

DURHAM UNIVERSITY - BOARD OF STUDIES IN CHEMISTRY

Response Plan for Hazardous Material Release Involving the Use of SC-B/A

These notes form **Special Code of Practice M** of the Chemistry Safety Policy and concern the use of self-contained breathing apparatus (SC-B/A) in response to a hazardous materials release such as gas escape or liquid spillage. The sections describe the response plan (Section A), provision and care of SC-B/A apparatus (Section B), use of SC-B/A (Section C) and the use of chemical suits (Section D).

A. RESPONSE PLAN FOR A HAZARDOUS MATERIAL RELEASE

1. Initiation Of The SC-B/A Team Response.

The member of the SC-B/A team who first arrives at an incident becomes the '**Responding Officer**' (**RO**) for the incident. The RO will:

- i. attend the laboratory/area and ensure that academic in charge of the area affected has been contacted (an unaffected individual from the laboratory or research group can be sent for this purpose);
- ii. secure the vicinity around the entrance to the area for the safety of other personnel and to enable safe working. This '**restricted area**' must be maintained for the duration of the incident. Security (43333) may be called to assist with maintaining the restricted area;
- iii. follow departmental policy for Accidents and Emergencies if the incident involves injured personnel who are able to receive treatment without further risk to the RO or other personnel;
- iv. make an assessment of the response that is required (detailed below).

2. Initial Incident Assessment.

Initial response assessment should be carried out by the RO, with the aim of identifying hazards and risks involved in the incident. The RO should interview researchers from the laboratory and the academic in charge to assess the nature of the incident and any potential sources of chemical hazard. The RO should review the incident area by safest means possible (visual examination from the entrance to the area; entering a short distance into area if the LEV is satisfactory; or inspection from the outside window).

The RO should aim to establish and record:

- whether the incident involves a fire, spill, release or leak;
- the quantity of the material(s) involved and their toxicity;
- the type of container involved and its condition;
- the location of the incident within the laboratory or area;
- the time the incident occurred;
- exposure that has occurred to personnel or property.

The record should be completed using the Responding Officer (RO) Checklist, available either electronically on the Safety Tablet (preferred), or in paper form (a paper copy is available in each of the Breathing Apparatus cabinets).

If the incident involves a fire, major release of volatile toxic or flammable materials, or an ongoing leak of flammable gases, the fire evacuation alarm should be sounded and the standard emergency procedures adopted (Tel. 9999 for the Fire Brigade, 43333 for the University emergency number).

The RO should:

- ensure that the safety tablet is collected by another member of the SC-B/A team;
- ensure that the decontamination bins are collected from CG018 (even if not subsequently needed);
- notify security (43333) that there has been an incident, and that it is being dealt with in house. Inform them of the basic details of the incident: where; what kind of incident; and contact details. Inform security that they will be contacted again if assistance is required.

If a chemical hazard is identified, the procedures detailed below should be followed.

3. Risk Assessment For The Use And Suitability Of SC-B/A.

Before the area is entered using SC-B/A, a dynamic risk assessment should be conducted using information provided by the RO, academic in charge of the area, researchers who were in the area at the time of the incident, and information from the departmental chemical database (LabSafe). The purposes of this assessment are to identify other hazards that may be present and confirm that SC-B/A is required and appropriate. A portable tablet is stored in a safe next to the SC-B/A on the first floor for querying LabSafe and obtaining risk assessment information. This tablet also has basic information, accessible offline, on the hazards present in each laboratory. The initial RO should ensure at an early stage that this tablet is collected by another member of the SC-B/A team. The risk assessment proforma below details the information required to enable a decision on the use of SC-B/A. This should be completed either electronically using the Chemistry Safety Tablet or on paper. Paper copies are available from the same location as the tablet.

