



RESPIREX™

# Limited-use SC1 Splash Suit Instructions for use



Type 3  
Type 4  
Type 5  
Type 6

EN14605:2005+A1:2009  
ENISO13982-1:2004+A1:2010  
EN13034:2005+A1:2009



EN1073-2:2002  
Class 1



EN1149-5:2008



Type 3-B  
Type 4-B  
Type 5-B  
Type 6-B

EN14126:2003

# Contents

<b>General Information .....</b>	<b>1</b>
<b>Warnings &amp; Limitations .....</b>	<b>2</b>
<b>Storage .....</b>	<b>2</b>
<b>Pre-checks .....</b>	<b>2</b>
<b>Dressing Procedure.....</b>	<b>3</b>
<b>Decontamination for removal of suit.....</b>	<b>8</b>
<b>Undressing Procedure .....</b>	<b>8</b>
<b>Disposal.....</b>	<b>8</b>
<b>Product labelling.....</b>	<b>9</b>
<b>Chemical Permeation Testing At Respirex.....</b>	<b>10</b>
<b>Material Performance Data .....</b>	<b>10</b>
<b>Whole Suit Performance .....</b>	<b>12</b>
<b>Sizing .....</b>	<b>13</b>

# General Information

The Respirix limited use SC1 splash suit is a one-piece chemical protection suit that conforms to the following European standards:

- **EN 14605:2005+A1:2009** Type3, Type 4 (Protective clothing against liquid chemicals - clothing with liquid-tight or spray-tight connections)
- **EN ISO 13982-1:2004+A1:2010** Type 5 (Protective clothing against solid particulates)
- **EN 13034:2005+A1:2009** Type 6 (Protective clothing offering limited protective performance against liquid chemicals)
- **EN 1073-2:2002** (Protective clothing against radioactive contamination - non-ventilated protective clothing against particulate radioactive contamination, Inward leakage Class 1)
- **EN 14126:2003** Type 3-B, Type 4-B, Type 5-B and Type 6-B (Protective clothing against infective agents)
- **EN 1149-5:2008** (Protective clothing - Electrostatic properties)

The European standards above specify the performance requirements for the materials of construction (e.g. abrasion resistance, tear resistance etc.), and for the suit as a whole (e.g. resistance to penetration by liquids). The suit is CE marked to indicate compliance with the basic safety requirements under Article 10 and 11B of the European directive 89/686/EEC on personal protective equipment (PPE).

Respirix limited use SC1 splash suits are manufactured from a high performance barrier laminate material engineered for use in chemical protective clothing.

The barrier laminate, offers protection in a wide range of applications including:

- Chemical handling
- Hazardous waste clean-up
- Paint spraying
- Pharmaceutical manufacturing and / or packaging
- Military applications
- Disease and disaster management
- Emergency response services, spill clean-up and accident interventions

Garment features include:

- A shaped Neoprene grommet fitted to the hood designed to provide a liquid-tight seal around the wearer's face mask.
- Integral booties option (sock like extension of the suit leg that encapsulates the entire foot) intended to be worn inside separate (i.e. not attached) protective safety boots that provide protection against mechanical risks.
- Outer legs (splash guards) intended to prevent liquid entering the safety boots
- Glove option Kemblok™ or KCL Butoject 898 gloves complying with EN374-1:2003, EN388:2003 & EN420:2003 permanently bonded to the suit (for data specific to either glove option please refer to the supplied user information).

To comply with the requirements of EN 14605:2005+A1:2009, EN ISO 13982-1:2004+A1:2010, EN 13034:2005+A1:2009, EN 14126:2003 and EN 1073-2:2002 the suit MUST be worn in combination with self contained compressed air breathing apparatus (SCBA) conforming to EN137 or a full face mask conforming to EN136. Please contact Respirix to verify the suitability of the face mask intended for use with the limited-use SC1 splash suit.

