

MULLION

FLOATATION GARMENTS & LIFE JACKETS





bsi.



THE SEA SHALL NOT HAVE THEM

Mullion Marine Safety and Personal Floatation Devices (PFD's) are designed to protect lives in some of the harshest and unforgiving environments known to man. Our focus is to design and produce the best possible safety solutions to meet different end uses combining comfort and durability with technical safety and protection.

Sadly, lives have consistently been lost to the cruel and unforgiving seas, with far too many modern day tragedies, often due to the wearer's lack of protective clothing or lifejackets.

Our Lifejackets, Floatation and Immersion suits are the preferred choice of workers in offshore energy oil and gas exploration; wind farm operations; commercial and inshore fishing; inland lakes and waterways; ports, docks and harbours; fisheries protection; coast guards; search and rescue; emergency services; international shipping and coastal communities worldwide.



GUIDANCE IN SELECTION OF APPROPRIATE PERSONAL FLOATATION DEVICES

Follow the checklist below to make the right choice of floatation garment:

- ✓ Check legal requirements
- ✓ Check requirements of national administration according to country / area of use
- ✓ Check own company requirements
- ✓ Check own company risk assessments
- ✓ Perform own risk assessment if none already existing
- ✓ Assess area of use and nature of work to be carried out
- ✓ Consider associated clothing / equipment to be worn and assess compatibility of all PPE with LSA product to be worn
- ✓ Check application of use according to the normative standards
- ✓ Select appropriate product according to area and application of use

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FLOATATION GARMENTS

Floatation garments provide protection from the elements whilst working, and in the event of an accidental immersion, prolong life and aid rescue. All Mullion Floatation garments are designed for constant wear and are classified as 50 Newton PFDs(*).

THE KEY PROTECTION FACTORS GIVEN ARE:

1. For working use

- ✓ Comfort and warmth
- ✓ Waterproofing to EN 343

2. For water immersion

- ✓ Floatation of wearer in water to prolong survival
- ✓ Reduction of cold shock and the effect of hypothermia in water
- ✓ Allows the wearer to manoeuvre himself in the water and to be recovered without encumbrance
- ✓ Conspicuousness in the water to aid recovery

(*): PFD: Personal Floatation Device which, when correctly worn and used in water, will provide the user with a specific amount of buoyancy which will increase the likelihood of survival. A PFD can be in the form of either an inherently buoyant foam garment or an inflatable lifejacket.

FLOATATION SUITS

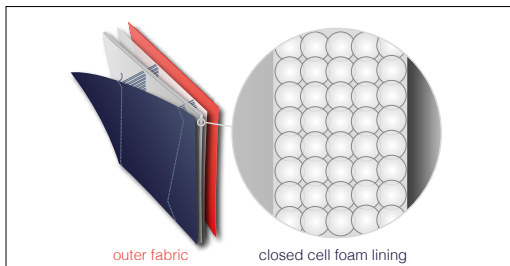
The aim of Mullion constant wear floatation garments is to protect against accidental immersion in water by providing the inherent buoyancy to assist a person in staying afloat, with the added advantage of a certain degree of protection against cold water shock and hypothermia while in the water.

These garments are designed to be comfortable to wear for constant working use and will keep the wearer warm and dry while doing so. In the case of accidental immersion or a Man Overboard situation these garments will float the wearers indefinitely in a comfortable position and allow them to swim to a rescue boat or liferaft without encumbrance.

These suits will not self-right the wearer automatically if face-down or unconscious in the water. Therefore, it is recommended that they are always worn in combination with a 275N lifejacket to guarantee the optimum performance, including automatic self-righting.

It is also recommended that for two piece versions the Jacket and Trouser are always worn together to achieve optimum performance and protection.

STANDARD FEATURES



1. GARMENT FULLY WATERPROOF

All outer materials on the constant wear suits are waterproof and conform to the standard EN 343. All seams on the suits are taped and 100% waterproof. The pocket flaps are fully water repellent and a storm flap which covers the front zipper will give optimum waterproofness of the suit/jacket.

2. INHERENT BUOYANCY

The buoyancy of the floatation garment is created by a closed cell foam. The Mullion suits have an inherent actual buoyancy varying from a minimum of 50N to 100N.

3. PROVIDES A DEGREE OF THERMAL PROTECTION

The suits provide a degree of thermal protection against cold water shock and delay hypothermia upon immersion.



4. ANTI-FLUSHING STRAPS

The suits are designed with anti-flushing straps to arms and legs. These can be used upon immersion. After falling in the water the anti-flushing straps can be tightened so the water in the suit can be warmed up by the body temperature of the wearer which will delay hypothermia.



5. MARINE GRADE WHISTLE

The Marine grade ISO 12402 approved whistle is attached to the suit and can be used in immersion situations to alert rescue teams. The whistle is positioned in the optimum position and placed for ease of access.



6. SOLAS APPROVED RETRO REFLECTIVE TAPE ON SUITS

To increase visibility of the wearer, retro reflective tapes on the hood and/or wrists and/or arms and/or chest and/or legs are added.



7. EASY DONNING

The suits have either zips or wide legs for ease of donning over boots or shoes.



8. HOOD AND COLLAR WITH BUILT-IN CHIN AND FACE PROTECTION

To increase comfort and to give the wearer optimum protection in heavy weather conditions a hood and collar is added with built-in chin and face protection.



9. POCKETS WITH FLEECE OR FOAM HAND WARMER LINING

On every suit there are pockets (on the chest or hips) with fleece or foam lining to keep hands comfortably dry and warm.

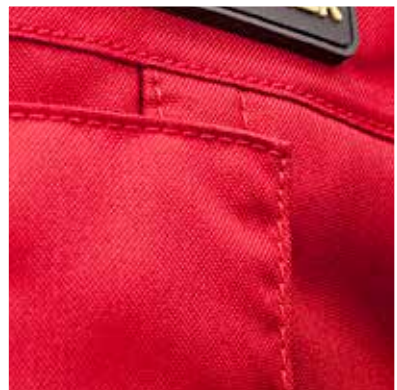


	AQUAFLOAT RANGE				
	SUPERIOR 1 piece Suit	SUPERIOR Jacket	SUPERIOR Trousers	HARNESS Jacket	SEAMASTER II Jacket
Standard	EN ISO 12402-5/6 EN ISO 15027-1	EN 393	EN 393	EN 393 Option: EN ISO 12401	EN 393
Actual Buoyancy level (size L)	74N	together with Superior Trousers 88 N	together with Superior Jacket 88 N	together with Superior Trousers 88 N	together with Superior Trousers 88 N
Fabric	300D*	300D*	300D*	300D*	300D*
Extra abrasion resistance	Knees + Seat (450D)	Seat (450D)	Knees + Seat (450D)	—	—
ID Pocket	Yes	Yes	No	No	Yes
Special features	—	—	—	Optional Harness (EN ISO 12401)	High-visibility (EN 471)
Colour	Red/Navy	Red/Navy	Red/Navy	Red	Hi-Vis Yellow/Navy
Reference	1MHN	1MM8	1MQ3	1MM7	1MJB
Sizes	S-3XL	S-3XL	S-3XL	S-3XL	S-3XL
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(*) D = Denier



NORTH SEA RANGE		COMFORT RANGE			
NORTH SEA I 1 piece Suit	NORTH SEA II 2 piece Suit	X5000 1 piece suit	X5000 Jacket	X5000 Trousers	MPS Multi Purpose Suit
EN ISO 12402-5/6 EN ISO 15027-1	EN ISO 12402-5/6	EN393	EN ISO 12402-5/6	EN ISO 12402-5/6	CE approved under ppe directive 89/686 EEC
74N	121N	88N	51N	51N	—
210D*	210D*	300D*	300D*	300D*	Gore-Tex®
—	—	No	No	Knees + Seat (450D)	—
No	No	No	No	No	—
—	—	High-visibility Breathability	High-visibility Breathability	High-visibility Breathability	Very lightweight drysuit
Red/Black, Hi-Vis yellow/black	Red/Black, Hi-Vis yellow/black	Hi-Vis yellow/Black	Hi-Vis yellow/Black	Hi-Vis yellow/Black	Black
1MHC	1MI8	1MG9	1MMG	1MQS	1MHM
S-3XL	S-3XL	XS-4XL	XS-4XL	XS-4XL	S-3XL
pg 22	pg 23	pg 26	pg 27	pg 27	pg 28



**“THE AQUAFLOAT RANGE
COVERS ALL GENERAL
REQUIREMENTS OF A
DEMANDING END-USER”**



AQUAFLOAT RANGE

Professional Range of Floatation Suits

The Aquafloat Range is our broadest range of floatation garments covering all general requirements of a demanding end-user. It is available in a variety of one piece suits, jackets and trousers appropriate to different end uses.



Superior Suit



Superior Jacket



Superior Trouser



Harness Jacket



Seamaster II Jacket



EN ISO 12402-5/6



EN 343:
1998



AQUAFLOAT SUPERIOR SUIT

1MHN

EN 343

BUOYANCY 74N

EN ISO 12402
EN ISO 15027

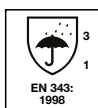
The AquaFloat Suit is a constant wear floatation suit tested according to ISO 15027: Class D for 2 hours thermal protection in cold water.

SUPERIOR BENEFITS

- High collar + extra protective chin strap with touch and close fastening
- High-visibility yellow adjustable insulated peaked hood, with built-in chin and face protection stowed in collar
- Elasticated back waist
- ID pocket on the chest
- Reinforcement panels added to knees and seat area.

KEY FEATURES

- Fully waterproof outer fabric + taped seams
- SOLAS approved retro-reflective tape on hood, upper arms, wrists and ankles
- Adjustable waist belt
- Storm flap
- 5 pockets: 2 chest pockets with water repellent flaps + marine grade whistle, 2 lower hip pockets with fleece hand warmer, 1 Napoleon pocket under storm flap
- Reinforcement panels added to knees and seat area
- Leg zips for ease of donning over boots
- Anti-flushing straps to arms and legs with easy grip pull tabs
- Inner adjustable neoprene wrist seals



AQUAFLOAT SUPERIOR JACKET		1MM8
EN 343	JKT + TRS: BUOYANCY 88N	EN 393

AQUAFLOAT SUPERIOR TROUSERS		1MQ3
EN 343	JKT + TRS: BUOYANCY 88N	EN 393

The AquaFloat Superior jacket has similar features to the Superior one piece suit.

Additional features to AQUAFLOAT SUPERIOR SUIT:

- + Crutch strap for wearer's safety
- + Elasticated draw cord with toggles in the hem

The AquaFloat Superior trouser has similar features to the Superior one piece suit.

It is recommended to combine with the jacket as a two-piece suit for the optimum protection

Additional features to AQUAFLOAT SUPERIOR SUIT:

- + Two lower hip pockets with fleece hand warmer in addition to the jacket
- + Adjustable elastic shoulder braces





EN 393



AQUAFLOAT HARNESS JACKET

1MM7

EN 343

JKT + TRS: BUOYANCY 88N

EN 393

The Aquafloat Harness jacket is a uni-colour red jacket designed to add an EN ISO 12401 deck safety harness to the harness apertures included on the chest. It can be supplied with or without the harness pre-fitted.

SUPERIOR BENEFITS

- High collar + extra protective chin strap with touch and close fastening
- High-visibility yellow adjustable insulated peaked hood, with built-in chin and face protection stowed in collar
- Harness apertures included on chest for adding a EN ISO 12401 harness
- Easy access at the hem for adding logos on the back of the jacket
- Lifejacket attachment loops on front chest and back neck for secure fitting of lifejacket
- Concealed internal waist belt for snug fit

KEY FEATURES

- Fully waterproof outer fabric + taped seams
- Retro-reflective tape on hood, shoulders and wrists
- Storm flap
- 5 pockets: 2 chest fleece lined handwarmer pockets with water repellent flaps + marine grade whistle,
- 2 lower hip pockets, 1 Napoleon pocket under storm flap
- Crutch strap for wearer's safety
- Anti-flushing straps to wrists with easy grip pull tabs
- Inner fixed neoprene wrist seals

Optional extras: pre-fitted EN ISO 12401 deck safety harness



EN 393



EN 343:
1998



EN 471:
1994



SEAMASTER II JACKET

TMJB

EN 343 JKT + TRS: BUOYANCY 88N EN 393 EN 471

The Aquafloat Seamaster II jacket is an EN 471 high-visibility yellow multi-pocket floatation jacket designed to achieve maximum visibility when worn day and night.

It is recommended to combine with the Aquafloat Superior trousers as a two-piece suit for the optimum protection.

SUPERIOR BENEFITS

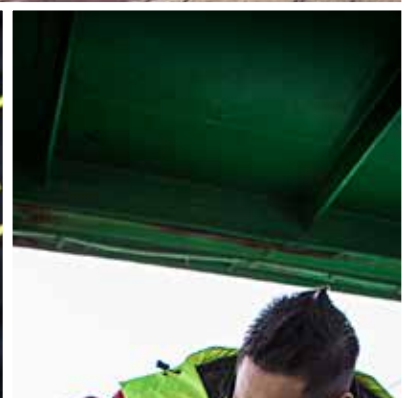
- High collar with extra protective chin strap with touch and close fastening
- High-visibility yellow adjustable insulated peaked hood, with built-in chin and face protection stowed in collar
- ID pocket on the chest
- Loop on left sleeve to add a light or other accessory
- Hi Visibility yellow fabric + reflective tape areas designed to achieve optimum conspicuousness and fully certified to EN471 standard
- Concealed internal waist belt for snug fit



KEY FEATURES

- Fully waterproof outer fabric + taped seams
- Retro reflective tape on hood, shoulders, back, front chest, upper and lower arms
- Storm flap
- 9 pockets: 2 lower chest pockets with fleece hand warmer, 2 hip pockets with water repellent flaps, 1 sleeve pocket + marine grade whistle, 1 radio pocket on chest, 1 napoleon pocket under storm flap, 1 ID pocket on chest, 1 inner pocket
- Crutch strap for wearer's safety
- Anti-flushing straps to wrists with easy grip pull tabs





“CONSTANT WEAR, GENERAL DECK AND CREW USE”



NORTH SEA RANGE

Active Range of Floatation Suits

Newest range in the Mullion collection created to offer a basic range of floatation suits which are certified according to the latest standard EN ISO 12402.

The Mullion North Sea range is available in 2 variations appropriate to different end uses.



North Sea I

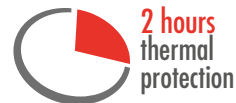
North Sea II



EN ISO 12402-5/6



EN 343:
1998



2 hours
thermal
protection



NORTH SEA I ONE PIECE SUIT

1MHC

EN 343

BUOYANCY 74N

EN ISO 12402
EN ISO 15027

The North Sea I – one piece suit is ideal for general utility use by deck hands, boat crew and fishermen. This suit is tested according to ISO 15027: Class D for 2 hours thermal protection in cold water.

KEY FEATURES

- Fully waterproof outer fabric + taped seams
- SOLAS approved retro-reflective tape on hood and chest
- High-visibility yellow adjustable insulated peaked hood, with built-in chin and face protection stowed in collar
- Storm flap
- 7 pockets: 2 chest pockets with water repellent flaps with marine grade whistle, 2 lower hip pockets with fleece hand warmer, 1 Napoleon pocket under storm flap and 2 inner pockets
- Leg zips for ease of donning over boots
- Anti-flushing straps to wrists & ankles



EN ISO 12402-5/6



NORTH SEA II TWO PIECE SUIT

1 M18

EN 343

BUOYANCY 121N

EN ISO 12402

The North Sea II – two piece suit is ideal for use in the same areas as the one piece but with the added flexibility and comfort afforded by separate jacket and trousers.

This two piece suit is sold as a combination. It is not available to buy jacket and/or trousers separately.

Additional features to NORTH SEA I - ONE PIECE SUIT:

- + Crutch strap added to the jacket for wearer's safety
- + Trousers with adjustable elasticated braces
- + Two hip pockets on the trousers in addition to the jacket



“**DESIGNED FOR MAXIMUM BREATHABILITY**”



COMFORT RANGE

Breathable Floatation Suits

The Comfort Range is available in a one piece suit or a jacket and trousers which are designed to offer maximum breathability for the wearer.

Ideal for use in yachting and leisure activities.



X5000 Suit



X5000 Jacket



X5000 Trousers



MPS Multi Purpose Suit



EN 393



EN 343:
1998



X5000 SUIT

1MG9

EN 343

BUOYANCY 88N

EN 393

SUPERIOR BENEFITS

- High breathability for active use without discomfort
- Specially developed lining combined with perforated foam to optimize breathability and wicking of perspiration for wearer comfort
- Additional ventilation system at underarms and across upper back and chest
- Lightweight and flexible for ease of movement in active use
- High visibility hood, collar strip, waist strip, upper body and arms + silver reflective piping feature for optimum conspicuousness
- High adjustable collar + adjustable insulated peaked hood + chin strap for optimum face protection zipped into collar
- Elasticated waist + waist belt in enclosed tunnel for comfort of fit

KEY FEATURES

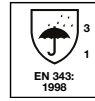
- Fully waterproof + highly breathable outer fabric + taped seams
- Highly breathable foam + wicking lining complex
- Retro-reflective tape on hood, chest, wrists and ankles
- Storm flap and extra protective chin strap with touch and close fastening
- 6 pockets: 2 fleece lined chest hand warmer pockets, 2 hip pockets with zip closures and 2 inner pockets
- Leg zips for ease of donning over boots
- Anti-flushing straps to wrist and ankles with easy grip pull tabs
- Inner adjustable neoprene wrist seals



EN ISO 12402-5/6



EN ISO 12402-5/6



X5000 JACKET

1MMG

EN 343

BUOYANCY 51N

EN ISO 12402

X5000 TROUSERS

1MQS

EN 343

BUOYANCY 51N

EN ISO 12402

The X5000 jacket is ideal for use in the same areas as the one piece but with the added flexibility and comfort afforded by separate jacket and trousers. The jacket can be worn on its own but it is highly recommended to combine with the trousers as a two piece suit for the optimum protection.

Additional features to X5000 – ONE PIECE SUIT:

- + Elasticated draw cord with toggles in the hem for securement and snug fit
- + Crutch strap added to the jacket for wearer's safety

The X5000 trousers have similar features to the X5000 suit. They can be worn in combination with the X5000 jacket.