Dynamic Risk Assessment Proforma For The Use Of SC-B/A. **Answer Q1a or Q1b and all others:**

Q1. a) If the material is known, which of the following GHS classifications apply:




H304 H318 H319 H330 H331 H332 H334 H335 H336

H304: May be fatal if swallowed and enters airways. H318: Causes serious eye damage. H319: Causes serious eye irritation. H330: Fatal if inhaled. H331: Toxic if inhaled. H332: Harmful if inhaled. H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled. H335: May cause respiratory irritation. H336: May cause drowsiness or dizziness.

b) If the material is not known, in accordance with the LabSafe database, which of the following are present in the area:

				
Toxic	Corrosive	Irritant	Gas	Poison
YES / NO	YES / NO	YES / NO	YES / NO	YES / NO

Q2. In accordance with the LabSafe database, which of the following are present in the area:

		
Explosive	Flammable	Oxidizing
YES / NO	YES / NO	YES / NO

Q3. Could any of the materials directly involved in the incident be classified under any of the GHS classifications in Q1a or Q1b?

YES / NO

If YES, the use of SC-B/A is appropriate.

Q4. Can the area be made safe within the safe working limits of the breathing apparatus?

YES / NO

If YES, the use of SC-B/A is appropriate.

Q5. Do any of the following apply: the materials directly involved in the incident be classified under any of the GHS classifications in Q2; nanoparticles are potentially present; the area is flooded? If you are unsure, the answer should be YES.

YES / NO

If YES, SC-B/A may only be used with extreme caution.

Q6. Do any of the following apply: dense smoke or dust is present that restricts visibility; obstacles inside the affected area hinder easy movement; electrical or radiation hazards are present in the affected area?

YES / NO

If YES, SC-B/A should not be used. Call the emergency services.

If Q3 and Q4 are answered YES, the use of SC-B/A is appropriate. If Q5 is answered YES, SC-B/A may only be used with extreme caution (i.e. if the amounts of material in Q5 are small and appropriate PPE is available; consult someone with appropriate expertise and/or the research group leader). If there is any doubt, seek assistance from the emergency services.

Decision to use SC-B/A:

Rationale; other PPE required: chemical suit, gloves (EN 374) etc; chemical suit permeation data; action to be taken.

4. SC-B/A Response.

If the use of SC-B/A is appropriate:

- i. One of the SC-B/A team will assume the role of '**Incident Commander**' (**IC**). The role of the IC is to remain outside the affected area, coordinate and supervise the SC-B/A response, ensure that records of the incident and response are generated, and liaise with other personnel as required. The IC should also use the Chemistry Safety Tablet to record photos and videos of the response.
- ii. The IC will assess the PPE required by the SC-B/A team for safe entry into the affected area. If any of the answers to Q1 of the dynamic risk assessment are YES, PPE must include chemical suits. Details of protocols for the use of chemical suits and their chemical compatibility are in **Section D** of this document.
- iii. PPE must be suitable to prevent exposure to toxic or harmful substances during the response. It is not expected, due to the maximum container size in the Department, that there will be direct contact between spilled materials and items of footwear.
- iv. The IC will identify a '**Response Team**' (**RT**) to enter the area wearing SC-B/A and the appropriate PPE to make it safe. The RT must comprise at least two personnel trained in the use of SC-B/A and able to operate in accordance with **Sections B, C** and **D** of this document.
- v. The IC will monitor the activities of the RT, including the time spent in the contaminated area. The RT must leave the affected area as soon as requested to do so by the IC or if the air supply is below the approved limit.

For Dealing with a Hazardous Material Release

- vi. The RT will enter the area, having taken precautions to ensure that they are not transporting any sources of ignition, and take the necessary steps to prevent the further release of hazardous materials. On completion of this task, they will leave the area, and follow the decontamination procedure.
- vii. The RT will deploy a spill kit if necessary, leave the area, and follow the decontamination procedures.
- viii. If the spill kit has been deployed, after a suitable waiting period, a new RT will enter the area and place contaminated materials in a contamination bin for disposal.

