

INTERCEPTOR™



Type 1 Gas-Tight Chemical Protection by Lakeland

GAS TIGHT

Interceptor™ is Lakeland's flagship fully encapsulating coverall offering fully sealed, gas-tight protection against hazardous chemicals either in gaseous or liquid form. Interceptor™ is fully approved and certified to EN 943-1:2002.

Interceptor™ uses unique Lakeland-engineered multi-layer / multi-film technology to create a material which is remarkably light and flexible yet features a superior barrier against a very wide range of chemicals. The weight of this type of garment is a major factor in work rates, work duration and minimising stress. Interceptor fabric is 325gsm – making it 15% lighter than its major competitor. In addition to the fabric Interceptor™ uses a number of unique features to create a superior product for this highest level of protection:-

- High strength stitched seams sealed with heat sealing chemical tape on the inside AND outside of the seam. The tape used is developed from the key outer layer of the Interceptor™ fabric to ensure seams maintain a sufficient level of barrier*
- Two-layer face-shield constructed of an outer layer of 10 mil teflon and an inner layer of 40mil PVC for superior chemical barrier. Sealing of the face-shield uses a unique patented system of etching to enable superior and more secure sealing of the seam.
- Standard vision and wide vision visor options
- SCBA accommodation inside the suit
- 122cm gas tight zipper with front or rear entry mounting options
- Two exhalation valves with covering flaps
- Attached sock boots with boot overflaps
- Two layer glove system as standard featuring an inner North Silvershield™ glove and outer Lakeland neoprene glove
- St Gobain "One Glove"™ system as option
- Front or rear entry optional designs

* Whilst every effort is made to ensure Interceptor seams are as effective as they can possibly be, seams and closures are always inevitably potential weak areas for any chemical suit and users should always take care to check the integrity of the suit, especially in consideration of possible damage or tears, both before and after use.

TYPE 1A



EN943-1
2002



DESIGN SPECIFICATION AND FEATURES

There are four basic options for the Interceptor™ Type 1a gas tight suit:-

- INT640:** Fully encapsulated front entry vapor-protective suit
- expanded back, attached sock boots with boot flaps
 - sealed seams inside and out
 - 122cm zipper (48"), double storm flap with hook and loop
 - 2 layer faceshield (10 mil Teflon/40 mil PVC)
 - Neoprene and North Silvershield™ glove system
 - 2 exhaust valves
 - 4cm waist belt with 3 belt loops sewn (inside) and sealed
 - Storage bag included

- INT650:** Fully encapsulated rear entry vapor-protective suit,
- expanded back, attached sock boots with boot flaps
 - sealed seams inside and out,
 - 122cm zipper (48"), double storm flap with hook and loop
 - 2 layer faceshield (10 mil Teflon/40 mil PVC)
 - Neoprene and North Silvershield™ glove system
 - 2 exhaust valves
 - 4cm waist belt with 3 belt loops sewn (inside) and sealed
 - Storage bag included

- INT640W:** Fully encapsulated front entry vapor-protective suit
- expanded back, attached sock boots with boot flaps
 - sealed seams inside and out
 - 122cm zipper (48"), double storm flap with hook and loop
 - 2 layer "wide-view" faceshield (10 mil Teflon/40 mil PVC)
 - Neoprene and North Silvershield™ glove system
 - 2 exhaust valves
 - 4cm waist belt with 3 belt loops sewn (inside) and sealed
 - Storage bag included

- INT650W:** Fully encapsulated rear entry vapor-protective suit
- expanded back, attached sock boots with boot flaps
 - sealed seams inside and out
 - 122cm zipper (48") double storm flap with hook and loop
 - 2 layer "wide-view" faceshield (10 mil Teflon/40 mil PVC)
 - Neoprene and North Silvershield™ glove system
 - 2 exhaust valves
 - 4cm waist belt with 3 belt loops sewn (inside) and sealed
 - Storage bag included

Other Options · St Gobain "One-Glove™" system

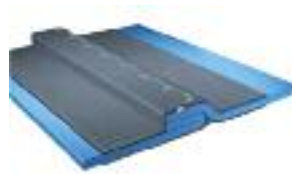
Fabric

Interceptor™ fabric is a unique multi-layer construction featuring a combination of some 10 barrier film layers and incorporating a non-woven diffusion layer. The layer sequence is optimised to provide a highly effective chemical barrier. The fabric is tough and strong yet also remarkably light and flexible given its chemical protective properties. It has been developed by our own Lakeland technologists and is not available from anyone except Lakeland and Lakeland approved distributors.