Additional features to X5000 – ONE PIECE SUIT:

- + Adjustable elasticated shoulder braces
- + Reinforcement panels added to knees and seat area
- + Two hip pockets on the trousers in addition to the jacket



MPS MULTI PURPOSE SUIT

1MHH

CE APPROVED UNDER PPE DIRECTIVE 89/686 FFC

The MPS Multi Purpose Suit is a very lightweight drysuit to be worn under an outer garment

SUPERIOR BENEFITS

- The suit is made from a breathable Gore-Tex® fabric
- Seam construction: double seams so that the seam will not open even when worn
- Inside the seams are heat seal taped and reinforced to be 100% watertight
- Socks made of same fabric as the suit itself enables use of any professional footwear



KEY FEATURES

- Breathable Gore-Tex® fabric
- YKK® diagonal plastic front zipper with double slider
- Neck seal made in elasticated Gore-Tex fabric
- In addition a separate 3 mm neoprene hood, which protects against cold water
- Soft neoprene wrist and neck seals for comfort
- Supplied in a carrying bag





**“EXTREME WEAR, PILOTS,
RIB, FRC AND LIFEBOAT
OPERATORS AND CREWS**”



EXTREME RANGE

Floatation Suits Designed to Fulfil Requirements in Extreme Conditions

The extreme range is specifically designed to give extra buoyancy and thermal protection and to diminish snagging hazards in extreme conditions. The range is designed with superior reinforcement panels on knees and seat areas for enhanced abrasion resistance.

These floatation suits are created for FRC (Fast Rescue Craft), Lifeboat and RIB (Rigid Inflatable Boat) operators and to fulfill the requirements of extreme conditions.

The Extreme Range is available in 6 variations appropriate to different end uses.



	FRC RANGE		X6 RANGE		
	FRC II 1 Piece suit	FRC III 1 Piece suit + lifejacket	X6 1 Piece suit	X6 Jacket	X6 Trousers
Standard	EC Directive 89/686/EEC	EC Directive 89/686/EEC EN399	EC Directive 89/686/EEC	EC Directive 89/686/EEC	EC Directive 89/686/EEC
Actual Buoyancy level (size L)	104 N	104N + 302N suit + lifejacket	91N	Together with X6 Trousers: 108N	Together with X6 Jacket: 108N
Fabric	300D	300D	300D	300D	300D
Extra abrasion resistance	Front leg + Seat (450D)	Full Front + Seat (450D)	Knees + Seat (600D)	Seat (600D)	Knees + Seat (600D)
ID Pocket	No	No	Yes	Yes	No
Special features	—	Integrated Lifejacket	—	—	—
Color	International Flame/Black	International Flame/Black	International Flame/Navy	International Flame/Navy	International Flame/Navy
Reference	1MC3	1MC4	1MH9	1MJ4	1MQ4
Sizes	S-3XL	S-3XL	S-3XL	S-3XL	S-3XL
Page	pg 32	pg 33	pg 34	pg 35	pg 35



EN 393



FRC2 SUIT

1MC3

EN 343 BUOYANCY 104N EC Directive 89/686/EEC

The FRC2 Suit has a lower collar than suits in our other ranges to avoid interference when wearing a safety helmet and to guarantee excellent 180° visibility for the operators. The hood is extended to fit over a crash helmet. It has superior reinforced panels added to the front leg, back leg and seat area and has extra foam added on the chest to give optimum buoyancy and wind chill resistance in extreme conditions. Attachment points on the suit make it possible to securely fit a lifejacket on top of it.

SUPERIOR BENEFITS

- Extended hood to fit over safety helmets
- Low collar to avoid interference with safety helmet
- Extra foam boosters on the chest to give optimum buoyancy protection and wind chill resistance
- High abrasion resistance reinforcement panels added to front and back legs + seat area
- SOLAS approved retro-reflective tape on hood, upper arms and wrists
- Lifejacket attachment loops to front chest and back neck



EN 393



EN 399



EN 343:
1998



FLOATATION GARMENTS

EXTREME RANGE

FRC3 SUIT

TMC4

EN 399 BUOYANCY 104N+302N EC Directive 89/686/EEC

The FRC3 Suit has the same features as the FRC2 Suit but has an incorporated inflatable 275N lifejacket (EN 399).

Additional features to FRC2 SUIT:

- + Integrated 275N lifejacket (EN 399)
- + Heavy duty high abrasion resistant reinforcement fabric to front chest and lifejacket cover to protect the lifejacket from being damaged

KEY FEATURES

- Fully waterproof outer fabric + taped seams
- Adjustable waist belt
- Storm flap with extra protective chin strap with touch and close fastening.
- 3 pockets: 2 lower hip pockets foam lined and 1 sleeve pocket + marine grade whistle
- Anti-flushing straps to wrists, thighs and ankles

OPTIONAL EXTRAS

- Neoprene wrist and ankle seals to offer semi-dry suit protection and prevent water ingress when operating open exposed craft

OPTIONAL EXTRAS

- Neoprene wrist and ankle seals to offer semi-dry suit protection and prevent water ingress when operating open exposed craft



EN 393



X6 SUIT

1MH9

EN 343 BUOYANCY 91N EC Directive 89/686/EEC

SUPERIOR BENEFITS

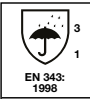
- Extra foam boosters on the chest to give added buoyancy protection and wind chill resistance
- High abrasion resistance reinforcement panels added to knees and seat area
- ID pocket on the left sleeve
- Extra pocket on the right arm for strobe light
- No chest pockets to minimize snagging hazards
- High collar + extra protective chin strap with touch and close fastening
- High-visibility yellow adjustable insulated peaked hood, with built-in chin and face protection stowed in collar
- SOLAS approved retro-reflective tape on hood, upper arms and wrists

KEY FEATURES

- Fully waterproof outer fabric + taped seams
- Storm flap
- Adjustable waist belt
- 7 pockets: 2 lower hip pockets with fleece hand warmer lining, 2 sleeve pockets + marine grade whistle in left sleeve pocket, 1 ID pocket, 1 napoleon pocket, 1 inside pocket
- Leg zips for ease of donning over boots
- Anti-flushing straps to wrists and ankles with easy grip pull tabs
- Inner adjustable neoprene wrist seals



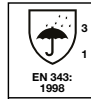
EN 393



EN 343:
1998



EN 393



EN 343:
1998



X6 JACKET

1MJA

EN 343 JKT + TRS: BUOYANCY 108N EC Directive 89/686/EEC

X6 TROUSERS

1MQ4

EN 343 JKT + TRS: BUOYANCY 108N EC Directive 89/686/EEC

The X6 jacket is ideal for use in the same areas as the one piece suit but with the added flexibility and comfort afforded by separate jacket and trousers. This jacket must be combined with the X6 Trousers for wear as a two piece suit to conform to the approval.

Additional features to X6 SUIT:

- + Reinforcement panels added to seat area in addition to trousers
- + Crutch strap for wearer's safety

Additional features to X6 SUIT:

- + Adjustable elasticated shoulder braces



“ IDEAL FOR OFFSHORE INSTALLATIONS, OFFSHORE SUPPLY VESSELS, BULK CARRIERS, COMMERCIAL SHIPS, CONTAINER AND FREIGHT SHIPS OPERATING IN COLD WATER AREAS ”



DRY SUITS & SEMI-DRY SUITS

SOLAS IMMERSION

+ ANTI-EXPOSURE SUITS

+ ISO 15027 CONSTANT WEAR SUITS

The primary aims in wearing these type of suits are:

- to reduce the risk of cold shock and delay the onset of hypothermia;
- to enable the user to propel himself in the water and extricate himself from the water without it becoming an encumbrance;
- to make the user sufficiently conspicuous in the water so as to aid his recovery

Immersion and Anti-Exposure Suits are regulated by the International Maritime Organization (IMO) under the International Convention for Safety of Life at Sea (SOLAS).

In accordance with the SOLAS requirements and according to the LSA (Life Saving Appliances) Code, Chapter II, 2.3:

- Where required as Immersion suits, they are designed to cover the whole body (including boots to cover the feet), with the exception of the face and with separate gloves that are permanently attached to the suit.
- Where required as Anti-Exposure suits only, they can be designed and supplied without the boots fitted (as permitted by the Administration) and equipped with a pocket for a portable VHF radio / telephone.

An Immersion Suit is a protective suit which reduces the body heat loss of a person wearing it in cold water and is designed to protect the user's body from the subsequent cooling effects of unintended immersion in water including cold shock and hypothermia.

The complete Immersion Suit System (suit together with clothes worn underneath) should be able to keep the user alive long enough for the rescue services to find and recover them. An individual's estimated thermal protection time will depend on water temperature and wave state as well as their physiology. See table below for approximate guidelines of expected survival times.

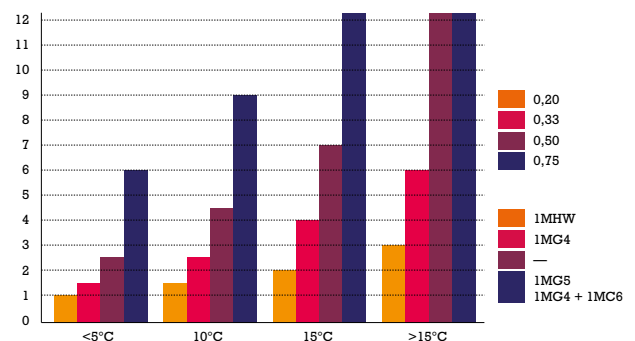
An un-insulated immersion suit or anti-exposure suit is intended to provide the wearer with up to 1 hour protection in a water temperature range of $> 5^{\circ}\text{C}$

An insulated immersion suit is intended to provide the wearer with up to 6 hours protection in a water temperature range of $> 0^{\circ}\text{C}$.

Constant Wear suits approved under ISO 15027 are also tested for thermal protection according to the protection levels in the table below. They are designed to be worn as working suits to protect the wearer from cold and wet conditions during normal activities. At the same time they will provide the necessary thermal protection in the event of the wearer being immersed in water.

THERMAL PROTECTION CATEGORIES

	Suit performance level			
	A	B	C	D
Period of immersion (h)	6	4	2	2
Water temperature ($^{\circ}\text{C}$)	2	2	5	10



STANDARD FEATURES ON OUR SOLAS IMMERSION SUITS

1. SOLAS APPROVED

Approved to 2010 SOLAS regulations (according to MSC.81(70); MSC.200(80), MSC.207(81), MSC.226(82)).



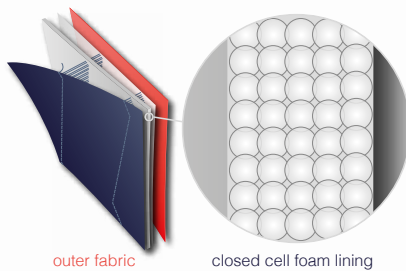
2. FULLY WATERPROOF

All outer fabrics are waterproof according to the standard EN 343. Immersion suits are taped with the most advanced seam technology ensuring maximum waterproofness.



3. THERMAL PROTECTION

Fully tested and certified under SOLAS regulations to give either 1 hour or 6 hours thermal protection against cold water shock and hypothermia during water immersion.



4. BOOTS, GLOVES AND HOOD

Provide thermal protection to the head, hands and feet on water immersion.



5. SOLAS APPROVED RETRO-REFLECTIVE TAPE

To enhance visibility and aid location of wearer.



6. MARINE GRADE WHISTLE

To aid location and rescue



7. COMPATIBILITY

All suits must be worn in conjunction with a compatible SOLAS / MED approved lifejacket.



SMART RANGE

Offshore Immersion, Anti-exposure and Constant wear Suits

SOLAS IMMERSION SUITS USED BY:

Large sea-going vessels; SOLAS regulated commercial cargo or passenger ships; offshore oil and gas rigs; offshore wind farms

SOLAS ANTI-EXPOSURE SUITS USED BY:

Rescue boat and marine evacuation system crews

ISO 15027 CONSTANT WEAR SUITS USED BY:

Offshore windfarms; offshore oil and gas; Search and rescue; Passenger transfer operators





	SEMI DRY			
	SSS1A 1 piece Suit	THERMAL LINER 1 piece Suit	SSS2A 1 piece Suit	MASII 1 piece suit
Standard	SOLAS Immersion + Anti-Exposure suit	—	SOLAS Immersion + Anti-Exposure suit	SOLAS immersion suit
Actual Buoyancy level (size L)	100N	65N	154N	—
Thermal protection	1 Hour	SSS1A + Liner = 6 hours	6 Hours	6 hours
Fabric	300D	Closed cell foam + nylon	300D	neoprene
Special features	Semi Dry Suit	—	Semi Dry Suit	Dry Suit
Colour	International Flame	Size colour coded	International Flame	Orange
Reference	1MG4	1MC6	1MG5	1MHZ
Sizes	S-XL	S-XL	S-XL	—
Page	pg 42	pg 43	pg 44	pg 44



RDS WE 1 piece Suit	SEAHORS SAR 1 piece Suit	FINFILL HEAVY LINER	BASIC 1 piece Suit	RDS ETSO 1 piece Suit
SOLAS immersion suits EN ISO 15027-1 constant wear suit	SOLAS immersion suits EN ISO 15027-1 constant wear suit	—	SOLAS immersion suits EN ISO 15027-1 constant wear suit	ETSO 2C-503 helicopter transit suit SOLAS
—	—	—	—	—
1 Hour	1 Hour	RDS WE or SAR + liner = 6 hours	1 Hour	4 Hour (with liner)
Gore-Tex®	Gore-Tex®	X-tex Finfill	Cordura	Gore-Tex® Nomex
Breathable Dry Suit	Fixed PU boots	—	Lightweight	Designed for helicop- ter transfer
Orange/black	Orange	black	Orange	Orange
1MHI	1MHK	1MHO	1MHL	1MHJ
S-2XL	S-2XL	—	S-2XL	S-2XL
pg 45	pg 46	pg 47	pg 48	pg 49



SMART SOLAS SUIT 1A (SSS1A)

TMG4

SOLAS 2010

BUOYANCY 100N

The Smart SOLAS Suit 1A is a semi-dry suit which provides optimum features and flexibility as a working suit combined with full approval as a SOLAS Immersion + Anti-Exposure Suit offering multifunctional use for any work or emergency abandonment situation..

SUPERIOR BENEFITS

- Provides a minimum of 1 hour of thermal protection against cold water shock and delays hypothermia upon immersion
- Can also be used as a working suit due to flexibility and comfort of design
- SOLAS approved retro-reflective tape to hood, shoulders, arms and back
- Provides additional buoyancy due to inherent flotation foam lining in excess of the SOLAS requirements of 70 Newton for an anti-exposure suit
- Fixed insulated hood for constant wear working use

- Additional neoprene hood for extra thermal protection during water immersion
- Comfortable soft neoprene neck seal
- 5 fingered neoprene gloves stowed in arm pockets for working use and for thermal protection during water immersion
- Adjustable waist belt with heavy duty metal interlocking buckles
- Soft and flexible neoprene socks for flexibility to wear under standard work boots and give added thermal protection during water immersion
- Wide anti-flushing straps on arms and ankles to give added thermal protection during water immersion
- Elasticated leg panels for snug fit and to increase thermal protection during water immersion
- Colour coded and sized storage bag with quick-rip touch and close opening panel to allow rapid donning in an emergency situation
- Compatible with Mullion SOLAS Hi-Rise 275N Lifejackets
- Inner fixed neoprene wrist seals

KEY FEATURES

- Fully waterproof outer fabric + taped seams
- Storm flap
- Sleeve pocket + marine grade whistle



OPTIONAL EXTRAS

Possibility to increase thermal protection from 1 to 6 hours as well as increasing the buoyancy by combining with our thermal floatation liner 1MC6. The thermal floatation liners are colour coded for sizing (S= red, M= navy, L= orange, XL=navy).



SMART THERMAL FLOATATION LINER 1MC6

This thermal floatation liner offers the flexibility to add to the Smart 1A Suit to increase the protection level to 6 hours, as and when needed.

SUPERIOR BENEFITS

- Flexible lightweight floatation liner gives both added buoyancy and thermal protection
- Easy access centre front zip
- Elastic thumb loops and foot stirrup straps to aid easy donning and security of fit under the Smart 1A Suit
- Colour coded for ease of matching sizes

KEY FEATURES

- Double sided smooth nylon quilted to 5mm foam liner for ease of donning
- Heavy duty front zip
- Butted and taped seams for reduction of bulk



6 hour thermal protection



SMART SOLAS SUIT 2A (SSS2A) 1MG5

SOLAS 2010

BUOYANCY 154N

The Smart SOLAS Suit 2A is a semi-dry suit and similar to the SSS 1A but has a higher buoyancy and thermal protection level (6 hours) provided by an additional foam insulation liner.

Additional features to SMART SOLAS SUIT 1A:

- + Provides a minimum of 6 hours of thermal protection against cold water shock and hypothermia upon immersion
- + Double layer foam insulation lining
- + Higher buoyancy due to double foam layer
- + Thicker neoprene boots
- No fixed hood

6 hour thermal protection



MAS II 1MHZ

SOLAS 2010

Provides a minimum of 6 hours of thermal protection against cold water shock and hypothermia upon immersion.

KEY FEATURES

- § 5 mm neoprene material
- § Hood with hook and loop fastener face seal
- § Waterproof zipper
- § Ankle strap in black webbing with touch and close fastening
- § Black webbing belt with steel buckle and D-ring
- § Solas approved retro-reflective tape
- § 3 finger neoprene gloves



RDS WE		TMHI
SOLAS 2010	EN ISO 15027-1	

A special model of the popular RDS Rapid Donning Suit especially made to meet the demands of the offshore industry.

SUPERIOR BENEFITS

- Collar opening for ease of donning and ventilation in warm weather.
- Gore-Tex® breathable fabric with ePTFE membrane.
- Seam construction: double seams for extra secure water tightness and durability.
- Socks made of same fabric as the suit itself enables use of any professional footwear.

KEY FEATURES

- YKK® plastic front zipper, for easy donning and doffing.
- SOLAS Reflective tapes: the suit is fitted with durable flexible reflective tapes in optimum positions, which assures visibility in all conditions.
- Hood: attached splash hood, which protects against wind and rain.
- In addition a separate 3 mm neoprene hood, which protects against cold water.
- Soft neoprene neck and wrist seals for comfort.
- 2 chest pockets with zipper and touch and close fastening. Left pocket is equipped with whistle, buddy line and small Carabiner hook.
- 2 large thigh pockets with flap and touch and close fastening.
- Sleeve pockets with integrated 3mm 5-finger-neoprene gloves.
- Internal elasticsation keeps the legs up and improves fit.
- Knee and seat reinforcements made of Cordura® material.
- Supplied in a durable fabric carrying bag.

OPTIONAL EXTRAS

Possibility to increase thermal protection from 1 to 6 hours by combining with our the thermal finfill heavy liner.



Important Notice: The 6 hours thermal protection can only be achieved with the RDS WE version with fixed boots.