For Rescuing An Incapacitated Person

- vi. The RT will enter the area, having taken precautions to ensure that they are not transporting any sources of ignition, and take the necessary steps to remove the incapacitated person. If possible, the incapacitated person should be moved to the nearest fire exit and tended to inside the building with the fire exit open. Otherwise, the incapacitated person should be moved a safe distance away from the laboratory, within the restricted area. The restricted area can be extended, if necessary. On completion of this task, the IC should inform Security of the situation, including the location of the incapacitated person. The RT should then follow the decontamination procedure.
- vii. After the incapacitated person has been removed from the area, the RT should not re-enter, as it is unlikely that there will be sufficient air remaining. A new RT may enter the area to prevent the further release of hazardous materials, or deploy a spill kit, if it has been assessed that the area is safe to enter. On completion of this task, they will leave the area, and follow the decontamination procedure.
- viii. If the spill kit has been deployed, after a suitable waiting period, a new RT will enter the area and place contaminated materials in a contamination bin for disposal.

5. Response Conclusion.

Decontamination

Any personnel who have entered the affected area must undergo decontamination to prevent exposure to any hazardous materials encountered.

- i. Any contaminated garments and items of PPE will be removed at the exit from the contaminated area and placed into a decontamination bin. Decontamination bins are stored in CG018. The IC will ensure that they are available before the RT enter the affected area. Two bins will be available: a red one for waste materials lined with a plastic bag, and a yellow one for equipment that will require cleaning before reuse. Bins will be closed before removal from the department to a secure area in the courtyard. Personnel removing the bins from the department to the secure area should wear appropriate PPE.
- ii. Contaminated waste and disposable safety items will be disposed of in line with departmental policy (**Section I**, http://community.dur.ac.uk/chem.safety/local/policy/policy_2017_18.html#section_I).
- iii. Safety equipment will be decontaminated as appropriate by physically removing contaminants (e.g. liquid rinse, evaporation) or inactivating contaminants by chemical detoxification (e.g. neutralising agents, bleach). The precise methods will be determined in consultation with Material Safety Data Sheets and Bretherick's handbook of reactive chemical hazards. Decontamination will be conducted outside in a secure area of the courtyard and overseen by the IC. Personnel cleaning equipment must wear appropriate PPE.
- iv. The IC should assess, in liaison with the RT, whether any equipment or materials inside the affected area have been contaminated. Any materials that have been contaminated should be placed into the appropriate contamination bin for either disposal or cleaning.
- v. The RT should remove any clothing that may have become contaminated. Contaminated clothing should be placed in a labelled bag for subsequent treatment (washing, if appropriate, or disposal).
- vi. Any members of the RT should shower thoroughly if there is any suspicion that PPE has failed to protect the user.
- vii. The RT is responsible for looking after the kit and making sure the equipment is ready for re-use (which will be verified in a subsequent safety audit).

Safeguarding the incident area

The '**restricted area**' must remain intact until the RT agree that it is safe for general personnel to re-enter.

- i. If the immediate area of the incident is still contaminated, provided it is safe, the restricted area can be reduced to allow general circulation, whilst restricting access to the immediate vicinity of the incident.
- ii. Once the incident area is decontaminated, the restricted area can be removed.

Incident reporting

After the incident has concluded, a report of the incident should be delivered to the Departmental Safety Coordinator (chem.safety@durham.ac.uk). A template for this report is given at the end of this document, but should be completed electronically if possible. The IC will also submit an IR1 form in line with University requirements. The DSC will arrange a post-incident briefing to assess the response and identify improvements to the response protocols.

