

Instructions for use and maintenance, part 4

(Translation of the original instructions for use and maintenance AWA)

Cargo nets Mod. LN

Cargo nets are excluded from Machinery Directive 2006/42/EC (no CE-marking allowed) but must be in conformity with national standards. Since A&H cargo nets comply with Machinery Directive 2006/42/EC, Annex I, the requirements of national EU standards are automatically abided by.

EASA CS-27./29.865 / EC Decision 2014/018/R, Amendment 9 to Part SPO, AMC1 SPO.SPEC.HESLO.100

as well as all lifting accessories, slings and their components, load securing devices and anchor points which are not in conformity with EU machinery directive 2006/42/EC or EASA CS-27./29.865 (used with/on Annex I helicopters/MIL)

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Revision E – what is new or has been modified? Watch this symbol: E X X

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	Index	Definitions	Maintenance: steel	Maintenance: textiles	Use of specific product

E X All «EG» or «EU» indications in front of «Machinery Directive» have been removed. X

Use

Correct use (normal operation mode)

Transport of cargo by enveloping the payload with a netting equipped with 4 loops (8 rope legs) which can be hooked to a suitable slinging point of a lifting accessory (Short- or LongLine) or directly to the helicopter.

It is used for the lifting of loads, in combination with a shock absorber and a swivel lifting hook.

Hooking of the cargo net onto the secondary cargo hook is done manually, cargo release can also be done electrically.

The cargo net's payload (Working Load Limit, WLL) does not always correspond to the helicopter's maximum carrying capacity. The indicated payload (WLL) must not be exceeded.

Limits, inappropriate uses and other possible risks can be found below in this AWA or in the general instructions AWA, part 1.

If used in the correct way, the cargo net guarantees safe handling.

It is designed to be used only and exclusively in the above mentioned way, that is, as a lifting device for the external load transport by helicopter.

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.



Your LN (description of the single components)

Design, construction and technical data

The LN is designed and built to carry the maximum external load possible for the type of intervention and/or for the type of helicopter used, that is, for its corresponding weight class, for example:

- Helicopter mod. AS 350 B3: max. working load limit (WLL) = 1400 kg
- Intended use: general external transport operations, **no logging** (HESLO 1, 2, 3 and 4; Part-SPO annex VIII; AMC1 SPO.SPEC.HESLO.100)
- Calculation based on: EASA CS-27./29.865 External Loads and related articles
- The expiry date is shown at "Exp." on the producer's label; in the event of damage, please consult AWA part 3.

If you have any doubts or questions, please contact the producer (take photos and mail them to us; in the meantime don't use the product).

Each individual component of the structure is certified and undergoes regular checks (quality assurance) by the producer on delivery and during manufacturing.

Design features of cargo nets (LN)

The netting can be delivered in black, blue, green or red. According to customer wishes, the mesh width can be 40, 60 or 100 mm, the cord size can be chosen between 5 or 8 mm. All cargo nets are made of polypropylene (PP).

- Cargo nets with carrying capacity up to 2500 kg (25 kN), 5 mm cord size
 - o Mesh width: 40, 60 or 100 mm, knitted (without knots), rectangular meshes

- o Colours available: black, blue, green or red
 - o Border rope with \varnothing from 12 to 14 mm, made of white PES
 - o Shape: rectangular or rectangular with cropped corners (octagon-like)
- Cargo nets with carrying capacity up to 4000 kg (40 kN), 8 mm cord size, rectangular or rhombic meshes
 - o Mesh width 100 mm, braided (without knots)
 - o Colours available: black
 - o Border rope with \varnothing of 16 mm, made of white PES
 - o Shape: rectangular or rectangular with cropped corners (octagon-like)

The bearing border rope is made of 3-strand twisted polyester (PES). It consists of 4 sectors of equal length (one per net border) and runs freely throughout the net meshes. Free movement of the border rope must be maintained, since any fixation would generate strong force application at the fixation point.

The corners of each sector of the border rope are equipped with suspension ropes of 1.5 m of length. These ropes can be finished with various end fittings, such as loops, thimbles, rings or hooks.

The cargo net corners are available in 3 versions.



All model types are described in data sheet DB LN-VAR, see www.air-work.swiss, [E](#) [Documents](#)



Cargo nets apt for dumping are described in AWA_LNS, see www.air-work.swiss, [E](#) [Documents](#)



Labels must not be removed. A product without label cannot be considered safe. If you have any questions, please contact the producer. AWA part 1, 2.2

Parameters, limit conditions, interfaces

Configurations allowed

Cargo nets manufactured by AirWork & Heliseilerei GmbH (A&H), including all their single components, are specifically designed for external load transport by helicopter. The indicated maximum payload WLL applies only if all 4 of the loops (or end fittings) are attached to the secondary cargo hook.



