

Instructions for use and maintenance HORIZONTAL NET HN2 + HN3

FOCA STC 25 - 60 – 21

EASA CS-27./29.865 / EC Decision 2014/018/R, AMC1 SPO.SPEC.HEC.100 (complex PCDS)

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Use

Correct use

The horizontal net is used for rescue operations or for evacuating one (1) injured person from a danger zone who needs to be transported in a horizontal position with the aid of a helicopter or other lifting device (crane, winch).

If used in the correct way, the HN2 or HN3 horizontal net guarantees safe lifting.

It is designed to be used only and exclusively in the above-mentioned way, that is, for rescue operations or for evacuating people by means of a helicopter or other load lifting devices.

User training



Personnel assigned to using this device must have adequate instruction and training prior to its first use. During the introduction to its use and subsequent in-depth training, particular stress should be placed on gaining a good knowledge of the present instructions for its use and maintenance.

Training has to be repeated at least once a year and proof of this must be demonstrable. Please document the type, amount and the date of training in an appropriate way.



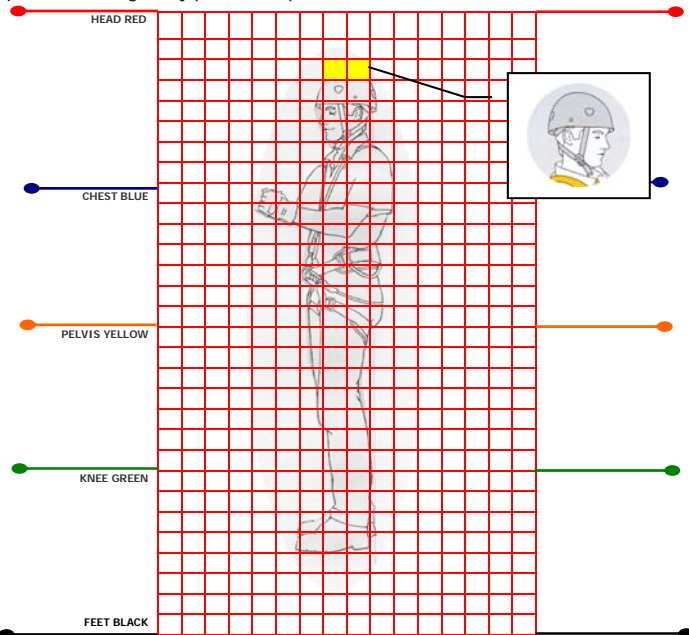
The product and its construction

Structure and technical data

The HN2 and the HN3 nets are designed and built to transport one (1) person in a horizontal position. All of the accessories are designed and chosen for a specific use during helicopter operations.

The structure allows the gentle transport of a person in a relatively flat (recumbent) position without the risk of falling from the net.

Each individual component of the structure is certified and undergoes regular checks (quality assurance) by the producer during every production phase.



The differences between HN2 and HN3

The HN2 net is manufactured with 2.5 mm elastic polyamide cord. Since polyamide shrinks when exposed to humidity (only the first time) the size of the net might be slightly reduced.

The HN3 net is manufactured with 2.5 mm polyester cord. Polyester is less elastic but does not shrink and hence the net will be less supple.

The indications of the P/N and S/N on the tags are different:

- HN2: P/N: 164025-16-30, S/N: HN2-User-XX0
- HN3: P/N: 264-025-664, S/N: HN3-User-XX0

Furthermore, the different models "HN2" and "HN3" are indicated on the rear and on the tag illustrating the right position of the head.

Figure: net with colour indications and positioning of the person

Warning: the figure is not to scale!

Colour codes

The different colours of the whippings on the load bearing ropes indicate correspondence (blue with blue, etc.) as well as the position of the load bearing ropes. The position and the length of the load bearing ropes at the edge of the net take into consideration the proportional distribution of the body mass (weight) in such a way as to assure a relatively horizontal position of the body.

At the same time, tags illustrate the appropriate placing of the body on the net (position of the head). The part number (P/N) on the producer's label also indicates the materials used.

Attention: Do not change any accessory without first having consulted the producer. It is also imperative that the producer be consulted for any question.

List of components (HN2 and HN3)

- ★ Complete net with border rope and tags (cannot be disassembled)
- ★ Bearing ropes with whippings in different colours: red, blue, yellow, green and black (replaceable in pairs of the same colour).

