

APPLICATION- and MAINTENANCE MANUAL (AMA)



Helicopter Rescue Bag TYROMONT (HEC Device for the external transport of a laying patient)



*Read this manual
carefully and retain it
for future references.*

APPLICATION- and MAINTENANCE MANUAL (AMA)

Helicopter Rescue Bag – TYROMONT

HEC Device for the External Transport of a laying Injured

PRELIMINARY REMARKS

This application and maintenance manual is a general tutorial for the described product and DOES NOT replace comprehensive instruction and proper training of any user.

Every user of this helicopter bag **must be accurately instructed and trained** in the application, use and maintenance of the device and must be in **proper physical and mental condition** when operating this product.

Insufficient training, wrong application or misuse of this product can lead to **fatal accidents**.

The limits, maintenance directives indications for possible mistakes listed in this AMA must be carefully observed and followed.

GENERAL DESCRIPTION

The HELICOPTER RESCUE BAG TYROMONT is applied for the lifting of an injured person in lying position from difficult-to-reach areas on a fixed rope or a hoist under a helicopter.

The helicopter rescue bag is a textile structure for the transport of an injured person in horizontal position. Overall length is 200 cm, unfolded width of 175 cm, tailored to fully enclose the person to be transported. In operation, the bag is closed tight around the injured person and eventually employed splints, vacuum-mattresses, etc by means of a wide-area Velcro closing to form a quasi-tubular structure. 4 fixation belts with adjustable buckles additionally fixate the transported person. The underside of the bag is equipped with plastic spikes to reduce the danger of slipping on steep snow- or grass covered slopes.

At the bottom-section of the helicopter rescue bag a system of diagonal belts bears the weight of the injured and ensures an even distribution of the weight of the person being carried. The diagonal belt bearing system is sewn to the bag and consists of one continuous (endless) belt. The carrying loops are integral part of this belt and are the attachment points of the suspension.

The suspension of the helicopter rescue bag to the load hook of the helicopter consists of 10 suspensions ropes with sewn in end – loops. The suspension ropes are attached to the carrying loops. The 5 suspension ropes of either side of the helicopter rescue bag are centralized into a Delta quick link. Both quick links must be safely connected in one steel carabiner of minimum breaking strength 3000 kg. This carabiner is connected to the load hook of the lifting line of the helicopter.

TECHNICAL SPECIFICATIONS

Textile Material of Bag

- Reinforced PES - Nylon fabric, Polyurethane coated
- Spec. 100 % POLYAMID PA 6.6, 223 g/m²
- Breaking strength: 3 kN
- AC-coated, impregnated
- Water resistance: 800mm WC 250g/ m²
- Color fastness degree 2

Carrying Belt System

- PES belt 45 mm x 1 mm
- Breaking strength: 14 kN
- Permanently sewn to the textile bag structure



Fixation Belts

- PES belt 45 mm x 1 mm
- Breaking strength: 14 kN
- Permanently sewn to the textile bag structure
- Buckles: Double-plate buckles, aluminum, adjustable, climbing harness quality

Seam

- Polyamide 6.6, bonded dtex 750
- Breaking load 4,800cN
- Elongation 20 %

Suspension Ropes

- PES low stretch, stranded, with sewn - in loops, temperature-stabilized
- Breaking strength: 11 kN

Bag Closing

- Large-area Velcro closing over the full length of the main bag area
- Measures: Length 155cm / Width 5 cm (tape), 32 cm (cloth)

Breaking Strength

- Structural breaking strength: Over kN
- Tested by the government-authorized Testing Institute for Mechanical Engineering HTL Innsbruck (AT)

Weight

- < 5.000g

WORKING LIMITATIONS

Permissible Configurations

The helicopter rescue bag is constructed to be able to safely carry the specified WLL at worst case (if all calculated work factors occur simultaneously) if used in accordance with all regulations.

Operation with helicopters in commercial aerial rescue

All matters of authorization of helicopters, load hook systems, hoists, flight parameters, etc. are solely subject to national authorities.

Weight Limits

- Maximum weight of transported person: 140 kg
- Maximum weight of additional material (vacuum mattress, splints, etc.): 12 kg
- Maximum body length of transported person: 210 cm
- Minimum body length of transported person: 130 cm

Maximum Flight Airspeed

- Fixed rope: 50 Knts
- Hoist cable/rope: Comply to hoist specifications

To avoid rotation of the bag in operation, a minimum forward airspeed of 15 Knts shall be achieved as soon as allowed by flight situation. This **does not apply** when a hoist is used and the hoist specifications do not allow this airspeed. In this case, an anti-rotation line or a rotation brake system can be useful.

