydrazine monohydrate 98%	n/a		>540	6
Hydrobromic Acid	10035-10-6		>480	6
Hydrochloric Acid 36%	7647-01-0	Muriatic Acid, Hydrogen Chloride,	>480	6
Hydrofluoric Acid 40%	7664-39-3	Fluohydric Acid	>480	6
Hydrofluoric Acid 60%	7663-39-3		>480	6
Hydrogen Peroxide 35%	7722-84-1	Albone, Peroxide, Hydrogen Dioxide, Hydroperoxide,	>480	6
Hydrogen sulphide	04/06/7783		>480	6
Isopropyl Alcohol	67-63-0	2-Propanol, IPA, Isopropanol, Petrohol, Dimethyl Carbinol	>480	6
Maleic Anhydride	108-31-6		>480	6
Mercury	7439-97-6		>480	6
Methanol	67-56-1	Methyl Alcohol, Wood Alcohol, Wood Naphtha, Wood Spirit	>480	6
Methyl Chloride	74-87-3		>480	6
Methyl Ethyl Ketone	78-93-3	MEK, Ethyl Methyl Ketone	>540	6
Methyl methacrylate (>99.0 wt%)	n/a		>540	6
Methyl Parathion	298-00-0	dimethyl-4-nitrophenyl, phosphorothionate	>480	6
N,N-Dimethylacetateamide (liquid)	526-84-7		>480	6
N. Methyl Pyrrolidone	872-50-4		>480	6
Nitric Acid Conc (70%)	7697-37-2	Aquafortis,	>480	6
Nitrobenzene	98-95-3	Oil of Mirbane, Nitrobenzol,	>480	6
Paraffin	8002-74-2		>480	6
Perchloroethylene	127-18-4	Ankilostin, Tetropil, Tetrachloroethylene, Tetracap, Didkene	>480	6
Petrol (unleaded)	8006-61-9	Gasoline, Benzin,	>480	6
Phenol liquid (90%)	108-95-2	Phenylic Acid, Phenic Acid, Phenyl Hydroxide, Oxybenzene	>540	6
Phenol liquid@45°c	108-95-2		>480	6
Phenol/Benzyl Alcohol 25/5	n/a		>480	6
Phosphoric Acid o 85+%	7664-38-2	Orthophosphoric Acid	>480	6
Phosphoric Pentachloride	10026-13-8		>480	6
Pivalic Acid	3377-92-2		>480	6
P-Nitrochlorobenzene 88°C	100-00-5		>480	6
Polyethylene Glycol 200	n/a		>480	6
Pro-set 125M Resin (960217)	n/a		>480	6
Pro-set 226pf Hardener (960228)	n/a		>480	6
Propionaldehyde	123-38-6		>480	6
Propionic Acid	79-09-4		>480	6
Propionitrile	107-12-0		>480	6
Propylene Oxide 99%	75-56-9		30	2
Reglone	85-00-7		>480	6
Ripcord	52315-07-8		>480	6
Round-Up	38641-94-0		>480	6
Sodium Cyanide (satd soln)	143-33-9		>480	6
Sodium Fluoride (satd)	7681-49-4		>480	6
Sodium Hydroxide 50%	1310-73-2	Soda Lye, Caustic Soda,	>480	6
Sodium Hypochlorite	7681-52-9	Bleach	>480	6
Sodium Monochloride	n/a		>480	6
Sodium Silicofluoride (sat'd)	16893-85-9		>480	6
Styrene	100-42-5	Cinnamol, Styrol, Vinylbenzene, Ethylbenzene, Styrolene,	>480	6
Sulphuric Acid 95+%	7664-93-9		>480	6
Sulphuric Acid 98+%	7664-93-9	Oil of Vitriol, Oleum (98%), Nordhausen Acid (98%), BOV	>480	6
SUVA HCFC-123 (1,1 Dichloro-2,2,2 Trifluoroethane)	n/a		380	5
TEGO 51	n/a		>480	6
Tetrabutyl Methyl Ether	1634-04-4		73	3
Tetracloroethylene	79-01-6		>480	6
Tetrahydrofuran (THF)	109-99-9		19	2
Tetramethyl Ammonium Hydroxide (Sat'd)	75-59-2		>480	6
Thionyl Chloride	07/09/7719		2	0
Thiourea Dioxide (sat'd)	1758-73-2		>480	6
Toluene	108-88-3	Toluol, Methacide, Phenylmethane, Methyl Benzene,	>480	6
Toluene 2,4 Diisocyanate	584-84-9	TDI, Nacconate 100	>480	6
Toluidine o	95-53-4		>480	6
Transformer Oil	n/a		>480	6
Trichloroacetic Acid 98%	76-03-9		>480	6
Trichloroethylene	79-01-6	Algylen, Westrosol, Trimar, Trilene, Triline, Trielene,	7	0
Triethylamine	121-44-8		5	0
Vinyl Acrylate	n/a		>480	6
Vinyl Benzyl Chloride	n/a		>480	6
Xylene m	1330-20-7	Xylol, Diethyl Benzene,	>480	6