Responding Officer (RO) Checklist

Nature of the incident: fire / spill / release / leak / other

If 'other', please specify:

Quantity of material involved:

Toxicity of the material:

Type of container the material was in:

Condition of the container:

Time the incident occurred:

Location of the incident:

Names of personnel exposed or injured:

Names of any uninjured witnesses:

Name of academic in charge:

Time restricted area established:

Incident Report

Name of Incident Commander (IC):

Outcome of the dynamic risk assessment for SC-B/A use:

Are sufficient other SC-B/A team members present (at least IC + 2)? YES / NO

Have the PPE needs been assessed? YES / NO

Is appropriate PPE available? YES / NO

Has the SC-B/A been checked? YES / NO

Names of Response Team (RT):

Assessment of PPE required by RT:

Time RT entered the affected area:

Activity undertaken by the RT:

Time RT left the area:

Contaminated waste produced:

Are there any contaminated materials in the affected area? YES / NO

Have contaminated materials been put in a decontamination bin? YES / NO

Has any of the PPE worn by the RT been compromised? YES / NO

Have any items of clothing worn by the RT been contaminated? YES / NO

Have the RT placed their safety equipment in contamination bins? YES / NO

Have any of the RT placed contaminated clothing in sealed bags? YES / NO

Have any of the RT needed to shower after the incident? YES / NO

Time restricted area released:

Has the incident report been submitted? YES / NO

Has the IR1 form been completed? YES / NO

B. THE DEPARTMENTAL SELF-CONTAINED BREATHING-APPARATUS (SC-B/A) PROVISION

1. The Chemistry Department owns six Dräger PAS MICRO short-duration positive-pressure, self-contained breathing-apparatus (SC-B/A) sets fed by medical-quality compressed air from a gas bottle, capable of sustaining life. Six sets are in labeled open access cabinets outside rooms CG015, CG209, and opposite room CG111. Spare cylinders are kept in the same access cabinets. Each set and component of each set (bottle, mask, harness) is labeled with a unique identifying number.
2. Mr P Hofmann, as a member of Chemistry technical staff, has responsibility for the equipment. Mr P White will provide back-up cover. They will ensure that each individual sets is checked monthly, and that records are kept of such checks. These routine checks (see attached test schedule) includes the visual inspection of hoses, harness, face seal integrity, plus high and low pressure tests explained in instruction to users below. The sets are serviced annually by a qualified Dräger engineer, usually in the period between December and February. Service sheets (a record of inspection) are issued by Dräger. If a set fails a test, it will be taken out of service.

The **gas bottles** are refilled after an incident, or when, during the routine tests, a pressure of less than 240 bar is indicated.

3. The main use of the sets is for performing operations when there has been a release involving toxic chemicals that cannot be dealt with safely by other means such as a spill kit. The process for responding to hazardous material release and deciding on the use of SC-B/A is set out in **Section A** of this document.
4. If circumstances dictate, then a pair of certificated users working together may use SC-B/A in an emergency to recover an incapacitated person from a toxic environment. In such circumstances, **the first action must be to call the emergency services**. After the emergency services have been called, the response should follow the same process as that for hazardous material release (**Section A** of this document).
5. Notices are attached to the cabinets to remind the trained users to report each usage of the SC-B/A to Mr. Hofmann and enter the use in the Incident Report booklet (in CG018). Mr. Hofmann then checks the equipment for damage and gas pressure.
6. Only experienced operators may use the SC-B/A equipment during the occurrence of a fire and then only to switch off equipment or to rescue persons in danger. It is NOT to be used for fighting fires, a job which must be left to the Fire Brigade.

A dedicated team of B/A users has been set up in the Department to deal with these emergencies and have been certificated for use and general maintenance of the sets for tasks setout in 3, above, (Mr W D Carswell, Dr P Dyer, Mr P Hofmann, Mr M Richardson and Mr P White, from 12/1/2017; Dr M Kitching and Mr P Stokes from 27/4/2017, and Miss Kerry Strong, Dr Connor Sibbald and Mr Gary Oswald from 7/11/2018). Users will undergo continuous training and be re-certified every 3 years.