Temperature Limits

- Minimum outside temperature: - 50 °C
- Maximum outside temperature: +50 °C

Altitude Limits

- - 180 m to +6.500 m to sea level.

Visibility

- Optical contact between pilot, winch operator and rescue bag must be possible during the whole operation.

STANDARD OPERATION of Helicopter Rescue Bag TYROMONT

This chapter only refers to the technical aspects of the application of the HELICOPTER RESCUE BAG TYROMONT in flight rescue operations. The medical aspects of the handling of the injured in such an operation are **not described** in this chapter. However, every operator of the helicopter rescue bag must be medically sufficiently trained for the treatment of a seriously injured person in difficult and/or mountainous conditions.

Preparation of the helicopter rescue bag for transport

For the transport to the injured, the helicopter rescue bag is either stored in the transport bag together with the vacuum mattress and pump or carefully coiled up. Either way, it must be securely hooked to the harness of the rescuer or the hook of the hoist in flight.



*Transport Bag
(P/N 93227)*

Transport of injured persons with the HELICOPTER RESCUE BAG TYROMONT

When the injured is reached, the bag is unhooked, completely unfolded / uncoiled and laid closely parallel beside the injured. Watch the correct position of head- and foot side. Now the Velcro closing must be completely opened and thus the bag completely opened so the bottom of the bag is free accessible.

1. Typical procedure of bedding of the injured

The injured now must be placed on the vacuum mattress following the medically correct procedure. This must only be done by medically properly trained personal. After evacuation of the air from the vacuum mattress with the vacuum pump, the injured is correctly immobilized in the Vacuum mattress he/she is ready to be placed in the helicopter rescue bag. If the vacuum mattress is equipped with fixation belts (such as the TYROMONT vacuum mattress 200 x 80), close the belts tightly against the injured without causing too much pressure on any part of the injured.

Untypical procedure of bedding of the injured

*Applied if **no vacuum mattress** is available or possible to be used. This is an emergency procedure. Make sure that the injured will not suffer any further injuries or a worsening of his status because of insufficient immobilisation. This procedure shall only be used if there is absolutely no possibility to use a vacuum mattress. In this case, the injured can be carefully lifted on his clothes into the bag. Again, remember that the use of the rescue bag without vacuum mattress is an untypical emergency procedure.*

Use of Backboards: Backboards or similar devices may only be used in the HELICOPTER RESCUE BAG TYROMONT if a sufficient fixation of such a device is built into the bag. Such fixations may only build into bag by the manufacturer and are available as option.



IMPORTANT:

The procedure description from now on only refers to the use with a vacuum mattress!

2. Positioning of the injured in the HELICOPTER RESCUE BAG TYROMONT

Lift the vacuum mattress with the properly immobilized injured carefully into the bag by using the carrying loops of the mattress.

On icy, snow covered or generally on slippery ground, it is necessary to protect the helicopter rescue bag from slipping by proper anchoring of the carrying loops before placing the injured in the bag. The anti-skid spikes on the bottom of the bag help against slipping but are no anchoring.

The injured must be placed exactly central to both sides of the bottom of the bag. In longitudinal direction, the injured must be placed in the bag so the top of the head of the injured is exactly in one line with the head side seam of the bottom of the bag.

Injured correctly placed in the bag / bag ready for closing



Now the Velcro closing of helicopter rescue bag must be closed tightly around the injured. Proper and tight closing of the Velcro is an important key to avoid rotation. After the Velcro is closed, the four fixation belts of the bag must be tightly closed but without causing unnecessary pressure to the injured.

Bag correctly closed and ready for lifting



Hold up the Delta quick link of the suspension and check if the ropes are clear and the suspension is not twisted.

After carefully following the above described steps the helicopter rescue bag with the injured is ready for lifting.

3. Lifting and air procedures

The 5 suspension ropes of either side of the helicopter rescue bag connected in each quick link must be safely connected in one steel carabiner of minimum breaking strength 3000 kg. This carabiner is connected to the load hook of the lifting line of the helicopter before lifting.

The flight rescuer hooks his suspension line into the connection steel carabiner.

Before lifting, all anchoring to the ground of the rescue bag and the flight rescuer must be removed.