Warning: the carabiner for attaching the load bearing ropes is not included in the delivery. The doctor is also attached to the carabiner, so it must be certified to bear the weight of 2 persons (minimum WLL 2.4 kN). **Minimum requirements: 1 steel carabiner, minimum 45 kN, EN 362, CE.**

Limit conditions of the system

Temperatures allowed (material)

- ★ Extreme loads for short periods: from +60°C to -50°C
- ★ Extreme loads for > 2h: from +40°C to -20°C

Attention: resistance values vary differently when the temperature is falling:

- ★ Steel: resistance tends to decrease
- ★ Textiles: resistance tends to increase

Configurations allowed

If used according to the regulations, the HN2 and HN3 net is designed to withstand the indicated maximum load even in the worst case (Worst Case: all of the calculated weight factors appear at the same time).

Deviations allowed: length tolerances

- ★ Net: +/- 10 cm
- ★ Ropes: +/- 2 cm

Loads allowed; Usable limits

The working load limit (WLL) is only valid when all of the load bearing ropes (10) are rigged. The system is loaded in the following way:

- ★ **Carrying capacity = working load limit (WLL)**
- ★ **Number of ropes = the number of sling ropes to be hooked up**

Only and exclusively the carabiner, to which the load bearing ropes as well as the rescuer are rigged, must be attached to the rescue winch hook or to the hooks of other rescue or load lifting devices.

Attention: the load bearing ropes must never be tied directly to the rescue winch hook.

Helicopter service for professional passenger transport

In order to obtain a licence for intervention helicopters, for load hook-up systems, flight parameters etc. one must apply to the aircraft navigation authority concerned.

Not only must helicopters intended for professional interventions have a valid licence but they must also possess the following minimum requisites:

- ★ Sufficient power reserve to be able to transport 2 people without risk attached to the winch or hook, taking into consideration the minimum weather and equipment conditions;
- ★ The winch must have a sufficient load lifting capacity as well as a sufficient power reserve;
- ★ The minimum distance between the winch hook and the ground is 1.7 m. The person transported in the net must not touch the ground (landing with patient attached!).

Attention: the load multiplication factor allowed is around + 1.0g and + 1.5g.

Preliminary procedures



Preparation of the person to be rescued/evacuated

In addition to medical treatment, any belongings that might damage the net must be removed: personal effects with cutting edges or sharp corners, skis, snowboard, tools, etc. External factors must also be taken into consideration: geographic position and the characteristics of the place where the rescue operation takes place, steepness of the terrain, seriousness of the injuries, etc.

Attention: make sure that the sling ropes are not tangled during the attaching procedure.

Preparation of the net

Spread the rolled-up HN2/HN3 net on the ground and make sure it is functional and ready to use by means of a visual check. Gently lay the person on the net keeping in mind the tag that indicates where to place the head.

- ★ Wrap the net over the patient's head and feet and tighten it, paying attention to the fact that the two signs indicating the centre of the net correspond to the patient's axis;
- ★ Small patients (children) are placed in a more inward position with respect to the net's length (the position of the head is more central as regards that indicated by the tag);
- ★ Bring together all of the load bearing ropes consecutively – taking the left and right rope of the same colour one by one – and then attach them to the carabiner;
- ★ Count the number of sling ropes out loud (1, 2 up to 10 or in colour pairs: red with red, blue with blue, etc.);
- ★ Keeping the carabiner still with one hand, grasp all of the sling ropes with the other and slide it down, bringing the ropes together in such a way as to make the net adhere to the sides of the body.

Attention: make absolutely sure that there are no objects with cutting edges or sharp corners that might damage the net.

Maximum height, in suspension, with an average person: 160 cm

Restoring/repackaging and preparation of the HN2/HN3

The net must be stored or provided for operation only when clean and absolutely dry. To have it ready for use, it is usually transported in the rescuer's or medic's rucksack, stored in helicopter compartments or inside the pouches of rescue bags.

 **Pay utmost attention that the HN2/HN3 does not come into contact with Velcro strips or Velcro cushions, since the splices and the cords would be damaged by the fasteners' tiny hooks.**

Possible inappropriate uses

(Ways of using the HN2/HN3 horizontal net that are inappropriate and for which the net is not designed)

Any use that is not in conformity with the regulations (inappropriate use) of the HN2/HN3 net can lead to evident or hidden damages to the same and, therefore, compromise its safety characteristics. In the event of inappropriate use, the producer disclaims all responsibility.