## Warnings & Limitations

- Only for use by trained competent personnel.
- Exposure to certain very fine particles, intensive liquid sprays and splashes of hazardous substances may require protective clothing of higher mechanical strength and barrier properties than those offered by the limited-use SC1 splash suit.
- The suit is designed for single use only, Respirix cannot guarantee the integrity or performance characteristics of a suit that has seen multiple cycles of usage.
- Limited-use SC1 splash suits should not be used in areas immediately dangerous to life or health (IDLH) or in environments where there is a high risk of puncture occurring.
- If the suit is heavily contaminated or mechanically damaged in any way it MUST NOT be used and MUST be disposed of.
- Never modify or alter this product.
- Before selecting appropriate protective clothing a detailed assessment of the nature of the hazard and the working environment should be undertaken. There are different factors such as concentration, temperature, pressure and other environmental influences that have significant influence on the barrier properties of limited-use SC1 splash suits.
- Please ensure that you have chosen suitable PPE for your application. The user shall be the sole judge for the correct combination of full body protective coverall and ancillary equipment (gloves, boots, respiratory equipment etc) and how long a limited-use SC1 splash suit can be worn on a specific application with respect to its protective performance, wear comfort or heat stress.
- Materials that may come into contact with the wearer's skin are not known to cause allergic reactions to the majority of individuals. These products contain no components made from natural rubber latex.
- The suit does not provide protection against heat or flame, it should therefore not be worn in potentially flammable or explosive environments.
- To achieve proper electrostatic dissipative performance, the person wearing the suit shall be properly earthed. The resistance between the person and the earth shall be less than  $10^9\Omega$ , e.g. by wearing adequate footwear.
- Electrostatic dissipative clothing should not be worn in oxygen enriched atmospheres without prior approval by a responsible safety engineer.
- The electrostatic dissipative performance of the suit can be affected by wear and tear and possible contamination.
- When selecting outer gloves and boots it is recommended that consideration be given to their compatibility with the electrostatic properties of the suit.

For any enquiries please contact the Respirix customer services department on

Tel : +44 (0)1737 778600 or Fax : +44 (0)1737 779441.

## Storage

Suits must always be stored in a clean and dry condition at ambient temperature, and if being stored for long periods of time, out of direct sunlight.

## Pre-checks

1. Visually inspect the suit for any damage that may impair the correct working of the garment together with the gloves.
2. The suit is free from contamination both inside and out.
3. The zip operates correctly and the slider is in good condition.
4. The suit materials are free from tears and holes. Pay particular attention to the seam areas.
5. The neoprene grommet fitted to the hood is free from splits or tears.

# Dressing Procedure

Entry to the suit is made via an opening at the rear that is sealed by a zip fastener protected by double overlapping flaps with either a self-adhesive strip or a Velcro® hook and loop closure.

It is good practice for an assistant to help the wearer don and doff the suit. This makes the process easier and quicker, and will help the wearer to avoid stumbling or tripping which may result in personal injury or damage to the suit.

Follow these steps in donning the suit:

1. Make sure the suit has been visually inspected. Also make sure the correct suit has been selected for the intended use.
2. Underclothing should be worn beneath the SC1 splash suit. As a minimum, a long sleeve shirt and long trousers or “long underwear” are recommended.
3. Remove all personal affects which may result in damage to the suit (e.g. pens, badges, jewellery etc.).
4. Remove shoes or boots. The integral bootees are not designed to accommodate footwear.
5. Tuck trousers into socks to make donning of suit legs and bootees easier.



Fig. 1.



Fig. 2.

6. While seated, place both legs into the suit then fold the outer legs (splash guards) upwards (see Fig. 1. & Fig. 2.).



Fig. 3.



Fig. 4.

7. Don safety boots (see Fig. 3.). It is strongly recommended that you wear a larger size of boot than normal (ideally at least one size larger), not only to accommodate the surplus fabric of the integral bootee, but also to ease in the donning process. **IMPORTANT:** Only certified ESD boots should be worn with the silver conductive tape integral sock boot.

8. Carefully fold down the outer legs of the suit over the exterior of the safety boots (see Fig. 4.). Once folded down it is important to ensure that the seam where the outer leg joins the suit is flat and does not form a 'channel' where liquid could collect. Liquid will not be able to enter the boots once the outer leg is fully folded down.

## Elasticated inner legs and straight outer legs

- a) Step into the suit as usual with foot through elastic stirrup (where fitted)
- b) Roll outer legs up approximately 20-23cms (Fig.5)
- c) Step into protective boots (Fig.6)
- d) Roll down outer leg over exterior of boots (Fig.7)

Exactly the same procedure should be utilised when wearing suits with elasticated inner and outer legs, plain inner and outer legs and plain socks with elasticated outer legs or plain outer legs.