At take – off, the rescuer must stand next beside the helicopter rescue bag with the injured with his suspension line pointing perfectly vertical upwards. The flight rescuer shall follow the take off process dynamically. It is important to avoid any twist and leave the ground and lift off from both feet without turning momentum.

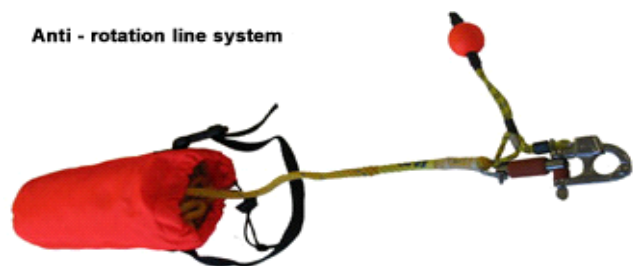
The lifting and flight procedures must be determined and trained by the operator.

Maximum flight airspeed on fixed rope is 50 Knts. The maximum flight airspeed on hoist cable/rope complies to the hoist specification.

To avoid rotation of the bag in operation, a minimum forward airspeed of 15 Knts shall be achieved as soon as allowed by flight situation. This **does not apply** when a hoist is used and the hoist specifications do not allow this airspeed. In this case, an anti-rotation line can be useful.

Anti rotation line (optional):

Especially for hoist operation, the use of an anti-rotation line device can be useful. For this type of operation, a separate anti-rotation line operator on the ground is necessary. This operator controls a possibly occurring rotation with the anti – rotation line.



IMPORTANT:



All flight procedures must be in accordance with the operated type of rotorcraft, approved and trained by the operator.

Weight and power limitations of the aircraft have absolute priority.

The final responsibility for all operations of the HELICOPTER RESCUE BAG TYROMONT remains at the rotorcraft captain.

STORAGE

The helicopter rescue bag must be stored dry, protected from direct sunlight and at normal ambient temperature.

The storage place for the helicopter rescue bag must be protected against and be free from any influence of **all kind of chemicals** which are able to harm textiles.

In a heliport environment, special attention shall be given to avoid the contact with:

- Fuels, lubricants, hydraulic oils and other technical liquids
- Battery acids, gels
- Disinfection materials of any kind
- The fumes of these substances

If the helicopter rescue bag is wet, it must be carefully air-dried before storage. If the helicopter rescue bag was exposed to saltwater or saltwater spray, it must be carefully rinsed with freshwater before drying and storage.

INSPECTION INSTRUCTIONS and FAILURE DETECTION

Inspection by the operator

The helicopter rescue bag must be carefully visually checked after every operation for damages, noticeable changes and soiling.

Special attention must thereby be given to the carrying structure. To make the detection of the carrying structure more visible, all seams at these structures are made in contrast colour (in this case white).

Contaminations with blood or other body liquids must be removed according to the cleaning instructions in chapter CLEANING INSTRUCTION. No cleaning / disinfection procedure exceeding these cleaning instructions must be applied.

Soiling caused by technical fluids or gases such as petrol, lubricants, battery acid, other acids or caustic solutions at all carrying parts of the helicopter rescue bag and its suspension must be withdrawn from service and must be checked by the manufacturer only.

Fatigue tolerance evaluation

If partial failures at the following components of the structure are detected at the visual check as described above, the helicopter rescue bag must not remain in service and needs to be inspected by the manufacturer. The following damage limits indicate the need of such an inspection:

1. Carrying Belt System, Textile Structure

Damage limits

- Any damage at the seam between the carrying belt system and the textile structure that lead to a disintegration of belt - textile or belt – belt.

- Any damage at the seam of the textile structure that lead to a disintegration of textile parts of more than 30 mm.
- Any soiling caused by technical fluids or gases such as petrol, lubricants, battery acid, other acids or caustic solutions at the carrying belt system in general (no size limitation) or at spots in the textile structure larger than 20 x 20 mm.
- Any cuts, rips or other mechanical damage at the carrying belt system.
- Any cuts, rips or other mechanical damage at the textile structure of a length of more than 30 mm.