7. General instructions for use of the equipment are given below.

C. INSTRUCTIONS TO CERTIFICATED USERS

Positive-pressure test:

1. Press the red button on the face mask nosepiece to switch off the valve.
2. Open the cylinder valve slowly, but fully, to pressurize the system. During pressurization the whistle will briefly sound.
3. Ensure that cylinder is fully charged and then close the cylinder valve.
4. Wait one minute and then observe the pressure gauge and reopen the cylinder valve. The gauge must not show a change in pressure of more than 10 bar (one radial marking on the gauge face). Discard and report problem with set if more than 10 bar change occurs.
5. Close the cylinder valve and vent the system as follows:
 - cover and seal the lung demand valve outlet with the palm of the hand. Press red button on the face mask nosepiece to activate air flow and then lift the hand to very slowly vent.
6. The whistle must commence in the range 105 to 95 bar.
7. Press the red button on the face mask nosepiece to switch off the valve.

Donning the set:

1. Fully loosen the shoulder straps and waist belt and put on the apparatus.
2. Check that the shoulder pads are not twisted and take the weight of the system on the shoulders by pulling the shoulder straps. Do not fully tighten at this stage.
3. Close the waist belt buckle and pull the ends of the waist belt until it is securely and comfortably.
4. Pull the shoulder straps until the breathing apparatus rests securely and comfortably on the hips. Do not over tighten.
5. Check that the face mask port, and the lung demand valve coupling and O-ring are clean and undamaged.
6. Connect the lung demand valve to the face mask as follows:
 - Push-in coupling: press into the port of the face mask until it latches in position. Check the attachment by gently attempting to pull the coupling apart.
 - Screw-in coupling: screw into the port of the face mask and tighten hand tight. When the lung demand valve is fitted to the face mask, the connector can swivel to allow for head and body movement of the wearer.
7. Put the neck strap of the face mask over the head, and then insert the neck strap stud into the hole in the centre strap of the head harness.

Donning the face mask:

1. Press the red button on the facemask nosepiece to switch off the valve.
2. Open the cylinder valve slowly, but fully, to pressurize the system.

3. Detach the neck strap stud from the centre strap of the head harness.
4. Spread the head harness. Place the chin into the chin cup of the facemask and pull the harness over the head locating the harness centre plate on back of the head.
5. Tighten both lower and then upper straps evenly towards the back of the head. If necessary, tighten the centre strap. A good seal can be obtained without excessive tightening of the straps - remember that comfort is the guide.
6. Breathe normally carry out the mask function check.

Mask function check:

1. Close the cylinder valve and breathe normally to empty the system of air. When empty, the facemask should hold on to the face to indicate a positive seal.
2. Immediately reopen the cylinder valve and breathe normally.
3. Inhale and hold your breath – there should be no audible leak. If a leak is detected, readjust the head harness and retest.
4. Recommence breathing – exhaled air should flow easily out of the exhalation valve.

AFTER USE PROCEDURES:

1. Fully slacken-off all straps.
2. After use wash the face mask with the cloth or disposable wipes provided. If blue lines are not visible on the cloth, discard and obtain a fresh one from Mr P Hofmann.

D. USE OF CHEMICAL SUITS

Chemical suits (MICROCHEM 3000 Coverall (Model 111) Yellow) for trained users of SC-B/A are provided by the department and are located in the breathing apparatus storage cupboards:



General information on the chemical suits provided by the department is on this page. The protocols for using the suits is on page 2, the EC declaration is on page 3, the technical specification is on page 4 and sizing information is on page 5.

These suits are anti-static, feature dual zip systems and double cuffs, and are composed of a multi-layer barrier fabric effective against numerous chemicals. They meet the following European standards:

- **Type 3** EN14605 Liquid tight suit
- **Type 4** EN14605 Spray tight suit
- **Type 5** EN ISO 13982-1 Dry particle suit
- **EN14126** Barrier to infective agents
- **EN1073-2** Barrier to radioactive particulates - Class 1
- **EN1149-5** Anti-static

Chemical Permeation Data

It is essential that chemical permeation data are checked before suits are used. Chemical suits must not be used for longer than the breakthrough detection time for the chemical in question. Chemical permeation data for the suit are available at:

Cached Copies

<http://community.dur.ac.uk/chem.safety/local/docs/Microgard.pdf>
The Chemistry Safety Tablet (in the Documents app)

Original Source Information

<http://www.microgard.com/searchsub2.asp>

Procedure For Use

In the event of a chemical spillage that requires use of a chemical suit, the following procedure applies:

Before Entering The Area

1. Before donning the suit, remove items that may impede movement, puncture the suit and that you don't want decontaminated.
2. Remove shoes/boots.
3. Put the suit on to the waist.
4. Put on appropriate footwear.
5. Put the suit on fully, with assistance to ensure zips are done up fully.
6. Put on rest of PPE (BA, gloves).
7. Ensure that another member of the BA team checks that the suit is being worn correctly, with no gaps, tears or other defects that would permit exposure to a hazardous material.

On Leaving The Area

1. Any contaminated suit must be removed with the help of another member of the BA team wearing suitable PPE.
2. The hood should be removed and turned inside out to prevent contamination of the wearer.
3. The fastenings should then be opened by the assistant, ensuring the body of the garment is folded outwards and away from the body of the wearer.
4. The assistant should then pull the cuff of the suit over the hands of the wearer and off the shoulders, turning the sleeves and body inside out in the process.
5. The body of the suit can then be removed back and down the legs of the wearer.
6. With the wearer sitting, boots should be removed and the legs of the suit pulled over the feet of the wearer.
7. The contaminated suit should be folded inside out and placed in the red decontamination bin.
8. Other items of PPE for washing and re-use should be placed in the yellow decontamination bin.
9. Contaminated waste and disposable safety items will be disposed of in line with departmental policy (**Section I**, http://community.dur.ac.uk/chem.safety/local/policy/policy_2018_19.html#section_I).

Other Information

Copies of the EC declaration, the technical specification and sizing information are presented below.



Microgard Ltd
9 Saltmarsh Court
Priory Park
Kingston upon Hull
HU4 7DZ
United Kingdom

EC DECLARATION OF CONFORMITY

We, Microgard Ltd, Kingston upon Hull, HU4 7DZ, United Kingdom, declare that the PPE described hereafter;

"Microchem® 3000, Model 103, Coverall" **"Microchem® 3000, Model 111, Coverall"**
"Microchem® 3000, Model 121, Coverall" **"Microchem® 3000, Model 122, Coverall"**
"Microchem® 3000, Model 130, Coverall" **"Microchem® 3000, Model 132, Coverall"**

- is in conformity with the provisions of Council Directive 89/686/EEC and with the requirements for Category III PPE
- meets the minimum requirements specified by product standards;

EN 14605: 2005 +A1: 2009 *Type 3 & 4 (Limited life, full body protection with liquid tight & spray tight connections)*

EN ISO 13982-1: 2004 +A1: 2010 *Type 5 (Limited life, full body protection against airborne solid particulates)*

EN 1073-2: 2002 *(Non-ventilated protective clothing against particulate radioactive contamination) performance classification of TIL Class 1*

EN 14126: 2003 *Types 3-B, 4-B, 5-B (Limited life, full body protective clothing against infective agents)*

EN1149-5: 2008 *for electrostatic dissipative protective clothing with a charge decay, half decay time $t_{50} < 4$ s*

- is identical to the PPE which is subject of EC type examination certificate No GB08/74805 issued by SGS UK Ltd, Weston-super-mare, United Kingdom, BS22 6WA
- is subject to the procedure set out in article 11.b. of directive 89/686/EEC under the supervision of the notified body SGS UK Ltd, Weston-super-mare, United Kingdom, BS22 6WA

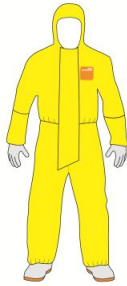
Carried out at Hull on date: 7th January 2013

A handwritten signature in black ink, appearing to read "Paul Bryce", is written above the printed name.