Interceptor™ fabric is blue as standard with grey and orange available to order.

Seams



The seam of any chemical protective garment is always a potential weak spot and gas-tight suits require the highest standard of seam construction to ensure the garment remains sealed even against the penetration of vapours and gases.

Interceptor™ seams are first stitched with an overlocking seam, then sealed BOTH INSIDE AND OUT with a heat sealed chemical tape. To ensure the chemical barrier is maintained at the seam the tape used is developed from the outer layer of the Interceptor™ fabric itself.

Gloves



Standard neoprene / North Silvershield® system



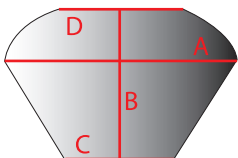
Optional St Gobain One-glove® system. Request separate leaflet for details.

Interceptor™ is supplied as standard with a glove system consisting of an inner North Silvershield™ glove and outer Lakeland 27mil neoprene Neosol® unsupported glove.

As an optional extra Interceptor™ is available to order with the unique St Gobain "ONEGlove™" system. This consists of a Kevlar® outer glove, Nomex® inner glove and flouropolymer barrier film. As each layer is bonded together in the ONEGlove™ this means fewer problems when the hand needs to be removed from the glove when wearing the suit.

Visor Dimensions and Construction

Interceptor™ comes with a choice of two visors: Standard and Wide Vision:-



Dimensions (cm)	A	B	C	D
Standard Visor	42.2	45.6	21.2	26.5
Wide vision visor	61.3	46.1	18.7	24

The visor is constructed with a two layer film - 40mil PVC on the inside for strength and flexibility, and 10mil Teflon for superior chemical barrier.

The Interceptor™ visor is sealed to the garment through the use of a Lakeland-patented technique which involves a unique etching of the edge of the visor material to enable a simpler and more secure seam.

Both visor and fabric-visor seam have been separately tested for permeation to the 15 chemicals required in EN 943. (see *technical data section*)

Other Components

Exhalation Valves

Interceptor™ includes 2 nylon 6/6 exhalation valves with SBC flappers. One is placed at the back of the hood. The other is on the lower back.

Zipper

The zipper is a gas-tight PVC zipper with stainless steel teeth.

APPLICATIONS AND MAINTENANCE

Interceptor™ is a Type 1 gas-tight suit designed for use in applications where users must work in areas where hazardous vapours and gases may be present:-

- Petrochemical and Refining
- Maintenance and high hazard cleaning
- Medical and biological contaminant hazards
- Nuclear clean-up operations
- Military applications
- Hazardous demolition and land and building remediation
- Interceptor™ fabric has been tested to a number of chemical warfare agents according to US test standards (see page 2). Testing to equivalent European standards is in progress.

Interceptor™ is designed as a single use garment intended for disposal after use. However, many users will wish to store the products for emergency use only for extended periods, or use the garment again after first or subsequent uses, provided it remains undamaged and uncontaminated.

In these cases we recommend the following:-

1. Given the extremely hazardous nature of applications the garment should be FULLY checked and pressure tested (see below) within 1 month of receipt. The garment should not be used if there is any evidence of damage to either fabric or any components but should be returned to Lakeland for checking and replacement.
2. The garment should be visually checked and pressure tested both BEFORE and AFTER every use. Again if there are any signs of wear or damage the garment should NOT be used.
3. After 5 years of storage we recommend any Interceptor™ still in use or storage be downgraded to a training suit only and garments for hazardous use should be replaced.



Pressure Test Kits

Test kits are available for purchase with Interceptor suits as separate items from Lakeland. These enable users to conduct pressure tests on garments as part of a maintenance schedule. All Interceptor™ suits are pressure tested to confirm gas-tightness before leaving the Lakeland factory. For training on conducting pressure tests please contact your local Lakeland Sales Manager or e-mail us at sales-europe@lakeland.com

Part 0010: NFPA Test Kit
Part 00200: Universal test Kit



Heat and Flash Fire Protective Overcovers

In some applications users may need protection from high temperatures or flash fire risk. For more information on these optional extras please contact Lakeland at sales-europe@lakeland.com



TECHNICAL DATA

Physical Fabric Properties

Test No	Description	Result	EN Class
EN 530	Abrasion	>2000cls	6
ISO 7854	Flex cracking	>1000-2500cls	2
ISO 9073	Trap. tear md/cd	244N / 229N	6
EN 13934-1	Tensile strength - md/cd	426N / 292N	4
EN 863	Puncture	40.9N	2
EN 13274-4	Resistance to ignition		Pass
EN 943-1 :2002 Cl B 3.5	Seam strength	mean 648N	Pass
EN 943-1 :2002 C4.3	Glove/sleeve attachment strength	mean 205.5N	Pass