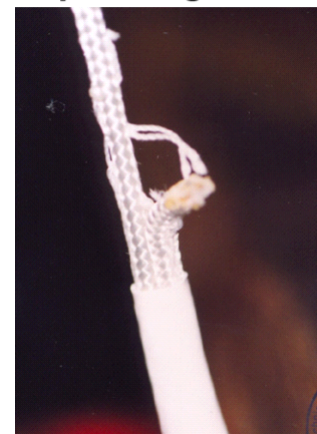
2. Suspension

Damage limits

- Any damage at the seam of the carrying loops.
- Any damage of the suspension ropes:
Exception: A roughening of the surface of the ropes caused by contact of the ropes with the Velcro can be tolerated.
- Any soiling caused by technical fluids or gases such as petrol, lubricants, battery acid, other acids or caustic solutions at any part of the suspension.
- Micro-flaws, hairline cracks, visible heavy impact marks at the anchoring plates.
- Abrasion of over 10 % of the original material thickness especially at the loops connected to the quick links.



Typical suspension rope damage



Colours in the picture inverted for better visibility

3. Velcro Closing

Damage limits

- Any damage at the seam between the textile structure and the Velcro that lead to a disintegration of more than 50 mm.
- Any soiling caused by technical fluids or gases such as petrol, lubricants, battery acid, other acids or caustic solutions at spots larger than 20 x 20 mm.
- Any cuts, rips or other mechanical damage at the Velcro parts of a length of more than 50 mm.

4. Zipper Closing (at foot – section)

Damage limits

- If the zipper closing at the foot section is damaged, it must be replaced by the original spare part. This can be done by the manufacturer or by a qualified service.

5. Outside Fixation Belts and Buckles

Damage limits

- At any damage of the outside fixation belts and their buckles, they must be replaced by the manufacturer.

INSPECTION INTERVALS

Before every operation all parts of the helicopter rescue bag must be carefully checked for visual damage, noticeable changes and soiling.

The helicopter rescue bag must be entirely checked annually and marked with a label indicating the date of the next check (+12month). This annual inspection has to be done by the manufacturer or an authorized person by the manufacturer for further operation.

The year of production (Prod.) and the serial number (S/N) are indicated on the label inside the bag in the head area of the helicopter bag.

CLEANING INSTRUCTION

- Hand-wash or hand-wash programme at 40° C (synthetic fibres, polyamide, polyester, polyacrylics).
- Clean blood - or secretion - spots with cold water as soon as possible.
- Air - dry, avoid direct sunlight.
 - Do not chlorinate, do not apply any detergent containing chlorine.
 - No Dry-Cleaning with hard brushes.
 - No contact with disinfection baths or aggressive disinfects.
 - Do not use metal tools to rubber spots or dirt.
 - Do not use laundry driers or spin driers.
 - Do not SPIN.
 - Do not iron, as non-correctable changes are to be expected.



For disinfection purposed, “ELTRA 40 Extra” from ECOLAB could be used.

Cleaning of Suspension

The cleaning of the suspension can be carried out in the same procedure as above. To avoid damage to the washing machine, the Delta quick link of the suspension shall be wrapped in a linen cloth.

Cleaning of the Velcro Parts

In addition to the above described washing procedure, dirt, forest remainders, etc. can and shall be removed from the Velcro parts by means of a soft brush (like hand-cleaning brush, etc.).

DRY ALL PARTS CAREFULLY AFTER CLEANING. NO USE OF ANY LAUNDRY DRIER OR NO SPINNING!

WARRANTY

At normal use and proper handling and maintenance, the manufacturer warrants 2 years from date of production/supply for material and manufacturing failures.

The warranty expires: at normal use after two years. Immediately at: misuse, unauthorized retrofitting, variances, wrong application, etc.

The manufacturer holds no responsibility for direct, indirect or accidental consequences or any other damages resulting from the use of this product. In case of the application of special fittings or connectors by the user, no warranty can be taken by the manufacturer for such fittings.

OPERATIONAL LIFESPAN (EXP.)

Without consideration of wear and other destruction, this product can be applied according to the specification of the manufacturer. Wear and destruction can reduce the operational lifespan to zero starting from the first use.

Lifetime = Storage time + usage time

Maximum lifetime for this product: **10 YEARS**

An extension of the lifespan after solely storage or minimal usage time/cycles is the responsibility of the manufacturer.



ATTENTION:

Damaged parts must be handed over to the manufacturer for analysis reasons. A continued use of a damaged part leads to an immediate loss of warranty.

CALLBACK AND DISPOSAL

The manufacturer reserves the right of an immediate recall of the product. The manufacturer can be contacted for correct disposal.

MANUFACTURER / CONTACT

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| MAINTENANCE RECORD | | |
|---------------------------|----------------------------|-------------------------------------|
| Date | Type of Maintenance | Name of Authorized Inspector |
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