SEAHORSE SAR

1MHK

SOLAS 2010

EN ISO 15027-1

The non-insulated Seahorse SAR is designed for rigorous professional use. It has been developed for the defence forces, border guards, sea rescue associations, and merchant vessels in several European countries.

SUPERIOR BENEFITS

- Gore-Tex® breathable fabric with ePTFE membrane.
- Seam construction: double seams for extra secure water tightness and durability.
- Diagonal diagonal dry zipper: opens from the right hip up to the left shoulder. The position of the zipper as well as its opening direction minimise the disadvantages of a heavy zipper when sitting and moving around.
- Telescopic waist: integrated suspenders keep the trousers up at the same time as the crotch strap keeps the top down.
- The telescopic design allows good flexibility of fit for different height ranges.

KEY FEATURES

- SOLAS Reflective tapes: the suit is fitted with durable flexible reflective tapes in optimum positions, which assures visibility in all conditions.
- High fleece lined collar, splash hood stowed in collar pocket with touch and close fastener.
- Fluorescent yellow hood, that has shaped visor, tightening cords, mesh lining and reflectors.
- In addition a separate 3 mm neoprene hood, which protects against cold water.
- Neck seal: flocked 2,5 mm super stretch neoprene. For easy donning, the flocked rubber surface is on the outside.
- Wrist seals: super stretch neoprene, easy to don and doff.
- Crotch strap + buckle
- Integrated suspenders and hanging loops for drying
- Internal elastics keep the legs up and improves fit.
- Knee and seat reinforcements made of Cordura® material.
- Fixed boots.
- 2 large thigh pockets with flap and touch and close fastening.
- Sleeve pockets with integrated 3 mm 5-finger neoprene gloves
- Cordura® Knee and seat reinforcements
- Supplied in a durable fabric carrying bag.

OPTIONAL EXTRAS

Possibility to increase thermal protection from 1 to 6 hours by combining with our the thermal finfill heavy liner.





FINFILL HEAVY LINER

1MHO

The X-Text Finnfill is made of elastic and watertight material, and it provides perfect thermal insulation. It's made from a four layer material, with Finnfill fibre as insulating layer, and breathable watertight X-Text membrane as intermediate layer. The surface material is an elastic and smooth tricot fabric, and the inner lining is fleece. The heavy model is designed to protect against extremely cold conditions.

KEY FEATURES

- Knitted neck and cuffs
- Front zipper
- Elasticated waist
- 1 pocket on the chest
- 2 hip pockets
- Elastic thumb loops and foot stirrup straps to aid easy donning.



SOLAS / MED
EN ISO 15027



SMART ESSENTIAL

1MHL

SOLAS 2010

ISO 15027-1

Immersion suit for general professional use

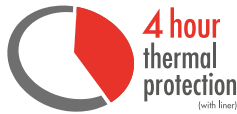
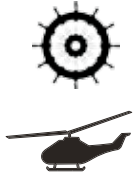
SUPERIOR BENEFITS

- Inside the seams are heat seal taped and reinforced to be 100% watertight
- Socks made of same fabric as the suit itself enables use of any professional footwear

KEY FEATURES

- 3-layer Cordura® fabric weight 235g/m².
- YKK® plastic front zipper for easy donning and doffing.
- SOLAS Reflective tapes: the suit is fitted with durable flexible reflective tapes in optimum positions, which assures visibility in all conditions.
- Hood and neck seal made in elasticated Gore-Tex® fabric.
- In addition a separate 3 mm neoprene hood, which protects against cold water.
- Soft neoprene wrist seals for comfort.
- 1 radio pocket on the left chest with whistle and buddy line.
- 1 large thigh pocket with flap and touch and close fastener.
- Sleeve pockets with integrated 3mm 5-finger neoprene gloves.
- Integrated suspenders and hanging loops for drying.
- Knee and seat reinforcements made of Cordura® material.
- Supplied in a durable fabric carrying bag.

ETSO 2C-503
 ETSO 2C-504
 SOLAS / MED
 EN ISO 15027



SMART ETSO

1MHJ

SOLAS + ETSO

EN ISO 15027-1

A special model of the popular RDS Rapid Donning Suit especially made to meet the demands of the offshore industry for helicopter transfer operations.

SUPERIOR BENEFITS

- Gore-Tex® Aramid 3 layer breathable fabric with ePTFE membrane.
- Smart Lining in outlast regulates body heat in different conditions. Lining is attached with a zipper so that it can be easily removed and washed.
- Seam construction: double seams for extra secure water tightness and durability.
- Socks made of same fabric as the suit itself enables use of any professional footwear.

KEY FEATURES

- Supplied in a durable fabric carrying bag.
- YKK® plastic front zipper, for easy donning and doffing
- 2 automatic outlet valves for excess air release
- Sleeve pockets with integrated neoprene gloves
- Cordura® Knee and seat reinforcements
- Separate neoprene hood
- Soft neoprene neck and wrist seals for comfort
- SOLAS Reflective tapes: the suit is fitted with durable flexible reflective tapes in optimum positions, which assures visibility in all conditions.
- Knee and seat reinforcements made of Cordura® material.
- Hood: attached splash hood, which protects against wind and rain.
- In addition a separate 3 mm neoprene hood, which protects against cold water.
- Gloves: integrated 3mm 5-finger neoprene gloves in sleeve pockets.



“ IDEAL FOR OFFSHORE FACILITIES, SUPPLY VESSELS, BULK CARRIERS, OIL AND LPG TANKERS, COMMERCIAL VESSELS, CONTAINER AND LOAD VESSELS THAT OPERATE IN COLD WATER ”



SOLAS FIREFIGHTER RANGE

SOLAS fire fighter kit

This equipment has been developed in close cooperation with our Sioen Firefighter Clothing department. Sioen Firefighter Clothing is specialized in the design and manufacture of firefighter clothing. They have developed solutions for all risks to which firemen are exposed. Their vast experience has helped us to develop a firefighter suit for our demanding offshore customers.



Fire fighter
intervention suit
(Jacket)



Fire fighter
intervention suit
(Trousers)



Fire helmet



Fire gloves leather



Fire boots



Firefighter
storage bag

MULLION SOLAS FIRE FIGHTER KIT

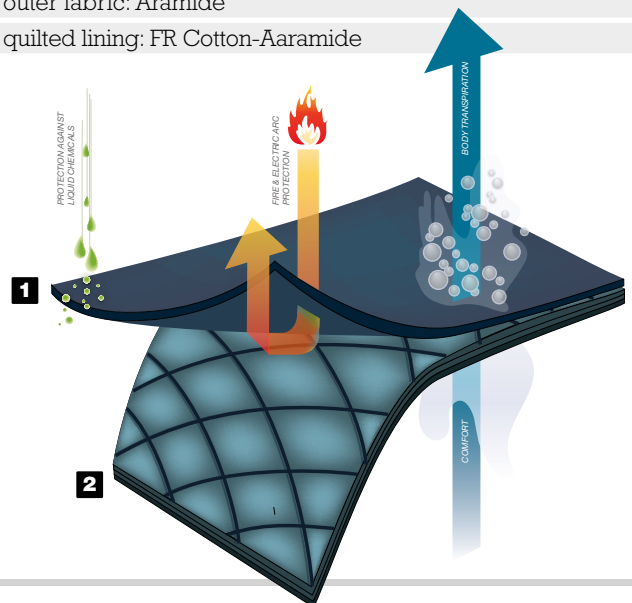


1. Fire fighter intervention jacket (1MMF)
approved according to SOLAS and EN 469
2. Fire fighter intervention trousers (1MPF)
approved according to SOLAS and EN 469
3. Fire helmet (2MZP)
approved according to SOLAS and EN 443
4. Fire gloves leather (2MZO)
approved according to SOLAS and EN 659
5. Fire boots (2MZN)
approved according to SOLAS and EN ISO 20345/EN15090
6. Firefighters storage bag (139Z)



COMPLEX 531:

1. outer fabric: Aramide
2. quilted lining: FR Cotton-Aaramide





FIRE FIGHTER INTERVENTION JACKET 1 MMF

SOLAS

EN 469

Professional fire fighter jacket that complies to SOLAS/MED regulations

KEY FEATURES

- Fire resistant jacket with a two-layer aramid thermal insulation barrier
- Breathable
- Excellent wicking performance
- Outer shell treated with water repellent finish
- Flame resistant triple trim reflective tape on chest, back and arms for optimum visibility day and night
- Stand-up collar with touch and close fastening to protect the neck
- Front zip closure
- Storm flap
- Adjustable wrist closures
- Colour standard orange
- Available in size S-2XL



FIRE FIGHTER INTERVENTION TROUSERS 1 MPF

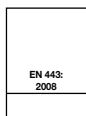
SOLAS

EN 469

Professional fire fighter trousers that complies to SOLAS/MED regulations

KEY FEATURES

- Fire resistant trousers with a two-layer aramid thermal insulation barrier
- Adjustable elasticated shoulder braces on trousers
- Front fly with zipper
- Flame resistant triple trim reflective tape around the legs
- Flame resistant triple trim reflective tape on legs for optimum visibility day and night
- Colour standard orange
- Available in size S-2XL



FIRE HELMET

2MZP

SOLAS

EN 443

Durable and adjustable flame retardant helmet with neck protector and replaceable visor.

KEY FEATURES

- Full-surface impact protection and insulation against heat all over the entire helmet inside
- Nomex chin strap (with 3-point attachment) with quick release buckle
- Replaceable visor
- Leather neck protector to protect neck, ears and part of the cheeks against flames, sparks, steam and liquids
- Inner and outer shell detachable for inspection, cleaning and maintenance
- One helmet fits head sizes 52-64 cm

FIRE GLOVES LEATHER

2MZO

SOLAS

EN 659

Heat and cut resistant leather gloves with Kevlar thread on seams. Perfect fit with elastic tightening at the wrists.

KEY FEATURES

- Cow-nappa leather
- Lining with cut resistant insulation material (100% Para-aramide)
- Eurotex membrane
- Elastic tightening at the wrist
- Kevlar thread



CE 0321
 EN ISO 20345 : 2004
 SB P E CI SRA
 EN 15090 : 2006
 F2 IS HI3 PT CI



FIRE BOOTS

2MZN

SOLAS

EN ISO 20345

EN 15090

Electrical Insulating fireman's boots, with rubber uppers, a protective toe cap, a flame retardant rubber outsole and a comfortable woven cotton canvas lining.

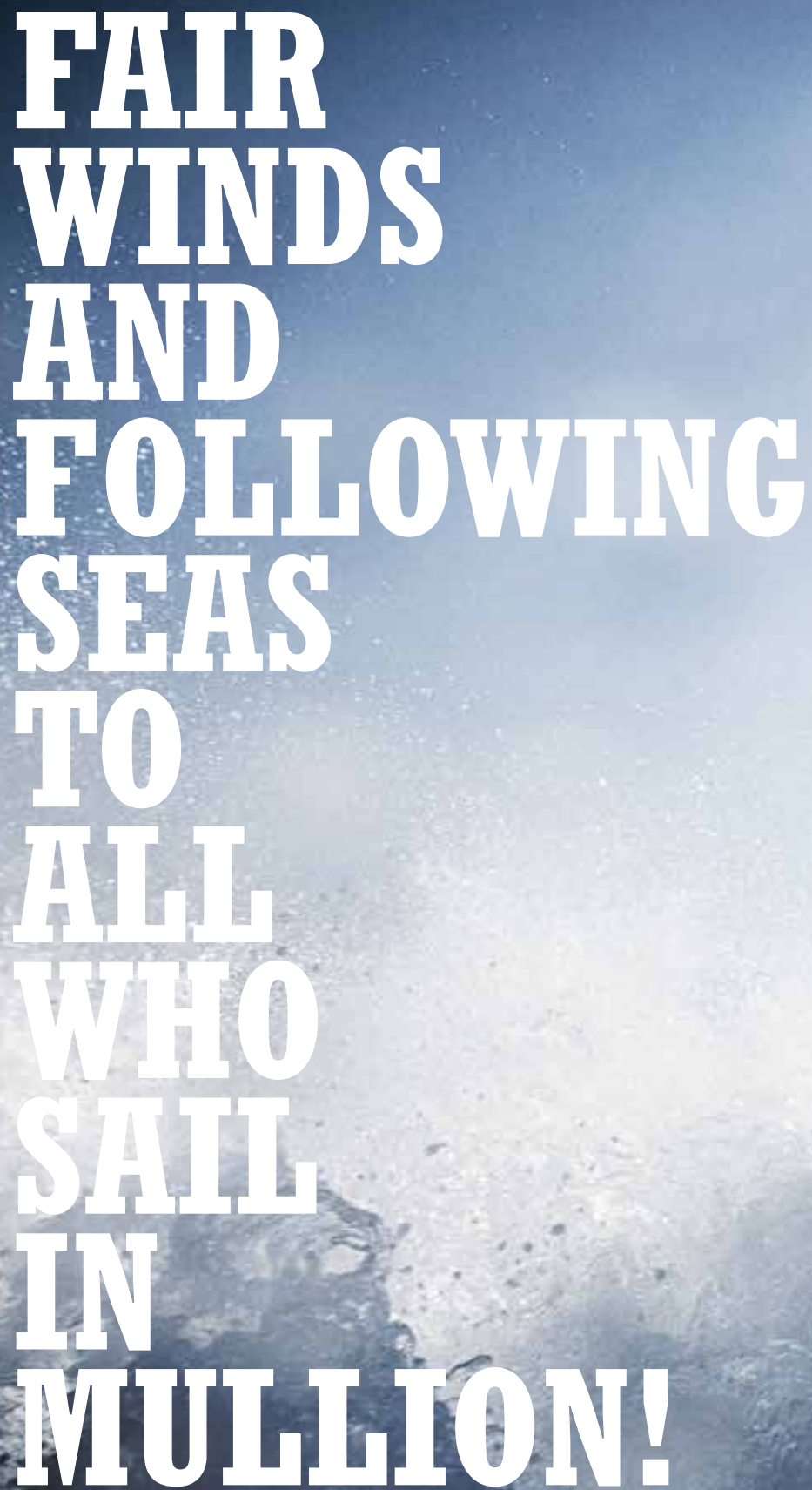
KEY FEATURES

- Flame retardant rubber upper with heat insulation and chemical resistance
- Flame retardant, fuel oil resistant and slip resistant rubber outsole
- Withstands 18kV and high temperature
- Cold insulating outsole construction
- Steel midsole that withstands pins and sharp objects
- Steel toe cap (EN ISO 20345)
- Comfortable woven cotton canvas lining

FIREFIGHTER STORAGE BAG

139Z





**FAIR
WINDS
AND
FOLLOWING
SEAS
TO
ALL
WHO
SAIL
IN
MULLION!**





Mullion
FORTUNE 150

CE

A MULLION DOUBLE CHAMBER INFLATABLE LIFE JACKET*

(* All Mullion double chamber lifejackets are SOLAS approved

STANDARD FEATURES:

1. MARINE GRADE WHISTLE

A Marine grade EN ISO 12402 approved whistle is fitted to the lifejacket. This whistle can be used in immersion situations to alert rescue teams. The whistle is fitted in the optimum position for ease of access.

2. AUTOMATIC WATER-ACTIVATED SOLAS LIGHT AND SOLAS APPROVED RETRO-REFLECTIVE TAPE ON BLADDER

When the bladder is inflated, the retro reflective tape and the SOLAS light increase the visibility of a man overboard to assist location and rescue. The SOLAS approved rescue light which is automatically activated is positioned on the bladder for optimal visibility and rescue.

Required surface area for 150N: 400 cm²
Required surface area for 275N: 400 cm²

3. OVERPRESSURE (OP) TUBE + ORAL INFLATION TUBE

The overpressure tube relieves pressure on one of the chambers when both chambers are automatically inflated simultaneously. The oral tubes can also be used for inflation by mouth; top-up or deflation.

4. RED RECOVERY GRAB STRAP ON BLADDER MARKED "LIFT"

The recovery grab strap facilitates manual recovery of a person from the water during rescue operations.

5. TWO AUTO INFLATION SYSTEMS (DOUBLE CHAMBER) WITH MANUAL OVER-RIDE

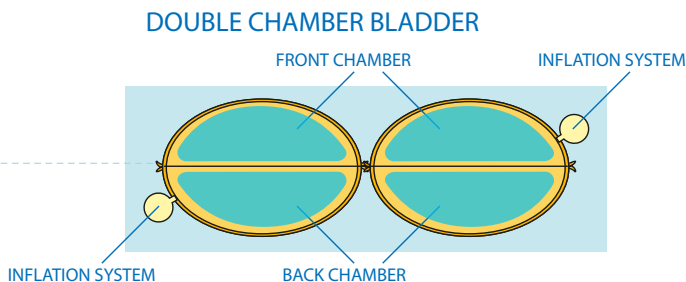
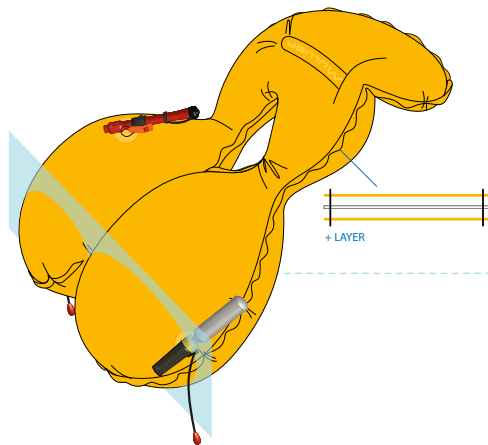
A SOLAS approved lifejacket has two chambers, each of which has an automatic inflation system which will activate on immersion in water. The manual over-ride can activate the inflation systems by pulling the toggles firmly, in the unlikely event that the automatic system fails. This way a pin will pierce the CO₂ cylinder which will inflate the bladder.

6. SECURE RETAINERS (STEEL D-RING, CRUTCH STRAP, BUDDY LINE)

A safety line can be attached to the steel D-ring, attached to the centre front buckle, to prevent the wearer from falling overboard.

The crutch strap prevents the lifejacket from rising above the head and ensures a secure fit and optimum stability of the PFD in water.

A buddy line can be used to attach multiple persons in water together. The high-visibility orange buddy line is stowed on the front edge of the bladder.