MICROGARD® Accessories

MICROGARD SURE STEP™ Overshoe

The MICROGARD SURE STEP™ Overshoe features 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 overshoes, resulting in safer yet more economical product.

Features include

- Single seam for increased durability
- Liquid resistant material
- Lint Free
- Generous sizing to accommodate shoe size 6-13
- Anti-static to EN1149-1

Microgard Outlast PCM Vest

OUTLAST® fabrics utilise Phase Change Materials (PCMs). This revolutionary material helps prevent overheating and reduce the risk of heat stress by absorbing excess heat, but giving you it back when you cool down, maintaining your bodies surface temperature.

Garment Features

- Detachable Hood
- Velcro Fastening
- Designed to be worn next to the skin or over a lightweight base layer i.e. polyester or cotton T-shirt
- Machine Washable at 60°c

Registered trademark of the Space Foundation, an initiative of the aerospace industry and NASA. Patented Outlast® Phase Change Technology is recognized by NASA as Certified Space Technology.

	Hooded coverall with attached feet	Hooded coverall with attached barrier gloves	Hooded coverall	Coverall with no hood	Apollo encapsulated suit	Saturn non-gas tight suit	Oversleeves	Overshoes	Overboots	Jacket	Trousers	Hospital style gown	Lab style coat	Cape hood	Hood
MICROGARD® 1500			■												
MICROGARD® 2000 COMFORT			■												
MICROGARD® 2000 PLUS	■		■	■			■	■	■					■	■
MICROGARD® 2500 PLUS	■		■	■			■	■	■	■	■			■	
MICROCHEM® 3000	■	■	■	■			■	■	■	■	■	■	■	■	
MICROCHEM® 4000	■	■	■	■	■	■	■	■	■	■	■	■	■		
MICROGARD® FR			■												
MICROGARD® CFR			■												

If you can't see the accessory you are looking for contact Microgard® on +44 (0) 1482 625444 to discuss your requirements