Min requirement comfortably exceeded

Chemical Warfare Agents

Interceptor™ has been tested independently against permeation by common chemical warfare agents according to the FINABEL test method (1 x 50µl / 37°C / 24H)

Agent	Acronym	No of Tests	Result Fabric Hrs:min	Result Seam Hrs:min
Sulfur Mustard	HD	3	>24:00	>24:00
Lewisite	L	3	>24:00	>24:00
V-Agent	VX	3	>24:00	>24:00
Sarin	GB	3	>24:00	>24:00
Tabun	GA	3	>24:00	>24:00
Soman	GD	3	>24:00	>24:00

Note that testing has been conducted against the Interceptor™ fabric AND the seam. In the tests, the challenge was made against the seam with 50% on the fabric only and 50% on the seam. As can be seen no permeation was recorded in 24 hours across 3 tests on each agent.

Fabric, seam and visor permeation tests

EN 943 requires permeation testing against 15 specified chemicals on the fabric, seams and visor. Also shown below, though not specifically required by the standard, are indicative tests results on the seam between the visor and fabric to prove its effectiveness.

Chemical	Fabric	Seam	Visor	Fabric/visor seam
Dichloromethane	6	6	6	-
Methanol	6	6	6	6
N-Heptane	6	6	6	6
Toluene	6	6	6	-
Diethylamine	6	6	6	-
40% Sodium Hydroxide	6	6	6	6
96% sulphuric acid	6	6	6	6
Ammonia Gas	6	6	6	-
Chlorine Gas	6	6	6	-
Hydrogen Chloride Gas	6	6	6	-
Acetone	6	6	6	-
Acetonitrile	6	6	6	-
Ethylacetate	6	6	6	-
Carbon Disulphide	6	6	6	-
Tetrahydrofuran	6	6	6	-

Interceptor™ Garment Dimensions

Area of measurement	Unit	XS	SM	MD	LG	XL	2XL	3XL	4XL
Length of boots	cm	27.94	27.94	29.21	29.21	30.48	31.75	31.75	34.29
Chest	cm	78.00	79.50	81.70	84.00	88.86	93.74	99.10	104.26
Inside seam	cm	70.32	75.46	77.68	80.32	83.64	86.91	89.29	93.94
Sleeve	cm	66.00	66.00	67.16	67.16	69.50	71.86	74.22	76.60

NB. Garment dimensions are in cm and measurements are +/-2cm. Bear in mind that Interceptor™ is deliberately sized large as other garments and equipment are often worn underneath.

Biological Hazard Protection

Interceptor™ has been tested to EN 14126:2003 and passes all tests in the highest class.

Standard	Description	Result	Class
ISO 16603:2004	Penetration by blood & body fluids – synthetic blood	Pass	N/A
ISO 16604:2004	Contact with blood & body fluids – blood-borne pathogens – Phi-X17 bacteriophage	Pass	6 of 6
ISO/DIS 22611:2003	Protection against biologically contaminated aerosols	>5 (log R)	3 of 3
ISO 22612:2005	Protection against dry microbial penetration	<1 [Log(10) CFU]	3 of 3
ISO 22610:2006	Resistance to wet microbial penetration	>75 (mins)	6 of 6

Chemical Permeation

In addition to the chemicals required for testing by EN943 Interceptor™ has also been tested against the chemicals as listed below.