“ THE PREFERRED CHOICE OF FISHERMEN AND PROFESSIONAL USERS WHERE MINIMUM SIZE AND WEIGHT COMBINED WITH MAXIMUM PERFORMANCE IS FAVOURED ”

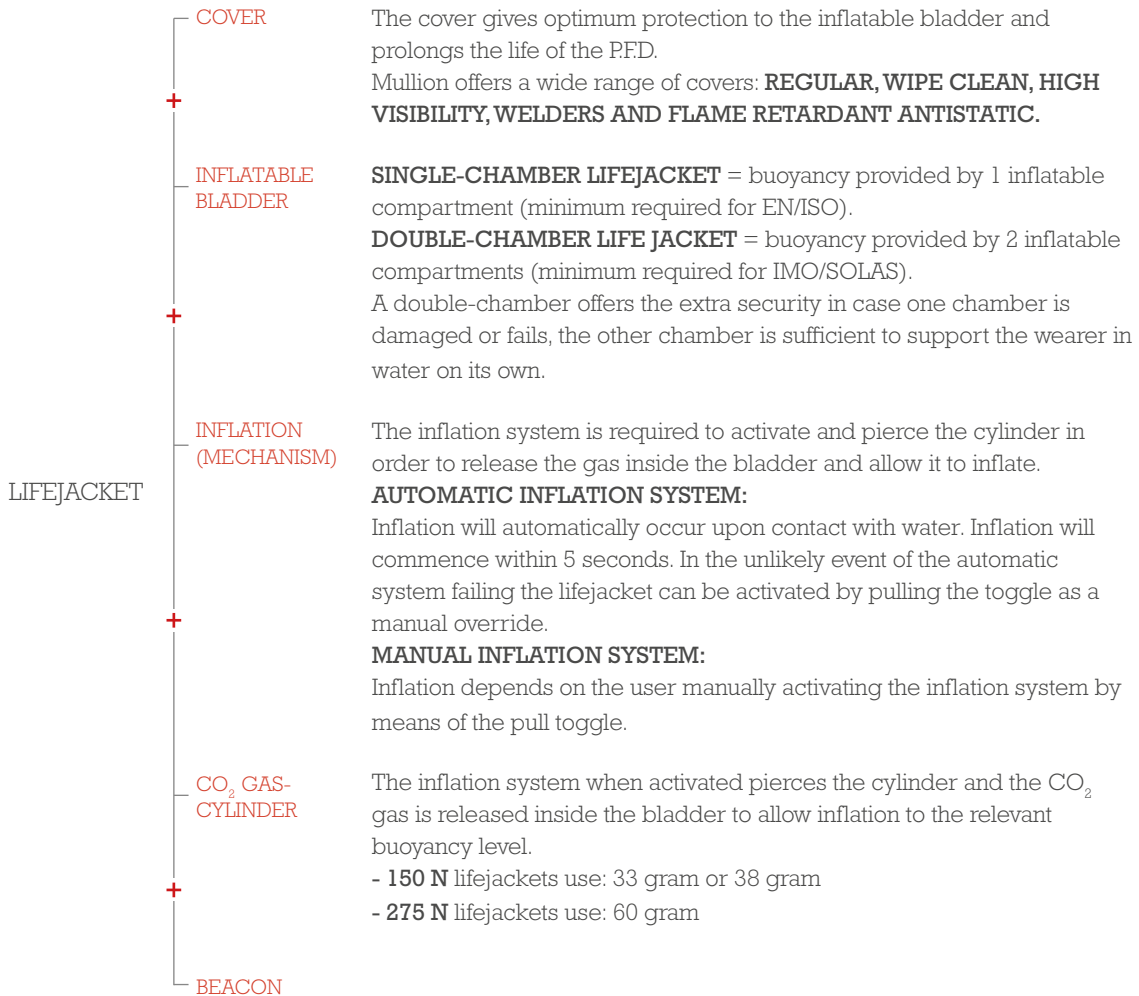


INFLATABLE LIFE JACKETS

An inflatable lifejacket is a Personal Floatation Device (PFD.)* from which the buoyancy is obtained by means of an inflation system and a compressed CO₂ gas cylinder.

Mullion inflatable lifejackets are available in 2 levels of buoyancy: 150 newton or 275 newton.

CONSTRUCTION OF A LIFEJACKET:



(*) PFD: Personal Floatation Device which, when correctly worn and used in water, will provide the user with a specific amount of buoyancy which will increase the likelihood of survival. A PFD can be in the form of either an inherently buoyant foam garment or an inflatable lifejacket.

A MULLION SINGLE CHAMBER INFLATABLE LIFE JACKET

STANDARD FEATURES

1. MARINE GRADE WHISTLE

A Marine grade EN ISO 12402 approved whistle is fitted to the lifejacket. This whistle can be used in immersion situations to alert rescue teams. The whistle is fitted in the optimum position for ease of access.

2. SOLAS APPROVED RETRO-REFLECTIVE TAPE ON BLADDER

When the bladder is inflated, the retro-reflective tapes increase the visibility of a man overboard to assist location and rescue.
Required surface area for 150N: 300 cm²
Required surface area for 275N: 400 cm²

3. ORAL INFLATION TUBE

An oral tube is provided to allow inflation by mouth; top-up or deflation

4. RED RECOVERY GRAB STRAP MARKED "LIFT"

The recovery grab strap facilitates manual recovery of a person from the water during rescue operations.

5. CRUTCH STRAP

The crutch strap prevents the lifejacket from rising above the head and ensures a secure fit and optimum stability of the PFD in water.

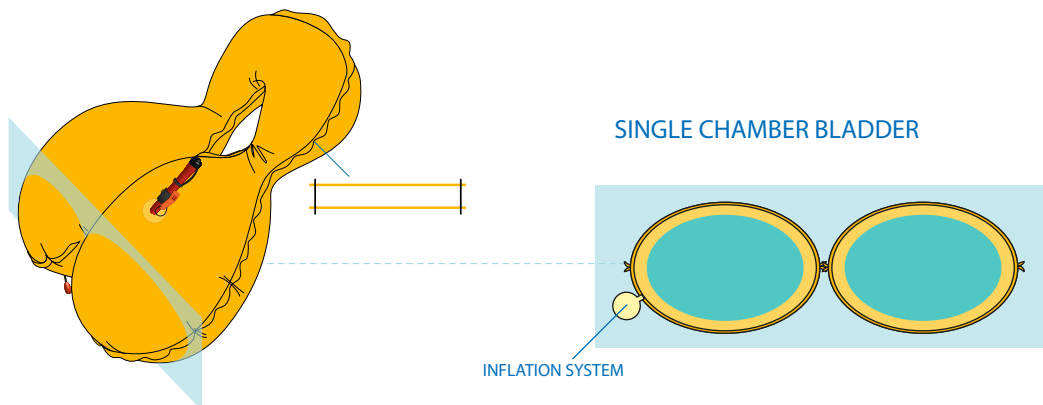
6. INFLATION SYSTEM

The inflation system is required to activate and pierce the cylinder in order to release the gas inside the bladder and allow it to inflate.

This is normally both automatic and manual. Manual only systems can be supplied for special purpose use.

7. BLADDER

All bladders are constructed with air tight materials and seams. Standard colour is Spanish yellow to enhance wearer location and visibility in water.





	COMPACT 150			STREAM 150		HI-TIDE 150		
	REGULAR	HEAVY DUTY WIPE CLEAN	LOCATOR	REGULAR	REGULAR	REGULAR	WIPE CLEAN	LOCATOR
Standard	EN ISO 12402-3	EN ISO 12402-3	EN ISO 12402-3 EN ISO 12402-6 EN ISO 12401	EN ISO 12402-3	EN ISO 12402-3 EN ISO 12401	EN ISO 12402-3	EN ISO 12402-3	EN ISO 12402-3 EN ISO 12402-6
Actual Buoyancy level	172 N			170 N	170 N	157 N		
Cover fabric *	PA-1000D	PVC+Tektor	PVC + Tektor	PA-420D		PA-450D	PA-450D	PA-450D
Metal interlock buckles	No	No	Yes	Yes	Yes	Yes	Yes	No
Quick release plastic buckles	Yes	Yes	No	No	No	No	No	Yes
D-ring	No	No	Yes	No	Yes	No	No	No
CO₂ gas cylinder	1 x 38 gram	1 x 38 gram	1 x 38 gram	1 x 33 gram	1 x 33 gram	1 x 33 gram	1 x 33 gram	1 x 33 gram
Special features		Extra reinforced + Comfort Neck	Extra reinforced + Comfort Neck + Safelink Solo Plb + Deck Safety Harness		Deck Safety Harness		Reinforced	+ Divansi PLB
Colour	Red Navy Olive green	Red/Orange	Red	Red	Red Navy	Red	Red/Orange	Hi-Vis Yellow/ Navy
Reference	3MV1	3MX9	3MX8	3MVS	3MVH	3MV4	3MVB	3MVF
Page	pg 68	pg 69	pg 69	pg 71	pg 71	pg 74	pg 74	pg 75

(*) PA: Polyamide / PES: Polyester / D: Denier



	HI-RISE 150		NEPTUNE 150					HI-TIDE 275	
LOCATOR	REGULAR	WIPE CLEAN	REGULAR	WIPE CLEAN	WELDERS	FR AST	HI-VIS FR AST	REGULAR	WIPE CLEAN
EN ISO 12402-3 EN ISO 12402-6	EN ISO 12402-3	EN ISO 12402-3	EN 396	EN 396	EN 396	EN 396 EN 1149-5 EN ISO 14116	EN 396 EN 1149-5 EN ISO 14116	EN ISO 12402-2	EN ISO 12402-2
	180N	180N	208 N					294N	
PA-450D	PA-450D	PA-450D	PA-450D	PA-450D	PA-450D	PES-300D + anti-static fibre	PES-300D + anti-static fibre	PA-450D	PA-450D
No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	No	No	No	No	No	No	No	No	No
No	No	No	Yes	Yes	Yes	Yes	Yes	No	No
1 x 33 gram	1 x 38 gram	1 x 38 gram	1 x 33 gram	1 x 33 gram	1 x 33 gram	1 x 33 gram	1 x 33 gram	1 x 60 gram	1 x 60 gram
+ Divansi PLB		Reinforced		Reinforced	Flame retardant	Flame retardant Anit-Static	Hi-Vis Flame retardant Anit-Static		Reinforced
Hi-Vis Yellow/ Navy	Red/Black	Red/Black	Red	Red/Orange	Silver	Royal Blue	Hi-Vis Yellow Hi-Vis Orange	Red	Red/Orange
3MVG	3MSV	3MSW	1MV8	1MY4	1MYD	1MUI	1MUE	3MVY	3MVP
pg 75	pg 77	pg 77	pg 80	pg 80	pg 81	pg 82	pg 83	pg 85	pg 85



HI-RISE 275		SEAFORCE II 275	MARINER 275					
REGULAR	WIPE CLEAN	REGULAR	REGULAR	WIPE CLEAN	HEAVY DUTY	WELDERS	FR AST	HI-VIS FR AST
EN ISO 12402-2	EN ISO 12402-2	EN ISO 12402-2	EN 399	EN 399	zEN 399	EN 399	EN 399 EN 1149-5 EN ISO 14116	EN 399 EN 1149-5 EN ISO 14116
320N		296N	324 N					
PA-450D	PA-450D	PA-1000D	PA-450D	PA-450D	PA-450D	PANOTEX®	PES-300D + anti-static fibre	PES-300D + anti-static fibre
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	No	No	No	No
No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
1 x 60 gram	1 x 60 gram	1 x 60 gram	1 x 60 gram	1 x 60 gram	1 x 60 gram	1 x 60 gram	1 x 60 gram	1 x 60 gram
	Reinforced	Asymmetric bladder + Optimum turning capacity		Reinforced	Reinforced	Flame retardant	Flame retardant Anit-Static	Hi-Vis Flame retardant Anit-Static
Red/Black	Red/Orange	Navy	Red	Red/Orange	Hi-Vis Yellow	Silver	Royal Blue	Hi-Vis Yellow Hi-Vis Orange
3MSY	3MSZ	3MV9	1MU4	1MU9	1MXH	1MYG	1MUJ	1MUF
pg 87	pg 87	pg 90	pg 94	pg 95	pg 95	pg 97	pg 96	pg 97



 SOLAS HI-RISE 150 			 SOLAS HI-RISE 275 					
REGULAR	WIPE CLEAN	REGULAR + SPRAYHOOD	REGULAR	WIPE CLEAN	HARNESS	sMRT LOCATOR	REGULAR + SPRAYHOOD	WIPE CLEAN + SPRAYHOOD
SOLAS EN ISO 12402-3	SOLAS EN ISO 12402-3	SOLAS EN ISO 12402-3	SOLAS EN ISO 12402-2	SOLAS EN ISO 12402-2	SOLAS EN ISO 12402-2	SOLAS EN ISO 12402-2	SOLAS EN ISO 12402-2	SOLAS EN ISO 12402-2
180N			320N					
PA-450D	PA-450D	PA-450D	PA-450D	PA-450D	PA-450D	PA-450D	PA-450D	PA-450D
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	No	No	No	No
Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2 x 38 gram	2 x 38 gram	2 x 38 gram	2 x 60 gram	2 x 60 gram	2 x 60 gram	2 x 60 gram	2 x 60 gram	2 x 60 gram
	Reinforced	Sprayhood		Reinforced	+ attachment loops for Fall Arrest Harness	Reinforced + Marine Rescue technologies AU10 beacon	Sprayhood	Reinforced + Sprayhood
Red/Black Navy/Black	Red/Black	Red/Black Navy/Black	Red/Black Navy/Black	Red/Orange	Red/Black Navy/Black	Red	Red/Black Navy/Black	Red/Orange
2MSF	2MSG	2MSQ	2MS1	2MS2	2MT2	2MTK	2MS9	2MTD
pg 100	pg 101	pg 101	pg 102	pg 103	pg 103	pg 104	pg 105	pg 105

COMPACT[®] 150

REGISTERED TRADEMARK

The Smallest Lifejacket in the World!

SINGLE
CHAMBER

ACTUAL
BUOYANCY
172N

EN ISO
12402

SUPERIOR BENEFITS

- The unique design fits high on the chest to afford maximum working flexibility with minimal snagging hazards.
- All snag hazards are removed to ensure safe working practice.
- It uses latest Quick Burst Zip technology for fast deployment in water.
- Optimum safety features for operational readiness indication and service requirements give the wearer total assurance.
- Highly abrasion resistant and durable materials are used to give extended life in harsh working environments.

The Mullion Compact[®] 150N CE/ISO range exists of 3 types of lifejackets each with a specific feature based on different working conditions.



Compact[®]
REGULAR



Compact[®]
HEAVY DUTY WIPE CLEAN



Compact[®]
LOCATOR



EN ISO 12402-3



COMPACT® 150 REGULAR

3MV1

EN ISO 12402 BUOYANCY: 172N Single Chamber

The Compact® 150 Mark II is ideal for general heavy use professional and commercial applications due to its high abrasion resistance outer cover.

KEY FEATURES

OUTER COVER

- High abrasion resistance fabric
- Quick burst zip fastening cover
- Quick release buckle
- Crutch strap
- Inflation system operational readiness indicator window on the back
- Service date information window on the back

BLADDER

- Marine grade whistle
- Oral inflation tube
- SOLAS approved retro-reflective tape on bladder
- Red recovery grab strap on bladder marked "LIFT"
- Inflation system
- 38g CO₂ gas cylinder

Options on special request: ISO 12401 Deck Safety Harness model





EN ISO 12402-3



EN ISO 12402-3/6
EN ISO 12401



COMPACT® 150 SUPREME

3MX9

EN ISO 12402-3 BUOYANCY: 172N Single Chamber

SUPERIOR BENEFITS

The Compact Supreme 150 Heavy Duty Wipe clean lifejacket is ideal for heavy commercial fishing applications especially for potters, crabbers, lobster fishermen and also suitable for construction workers.

Additional features to COMPACT® 150 REGULAR:

- + High abrasion resistance fabric reinforced with additional high abrasion resistance "Tektor" fabric around the sides and lower edges of the cover to prevent damage.
- + Durable wipe clean PVC reinforcement comfort collar padding to the back of the neck.
- + Mesh back feature improves weight dispersal & reduces pressure on back of neck
- + Concealed zip cover fastening with burst point at centre back neck.
- + New inflation system – less chance of inadvertent inflation / smoother design to minimize abrasion on cover & bladder.

COMPACT® 150 SUPREME LOCATOR

3MX8

EN ISO 12402 / 12401 BUOYANCY: 172N Single Chamber

SUPERIOR BENEFITS

The compact Supreme 150 Locator Heavy Duty Wipe clean lifejacket is integrated with the Kannad Safelink SOLO Personal Locator Beacon.

Additional features to COMPACT® 150 SUPREME:

- + Integrated deck safety harness approved to EN ISO 12401
- + Automatic water-activated SOLAS light

Options on special request: ISO 12401 Deck Safety Harness model

STREAM 150

Constant Wear, All-weather Lifejacket

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
170N**

**EN ISO
12402**





EN ISO 12402-3



EN ISO 12402-3
EN ISO 12401



STREAM II 150 REGULAR		3MVS
EN ISO 12402/12401	BUOYANCY: 170N	Single Chamber

STREAM 150 REGULAR		3MVH
EN ISO 12402/12401	BUOYANCY: 170N	Single Chamber

The Stream 150N lifejacket is a constant wear, all-weather lifejacket for general use with foul weather clothing. The Stream 150N is a standard horseshoe design with a touch and close fastening cover and a single back strap.