MICROGARD® Fabric Performance

	Microgard 1500*	M2000 Comfort***	M2000**** Plus	Microgard 2500 Plus	Microchem 3000	Microchem 4000	Microgard FR	Microgard CFR
	SMS	Microporous PE Laminate	Microporous PE Laminate	Microporous PP Laminate	Spunbond PP with barrier film	5 Layer laminate	50% FR Treated Sontara, 5% woodpulp, 45% polyester with addition of Fluro-chemical	50% FR Treated Sontara, 5% woodpulp, 45% polyester with PVC Barrier film
EN14325 FABRIC PHYSICAL TESTS								
EN 530 Abrasion	10	10	100	100	500	2000		
EN ISO 7854 Flex Cracking	15,000	40,000	40,000	40,000	100,000	100,000	>100,000	>5,000
EN ISO 9073-4 Tear Resistance (MD)	22.6N	15N	40.7	43.1N	44N	142.4N	29.6N	21.4N
EN ISO 9073-4 Tear Resistance (CD)	28.8N	30N	18.6N	35.7N	29N	105.4N	36.6N	25N
EN ISO 13934-1 Tensile Strength (MD)	>100N	77N	108.1N	122.8N	109N	172N		
EN ISO 13934-1 Tensile Strength (CD)	>55N	44N	48.3N	113.5N	62N	84N		
EN 863 Puncture Resistance	9.87N	7.2N	8.2N	15.23N	10N	16N	13.18N	14.64N
EN ISO 13938-1 Burst Resistance		>100kPa	184.1kPa	110.7kPa	90kPa	379kPa	160kPa	252kPa
EN 13274-4 Resistance to ignition	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass
EN 1149-1 Anti-static	Pass**	Pass	Pass	Pass	Pass	Pass	Pass	Pass
BS EN 20811 Hydrostatic Head (water pressure test)		>100cm	232cm	>250cm	356cm	>692cm	>100cm	>100cm
EN533 Limited Flame Retardancy							Index 1/0	Index 1/0
ISO 6530 Repellency to Liquids – 30% Sulphuric Acid	99.1%	96.0%	96.7%	99.30%	98.00%	93.4%	95.2%	
ISO 6530 Repellency to Liquids – 10% Sodium Hydroxide	97.5%	95.6%	96.7%	96.30%	97.70%	93.0%		
ISO 6530 Repellency to Liquids – n-heptane (undiluted)	0.0%	98.3%	93.8%	87.20%	92.20%	91.0%		
ISO 6530 Repellency to Liquids – Isopropanol	23.1%	91.9%	95.5%	91.70%	79.10%	90.7%		
ISO 6530 Resistance to penetration by liquids – 30% Sulphuric Acid	0.0%	0.0%	0.0%	0%	0%	0%	1.15%	
ISO 6530 Resistance to penetration by liquids – 10% Sodium Hydroxide	0.0%	0.0%	0.0%	0%	0%	0%		
ISO 6530 Resistance to penetration by liquids – n-heptane (undiluted)	26.6%	0.0%	0.0%	0%	0%	0%		
ISO 6530 Resistance to penetration by liquids – Isopropanol	19.5%	0.0%	0.0%	0%	0%	0%		
ALOXITE PARTICLE PENETRATION TEST (FABRIC) FILTRATION EFFICIENCY %								
Particle Size 1.0 – 1.5µm	98.3%		>99%					
Particle Size 1.5 – 2.0µm	98.6%		>99%					
Particle Size 2.0 – 2.5µm	99.2%		>99%					
Particle Size 2.5 – 3.0µm	99.5%		>99%					
Particle Size 3.0 – 3.5µm	99.7%		>99%					
Particle Size >3.5µm	99.8%		100%					
EN ISO 6529/EN374-3 PERMEATION TEST – NBT 1.0µm/cm²***								
Acetone				Immediate	21	>480mins		
Acetonitrile				Immediate	5	>480mins		
Ammonia (anhydrous), 99.99%				Immediate	2	2mins		
Carbon Disulfide				5	Immediate	Immediate		
Chlorine Gas, 99.5%				Immediate	Immediate	>480mins		
Dichloromethane				Immediate	Immediate	12mins		
Diethylamine				Immediate	Immediate	4mins		
Ethyl Acetate				Immediate	2	>480mins		
n-Hexane				Immediate	>480	>480mins		
Hydrochloric Acid 36%						>480mins		>480mins
Hydrogen Chloride, 99.0%				Immediate	>480	>480mins		
Methanol				Immediate	>480	>480mins		
Sodium Hydroxide, 30%			>480mins	>480	>480	>480mins		
Sulfuric Acid 96%				>480	>480	>480mins		16mins
Tetrahydrofuran				Immediate	Immediate	19mins		
Toluene				Immediate	3	>480mins		
EN14126 BARRIER TO INFECTIVE AGENTS								
ISO 16603 Resistance to penetration by blood/fluids under pressure			Class 6 of 6	Class 6 of 6	Class 6 of 6	Class 6 of 6		
ISO 16604 Resistance to penetration by blood borne pathogens			Class 6 of 6	Class 6 of 6	Class 6 of 6	Class 6 of 6		
EN ISO 22610 Resistance to wet bacterial penetration (mechanical contact)			Class 6 of 6	Class 6 of 6	Class 6 of 6	Class 6 of 6		
ISO/DIS 22611 Resistance to biologically contaminated aerosols			Class 3 of 3	Class 3 of 3	Class 3 of 3	Class 3 of 3		
ISO 22612 Resistance to dry microbial penetration			Class 3 of 3	Class 3 of 3	Class 3 of 3	Class 3 of 3		

*Results shown relate to 50gsm SMS. Contact Microgard Ltd for performance of 60gsm SMS fabric used in M1500 Standard product.
**Pass applies to WH15 & BL15 Microgard 1500 Standard. Contact Microgard Ltd for details.
***Fabric results for Microporous fabric which covers at least 85% of the product. Refer to M1500 results for back panel fabric performance
****Fabric results for white. For Green results please visit www.microgard.com
*****Permeation results recorded at 0.1µm/cm2 for M2500 Plus fabric

All chemical breakthrough times quoted relate to laboratory tests on fabrics only. Seams and closures may have lower breakthrough times – particularly when worn or damaged. The final determination of suitability is the user's responsibility.

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MICROGARD®
High Performance Protection in Comfort

MICROGARD® garments are designed and manufactured under an ISO 9001 quality control approved system.