CHEMICAL NAME(S)	CAS NO.	CON	STATE	ASTM F739 Normalized Breakthrough Time (Minutes) @ 0.1 µg/cm²/min.	Steady State Permeation Rate (µg/cm²/min.)	CE EN 374-3 Normalized Breakthrough Time (Minutes) @ 1.0 µg/cm²/min.
1,1,2,2-Tetrabromoethane	97-27-6	98.0%	Liquid	>480	<0.01	>480
1,2 Butylene Oxide	106-88-7	99.0%	Liquid	>480	<0.01	>480
1,2-Dichloroethane *	107-06-2	99.0%	Liquid	>480	<0.04	>480
1,3-Butadiene *	106-99-0	99.0%	Liquid	>480	<0.02	>480
2,2,2-Trichloroethanol *	115-20-8	99.0%	Liquid	>480	<0.01	>480
2,3-Dichloro-1-Propene *	78-88-6	98.0%	Liquid	>480	<0.01	>480
4-Bromofluorobenzene *	460-00-4	99.0%	Liquid	>480	<0.02	>480
Acetic Acid *	64-19-7	99.7%	Liquid	360	0.91	470
Acetone *	67-64-1	99.0%	Liquid	>480	<0.05	>480
Acetonitrile *	75-05-8	99.0%	Liquid	>480	<0.01	>480
Acetyl Chloride *	75-36-5	98.0%	Liquid	150	5.14	210
Acrolein *	107-02-8	98.0%	Liquid	>480	<0.01	>480
Acrylic Acid *	79-10-7	99.5%	Liquid	370	1.23	430
Acrylonitrile *	107-13-1	99.0%	Liquid	>480	<0.01	>480
Allyl Chloride *	107-05-1	98.0%	Liquid	>480	<0.01	>480
Ammonia *	7664-41-7	99.0%	Gas	>480	<0.01	>480
Ammonium Fluoride *	12125-01-8	40.0%	Liquid	>480	<0.01	>480
Benzonitrile *	100-47-0	99.0%	Liquid	>480	<0.02	>480
Benzoyl Chloride	98-88-4	98.0%	Liquid	>480	<0.07	>480
Bromine	7726-95-6	98.0%	Liquid	120	20.6	120
Bromochloromethane	74-97-5	98.0%	Liquid	>480	<0.05	>480
Carbon Disulfide *	75-15-0	98.0%	Liquid	>480	<0.06	>480
Chlorine *	7782-50-5	99.5%	Gas	>480	<0.01	>480
Chloroacetyl Chloride	79-04-9	98.0%	Liquid	>480	<0.01	>480
Chlorobenzene	106-90-7	99.9%	Liquid	>480	<0.04	>480
Chlorosulfonic Acid *	7790-94-5	97.0%	Liquid	190	0.3	>480
Cyclohexylamine	108-91-8	99.0%	Liquid	>480	<0.01	>480
Dichloromethane *	75-09-2	99.0%	Liquid	>480	<0.10	>480
Diethylamine *	109-89-7	99.0%	Liquid	>480	<0.01	>480
Diethylenetriamine *	111-40-0	98.0%	Liquid	>480	<0.01	>480
Dimethyl Disulfide	624-92-0	99.0%	Liquid	>480	<0.02	>480
Dimethyl Ether (gas)	115-10-6	99.0%	Gas	>480	<0.02	>480
Dimethyl Sulfoxide *	67-68-5	99.0%	Liquid	>480	<0.06	>480
Dimethylformamide *	68-12-2	99.0%	Liquid	>480	<0.04	>480
Di-n-Butyl Ether *	142-96-1	99.0%	Liquid	>480	<0.01	>480
Ethyl Acetate *	141-78-6	99.0%	Liquid	>480	<0.01	>480
Ethyl Acrylate	140-88-5	99.0%	Liquid	>480	<0.04	>480
Ethyl Methacrylate	97-63-2	99.0%	Liquid	>480	<0.04	>480
Ethyl Vinyl Ether	109-92-2	99.0%	Liquid	>480	<0.03	>480
Ethylamine (gas)	75-04-7	97.0%	Gas	>480	<0.01	>480
Ethyle Ether *	60-29-7	98.0%	Liquid	>480	<0.07	>480
Ethylene Oxide *	75-21-8	99.7%	Liquid	>480	<0.01	>480
Ferric Chloride	7705-08-0	Saturated	Liquid	>480	<0.01	>480
Fluorobenzene *	462-06-6	99.0%	Liquid	>480	<0.01	>480
Fluorosilicic Acid (25 wt% aqueous sol.) *	16961-83-4	25.0%	Liquid	>480	<0.01	>480
Formic Acid *	64-18-6	99.0%	Liquid	>480	<0.01	>480
Hexachloro-1,3 Butadiene *	87-68-3	99.0%	Liquid	>480	<0.01	>480
Hexane *	110-54-3	99.0%	Liquid	>480	<0.01	>480
Hydrazine Hydrate (64% hydrazine)	10217-52-4	100.0%	Liquid	410	0.076	>480
Hydroiodic Acid *	10034-85-2	56.5%	Liquid	>480	<0.01	>480
Hydrofluoric Acid	7664-39-3	50.0%	Liquid	>480	<0.01	>480
Hydrogen Chloride *	7647-01-0	99.0%	Gas	>480	<0.01	>480
Hydrogen Fluoride Gas *	7664-01-0	99.0%	Gas	190	0.32	>480