OUTER COVER

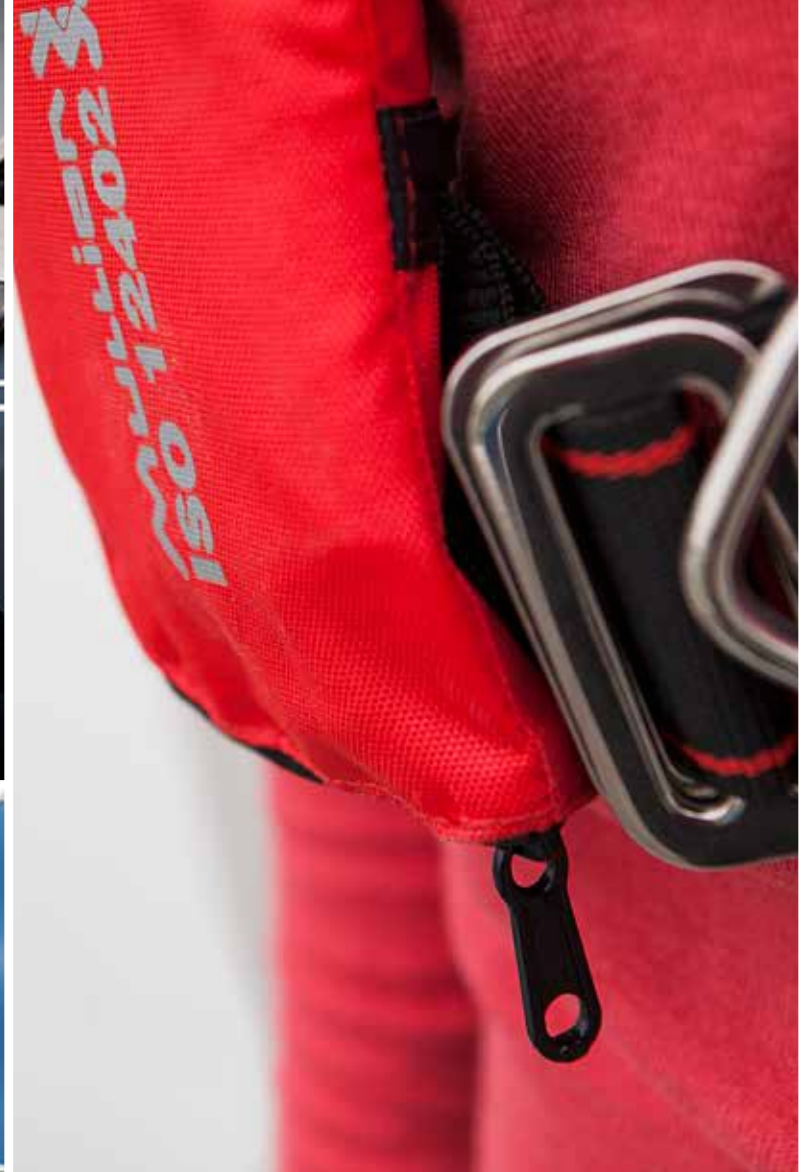
- Durable waterproof fabric
- Touch and close fastening cover
- Adjustable waist belt
- Stainless steel interlocking belt buckles
- Crutch strap
- Service date information tag on the belt

ADDITIONAL FEATURES TO STREAM II

- Stainless steel front D-ring approved as deck safety harness

BLADDER

- Marine grade whistle
- Oral inflation tube
- Retro-reflective tape on bladder
- Red recovery grab strap on bladder marked "LIFT"
- Inflation system
- 33 g CO₂ gas cylinder



THE PREFERRED CHOICE OF FISHERMEN AND PROFESSIONAL USERS WHERE MINIMUM SIZE AND WEIGHT COMBINED WITH MAXIMUM PERFORMANCE IS FAVOURED



HI-TIDE 150

Standard Horseshoe Style.

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
175N**

**EN ISO
12402**

The Hi-Tide 150 lifejacket is a constant wear, all-weather lifejacket for general use with foul weather clothing.

The Hi-Tide 150N range is available in 4 variations appropriate to different end uses.



Hi-Tide
REGULAR



Hi-Tide
WIPE CLEAN



Hi-Tide
LOCATOR



Hi-Tide
LOCATOR



EN ISO 12402-3



EN ISO 12402-3



HI-TIDE 150 REGULAR

3MV4

EN ISO 12402

BUOYANCY: 175N

Single Chamber

KEY FEATURES

OUTER COVER

- Durable waterproof fabric
- Zip fastening closure
- Adjustable waist belt
- Stainless steel interlocking belt buckles
- Stainless steel D-ring on belt
- Crutch strap

BLADDER

- Marine grade whistle
- Oral inflation tube
- SOLAS approved retro-reflective tape
- Red recovery grab strap marked "LIFT"
- Inflation system
- 33g CO₂ gas cylinder

HI-TIDE 150 WIPE CLEAN

3MVB

EN ISO 12402

BUOYANCY: 175N

Single Chamber

SUPERIOR BENEFITS

The Hi-Tide 150 Wipe Clean PVC reinforced version is ideal for heavy duty industrial use.

Additional features to HI-TIDE 150 REGULAR:



Durable wipe clean PVC reinforcement



HI-TIDE 150 LOCATOR

3MVF

EN ISO 12402 BUOYANCY: 175N Single Chamber

SUPERIOR BENEFITS

The Hi-Tide 150 Locator is integrated with the Divansi® Personal Locator Beacon.

It is available in hi-vis yellow with retro reflective striping on the front and back to improve visibility

To improve comfort the Hi-Tide Locator has a detachable fleece at the back of the neck

Additional features to HI-TIDE 150 REGULAR:

- + Durable wipe clean PVC reinforcement
- + Inflation system operational readiness indicator window and service date information window
- + Quick release buckle
- + Bladder is designed for harsh working conditions: it has an additional double layer membrane for superior damage limitation and enhanced integrity to increase working life
- + Detachable fleece at the back of the neck

HI-TIDE 150 LOCATOR

3MVG

EN ISO 12402 BUOYANCY: 175N Single Chamber

SUPERIOR BENEFITS

The Hi-Tide 150 Locator is integrated with the Divansi Personal Locator Device.

Additional features to HI-TIDE 150 REGULAR:

- + Durable wipe clean PVC reinforcement
- + Quick release buckle

HI-RISE 150

State of the art inflatable lifejacket.

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
180N**

**EN ISO
12402**

SUPERIOR BENEFITS

- Ideal for offshore use with foul weather clothing.
- Designed to combine optimum safety and comfort.
- Stylized horseshoe design with offset shoulder straps to alleviate weight and pressure stress on neck and shoulders.
- The bladder has a unique hinged head pillow for optimal comfort and head support in water.
- The shape of the bladder is tailored to the contours of the wearer to create a snug secure fit whilst giving supreme in-water performance.



HI-RISE 150 REGULAR **3MSV**
 EN ISO 12402 BUOYANCY: 180N Single Chamber

KEY FEATURES

OUTER COVER

- Durable waterproof fabric
- Reflective silver piping on the front
- Zip fastening closure
- Adjustable waist belt
- Stainless steel interlocking belt buckles
- Crutch strap

BLADDER

- Marine grade whistle
- Oral inflation tube
- SOLAS approved retro-reflective tape
- Red recovery grab strap marked "LIFT"
- Inflation system
- 38g CO₂ gas cylinder

HI-RISE 150 REGULAR **3MSW**
 EN ISO 12402 BUOYANCY: 175N Single Chamber

SUPERIOR BENEFITS

The Hi-Tide 150 Wipe Clean PVC reinforced version is ideal for heavy duty industrial use.

Additional features to HI-TIDE 150 REGULAR:

- +** Durable wipe clean PVC reinforcement



**IDEAL FOR GENERAL
USE WITH FOUL
WEATHER CLOTHING**



NEPTUNE 150

Standard Horseshoe Style.

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
208N**

EN 396

The Neptune 150N lifejacket is a constant wear, all-weather lifejacket for general use with foul weather clothing.

The Neptune 150N CE range is available in 5 variations appropriate to different end uses.



Neptune
REGULAR



Neptune
WIPE CLEAN



Neptune
WELDERS



Neptune
FR AST



Neptune
HI-VIS FR AST



NEPTUNE 150 REGULAR

1MV8

EN 396

BUOYANCY: 208N

Single Chamber

The Neptune 150 is a standard horseshoe design with a zip closure cover and a single back strap for general utility use.

KEY FEATURES

OUTER COVER

- Durable waterproof fabric
- Zip fastening cover
- Adjustable waist belt
- Stainless steel interlocking belt buckles
- Stainless steel D-ring on belt
- Crutch strap

BLADDER

- Marine grade whistle
- Oral inflation tube
- SOLAS approved retro-reflective tape
- Red recovery grab on bladder strap marked "LIFT"
- Inflation system
- 33g CO₂ gas cylinder

NEPTUNE 150 WIPE CLEAN

1MY4

EN 396

BUOYANCY: 208N

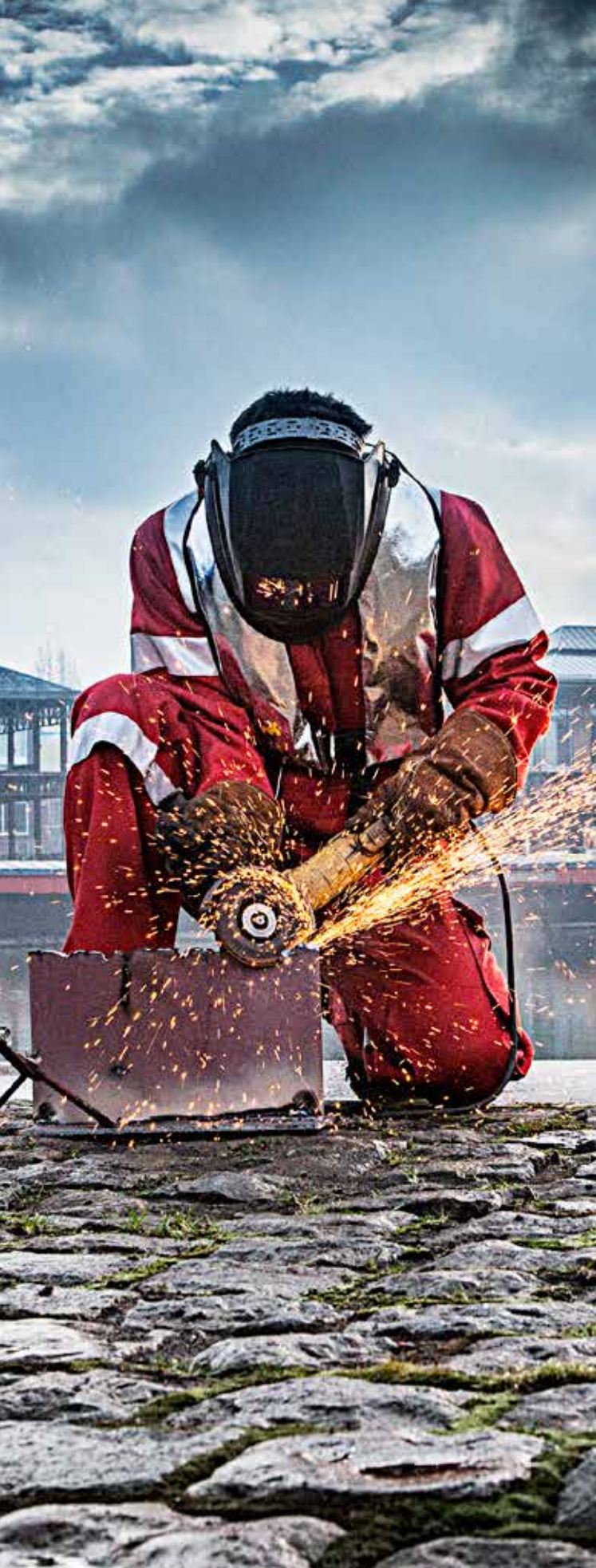
Single Chamber

SUPERIOR BENEFITS

The Neptune 150 Wipe Clean PVC reinforced version is ideal for heavy duty industrial use.

Additional features to NEPTUNE 150 REGULAR:

- + Durable wipe clean PVC reinforcement.



EN 396



NEPTUNE 150 WELDERS

1MYD

EN 396

BUOYANCY: 208N

Single Chamber

SUPERIOR BENEFITS

The Neptune 150 Welders lifejacket is ideal for use by workers conducting welding activities in marine environments. This Lifejacket is light weight and comfortable with a tough Panotex® aluminized cover protecting it from molten metal splashes and sparks. This lifejacket has a FR touch and close fastening cover.

Additional features to NEPTUNE 150 REGULAR:

- + FR Touch and close fastening cover instead of zip fastening cover
- + Durable aluminized Panotex® silver wipe clean cover
- +
 - EN407 : EN367 Convective Heat Level 2
 - EN407 : ISO6942 Radiant Heat Level 4
 - EN407 : EN348 Small splashes of Molten metal L3
 - EN407 : EN373 Large Quantity of Molten Iron L4 ISO11612:ISO9151 Convective Heat Level B1 ISO11612:ISO6942 Radiant Heat Level C4 ISO11612:ISO9185 Molten Aluminium Level D3 ISO11612:ISO9185 Molten Iron Level E3 ISO11612:ISO15025 Limited Flame Spread Pass A1 ISO14116:ISO15025 Limited Flame Spread Index 3 ISO11611:ISO9150 Impact of Molten metal drops Class 2 EN469 : ISO6530 Penetration by Liquid chemicals BS EN 1149-5: BS EN 1149-1

Optional extras:

Navy FR over cover for anti-glare and anti-reflection



NEPTUNE 150 FR AST **1MUI**
 EN 396 BUOYANCY: 208N Single Chamber

SUPERIOR BENEFITS

Ideal for use on oil refineries, petrochemical sites, oil tankers, granary production and processing sites, grain silos and grain barges.

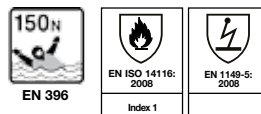
The Neptune 150 Flame Retardant Antistatic is ideal for use by workers in areas where there is risk of fire or explosion caused by static, sparks or combustible materials. This lifejacket is light weight and comfortable while giving optimum protection to wearers in such ATEX environments.

It has been specifically designed to be compatible to wear with a full FR AST protective coat from our in-house range – the Sioen Duffel style. This ensures that the FR AST properties of the coat are not compromised by the use of a lifejacket over the top. The positioning of the retro-reflective tape also ensures non-interruption of the corresponding reflective tape on the coat as it blends in with it to give full conformity in the combination of wear.



Additional features to NEPTUNE 150 REGULAR:

- +** Outer cover in FR AST fabric
- +** All straps and belt in FR AST webbing
- +** All metal buckles in FR AST quality
- +** FR AST protective covers over zip pullers
- +** Horizontal chest reflective tape bands on cover positioned to blend with equivalent FR AST protective coat –style 3074
- +** Bladder in FR fabric



NEPTUNE 150 HI-VIS FR AST

1MUE

EN 396

BUOYANCY: 208N

Single Chamber

SUPERIOR BENEFITS

Ideal for use on oil refineries, petrochemical sites, oil tankers, granary production and processing sites, grain silos and grain barges.

The Neptune 150 hi-vis Flame Retardant Antistatic lifejacket has the same features as the Neptune 150 FR AST and offers the wearer extra visibility when worn.

It has been specifically designed to be compatible to wear with a full FR AST protective coat from our in-house range – the Sioen Duffel style. This ensures that the FR AST properties of the coat are not compromised by the use of a lifejacket over the top. The positioning of the retro-reflective tape also ensures non-interruption of the hi-visibility EN 471 requirement of the coat as it blends in with it to give full conformity in the combination of wear.

Additional features to NEPTUNE 150 FR AST:

- + Hi-vis orange or yellow cover
- + Vertical chest and diagonal shoulder reflective tape bands on cover positioned to blend with equivalent FR AST coats – style 9464

HI-TIDE 275

Standard Horseshoe Style

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
294N**

**EN ISO
12402**

The HI-TIDE 275 lifejacket is a constant wear, all-weather lifejacket for onshore and offshore use with special protective clothing.

The HI-TIDE 275 ISO range is available in 2 variations appropriate to different end uses.



Hi-Tide
REGULAR



Hi-Tide
WIPE CLEAN



EN ISO 12402-2



EN ISO 12402-2



HI-TIDE 275 REGULAR

3MVP

EN ISO 12402-2 BUOYANCY: 294N Single Chamber

KEY FEATURES

OUTER COVER

- Durable waterproof outer fabric
- Double shoulder straps for comfort and reduction of weight to the back neck. Reflective silver piping on the front
- Zip fastening cover
- Stainless steel interlocking belt buckles
- Adjustable waist belt
- Detachable crutch strap

BLADDER

- Single chamber
- Oral inflation tube
- SOLAS approved retro-reflective tape on bladder
- Red recovery grab strap marked "LIFT"
- Whistle
- 1 x 60gm CO₂ gas cylinder

HI-TIDE 275 WIPE CLEAN

3MVP

EN ISO 12402-2 BUOYANCY: 294N Single Chamber

SUPERIOR BENEFITS

The HI-TIDE 275 Wipe Clean PVC reinforced version is ideal for heavy duty industrial use with special protective clothing.

Additional features to HI-TIDE 275 REGULAR:

- + Durable wipe clean PVC reinforcement

HI-RISE 275

State of the art inflatable lifejacket

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
320N**

**EN ISO
12402**

SUPERIOR BENEFITS

- Ideal for offshore extreme use with foul weather clothing and equipment.
- Designed to combine optimum safety and comfort.
- Stylized horseshoe design with offset shoulder straps to alleviate weight and pressure stress on neck and shoulders.
- The bladder has a unique hinged head pillow for optimal comfort and head support in water.
- The shape of the bladder is tailored to the contours of the wearer to create a snug secure fit whilst giving supreme in-water performance.



HI-RISE 275 REGULAR

3MSY

EN ISO 12402 BUOYANCY: 320N Single Chamber

KEY FEATURES

OUTER COVER

- Durable waterproof outer fabric
- Zip fastening closure
- Reflective silver piping on the front
- Adjustable waist belt
- Stainless steel interlocking belt buckles
- Crutch strap

BLADDER

- Marine grade whistle
- Oral inflation tube
- SOLAS approved retro-reflective tape
- Red recovery grab strap marked "LIFT"
- Inflation system
- 1 x 60gm CO₂ gas cylinder

HI-RISE 275 REGULAR

3MSZ

EN 399 BUOYANCY: 324N Single Chamber

SUPERIOR BENEFITS

The Mariner 275 Wipe Clean PVC reinforced version is ideal for heavy duty industrial use with special protective clothing.

Additional features to MARINER 275 REGULAR:

- + Durable wipe clean PVC reinforcement



**“ IDEAL FOR POLICE, GOVERNMENT
AUTHORITIES, CUSTOMS, PILOTS
AND RIB OPERATORS ”**



SEAFORCE II 275[®] *

(*) Protected Design Registration No. DM/080105

Design Registered as a Unique Asymmetric Shaped Bladder Offering Optimum Turning Capacity

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
296N**

**EN ISO
12402**

Specifically designed for people working in extreme conditions and for special purpose operations where the risk of falling into water is high.

SUPERIOR BENEFITS

- Has a unique highly asymmetric shaped bladder which gives optimum turning capacity when worn in combination with dry suits, waders, firefighters' suits, heavy clothing or floatation garments.
- The stylized vest design with cross over back and panel optimizes the redistribution of trapped air in dry suits and/or heavy garments worn underneath the lifejacket to further enhance self-righting.
- Double membrane technology used in the bladder gives superior damage protection against perforation and piercing.
- Enhanced safety features for operational readiness indication and service requirements give the wearer total assurance.