Several types of inappropriate use:

- ★ Hooking up at any point that is not the authorised slinging point;
- ★ Incomplete attaching of all of the sling ropes or all of the hooks present;
- ★ Attaching of a weight that is greater than the maximum allowed for each hook or greater than the total weight allowed;
- ★ Rigging slings or accessories that are tangled;
- ★ Replacing accessories with products that are not certified;
- ★ Throwing the net/the sling from the helicopter;
- ★ Lengthening the sling ropes with unauthorised components or other inappropriate means;
- ★ In case of slanting position, the **use of vacuum mattresses or similar auxiliaries** may cause the body to be in an elevated position with respect to the head and feet and thus result in the loss of the transported person!

Attention: This list is incomplete. Therefore, avoid similar situations that deviate from appropriate use.

Be careful to avoid other possible risks

The following factors could lead to dangerous situations and, therefore, must absolutely be avoided:

- ★ Knots in the ropes;
- ★ Tying an object to a rope;
- ★ The net getting caught in rocks, walls, trees, etc.;
- ★ Contact with or rubbing against cutting edges or sharp corners (e.g. the helicopter's landing skids);
- ★ Pressing and rubbing against cutting edges, sharp corners or other materials;
- ★ Contact with electric cables;
- ★ Sparks caused by induction or electrostatic discharges;

In the cases mentioned above, the carrying capacity of the working tools can be annulled and, therefore, prevent the component/components in question from working.

ATTENTION: This list is not complete, so look out for similar situations when using the net.



Specific risks while working with a helicopter

The distance between the upper position of the winch hook (when retracted) and the point of reference, "ground level", can vary greatly according to the type of helicopter and the position of the winch.

The HN2/HN3 are designed in such a way that, when the authorised helicopter models are used, the person lying down and attached to the winch hook does not touch the ground when the helicopter is on the ground.

However, during emergency procedures, contact with the ground cannot be excluded, given the compression of the landing gear as well as the stretched-out structure of the net and the bend of the body.



Position in flight




Position on the ground

Maintenance

Basic principle

Based on EC Directive 2009/104/EC (CH: regulations OPI art. 32.b, CFSL 6512, art. 6.1), the work equipment must be inspected at least once a year by a qualified person who is an expert in the field. Also see Checklist n. 67017 compiled by Suva.

 **The producer disclaims all responsibility for damages caused by inappropriate maintenance.**

The necessary check

Before and after every assignment, the structural components must be checked visually to make sure they are working perfectly and that there is no damage.

In particular, the locking mechanisms of the hooks must be examined to be sure that they function safely.



In principle, even if there is the slightest doubt regarding safety, the net must be immediately removed from service and checked.

Situations in which the net must be removed from service

Following a stress caused by a fall or in the event of damage to a load bearing part of the structure, the HN2/HN3 horizontal net must be immediately **removed from service and made available to the producer**.

Structural components stressed by overloading cannot be seen visually and cannot be repaired.

Steel components must be replaced even before their expiry date when wear due to contact reaches 10% of the minimum diameter of the component ($D_1 + D_2 : 2 = >90\%$ D_{1-2})

Textile components are removed from service when their structure has been damaged by mechanical, chemical or thermal stress.

Damage to the components may occur due to a fall on a hard surface.

Attention:



- In the event of interventions in contaminated areas, e.g. rescue operations dealing with machine accidents (battery acid), or on surfaces treated with nitrates, the HN2/HN3 may become polluted with corrosive substances and, therefore, become damaged.**
- Any modification to the structure, e.g. following stamping/punching or the replacement of parts with ones that are not certified, will cause the producer to immediately disclaim all responsibility.**
- Avoid contact with any abrasive, cutting or pointed object.**

Cleaning and storage

If the structural components become dirty, wash them with water at a max. temperature of 30°C and then let them dry in a well-ventilated room.

The HN2/HN3 net can also be cleaned in the washing machine but before doing so, it must be placed inside a closed washing bag (leave the sling ropes attached!)

- max. temperature 30 °C
- do not use laundry detergent
- choose a delicate wash cycle (for example the sports wash program)
- choose a washing time of approximately 40 minutes

The net and its components should be transported and stored only when absolutely dry and in their special bag. Store far away from sources of light and heat.