The use of a shock absorber is not necessary, see AWA part 1, 4.4



For the lifting and transport of loads, it is compulsory to place a low-torque swivel between the rope and the cargo (rule of technology). Without a low-torque swivel, due to load rotation, the rope can be already irreparably damaged during one flight cycle. AWA part 1, 2.2



The use of other components by other producers, mainly secondary or remote cargo hooks, can compromise the aforementioned characteristics or lead to dysfunctions (see also AWA part 1, 6.8 "Disclaimer" and "Warranty").



For more information, also check AWA part 1, technical definitions

Helicopter service for professional load transport

The authorisation for helicopter external sling load operations (HESLO 1 to 4) must be obtained by the helicopter operator.

Loads allowed; usable limits

The indicated payload (WLL) must not be exceeded.
Temperatures allowed: from -50°C to $+50^{\circ}\text{C}$.

Interfaces to other systems and/or components of a load lifting device

The suspension ropes' end fittings/loops can be rigged as follows:

1. all four to a manually operated single cargo hook
2. all four to an electrically operated single cargo hook
3. two per side when using a double cargo hook
4. each separately attached to the special design fittings of a double hook Nubbin type
5. two per special design fitting of a double hook Nubbin type
6. all four onto the special design fitting of a double hook Nubbin type
7. each separately attached to other slinging equipment, e.g. a four-leg sling

The list is not exhaustive, other safe applications are possible!



Fig. 2: AM-NUB_30 special design fitting

Preliminary and start-up procedures

Check list for first-time operation

- Do all components have the same performance values (WLL in kN or kg)?
- Are the performance values (WLL in kN or kg) of all LLD components compatible with the helicopter's maximum carrying capacity?
- Do all the connecting links fit with their appropriate connection points (safety hooks with thimbles, etc.)?
- Do the rope lengths meet the requirements (obstacle clearance)?
- Do all accessories of the slinging equipment meet the requirements of the cargo hook manufacturer?
- Are all people involved in the operation adequately instructed regarding the use of the product?

Start-up procedure

Spread the net flat on the ground and make sure all ropes and their end fittings are equally extended in a straight line. Distribute the cargo evenly on the net, beginning in the middle (marking). Preferably pile up more load in the centre than on the outside, since the net will form a bag during lifting, so the external zone is more strongly deflected than the middle sector.

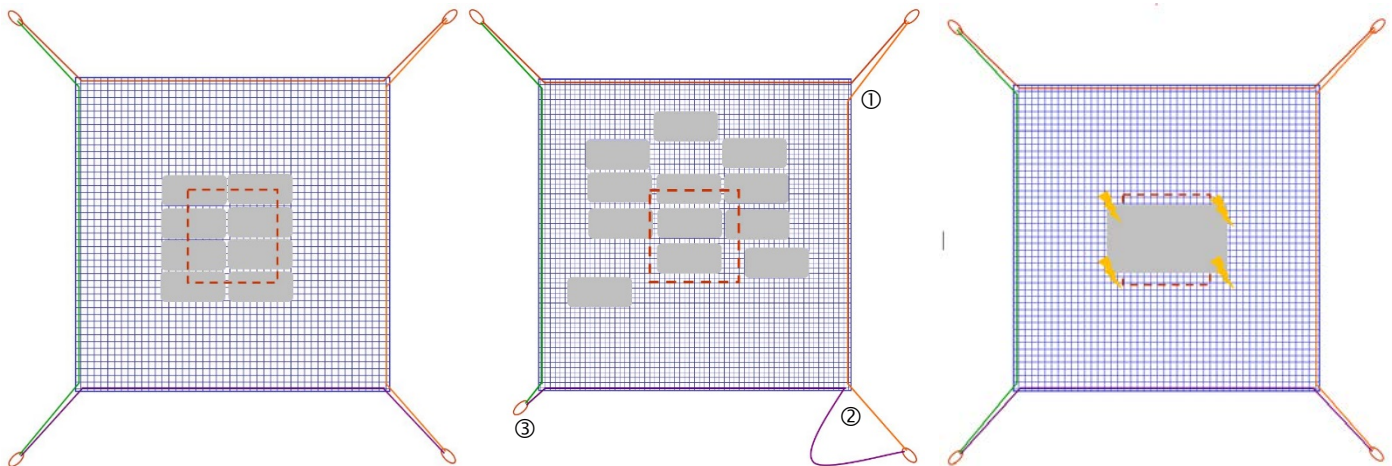


Fig. 3, left: correct preparation and loading = cargo piled up high in the middle, suspension ropes equally distributed and extended.