Fig. 5



Fig. 6



Fig. 7

## Single elasticated legs

- a) Step into the suit as usual with foot through elastic stirrup (where fitted)
- b) Roll elasticated legs up approximately 20-23cms (Fig.8)
- c) Step into protective boots (Fig.9)
- d) Roll down elasticated legs over exterior of boots (Fig.10)

Exactly the same procedure should be utilised when wearing suits with straight outer legs.



Fig. 8



Fig. 9



Fig. 10



Fig. 11



Fig. 12

9. Don your full face mask in accordance with the manufacturer's instructions. At this point in the donning procedure do not attach a filter canister to the face mask. If wearing SCBA (self contained breathing apparatus) the hose connecting the face mask to the compressed air cylinder will need to be disconnected at this stage (see Fig. 12).

10. Stand up, lift the suit and place both arms into the sleeves until the hands are placed comfortably into the attached laminate gloves (it is recommended that cotton gloves are worn inside the laminate gloves attached to the suit). This operation will be eased if both arms are put into the sleeves simultaneously rather than one at a time.

11. Tilt your head forward slightly (see Fig. 13) and with the aid of the dressing assistant ease the hood of the suit over your head. The dressing assistant should stretch and manipulate the rubber grommet attached to the hood until the face mask is able to protrude through the opening. The dressing assistant should ensure that the grommet forms a snug seal around the face mask (see Fig. 14). The grommet should be drawn as close to the visor clamp as possible.



Fig. 13



Fig. 14

12. The dressing assistant should fully fasten the zipper across the back then carefully remove the backing paper from the self-adhesive strip, if fitted, attached to the lower zip flap by pulling from the tab.

13. Seal down the upper flap evenly to the suit trying to leave the minimum of gaps and ridges for the possible ingress of spray or splash Fig. 15 & Fig. 16. Note: when sealing down the upper flap you may find it easier to achieve a smooth seal by working from the centre outwards. **IMPORTANT:** If using the nylon fine tooth zip to comply with the requirements of EN14605:2005+A1:2009, EN 13034:2005+A1:2009, EN ISO 13982-1:2004+A1:2010, EN 14126:2003 and EN 1073-2:2002 the outer flaps must be sealed using a suitable liquid impermeable tape.



Fig. 15



Fig. 16

## Wearing gloves with double elasticated sleeves

- a) Put on the suit as usual
- b) Roll back the outer sleeve (Fig.17) approximately 15 cm (6 inches)
- c) Put on the glove with the inner sleeve of the suit to the inside of the glove (Fig.17)
- d) Roll the outer elasticated sleeve down over the exterior of the glove (Fig.18)

Exactly the same procedure should be utilised when wearing suits with elasticated inner sleeves and straight outer sleeves.



Fig. 17



Fig. 18

## Wearing gloves with single elasticated sleeves

- a) Put on the suit as usual
- b) Put on the glove with the elasticated sleeve of the suit to the inside of the glove (Fig.19)
- c) Pull the elasticated sleeve over the glove (Fig.20)



Fig. 19



Fig. 20

## Wearing gloves with Kemblok™ gloves

- a) Put on the suit as usual with the Kemblok™ glove (Fig.5)
- b) Put on the neoprene glove over the Kemblok™ glove (Fig.6)



Fig. 21



Fig. 22



14. In order to provide extra mechanical protection to the integral Kembrok™ gloves an additional pair of polymer outer gloves should be worn (see Fig. 23).



Fig. 23



Fig. 24

15. If wearing a full face mask conforming to EN136, fit an appropriate filter canister conforming to EN141 (see Fig. 24), the dressing procedure is now complete and you are ready to enter the hazardous environment,

*or alternatively*

Don SCBA in accordance with manufacturer's instructions (see Fig. 25), turn on the air supply and reconnect the hose from the compressed air cylinder to the face mask, the dressing procedure is now complete and you are ready to enter the hazardous environment.