The HN2/HN3 net must not be dried in a tumble dryer!



It is compulsory that checks and any possible repairs be carried out by the producer.

Resistance to chemical substances

Any contact with corrosive substances or solvents must be avoided. In the event of contact with chemical substances, please contact the producer.

Among corrosive substances and solvents we include: all fuels and lubricants, acid and alkaline solutions as well as acetone and **vomit**.

Service life (EXP.)

If not worn out or damaged in other ways, this product can be used for up to 5 years. Instead, wear or other damages could nullify the product's functionality even at its first use. Keeping to regulations, the product can be used and/or retained for up to 5 years.

The expiry date is shown at "Exp." on the producer's label. Authorisation to prolong the expiry date, because the product has only been stored and never used, can only be obtained from the producer.



Damaged components must be made immediately available to the producer. Any further use of damaged components will cause the producer to immediately disclaim all responsibility.

Guarantee

If used for the purposes for which it was designed and if both use and storage are carried out according to the regulations (see instructions for use and maintenance), the producer guarantees the product regarding material and production defects for a period of 1 year.

The guarantee is null and void: after one year of normal use; immediately in the event of inappropriate use, modifications to the structure or other parts, wrong use, etc.

The producer disclaims all responsibility for any direct or indirect consequences, accidents and any other type of damage caused by the use of its products..

Attention:



Pay careful attention to the instructions regarding the use of the other components (carabiner) and especially to other risks indicated therein but not included in the present instructions.

Recall

The producer reserves the right to recall the HN2/HN3 horizontal net at any time. However, such recall should normally take place after the product's expiry date. The producer will take care of the product's disposal directly or supervise its disposal in accordance with the regulations in force for the protection of the environment.

Regulations

Legal assumptions

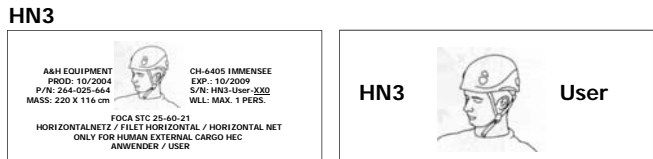
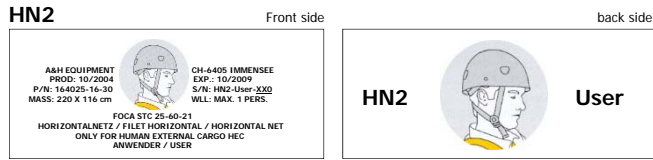
The product is in conformity with the minimum requirements of the law for use with helicopters:

- Swiss DETEC Ordinance relating to aircraft manufacturers (VLH, SR 748.127.5)
- Commission Regulation (EU) 748/2012
- FOCA, Technical Communication TC 50.605-20, issued 01.05.2007, revision 3. At the moment of type approval, the minimum requisites (breaking tenacity, loading) were not affected by the new EASA regulations and EASA CM-CS-005 on PCDS.

- Since 2013, the product has been granted “grandfather rights” by EASA
 - A&H-POH CH.21.G.0022,
 - A&H-POH, annex A, Capability List
 - EASA FAQ n. 20095, 4th paragraph: "According to the GM the Design Approval Holder shall identify in all its Design (TC, STC, ETSO, Repair, Change) approved after 28 December 2009, how the Manufacturer has to mark subject Parts and Appliances in accordance with 21A.804(a) 1; which can be limited to identifying a marking field and the method, without prescribing the actual text or symbols".
- and is supervised by FOCA.

A state-of-the-art product at the moment of the publication of these instructions.

Labels (trade-marks)



Slight variations are possible

Producer and Type Certificate holder
AirWork & Heliseilerei GmbH (A&H)
A&H Equipment

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 E-mail: office@air-work.com, Internet: www.air-work.com

EASA Part 21 G POA (CH.21.G.0022)

Certification

Federal Office of Civil Aviation (FOCA)
 Process Type Certification (MZ)
 Mühlestrasse 2
 CH-3063 Ittigen

Supplemental type certificate issued by the Federal Office of Civil Aviation (FOCA STC): n. 25 - 60 - 21

Rights of sale

The owners of the rights of sale and all of the resulting rights and obligations:
 AirWork & Heliseilerei GmbH (A&H), Bahnhofweg 1, CH-6405 Immensee

For any questions, please contact the producer.

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