EN ISO 12402-2



SEAFORCE II

3MV9

EN ISO 12402-2

BUOYANCY: 296N

Single Chamber

KEY FEATURES

OUTER COVER

- Zip fastening lifejacket cover
- High abrasion resistance waterproof fabric
- Extended fabric back for enhanced comfort
- Offset shoulder back straps for added comfort and reduction of weight on neck
- Double belts for extra security
- Stainless steel interlocking belt buckles
- Centre front vest fastening heavy duty zip + easy grip puller
- White Mullion reflective tape on front shoulders
- Inflation system operational readiness indicator window on right front
- Service date information window on left front
- Crutch strap

BLADDER

- Double membrane technology to give superior damage protection against perforation and piercing
- Marine grade whistle
- Oral inflation tube
- SOLAS approved Retro-reflective tape
- Red recovery grab strap on bladder marked "LIFT"
- Inflation system
- 60g CO₂ gas cylinder

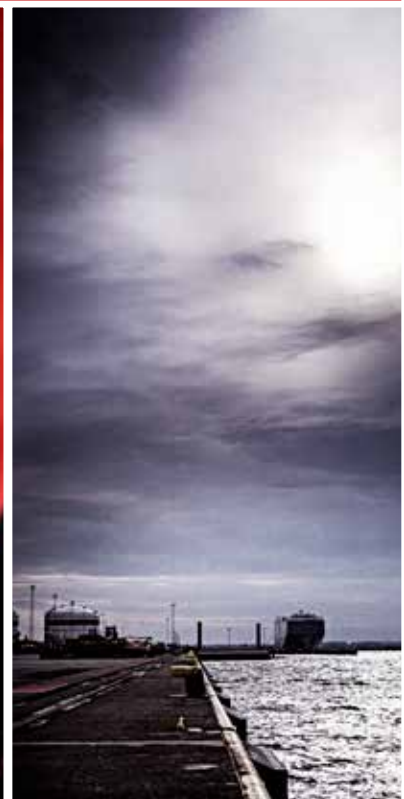
FEATURES OF THE SEAFORCE II



1. High abrasion resistance outer cover in vest style with extended back panel for support
2. Offset double shoulder straps for enhanced comfort
3. Centre front vest fastening heavy duty zip + easy grip puller extension
4. Zip closure lifejacket cover
5. Reflective tape on front cover
6. Marine grade stainless steel buckles
7. Crutch strap
8. Inflation system operational readiness indicator window on right front
9. Service date information window on left front



**“ IDEAL FOR ONSHORE AND OFFSHORE
USE UNDER EXTREME CONDITIONS
WITH SPECIAL PROTECTIVE CLOTHING
AND OR HEAVY EQUIPMENT ”**



MARINER 275

Standard Horseshoe Style

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
324N**

EN 399

The Mariner 275 lifejacket is a constant wear, all-weather lifejacket for onshore and offshore use with special protective clothing.

The Mariner 275N CE range is available in 6 variations appropriate to different end uses.



Mariner
REGULAR



Mariner
WIPE CLEAN



Mariner
HEAVY DUTY



Mariner
FR AST



Mariner
HI-VIS FR AST



Mariner
WELDERS



MARINER 275 REGULAR

1MU4

EN 399

BUOYANCY: 324N

Single Chamber

The Mariner 275 is a standard horseshoe design with a zip closure cover and a single back strap.

KEY FEATURES

OUTER COVER

- Durable waterproof fabric
- Zip fastening cover
- Adjustable waist belt
- Stainless steel interlocking belt buckles
- Stainless steel D-ring on belt
- Crutch strap

BLADDER

- Marine grade whistle
- Oral inflation tube
- SOLAS approved retro-reflective tape on bladder
- Red recovery grab strap on bladder marked "LIFT"
- Inflation system
- 60gm CO₂ gas cylinder



MARINER 275 WIPE CLEAN

1MU9

EN 399

BUOYANCY: 324N

Single Chamber

SUPERIOR BENEFITS

The Mariner 275 Wipe Clean PVC reinforced version is ideal for heavy duty industrial use with special protective clothing.

Additional features to MARINER 275 REGULAR:

- + Durable wipe clean PVC reinforcement

MARINER 275 HEAVY DUTY

1MXH

EN 399

BUOYANCY: 324N

Single Chamber

SUPERIOR BENEFITS

The Heavy Duty Mariner is ideal for construction, port and dock workers. It is suitable for use in environments where heavy abrasion, dirt, oil and grease may cause premature wear and damage to the bladder. It has a padded back neck and double shoulder straps for comfort and reduction of weight on the back neck area. The high visibility yellow cover with SOLAS retro-reflective tape gives enhanced safety in high activity areas.

Additional features to MARINER 275 REGULAR:

- + Durable hi-vis yellow wipe clean PVC reinforcement
- + Padded back neck and offset double shoulder straps for comfort and reduction of weight to the back neck
- + SOLAS retro-reflective tape on front cover



EN 399



EN ISO 14118:
2008



EN 1149-5:
2008

Index 1



MARINER 275 FR AST

1MUJ

EN 399

BUOYANCY: 324N

Single Chamber

SUPERIOR BENEFITS

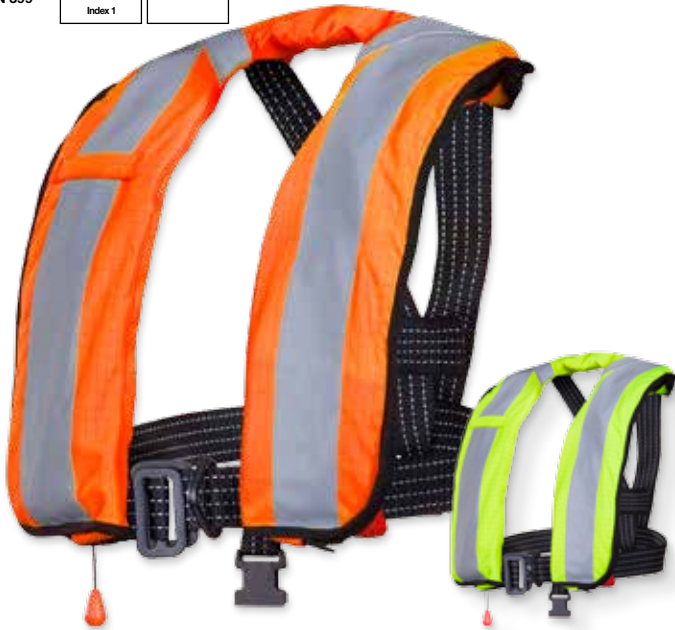
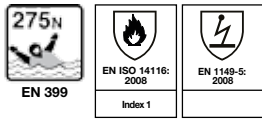
The Mariner 275 Flame Retardant Antistatic is ideal for use by workers in areas where there is risk of fire or explosion caused by static, sparks or combustible materials. This lifejacket is light weight and comfortable while giving optimum protection to wearers in such ATEX environments.

It has been specifically designed to be compatible to wear with a full FR AST protective coat from our in-house range – the Sioen Duffel style. This ensures that the FR AST properties of the coat are not compromised by the use of a lifejacket over the top. The positioning of the retro-reflective tape also ensures non-interruption of the corresponding reflective tape on the coat as it blends in with it to give full conformity in the combination of wear.



Additional features to MARINER 275 REGULAR:

- + Outer cover in FR AST fabric
- + All straps and belt in FR AST webbing
- + All metal buckles in FR AST quality
- + FR AST protective covers over zip pullers
- + Horizontal chest reflective tape bands on cover positioned to blend with equivalent FR AST protective coat –style 3074
- + Bladder in FR fabric



MARINER 275 HI-VIS FR AST **1MUF**
 EN 399 BUOYANCY: 324N Single Chamber

SUPERIOR BENEFITS

The Mariner 275 hi-vis Flame Retardant Antistatic lifejacket has the same features as the Mariner 275 FR AST and offers the wearer extra visibility when worn.

It has been specifically designed to be compatible to wear with a full FR AST protective coat from our in-house range – the Sioen Duffel style. This ensures that the FR AST properties of the coat are not compromised by the use of a lifejacket over the top. The positioning of the retro-reflective tape also ensures non-interruption of the hi-visibility EN 471 requirement of the coat as it blends in with it to give full conformity in the combination of wear.

Additional features to MARINER 275 FR AST:

- + Hi-vis orange or yellow cover
- + Vertical Chest and diagonal shoulder reflective tape bands on cover positioned to blend with equivalent FR AST coats – style 9464

MARINER 275 WELDERS **1MYG**
 EN 399 BUOYANCY: 324N Single Chamber

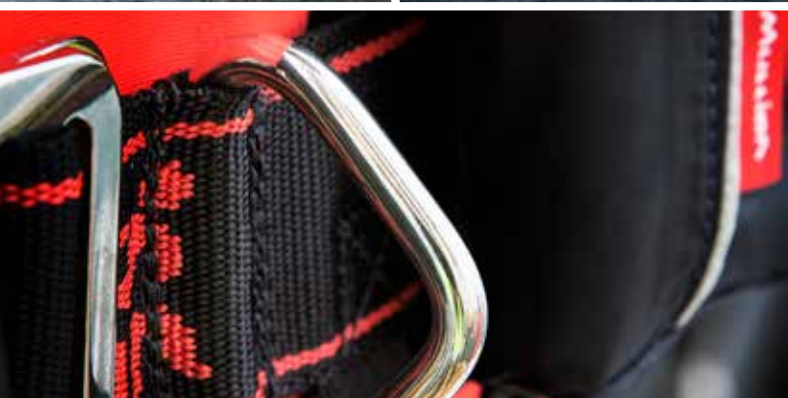
SUPERIOR BENEFITS

The Mariner 275 Welders lifejacket is ideal for use by workers conducting welding activities in marine environments. This Lifejacket is light weight and comfortable with a tough Panotex® aluminized cover protecting it from molten metal splashes and sparks. This lifejacket has a touch and close fastening cover.

Additional features to MARINER 275 REGULAR:

- + Touch and close fastening cover instead of zip fastening cover
- + Durable aluminized Panotex® silver wipe clean cover
- + EN407 : EN367 Convective Heat Level 2
 EN407 : ISO6942 Radiant Heat Level 4
 EN407 : EN348 Small splashes of Molten metal L3
 EN407 : EN373 Large Quantity of Molten Iron L4 ISO11612:ISO9151 Convective Heat Level B1 ISO11612:ISO6942 Radiant Heat Level C4 ISO11612:ISO9185 Molten Aluminium Level D3
 ISO11612:ISO9185 Molten Iron Level E3
 ISO11612:ISO15025 Limited Flame Spread Pass A1
 ISO14116:ISO15025 Limited Flame Spread Index 3
 ISO11611:ISO9150 Impact of Molten metal drops Class 2
 EN469 : ISO6530 Penetration by Liquid chemicals
 BS EN 1149-5: BS EN 1149-1

Optional extras:
 Navy FR over cover for anti-glare and anti-reflection



“ IDEAL FOR OFFSHORE EXTREME USE WITH FOUL WEATHER CLOTHING AND EQUIPMENT ”



HI-RISE 150 + 275 SOLAS LIFEJACKETS

State of the Art SOLAS Inflatable Lifejackets

DOUBLE
CHAMBER

SOLAS

EN ISO
12402

SUPERIOR BENEFITS

- These lifejackets are dual approved to latest SOLAS 2010 regulations and EN ISO 12402.
- Designed to combine optimum safety and comfort.
- Stylized horseshoe design with offset shoulder straps to alleviate weight and pressure stress on neck and shoulders.
- The bladder has a unique hinged head pillow for optimal comfort and head support in water.
- The shape of the bladder is tailored to the contours of the wearer to create a snug secure fit whilst giving supreme in-water performance.

The Hi-Rise range is available in 9 variations appropriate to different end uses.



HI-RISE 150
REGULAR



HI-RISE 150
WIPE CLEAN



HI-RISE 150
REGULAR + SPRAYHOOD



HI-RISE 275
REGULAR



HI-RISE 275
WIPE CLEAN



HI-RISE 275
FALL ARREST HARNESS



sMRT HI-RISE 275



HI-RISE 275
REGULAR + SPRAYHOOD



HI-RISE 275
WIPE CLEAN + SPRAYHOOD



EN ISO 12402-3



HI-RISE 150 REGULAR*

2MSF

EN ISO 12402+SOLAS BUOYANCY: 180N Double Chamber

(*) Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-3

KEY FEATURES

The HI-Rise 150 is a stylized horseshoe design with a zip closure cover and a double back strap for general offshore use.

OUTER COVER

- Durable waterproof fabric
- Zip fastening cover
- Reflective silver piping on the front
- Adjustable waist belt
- Stainless steel interlocking belt buckles
- Stainless steel D-ring on belt
- Crutch strap

BLADDER

- Buddy line
- Automatic water-activated SOLAS light with manual switch option also
- Marine grade whistle
- Oral inflation tube
- Over pressure oral tube + relief valve on front chamber for manual inflation and deflation and also to relieve any excess pressure if both chambers are fired simultaneously
- SOLAS approved retro-reflective tape
- Red recovery grab strap marked "LIFT"
- Inflation systems
- 2 x 38g CO₂ gas cylinders





EN ISO 12402-3



EN ISO 12402-3



HI-RISE 150 WIPE CLEAN*

2MSG

ENISO 12402+SOLAS BUOYANCY: 180N Double Chamber

(*) Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-3

SUPERIOR BENEFITS

This Hi-Rise 150 Wipe clean PVC reinforced version is ideal for heavy duty industrial use.

Additional features to HI-RISE 150 REGULAR:

- + Durable wipe clean PVC reinforcement

THE HI-RISE 150 SOLAS LIFEJACKET IS IDEAL FOR OFFSHORE USE WITH FOUL WEATHER CLOTHING.

HI-RISE 150 + SPRAYHOOD

2MSQ

ENISO 12402+SOLAS BUOYANCY: 180N Double Chamber

(*) Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-3

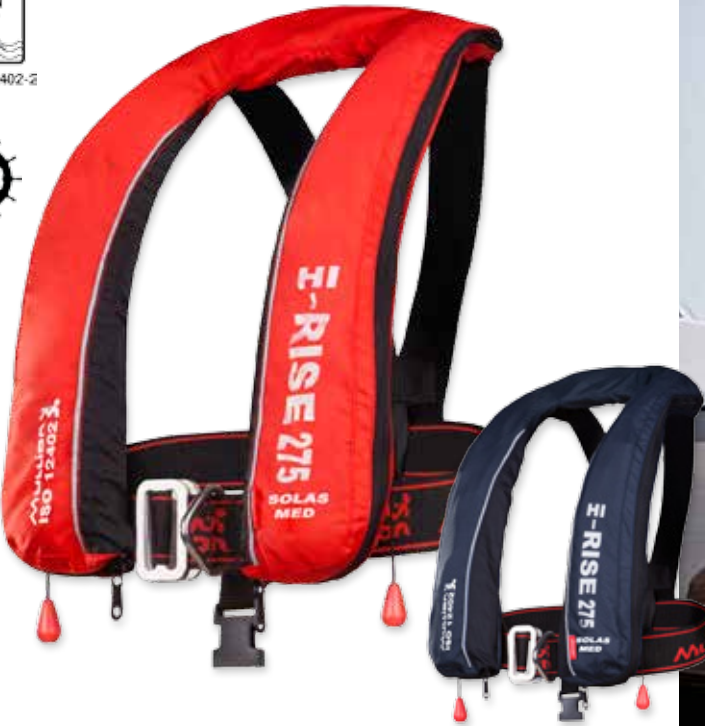
The Hi-Rise 150 SOLAS lifejacket is also available with the addition of a Sprayhood. The sprayhood gives optimum protection to face and mouth by protecting airways from water ingress and spray. Face window panel incorporates breath holes to prevent asphyxiation.

AVAILABLE IN STANDARD VERSION 2MSQ





EN ISO 12402-2



HI-RISE 275 REGULAR*

2MS1

EN ISO 12402 + SOLAS BUOYANCY: 320N Double Chamber

(* Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-2

KEY FEATURES

The HI-Rise 275 is a stylized horseshoe design with a zip closure cover and a double back strap for extreme offshore use.

OUTER COVER

- Durable waterproof fabric
- Zip fastening cover
- Reflective silver piping on the front
- Adjustable waist belt
- Stainless steel interlocking belt buckles
- Stainless steel D-ring on belt
- Crutch strap

BLADDER

- Buddy line
- Automatic water-activated SOLAS light with manual switch option also
- Marine grade whistle
- Oral inflation tube
- Over pressure tube + relief valve on front chamber for manual inflation and deflation and also to relieve any excess pressure if both chambers are fired simultaneously
- SOLAS approved retro-reflective tape
- Inflation systems
- 2 x 60g CO₂ gas cylinders



EN ISO 12402-2



EN ISO 12402-2



HI-RISE 275 WIPE CLEAN*

2MS2

EN ISO 12402 + SOLAS BUOYANCY: 320N Double Chamber

(* Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-2

SUPERIOR BENEFITS

This Hi-Rise 275 Wipe clean PVC reinforced version is ideal for heavy duty industrial use.

Additional features to HI-RISE 275 REGULAR:

- + Durable wipe clean PVC reinforcement

THE HI-RISE 275 SOLAS LIFEJACKET IS IDEAL FOR EXTREME OFFSHORE USE

HI-RISE 275 + FALL ARREST HARNESS*

2MT2

EN ISO 12402 + SOLAS BUOYANCY: 320N Double Chamber

(* Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-2

SUPERIOR BENEFITS

The Hi-Rise 275 SOLAS lifejacket is also available with the addition of a fall arrest harness. The lifejacket has an attachment system, which can easily be fitted to most fall arrest harnesses.

- Standard fall arrest harness options available
- Other models of fall arrest harness can be considered on request.

Additional features to HI-RISE 275 REGULAR:

- + Attachment system on the cover to fit a fall arrest harness



SMRT HI-RISE 275*

2MTK

EN ISO 12402 + SOLAS BUOYANCY: 320N Double Chamber

(* Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-2

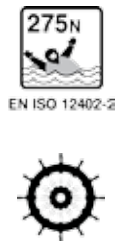
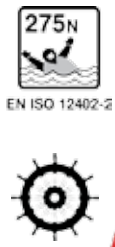
SUPERIOR BENEFITS

The SMRT H-Rise 275 is a lifejacket specifically designed to integrate a Personal Locator Beacon (PLB). This lifejacket is compatible with MRT AU10 model.

THE ULTIMATE IN SAFETY FOR LOCATION AND RESCUE!

Additional features to HI-RISE 275 REGULAR:

- + Durable wipe clean PVC reinforcement
- + Black/Silver chequered retro-reflective tape on the upper chest
- + 2 inflation systems operational readiness indicator windows on the back
- + Service date information window on the back
- + Beacon access zip on front
- + Additional foam and double fabric padding layer to protect the beacon inside the cover
- + Snag proof press-stud security system for zip closures



HI-RISE 275 + SPRAYHOOD 2MS9

EN ISO 12402 + SOLAS BUOYANCY: 320N Double Chamber

(* Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-2

The Hi-Rise 275 SOLAS lifejacket is also available with the addition of a Sprayhood. The sprayhood gives optimum protection to face and mouth by protecting airways from water ingress and spray. Face window panel incorporates breath holes to prevent asphyxiation.