To enable the wearing of a firefighters safety helmet (see Fig. 25), any excess material of the suit hood should be gathered towards the rear of the head. Care should be taken to avoid pulling the rubber grommet away from the face mask, thus compromising the seal. The internal harness of the helmet should be fully opened and the chinstrap adjusted to its maximum length.

Note: Given that there is no standard size for individuals, it may be the case that the legs of the suit are too long for the wearer. Adjustment can be made by the dressing assistant grasping the excess material and pulling it up under the straps of the breathing apparatus.



Fig. 25

## Decontamination for removal of suit

Preliminary washing by means of a high pressure shower will remove most of the contaminant from the outer surfaces of the suit sufficient to allow the wearer to undress from the garment.

Should you not have access to a high pressure shower, the suit can be sprayed with copious quantities of water and a suitable detergent and neutralizer for a minimum period of 5 minutes.

## Undressing Procedure

This procedure will be carried out after decontamination and is easier with the assistance of two dressing assistants. It is ESSENTIAL that the assistants wear suitable protective clothing.

1. If applicable the wearer should release the waist straps of the SCBA set, slacken the shoulder straps and disconnect the hose from the face mask whilst the first dresser supports the set. The SCBA set can then be removed by the assistants.
2. The second assistant can then break the seal on the cover flap at the rear of the suit and fully unfasten the zipper.
3. The rubber grommet is manipulated forwards away from the face mask, the wearer's head is tilted and the hood is eased forward over the wearer's head so it is clear of the face mask.
4. The wearer's arms can then be withdrawn from the suit ensuring that the gloves are not pulled back into the sleeves. This is achieved by the assistants holding the gloves as the arms are withdrawn.
5. The face mask can now be removed by the wearer.
6. The suit should be lowered to the below the waist so that the wearer can adopt a sitting position. The assistants can then remove the safety boots and withdraw the wearer's legs from the suit.

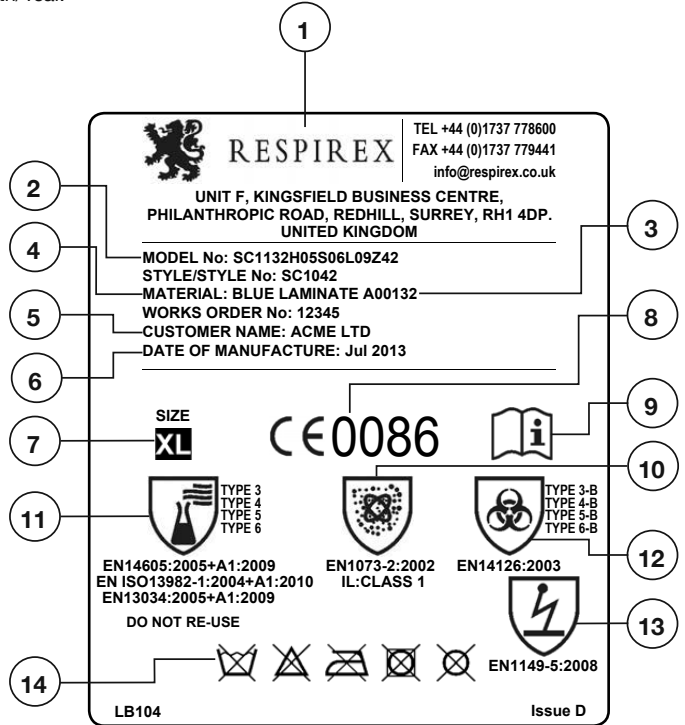
## Disposal

Uncontaminated SC1 splash suits may be incinerated. Contaminated garments should be handled as contaminated waste in accordance with local and national regulations.