Isobutane	7664-39-3	99.0%	Gas	>480	<0.01	>480
Isobutylbenzene	75-28-5	99.5%	Liquid	>480	<0.03	>480
Isoprene	538-93-2	98.0%	Liquid	>480	<0.02	>480
Maleic Acid	78-79-5	Saturated	Liquid	>480	<0.01	>480
Maleic Anhydride (solution)	110-16-7	99.5%	Liquid	>480	<0.01	>480
Methacrylic Acid	108-31-6	99.0%	Liquid	>480	<0.01	>480
Methanol *	79-41-4	99.9%	Liquid	>480	<0.01	>480
Methyl Chloride *	67-56-1	99.5%	Gas	>480	<0.04	>480
Methyl Chloroformate	74-87-3	99.0%	Liquid	>480	<0.06	>480
Methyl Formate	79-22-1	97.0%	Liquid	>480	<0.01	>480
Methyl Iodide *	107-31-3	99.9%	Liquid	>480	<0.01	>480
Methyl Mercaptan *	74-88-4	99.0%	Gas	>480	<0.01	>480
Methylamine (40% w/w in H ₂ O) *	74-93-5	40% by w/w H ₂ O	Liquid	>480	<0.01	>480
N,N-Dimethylaniline *	121-69-7	99.0%	Liquid	>480	<0.01	>480
n-Butyl Acetate *	123-86-4	99.0%	Liquid	>480	<0.01	>480
Nitric Acid *	7697-37-2	90.0%	Liquid	>480	<0.01	>480
Nitric Oxide	10102-43-9	99.0%	Solid	>480	<0.01	>480
Nitrobenzene *	98-95-3	99.0%	Liquid	>480	<0.01	>480
Nitrochloro Benzene (ethanol solution)	201-854-9	Saturated	Liquid	>480	<0.01	>480
Nitrogen Tetroxide (<10°C)	10102-44-0	99.0%	Liquid/gas	>480	<0.01	>480
Nonylamine	112-20-9	98.0%	Liquid	>480	<0.01	>480
Oleum	7664-93-9/7446-11-9	98.0%	Liquid	>480	<0.01	>480
Oxalic Acid (solution)	144-62-7	Saturated 75%	Liquid	>480	<0.01	>480
Phenol	108-95-2	90.0%	Liquid	>480	<0.01	>480
Phosphoric Acid *	79-41-4	85.0%	Liquid	>480	<0.01	>480
Potassium Hydroxide *	1310-58-3	88.0%	Liquid	>480	<0.01	>480
Propionaldehyde	123-38-6	99.0%	Liquid	>480	<0.01	>480
Propionic Acid	79-09-4	99.5%	Liquid	>480	<0.01	>480
Sodium Hydroxide *	1310-73-2	50.0%	Liquid	>480	<0.01	>480
Sulfur Trioxide	7446-11-9	Saturated	Liquid	>480	<0.01	>480
Sulfuric Acid *	7664-93-9	98.0%	Liquid	>480	<0.01	>480
Tetrachloroethylene *	127-18-4	99.0%	Gas	>480	<0.01	>480
Tetrahydrofuran *	109-99-9	99.0%	Gas	>480	<0.07	>480
Thionyl Chloride *	7719-09-7	99.0%	Liquid	30	56	>480
Tiethoxysilane	998-30-1	95.0%	Liquid	>480	<0.01	>480
Toluene *	108-88-3	99.0%	Gas	>480	<0.03	30
Toluene-2,4-Diisocyanate *	584-84-9	98.0%	Liquid	>480	<0.01	>480
Trichloroethylene *	79-01-6	99.0%	Liquid	>480	<0.02	>480
Vinyl Acetate *	108-05-4	99.0%	Liquid	>480	<0.07	>480
Vinyl Bromide	593-60-2	99.0%	Gas	>480	<0.02	>480

Notes:

1. Chemicals marked * are actual tests on ChemMAX® 4 fabric which is exactly half the structure of Interceptor™ so results can be safely concluded. 2. Results are shown for both US ASTM F739 and CE EN374 permeation test. 3. All other tests against ChemMAX® 3 fabric can also be applied to Interceptor™.

INTERCEPTOR™

Type 1 Fully Gas-Tight Chemical Protection with alumized glass overcover options, from Lakeland

- Multi-layer fabric with high chemical barrier
- Light and flexible - 15% lighter than the most common alternative
- Front / rear entry options
- Standard or wide vision visor options
- High strength seams taped inside and out
- Two layer glove system / St Gobain "Oneglove"® option
- Two layer patented PVC / Teflon visor system
- Pressure test kits available



Available in Interceptor™ Blue as standard or in Orange or Grey to order.



Blue



Grey



Orange

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