AVAILABLE IN STANDARD VERSION 2MS9



HI-RISE 275 WIPE CLEAN + SPRAYHOOD 2MTD

EN ISO 12402 + SOLAS BUOYANCY: 320N Double Chamber

(* Approvals: SOLAS 2010 (according to MSC. 81(70); MSC. 200(80); MSC.207 (81); MSC.226(82)) + EN ISO 12402-2

AVAILABLE IN PVC VERSION 2MTD





IDEAL FOR SEARCH AND RESCUE SERVICES, EMERGENCY SERVICES, COAST GUARDS, MARINE PROTECTION AND SURVEILLANCE SERVICES.



SPECIAL PURPOSE HYBRID VEST

Special Rescue Vest.

**SINGLE
CHAMBER**

**ACTUAL
BUOYANCY
373N**

**EN ISO
12402**

SUPERIOR BENEFITS

- Has a unique highly asymmetric shaped bladder which gives optimum turning capacity when worn in combination with dry suits, waders, firefighters' suits, heavy clothing or floatation garments.
- The stylized vest design optimizes the redistribution of trapped air in dry suits and/or heavy garments worn underneath to further enhance self-righting.
- Double membrane technology used in the bladder gives superior damage protection against perforation and piercing.
- Built-in supported spray hood of superior design for extra protection and comfort.
- Enhanced safety features for operational readiness indication and service requirements give the wearer total assurance.
- Multiple equipment pockets with flexible positioning possibilities to suit individual requirements.
- Special quick release belt and grab strap system for ultimate protection against entrapment risks.
- Detachable inflatable collar for ease of servicing and replacement.
- ISO 12401 approved safety line / foot strop with heavy duty grapple release hooks + strain indicator incorporated in quick release safe storage pouch inside vest.
- Adjustable double thigh straps for wearer comfort and security.



EN ISO 12402-5/6



EN ISO 12402-2

SPRAYHOOD
ISO 12402-8



SEAFORCE

1MN2

ISO12402 BUOYANCY 373N Asymmetric Single Chamber

BUOYANCY: VEST: 77N + LIFEJACKET: 296N

KEY FEATURES

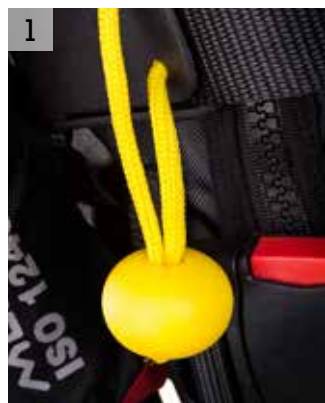
VEST + LIFEJACKET COLLAR

- Zip fastening lifejacket cover
- High abrasion resistance waterproof fabric
- 3D Spacer comfort back neck
- Flexothane® elasticated side panels for comfort and multi-size fit
- Snag proof attachment system for inflatable lifejacket collar to vest
- Lifejacket pull toggle secured to vest to minimize snagging
- Double belts for extra security
- Push button buckle on lifejacket waist belt
- Quick release buckle on chest belt system with easy grab yellow pull toggle + metal O-ring on back for attachment of safety line (*image 1*)
- Quick release grab strap system on back concealed under Rescue flap on upper back
- Centre front vest fastening heavy duty zip + easy grip puller
- Black / silver rescue reflective tape on front and back shoulders + upper back
- Inflation system operational readiness indicator window on right front
- Service date information window on left front
- Concealed knife pocket on chest
- 4 slot lash tabs on right and left chest for attachment of equipment/ lights
- Guardian Rescue domed clip on light (with dual function fixed beam or strobe options) (*image 2*)
- Molle system around vest allows flexible fit of multiple equipment pockets
- 1 Radio pocket + 1 combined PLB / flare pocket provided
- 3 D-rings at front hem for accessories attachment
- Nominal 50N inherent buoyancy foam inside vest with hook and loop opening panels to allow removal / replacement



BLADDER

- Nominal 275N buoyancy amorphic hinged design of asymmetric inflatable bladder
- Hi-vis orange supported breathable spray hood to fit around bladder with easy stud quick release system
- Marine grade whistle
- Oral inflation tube
- SOLAS approved light
- SOLAS approved Retro-reflective tape
- Red recovery grab strap on bladder marked "LIFT"
- Inflation system
- 60g CO₂ gas cylinder





PLBs are Personal Locator Beacons which are small, personal emergency beacons that, when activated, give off a distress signal to aid swift location and rescue. Some types directly alert a special dedicated receiver on board the vessel; some can be operated through standard AIS (Automatic Identification System) Equipment already on the vessel. These types can be either manually or automatically activated. Other types send a signal via satellite directly to the Emergency Services. These types of PLB can only be manually activated.

Mullion can offer a range of different types of PLB integrated with lifejackets to suit different areas of use and operation.

SMART LIFEJACKETS

- Lifejackets specifically designed to integrate a Personal Locator Beacon (PLB).
- Ultimate safety and rescue option.
- Mullion can equip your lifejacket with a Beacon and/or supply the actual beacon.

KEY BENEFITS

- A personal locator beacon provides additional rescue support as it can quickly locate and aid rescue in a man overboard situation.
- Mullion has created and adjusted several lifejacket models to fit or integrate a beacon. Each beacon is integrated inside the cover in the best position to optimize its functional efficiency according to type of operation.
- Combined PFD + PLB models are tested and approved as “special purposes products”.

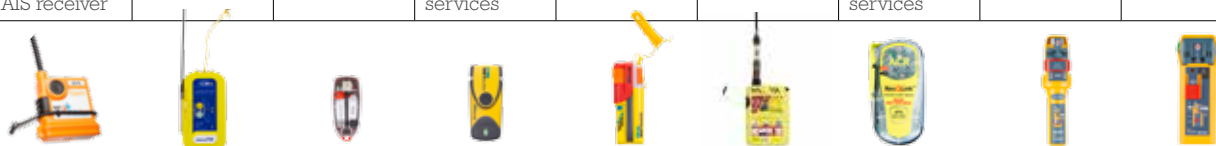
BEACONS

Beacons are small devices used to alert vessels and search and rescue agencies of distress. Strictly they interface with receivers on ships and/or global emergency services via satellite systems. When manually or automatically activated upon immersion, these beacons send out a distress signal.

BEACON OPTIONS

- Marine Rescue Technologies – AU10 beacon (Automatic water activated beacon)
- Weatherdock Easy Rescue beacon (Automatic activated beacon)
- Seareka Divansi beacon (Automatic when integrated in lifejacket)
- Kannad Safelink SOLO Beacon (Manual activated beacon)
- Kannad Safelink R10 Beacon (Automatic when integrated in lifejacket) ACR ResQLink 406MHz (distress frequency) International receiver on vessel

Supplier	Marine Rescue Technologies	Weatherdock	Seareka	Kannad/McMurdo	Kannad/McMurdo	Rhotheta	ACR	Ocean Signal	Ocean Signal
Type	AU10	Easy Rescue	Divansi	Safelink SOLO/McMurdo Fastfind	Safelink R10/McMurdo S20 Smartfind	RT - B77HELB	ResQLink	MOB01	M100
Frequency	121.5 MHz + AIS	AIS	869 MHz	406 MHz (distress frequency)	AIS channel 1 - 161.975 MHz, AIS channel 2 - 162.025 MHz	121.5 MHz	406 MHz (distress frequency)	AIS channel 1 - 161.975MHz, AIS channel 2 - 162.025 MHz	121.5 MHz + AIS
Receiver	Sea Marshall receiver on vessel + AIS receiver	AIS receivers	Divansi receiver on vessel	International search and rescue services	AIS receivers	Rhotheta receiver on vessel	International search and rescue services	AIS receivers	Receiver on vessel + AIS receiver





1. SMRT - AU10 (Automatic water activated beacon)

The sMRT AU10 beacon will send a distress signal to a local receiver (vessel). The beacon will activate by means of full water immersion.

Operating Frequencies: 121.5 MHz and AIS



sMRT Hi-Rise 275





2. Weatherdock Easy Rescue beacon (Automatic activated beacon)

This beacon has a built in GPS and transmits a distress signal to all AIS receivers. When the lifejacket inflates in an emergency, a ripcord tears off a magnetic switch from the transmitter. This leads to an automatic activation of the AIS emergency beacon.



Hi-Rise 275N





3. Seareka Divansi beacon (Automatic when integrated in lifejacket)

The Divansi beacon immediately sends an alert to a local receiver (vessel) if a MOB event occurs. The MOB can be followed by the receiver in real time thanks to the built-in GPS. The beacon will activate automatically by means of full inflation of the lifejacket.



Compact 150N



Hi-Tide 150N



Hi-Rise 275N



4. Kannad Safelink SOLO Beacon (Manual activated beacon)

This beacon works by transmitting an emergency signal via the 406 MHz distress frequency, which is monitored by the global COSPAS-SARSAT satellite system, alerting international search and rescue services to the emergency situation and the ID of the beacon user. The beacon must be activated by the wearer when the life jacket is inflated.



Compact 150N



Hi-Rise 275N



5. Kannad Safelink R10 Beacon (Automatic when integrated in lifejacket)

A unique emergency alert of a MOB is transmitted to all AIS (Automatic Identification System) receivers within a radius of 4 miles. The GPS location of the MOB will become viewable on the AIS receiver. The beacon will activate automatically by means of full inflation of the lifejacket.



Compact 150N



Mariner 275N



Hi-Rise 275N





6.ACR Beacon (Manual activated beacon)

This beacon works by transmitting an emergency signal via the 406 MHz distress frequency, which is monitored by the global COSPAS-SARSAT satellite system, alerting international search and rescue services to the emergency situation and the ID of the beacon user. The beacon must be activated by the wearer when the life jacket is inflated.



Compact 150N



Hi-Rise 275N





7. Ocean Signal MOB1 (Automatic when integrated in lifejacket)

A unique emergency alert of a MOB is transmitted to all AIS (Automatic Identification System) receivers within a radius of 4 miles.

The GPS location of the MOB will become viewable on the AIS receiver. The beacon will activate automatically by means of full inflation of the lifejacket.





8. Ocean Signal M100 Beacon (Manual activated beacon)

The M100 from Ocean Signal transmits a distress signal to all AIS receivers. The M100 also transmits a 121,5 MHz homing signal in addition to AIS. The M100 will activate automatically by means of full inflation of the lifejacket.



INFLATION SYSTEMS

AUTOMATIC INFLATION SYSTEMS

Automatic inflation systems are activated by ingress of water. Upon immersion in water, a firing mechanism will activate and pierce a CO₂ cylinder. The gas released from the cylinder will inflate the bladder of the lifejacket and create buoyancy. All automatic systems have an alternative manual override, which allows the user to pull the toggle and inflate the lifejacket if necessary.



1. HALKEY ROBERTS Alpha Auto

The Alpha® Auto Inflator activates when the cartridge comes into contact with water. The cartridge mechanism consists of a clear cap cartridge with water access apertures and a compressed high powered spring which is held by a cellulose salt bobbin. When the cellulose salt bobbin comes into contact with water the cellulose dissolves and it releases the spring which pushes a plunger forward, in turn forcing a cutter into the CO₂ cylinder. The cutter allows the CO₂ to travel through the one way valve in the inflator head and inflate the lifejacket.

The Automatic system is backed up by a manual override, which allows the user to pull the toggle and activate the cutter to pierce the gas cylinder in order to inflate the lifejacket alternatively.



2. UNITED MOULDERS LTD MK5 Auto

The UML MK5 Automatic system activates when the cartridge comes into contact with water. The cartridge mechanism contains a compressed high powered spring which is held by a cellulose paper element. When the paper element comes into contact with water it dissolves and releases the spring which pushes a cutter forward to pierce the CO₂ cylinder and release the CO₂ gas. The gas then travels through the one way valve in the inflator head and inflates the lifejacket.

The Automatic system is backed up by a manual override, which allows the user to pull the toggle and activate the cutter to pierce the gas cylinder in order to inflate the lifejacket alternatively.



UML United Moulders Ltd

3. UNITED MOULDERS LTD Pro Sensor Auto Dual Point Indicator / Pro Sensor Elite

This system activates when the cartridge comes into contact with water. The cartridge mechanism contains a compressed high powered spring which is held by a cellulose paper element. When the paper element comes into contact with water it dissolves and releases the spring which pushes a cutter forward to pierce the CO₂ cylinder and release the CO₂ gas. The gas then travels through the one way valve in the inflator head and inflates the lifejacket. Benefits of the Dual Point indicator system: the user has immediate visual check of the operational status of the cylinder and cartridge. The Automatic system is backed up by a manual override, which allows the user to pull the toggle and activate the cutter to pierce the gas cylinder in order to inflate the lifejacket alternatively.



HAMMAR
BETTER SOLUTIONS FOR SAFETY AT SEA

4. HAMMAR A1 / M1 Hydrostatic Auto

This inflation mechanism requires both water and pressure combined to activate automatically. It requires full immersion in water to a minimum 10 cm depth to activate fully. At this point the hydrostatic valve opens and lets the water meet the water sensitive element that in turn releases a stainless steel coil spring. The spring then drives a cutter into the end of the gas cylinder to pierce it and release the gas through the sealing ring aperture in the bladder and inflate the lifejacket. The Automatic system is backed up by a manual override, which allows the user to pull the toggle and activate the cutter to pierce the gas cylinder in order to inflate the lifejacket alternatively.



HAMMAR
BETTER SOLUTIONS FOR SAFETY AT SEA

5. HAMMAR MA1/ EC Hydrostatic Single Point Indicator Auto

This inflation mechanism also requires both water and pressure combined to activate automatically. It requires full immersion in water to a minimum 10 cm depth to activate fully. At this point the hydrostatic valve opens and lets the water meet the water sensitive element that in turn releases a stainless steel coil spring. The spring then drives a cutter into the end of the gas cylinder to pierce it and release the gas through the sealing ring aperture in the bladder and inflate the lifejacket. This system differs from the A1 / M1 inflator in that it has the advantage of the cylinder being glued into the back of the system to give a secure seal so that it cannot come loose or detached in use. The single point indicator on the front also gives the user an immediate visual check of the operational status of the cylinder and cartridge. The Automatic system is backed up by a manual override, which allows the user to pull the toggle and activate the cutter to pierce the gas cylinder in order to inflate the lifejacket alternatively.

MANUAL INFLATION SYSTEMS

Manual-only inflation systems are activated by the user by pulling on a toggle or handle. By pulling on the toggle or handle a lever system is released which will activate the cutter to pierce the CO₂ cylinder and thereby release the gas into the lifejacket to achieve full inflation.

There are three different options for manual inflation systems:



1. UNITED MOULDERS LTD Mini-Manual

The UML Manual only system will not activate automatically and can only be activated by means of the pull toggle which breaks off the green clip when pulled correctly.



2. UNITED MOULDERS LTD Pro Sensor Manual Single Point Indicator

The UML Pro Sensor Manual only Single Point Indicator system will also not activate automatically and can only be activated by means of the pull toggle. There is no clip to break off on this system. The lever is simply pulled down fully and can be clicked back into place afterwards.

Benefits of the Single Point indicator system: the user has immediate visual check of the operational status of the cylinder.



3. HAMMAR M1 Manual

The Hammar Manual only system will not activate automatically and can only be activated by means of the pull handle which breaks off completely when pulled correctly.

SPARE PARTS

HALKEY ROBERTS

Alpha Auto



LIN04MORA
HALKEY ROBERTS
ALPHA AUTO
INFLATION SYSTEM
+ T TOGGLE



LIN04MORW
HALKEY ROBERTS
ALPHA AUTO
INFLATION SYSTEM
+ BALL TOGGLE



LIN04SBRA
HALKEY ROBERTS
AUTO SUPER BOBBIN



LIN04PARA
HALKEY ROBERTS
ALPHA MANUAL
FIRING CLIP



LCY033000
CO2 CYLINDER 33GR



LCYS38000
CO2 CYLINDER 38GR



LCY060000
CO2 CYLINDER 60GR

UNITED MOULDERS LTD

MK5 Auto



LIN03MARA
UNITED MOULDERS
MK5 AUTO INFLATION
SYSTEM



LIN03CARA
UNITED MOULDERS
MK5 AUTO INFLATION
SYSTEM



LIN03PARA
UNITED MOULDERS MK5
MANUAL FIRING CLIP



LCY033000
CO2 CYLINDER 33GR



LCYS38000
CO2 CYLINDER 38GR



LCY060000
CO2 CYLINDER 60GR

UNITED MOULDERS LTD

Pro Sensor Auto Dual Point Indicator

Pro Sensor Elite



LIN07MORA
UNITED MOULDERS
PROSENSOR DUAL
POINT INDICATOR
SYSTEM



LIN07CORA
UNITED MOULDERS
PROSENSOR AUTO
CARTRIDGE



LIMR0002U
UNITED MOULDERS
PROSENSOR DUAL
POINT INDICATOR
SYSTEM



LIT00002U
UNITED MOULDERS
PROSENSOR ELITE
AUTO CARTRIDGE



LCY033000
CO2 CYLINDER 33GR



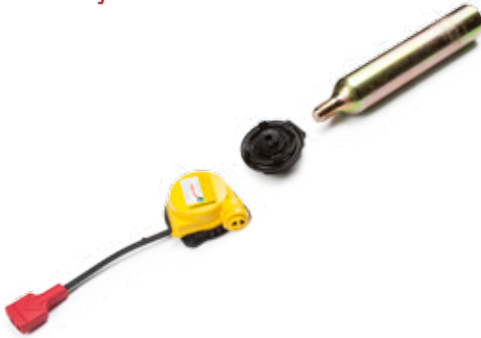
LCYS38000
CO2 CYLINDER 38GR



LCY060000
CO2 CYLINDER 60GR

HAMMAR A1 / M1

Hydrostatic Auto



LIN01F000
HAMMAR A1/M1 AUTO
FRONT



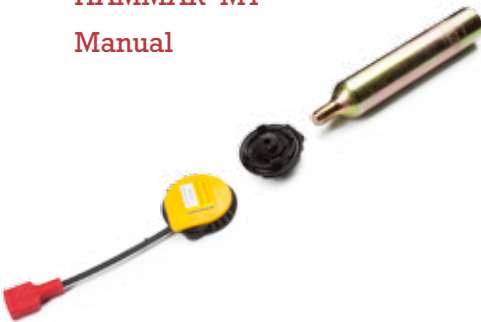
1MZWA2YN3
NEOPRENE SLEEVE
3 SIZES: FOR 33 GM CYL.,
38 GM CYL., 60 GM CYL.