Paul Bryce
Technical Director



Technical Data Sheet



MICROCHEM® 3000, Model 111

Part Number: YE30-W-00-111

Fabric: MICROCHEM® 3000

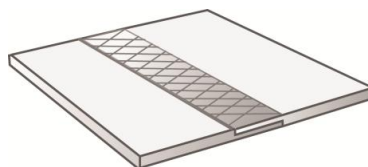
Seam Type: Ultrasonically welded

Product Description & Features	CE Category
Coverall with elasticated 2-piece hood and front entry double-zip system. Elasticated double cuffs (knitted inner cuff), waist and ankles.	Cat III

Whole Suit "TYPE" Test Results*		
Test Method	Description	Result
EN ISO 17491-3	Type 3 Jet Spray Test	Pass
EN ISO 17491-4 (Method B)	Type 4 High Level Spray Test	Pass
EN ISO 13982-2	Type 5 Particulate inward leakage	IL _{82/90} ≤ 30 % TILS _{8/10} ≤ 15 %
EN 1073-2	Barrier to Radioactive particulates	Class 1 of 3
EN ISO 13935-2	Seam Strength	Class 4 of 6

* Test performed with wrists, cuffs, ankles and hood taped to ancillary PPE.

CE Approvals	
EN 14605: 2005 +A1:2009	Type 3 (Limited life, full body protection with liquid tight connections)
EN 14605: 2005 +A1:2009	Type 4 (Limited life, full body protection with spray tight connections)
EN ISO 13982-1: 2004 +A1:2010	Type 5 (Limited life, full body protection against airborne solid particulates)
EN1073-2: 2002	(Non-ventilated protective clothing against particulate radioactive contamination) performance classification of TIL Class 1
EN14126: 2003	Types 3-B, 4-B, 5-B (Limited life, full body protective clothing against infective agents)
EN1149-5: 2008	for protective clothing with electrostatic dissipative properties"



Ultrasonically Welded Seams

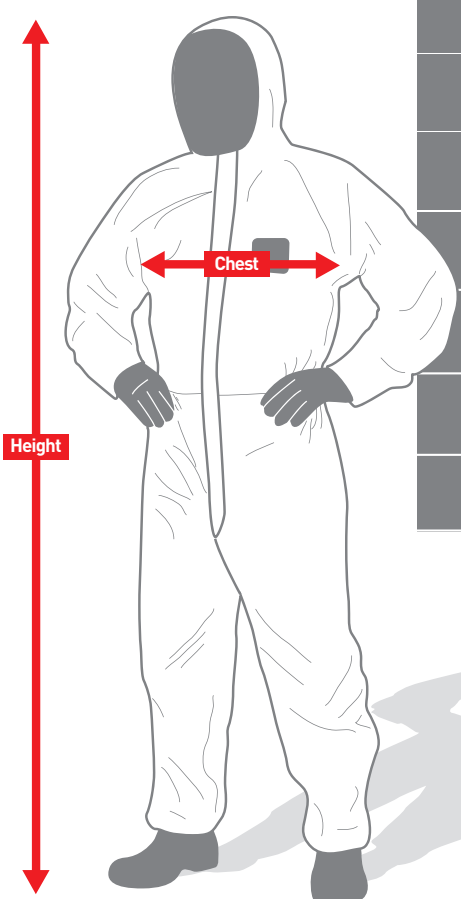
Provides a strong liquid and particle barrier

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 re-use. 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[®]

COVERALL SIZE CHART



	CHEST (cm)	HEIGHT (cm)
S	84-92	164-170
M	92-100	170-176
L	100-108	176-182
XL	108-116	182-188
2XL	116-124	188-194
3XL	124-132	194-200
4XL	132-140	200-206
5XL	140-148	206-212

PLEASE NOTE: This size chart is intended to be used as a guide only.
For assistance in the selection of suitable chemical protection clothing for your workforce please contact sales@microgard.com

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Dr John Sanderson
10 September 2018

(Review Date: 10 September 2019)