# Product labelling

1. Manufacturer of garment;  
Respirex International Ltd.
2. Manufacturer's Model number
3. Material of Manufacture.
4. Manufacturer's Order No.
5. Customer Name.
6. Date of manufacture; Day/Month/Year.
7. Garment Size

Size	Chest (cms)
S	88-96
M	96-104
L	104-112
XL	112-124
XXL	124-136



8. CE Mark and notified Body code.
9. "Open Book Pictogram"; wearer must refer to the "Instructions for use" for further information.
10. Protection against particulate radioactive contamination
11. Protection against liquid chemicals and solid particulates
12. Protection against biological hazard
13. Protection against electrostatic hazard
14. Five care pictograms indicating that clothing is not suitable for cleaning and reuse.
  - Pictogram 1 Do not wash
  - Pictogram 2 Do not bleach
  - Pictogram 3 Do not iron
  - Pictogram 4 Do not machine dry
  - Pictogram 5 Do not dry clean

## Chemical Permeation Testing At Respirix

Permeation is the process by which a chemical moves through protective clothing material on a molecular level. At its headquarters in Surrey, UK, Respirix operate a chemical permeation testing laboratory equipped with the latest technology. All testing is carried out by fully qualified chemists who are able to test Respirix's own materials against a wide range of chemical substances. In this way the customer can be advised and recommended the most suitable material to use against any challenging chemical encountered in the workplace.

Permeation tests can be carried out in accordance with EN374-3, EN ISO 6529 and ASTM 739. The clothing material is exposed to the challenging chemical in a permeation cell so that breakthrough times and permeation rates can be measured. Breakthrough time is the time taken for the chemical to permeate through the material after continuous contact with the outer surface of a chemical safety suit. Permeation rates, measured in  $\mu\text{g (min.cm}^2\text{)}$ , are an indication of the amount of chemical reaching the wearer inside the suit after breakthrough occurs.

For advice on chemical permeation or decontamination contact the Respirix laboratory on Tel :+44 (0)1737 778600, Fax :+44 (0) 1737 779441 or Email: [laboratory@respirex.co.uk](mailto:laboratory@respirex.co.uk), where our qualified staff will be happy to help you. Outside of normal working hours (9.00am-5.00pm Mon-Fri) please leave details of your enquiry on the answerphone service so that the laboratory staff can deal with your query with the minimum of delay.

## Material Performance Data

Unless otherwise stated, all data shown indicates performance characteristics of the barrier laminate material in accordance with the requirements of EN14605:2005+A1:2009, EN 13034:2005+A1:2009, EN ISO 13982-1:2004+A1:2010, EN 14126:2003 and EN 1073-2:2002, plus additional standards.

## Resistance to permeation by chemicals

Tests carried out under laboratory conditions by independent accredited laboratories in accordance with EN374-3 or EN ISO 6529. Table shows average breakthrough times in minutes.

Chemical	Result Barrier laminate material	Result Kemblok™ Glove	Result KCL Butoject 898 Glove	EN Class*
Acetonitrile 99.9%	> 480 mins	> 480 mins	> 480 mins	6 of 6
SodiumHydroxide40%	> 480 mins	> 480 mins	> 480 mins	6 of 6
Methanol 99.9%	> 480 mins	> 480 mins	> 480 mins	6 of 6
SulphuricAcid95-98%	> 480 mins	> 480 mins	> 480 mins	6 of 6

Respirex's in-house laboratory can provide permeation data against other chemicals if required. \* EN class specified by EN 14325:2004, the higher the class number the better the performance.

## Repellency to liquid chemicals

Tests carried out under laboratory conditions by independent accredited laboratories in accordance with EN ISO 6530.

Chemical	Repellency index	EN Class*
Sulphuric acid 30%	> 95%	3 of 3
SodiumHydroxide10%	> 95%	3 of 3
o-Xylene 99.9%	> 95%	3 of 3
Butan-1-ol 99.9%	> 90%	2 of 3

\* EN class specified by EN 14325:2004, the higher the class number the better the performance.

## Resistance to penetration by liquid chemicals

Tests carried out under laboratory conditions by independent accredited laboratories in accordance with EN ISO 6530.

<b>Chemical</b>	<b>Penetration index</b>	<b>EN Class*</b>
Sulphuric acid 30%	< 1%	3 of 3
SodiumHydroxide10%	< 1%	3 of 3
o-Xylene 99.9%	< 1%	3 of 3
Butan-1-ol 99.9%	< 1%	3 of 3

\* EN class specified by EN 14325:2004, the higher the class number the better the performance.

## Protection against infective agents

Tests carried out under laboratory conditions by independent accredited laboratories.