LIN01B000
HAMMAR A1/M1 AUTO
BACK

HAMMAR M1

Manual



LIN02F000
HAMMAR M1 MANUAL
FRONT



1MZWA2YN3
NEOPRENE SLEEVE
3 SIZES: FOR 33 GM CYL.,
38 GM CYL., 60 GM CYL.



LIN01B000
HAMMAR MANUAL BACK



LCY033000
CO2 CYLINDER 33GR



LCYS38000
CO2 CYLINDER 38GR



LCY060000
CO2 CYLINDER 60GR

HAMMAR MA1/ EC
Hydrostatic Single Point
Indicator Auto



LIN04F000
 HAMMAR AUTO FRONT
 SINGLE POINT INDICATOR



1MZWA2YN3
 NEOPRENE SLEEVE
 3 SIZES: FOR 33 GM CYL.,
 38 GM CYL., 60 GM CYL.



LIN04B330
 HAMMAR BACK
 + 33GR CYLINDER



LIN04B380
 HAMMAR BACK
 + 38GR CYLINDER

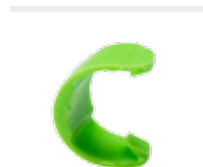


LIN04B600
 HAMMAR BACK
 + 60GR CYLINDER

UNITED MOULDERS LTD
Mini-Manual



LIN09M0RM
 UNITED MOULDERS MINI
 MANUAL INFLATION
 SYSTEM



LIN03PMRA
 UNITED MOULDERS
 MANUAL FIRING CLIP



LCY033000
 CO2 CYLINDER 33GR



LCYS38000
 CO2 CYLINDER 38GR



LCY060000
 CO2 CYLINDER 60GR

UNITED MOULDERS LTD

Pro Sensor Manual Single Point Indicator



LIN08MORA
UNITED MOULDERS
MANUAL INFLATION
SYSTEM

LCY033000
CO2 CYLINDER 33GR

LCYS38000
CO2 CYLINDER 38GR

LCY060000
CO2 CYLINDER 60GR

ACCESSORIES



1MZ9A2GWL
STANDARD CRUTCH
STRAP FOR ALL
LIFEJACKETS APART
FROM COMPACT + FR/
AST MODELS. LENGTH
120 CM.



2MZFA2GWL
CRUTCH STRAP
FOR COMPACT
ONLY. LENGTH 140CM



2MZRA2GWG
FR/AST CRUTCH
STRAP FOR ALL FR/AST
LIFEJACKET MODELS.
LENGTH 120CM



LLI0000OS
SOLAS S.O.S. LIGHT



LWH030C10
WHISTLE



1MZWA2YN3033
NEOPRENE SLEEVE
FOR 33 GM CYLINDER



1MZWA2YN3038
NEOPRENE SLEEVE
FOR 38 GM CYLINDER



1MZWA2YN3060
NEOPRENE SLEEVE
FOR 60 GM CYLINDER



IRFQ50M0R
(LENGTH : 12CM)
IRFPP50M0R
(LENGTH : 22CM)
SOLAS REFLECTORS
SELF-ADHESIVE



1MZ1A2VP1
(CE) STD SIZE
FR WELDERS COVER



2MZUA2VP1
SOLAS FR WELDERS
COVER

TECHNICAL INTRODUCTION TO MARITIME SAFETY CLOTHING

DIFFERENT TYPES OF PROTECTION CAN BE OPTIONALLY COMBINED

- Inherent buoyancy or inflatable buoyancy
- Thermal protection against hypothermia
- Foul weather protection
- High visibility
- Flame retardant, chemical resistant and antistatic properties

DEFINITIONS AND EXPLANATIONS

INHERENT BUOYANCY MATERIAL

Buoyancy provided by a material which is less dense than water, e.g. a closed cell foam, and forming a permanent part of the garment.

PERSONAL FLOATATION DEVICE (PFD)

A safety device for persons engaged in activities, whether in relation to their work or their leisure, in or near water. PFDs, when correctly worn, should give a reasonable assurance of safety from drowning to a person who is immersed in water by providing a specific amount of extra buoyancy to increase the chances of survival.

PFDs can be divided into the following two main classes:

- those which provide face up in-water support to the user regardless of physical conditions (lifejackets).
- those which require the user to make swimming and other postural movements to position the user with the face out of the water (buoyancy aids).

Within these main two classes there are a number of levels of support, types of buoyancy, activation methods.

BUOYANCY AID

Garment or device which when correctly worn and used in water, will provide a specific amount of buoyancy to assist the wearer to float in a vertical or upward position with the airways clear of the water. This type of device will NOT self-right the wearer from a face-down position.

FLOATATION GARMENT – CONSTANT WEAR SUIT

A floatation garment is a type of constant wear suit designed to keep the wearer warm and dry at work and protect against drowning in water with a degree of thermal protection against cold shock and hypothermia. These garments are also technically classified as PFDs or buoyancy aids, always offering a minimum of 50 Newtons buoyancy. By means of the inherent floatation buoyancy foam lining, this type of garment will keep wearers afloat indefinitely and allow them to swim without undue encumbrance. However they will not automatically self-right the wearer from a face-down position. For this the use of a compatible lifejacket is required, preferably of a 275N buoyancy level to ensure optimum self-righting performance is achieved.

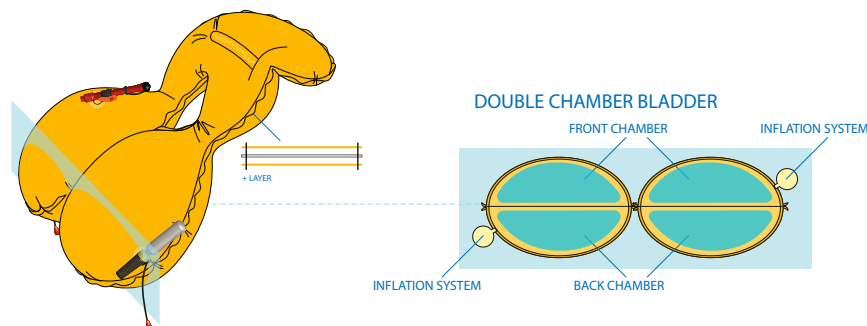
INFLATABLE LIFE JACKET

Personal flotation device from which the buoyancy is obtained by inflating it by mouth (orally inflated) or from a compressed CO₂ gas cylinder; either manually by pulling a handle operated by the wearer, or automatically without the wearer carrying out any action, but as a result of immersion in water, either by a hydrostatic mechanism or a cellulose cartridge type of mechanism. Mullion 150N and 275N inflatable life jackets are made of a single-chamber bladder (EN / ISO standards) or double-chamber bladder (required for IMO/SOLAS regulations). A 'stand alone' automatic life jacket will self-right the wearer if correctly donned; it will turn over a person falling into the water face down, even if he/she is unconscious, it will NOT, however protect against cold shock or hypothermia. These are mainly worn on their own in warmer climates where there is less risk of cold water immersion and shock.

They can also be worn in conjunction with a constant wear suit, the latter being the ideal combination to give the wearer all round protection. Where the two are worn together, it is important to follow the donning instructions strictly and check and test their compatibility as one can counteract the other and have a negative effect on the self-righting properties. For example a 150 Newton life jacket worn with a constant wear floatation suit is not recommended for self-righting purposes; for this application we advise the use of a compatible 275 Newton lifejacket. If in doubt please contact Mullion for guidance.

DOUBLE-CHAMBER BUOYANCY SYSTEMS

Buoyancy provided by 2 separate inflatable compartments, such that if mechanical damage occurs to one, the other can still operate and provide sufficient buoyancy on its own (required for IMO / SOLAS application).



HYPOTHERMIA

A condition where the body core temperature is below 35°C, that is, 2°C lower than the 'normal' core body temperature (=37°C). The state of hypothermia is of a higher risk to a person immersed in cold water than in a cold air environment, due to the fact that water is a greater conductor of heat than air. Consequently the body cools much more rapidly in water than in still air of the same temperature (approximately 25 times faster).

MARITIME PPE PRODUCT STANDARDS

EN 393 / EN ISO 12402-5: 50N BUOYANCY AIDS



EN ISO 12402-5
EN 393

Have a buoyancy of no less than 50 Newton for the average adult. This level is intended for use by those who are competent swimmers and who are near to bank or shore, or who have help and a means of rescue close at hand. These garments have minimal bulk, but they are of limited use in disturbed water, and cannot be expected to keep the user safe for a long period of time. They do not have sufficient buoyancy to protect people who are unable to help themselves. They require active participation by the user.

EN 395 / EN ISO 12402-4: 100N LIFE JACKETS



EN ISO 12402-4
EN 395

Have buoyancy of no less than 100 Newton for the average adult. This level is intended for those who may have to wait for rescue, but are likely to do so in sheltered water. The device should not be used in rough conditions.

EN 396 / EN ISO 12402-3: 150N LIFE JACKETS



EN ISO 12402-3
EN 396

Have buoyancy of no less than 150 Newton for the average adult. This level is intended for general application or for use with foul weather clothing.

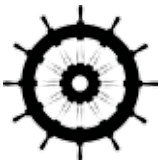
EN 399 / EN ISO 12402-2: 275N LIFE JACKETS



EN ISO 12402-2
EN 399

Have buoyancy of no less than 275 Newton for the average adult. This level of lifejacket is intended primarily for offshore use under extreme conditions. It is also of value to those who are wearing clothing which traps air or loads such as tool belts which may adversely affect the self-righting capacity of the lifejacket.

IMO / SOLAS / MED



The International Maritime Organisation governs the Convention of Safety Of Life at Sea (SOLAS). This Convention requires that SOLAS requirements are met for all life-saving equipment carried and used on board all ships on international voyages including passenger ships and cargo ships of 500 gross tonnes or more. This includes lifejackets, abandonment suits and immersion suits.

Recognition that the equipment fully complies with the requirements of the MED (Marine Equipment Directive) will be denoted by a 'Ships Steering Wheel' mark which must be on all equipment sold to European Community Ships of 500 tons or more in size.

SOLAS LIFEJACKETS

All lifejackets must be of double chamber design with 2 automatic inflation systems as well as be fitted with a SOLAS approved light and buddy line for optimum safety.

SOLAS IMMERSION + ANTI-EXPOSURE SUITS

These Immersion and Anti-Exposure Suits should provide the highest level of safety and performance. They incorporate inherent buoyancy which gives the wearer flotation and thermal protection in order to provide the optimum chance of survival and rescue before any negative effects of cold water immersion set in and to protect against the risks of drowning.

In accordance with the SOLAS requirements, according to the LSA Code, Chapter II, 2.3:

- Where required as Immersion suits, they are designed to cover the whole body (including boots to cover the feet), with the exception of the face and with separate gloves that are permanently attached to the suit.
- Where required as Anti-Exposure suits only, they can be designed and supplied without the boots fitted (as permitted by the Administration) and equipped with a pocket for a portable VHF radio / telephone.

An un-insulated immersion suit or anti-exposure suit is intended to provide the wearer with up to 1 hour protection in a water temperature range of $> 5^{\circ}\text{C}$

An insulated immersion suit is intended to provide the wearer with up to 6 hours protection in a water temperature range of $\geq 0^{\circ}\text{C}$.

These suits are designed to be worn in conjunction with a compatible SOLAS / MED approved lifejacket.

EN ISO 15027-1: CONSTANT WEAR SUITS

A constant wear suit is designed to be worn as a working suit to keep the wearer warm and dry during normal activities and to provide thermal protection in the event of accidental immersion, to prolong life and to aid rescue. An individual's estimated thermal protection time when wearing this type of equipment will depend upon the water temperature, weather conditions, clothing, the cold tolerance of the person and the person's behaviour. The primary aims in wearing a constant wear suit are:

- to reduce the risk of cold shock and to delay the onset of hypothermia;
- to enable the user to propel himself in the water and extricate himself from the water without it becoming an encumbrance;
- to make the user sufficiently conspicuous in the water so as to aid his recovery.

THERMAL PROTECTION CATEGORIES

	Suit performance level			
	A	B	C	D
Period of immersion (h)	6	4	2	2
Water temperature ($^{\circ}\text{C}$)	2	2	5	10

ISO 15027-2: ABANDONMENT SUITS

An abandonment suit is designed to be donned in an emergency or planned abandon ship situation and will provide protection from cold shock and delay the onset of hypothermia. The complete immersion system (suit and clothes worn under the suit) should be able to keep the user alive long enough for the rescue services to find and recover them. An individual's estimated thermal protection time will depend on water temperature and wave state as well as their physiology. The primary aims in wearing an abandonment suit are:

- to reduce the risk of cold shock and delay the onset of hypothermia;
- to enable the user to propel himself in the water and extricate himself from the water without it becoming an encumbrance;
- to make the user sufficiently conspicuous in the water so as to aid his recovery.

HSE / MENSAFE COMPATIBILITY TEST PROTOCOL FOR LIFEJACKETS AND IMMERSION SUITS ON OFFSHORE INSTALLATIONS

This protocol ensures compatibility of combinations of lifejackets and immersion suits likely to be used in differing emergency scenarios by offshore installation personnel.

The format for this Test Protocol is based on core tests, such as donning, ergonomic factors and in-water performance.

EN 1095 / ISO 12401: DECK HARNESSSES / SAFETY LINES

This European and International Standard is applicable to harnesses and safety lines in the following sizes of body weight. Size 1: over 50kg , Size 2: between 20kg and 50kg , Size 3: lower than 20kg; which are intended to be worn by all persons when in the exposed cockpit or on the working deck of a craft afloat. It is not applicable to dinghy "trapeze" harnesses, windsurfing harnesses, seat harnesses for fast motor boats or harnesses intended to protect against falls from a height.

Deck safety harnesses and safety lines manufactured according to this International Standard will give reasonable assurance that the wearer will remain attached to the craft.

The primary aims in wearing a deck safety harness are:

- to prevent the wearer from falling into the water
- to assist in recovering the wearer onto the working deck.

SOME DEFINITIONS

CLO VALUE: A unit to express the relative thermal insulation value. One CLO = $0.1555 \text{ } ^\circ\text{C} \times \text{m}^2 / \text{W}$

DRY SUIT: A garment that stops the entry of significant quantities of water upon immersion, the insulation depends on the wearer staying dry.

SEMI-DRY SUIT: A garment that allows controlled entry of a limited amount of water when the wearer is immersed.

WET SUIT: A garment that allows the controlled entry and exit of water when the wearer is immersed. By keeping a stationary layer of water close to the body, this will work as an insulation layer.

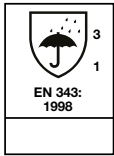
IMMERSION SUIT: A suit intended to protect the wearer from the effects of immersion in cold water.

ABANDONMENT SUIT: An immersion suit, designed to permit rapid donning in the event of an imminent immersion

ANTI-EXPOSURE SUIT: A protective suit designed for use by rescue and life boat crews and marine evacuation systems parties. It requires head and hand protection but the feet need not be covered. This type of suit requires a minimum buoyancy of 70N.

FLOATATION SUIT: A floatation garment is a type of constant wear suit designed to keep the wearer warm and dry at work and protect against drowning in water with a degree of thermal protection against cold shock and hypothermia. These garments are also technically classified as PFDs or buoyancy aids, always offering a minimum of 50 Newtons buoyancy. By means of the inherent floatation buoyancy foam lining, this type of garment will keep wearers afloat indefinitely and allow them to swim without undue encumbrance. However they will not automatically self-right the wearer from a face-down position. For this the use of a compatible lifejacket is required, preferably of a 275N buoyancy level to ensure optimum self-righting performance is achieved.

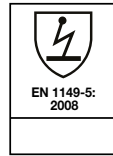
OTHER EUROPEAN PPE STANDARDS



EN 343

Protective clothing against rain, wind and cold at temperatures higher than -5°C .

Performance parameters:
x: waterproofness (3 levels)
y: breathing properties (3 levels)



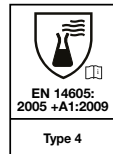
EN 1149-5

Protection against the danger caused by static electricity



EN ISO 20471

High-visibility clothing:
x: surface of fluorescent and retroreflective material (3 levels)
y: quality of the retroreflective material (2 levels)



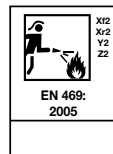
EN 14605

Protection against liquid chemicals, spraytight (type 4)



EN ISO 14116

Protection against flames:
x: flame spreading index (3 levels).
y: durability index



EN 469

Protective clothing against fire
Xf2 the performance in the heat test : flame
Xr2 the performance in the heat test : radiation
Y2 the performance in the waterproofness tests
Z2 the resistance against water vapour



EN ISO 11612

Protective clothing for workers exposed to heat:
A: min. requirements, fabric combination conforms to EN 533 index 3 + min.

EC Council Directive 89/686/EC:

Basic Health and Safety Requirements for PPE.

SIZE TABLE

SIZE TABLE FLOATATION GARMENTS: BODY MEASUREMENTS				
Size	Mass Kg	Height	Chest	Waist
XS	< 50 kgs	158-176	80-88	68-76
S	50-70 kgs	164-182	88-96	76-84
M	70-80 kgs	164-182	96-104	84-92
L	80-90 kgs	170-188	104-112	92-100
XL	90-110 kgs	170-188	112-120	100-108
XXL	> 110 kgs	176-194	120-128	108-116
XXXL	> 110 kgs	176-194	128-136	116-124
XXXXL	> 110 kgs	176-194	136-144	124-132

SIZE RANGE SMART SOLAS: BODY MEASUREMENTS					
SIZE	Height	Chest	Waist	Socks 1MG4	Socks 1MG5
S	164-182	80-96	68-84	40/42	43/45
M	170-188	96-112	84-100	43/45	
L	176-205	112-136	100-124	43/45	
XL	176-205	136-144	124-132	46/48	

SIZE RANGE MAS	
SIZE	Body measurements
S	150-165
M	165-180
L	180-195
XL	195-205

SIZE RANGE DRY SUITS: BODY MEASUREMENTS				
SIZE	Height	Chest	Hip	Boots
S	152-164	88-96	86-94	40
M	164-170	96-104	94-102	42
L	170-182	104-112	102-110	44
XL	182-194	112-120	110-118	46
2XL	194-200	120-128	118-126	48

SIZE RANGE SINGLE CHAMBER LIFEJACKETS			
SIZE	Mass Kg	Chest	Height
UNI	≥ 40 Kgs	86cm-151cm	≥ 150 cm

SIZE RANGE HI-RISE LIFEJACKETS			
SIZE	Mass Kg	Chest	Height
UNI	≥ 43 Kgs	≤ 180 cm	≥ 155 cm