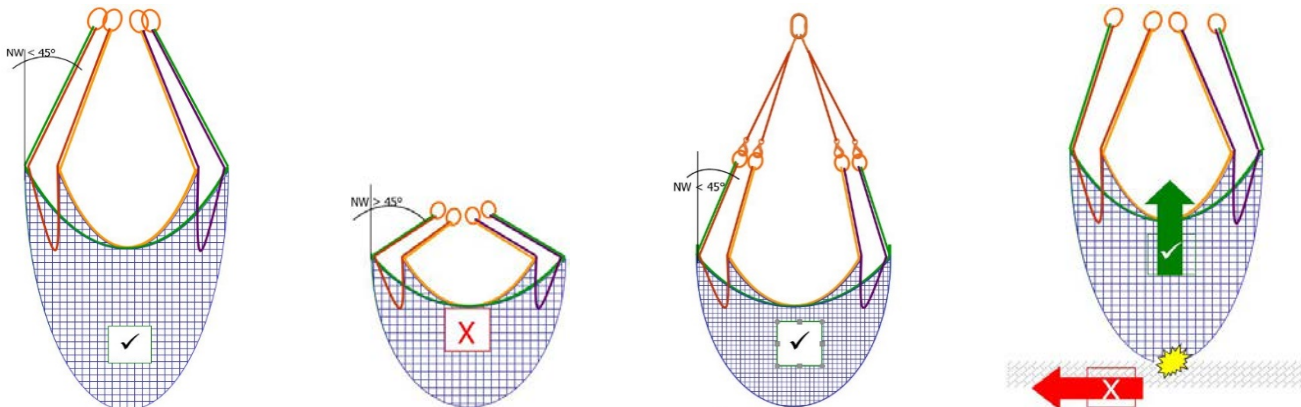
Fig. 4, centre: **wrong** preparation and loading = cargo **not** placed in the middle, **not** piled up but distributed all over the net, (1) border rope/end fitting **not** protruding from corner but from net side, (2) border rope/end fitting misaligned, (3) border rope with end fitting too short (when lifting the load, the border rope will glide rapidly through the net meshes causing strong friction and thus damage the cords).

Fig. 5, right: risky manner of loading. Stiff pallets or IBC generate heavy loading of the net corners and prevent the netting from spreading evenly. Moreover, asymmetrically loaded pallets easily tilt over.



Small parts, such as tools, clips, compressor hoses, etc. must be packed into closed containers; otherwise there is the risk of losing them during flight.

Load lifting must be performed in a vertical direction! Dragging the cargo net over the ground must absolutely be avoided, since this will significantly damage the netting. When transporting lightweight voluminous loads such as hay or straw, the cargo net can be directly hooked by means of its end fittings. With bulky voluminous loads (chests, barrels, etc.) it might be necessary to attach a four-leg sling to the rope end fittings.



NW = AI (angle of inclination)

Fig. 6, standard load; Fig. 7: Bulky loads creating high angles of inclination must be avoided; Fig. 8: Extension by means of a four-leg sling, Fig. 9: Vertical lifting is compulsory since dragging the net over the ground damages the netting

Special cargo

When transporting voluminous but lightweight loads such as hay, straw, insulating material, etc., it is possible to sling several cargo nets side by side, provided the load pick-up and depositing areas are big enough. 2 cargo nets can be attached simultaneously to the secondary cargo hook, provided the hook is of sufficient size; before doing so, join the end fittings of each net by means of a shackle or any other suitable slinging device. In this case, however, the ideal solution is the use of a two-leg sling.

For transport with a two-leg sling the following rules apply:

- Each leg of the two-leg sling (TWLS) must be able to carry 100% of the entire payload (see FH-SY page 3.2.3-2 TWLS) WLL 32 kN = 32 kN WLL per leg
- Each leg must be loaded with only 50% of the entire payload (i.e. half of the total WLL) WLL 32 kN = 16 kN of load per leg
- The total payload (WLL) of the two-leg sling must not be exceeded WLL 32 kN = 32 kN total load
- The angle of inclination on both sling legs must not exceed 45° per leg.

3 or 4 cargo nets can be transported with the help of a four-leg sling; before doing so, join the end fittings of each net by means of a shackle or any other suitable slinging device and attach them to the safety hooks of a four-leg sling.

For transport with a four-leg sling the following rules apply:

- Each leg of the four-leg sling (FLS) must be able to carry 50% of the entire payload (see FH-SY page 3.2.3-2 FLS) WLL 32 kN = 16 kN WLL per leg
- Each leg must be loaded with only 25% of the entire payload (i.e. a quarter of the total WLL) WLL 32 kN = 8 kN of load per leg
- The total payload (WLL) of the four-leg sling must not be exceeded. WLL 32 kN = 32 kN total load
- The angle of inclination on all sling legs must not exceed 30° per leg.



The maximum payload (WLL) of two-leg or four-leg slings and of the single sling legs must never be exceeded!