<b>Test Method</b>	<b>Property</b>	<b>EN Class*</b>
ISO 16603	Resistance to penetration by synthetic blood	6 of 6
ISO 16604	Resistance to penetration by blood-borne pathogens	6 of 6
ISO/DIS 22611	Resistance to penetration by biologically contaminated aerosols	3 of 3
EN ISO 22612	Resistance to dry microbial penetration	3 of 3
EN ISO 22610	Resistance to wet microbial penetration	6 of 6

\*EN class specified by EN 14126:2003, the higher the class number the better the performance.

## Physical Properties

Tests carried out under laboratory conditions by independent accredited laboratories.

<b>Test Method</b>	<b>Property</b>	<b>EN Class*</b>
EN 530 Meth 2	Abrasion resistance	6 of 6
EN ISO 7854 Meth B	Flex cracking resistance	1 of 6 (visual assessment)
EN ISO 7854 Meth B	Flex cracking resistance(-30°C)	2 of 6
EN ISO 9073-4	Trapezoidal tear resistance	4 of 6
EN ISO 13934-1	Tensile strength	3 of 6
EN 863	Puncture resistance	2 of 6
EN 13274-4 Meth 3	Resistance to ignition	Pass
EN 25978	Resistance to blocking	Slight blocking

\* EN class specified by EN 14325:2004, the higher the class number the better the performance.

# Whole Suit Performance

Tests carried out under laboratory conditions by independent accredited laboratories.

Type 3 Liquid jet test	EN14605:2005+A1:2009	Pass
Type 4 Liquid spray test	EN14605:2005+A1:2009	Pass
Type 5 Protection against airborne solid particulates	EN13982:2004+A1:2010	Pass $L_{jmn}, 82/90 \leq 30\%$ $L_s, 8/10 \leq 15\%$
Type 6 Liquid spray test (mist test)	EN13034:2005+A1:2009	Pass
Radioactive particulates	EN 1073-2:2002	Class 1
Seam strength	EN ISO 13935-2:1999	Class 4*
Surface resistance ( $\Omega$ )	EN 1149-5:2006	Pass Face, Mean $3.5 \times 10^{8**}$ Reverse, Mean $3.3 \times 10^{7**}$

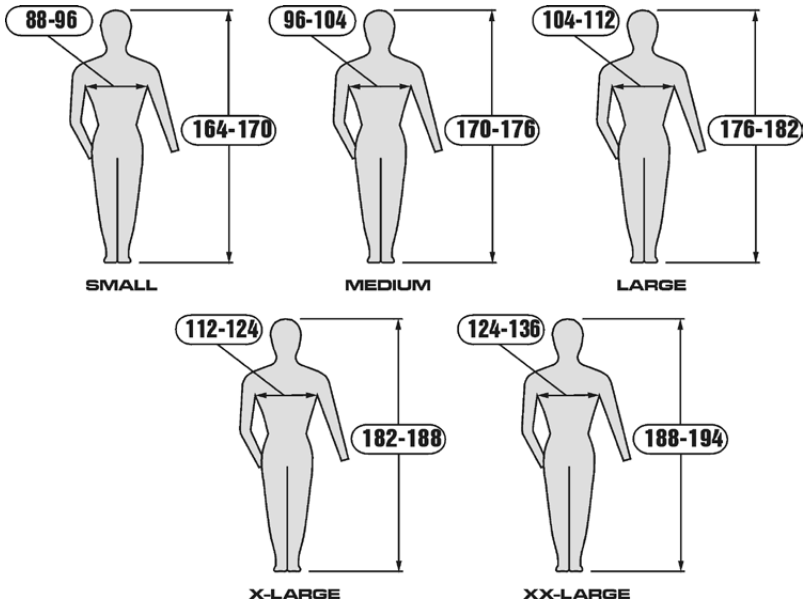
\* EN class specified by EN 14325:2004, the higher the class number the better the performance.

\*\* EN1149-5:2008 requires a surface resistance of less than or equal to  $2.5 \times 10^9 \Omega$ , on at least one surface, tested according to EN1149-1.

# Sizing

The following pictograms designate the range of height & chest sizes suitable for the SC1 splash suit, check your body measurements to make sure you are suitable. Body measurements in cm.

Size	Height	Chest
S	164-170	88-96
M	170-176	96-104
L	176-182	104-112
XL	182-188	112-124
XXL	188-194	124-136











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