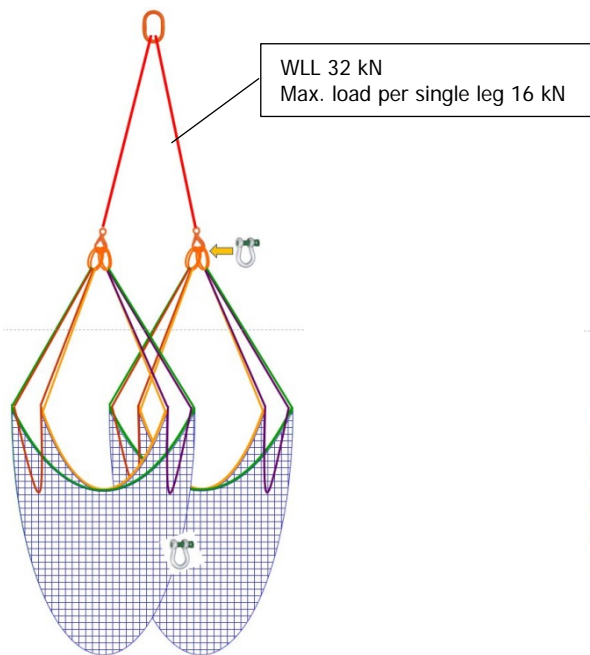


Fig. 10: 2 cargo nets attached to two-leg sling (TWLS)

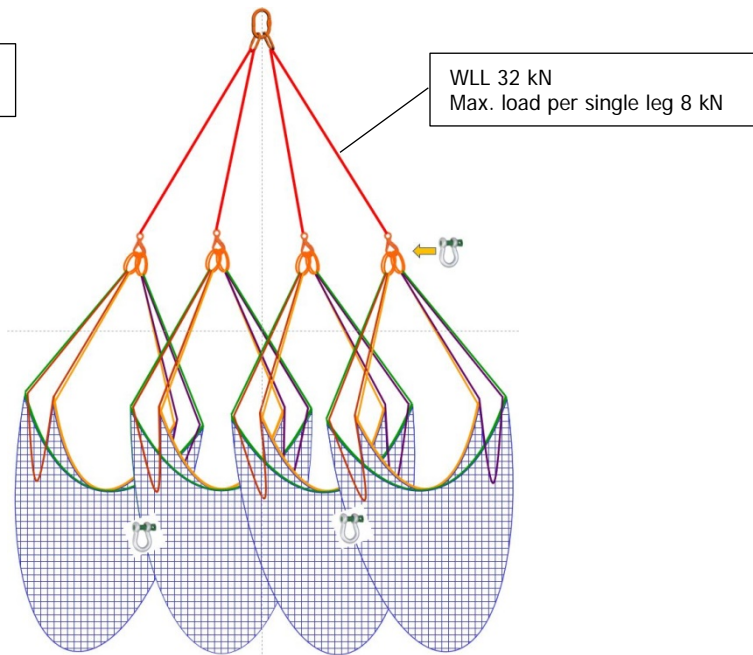


Fig. 11: 4 cargo nets attached to four-leg sling (FLS)

Symbolic illustration



Optionally: connect the cargo nets by means of a shackle to make them stay together.
Optionally: join the cargo net's end fittings in a shackle and rig it onto the safety hook

End of operation procedure

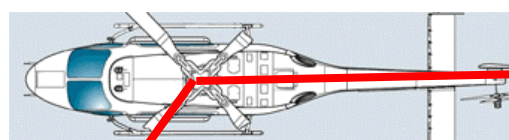
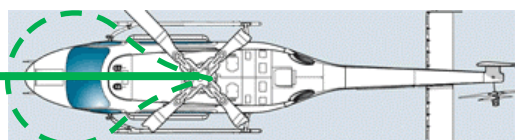
On ending the flying operation, an instructed person must help the pilot to deposit the rope on the ground. Usually the rope is deposited in a forward direction, within the pilot's field of vision.

In case the pilot is obliged to deposit the rope without the help of an instructed person, make sure that the landing site is big enough (or sufficiently sloping in a rearward direction) to avoid the rope getting caught under the helicopter (skids, wheels, tail rotor).

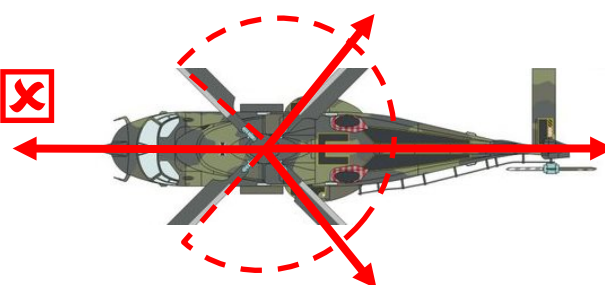
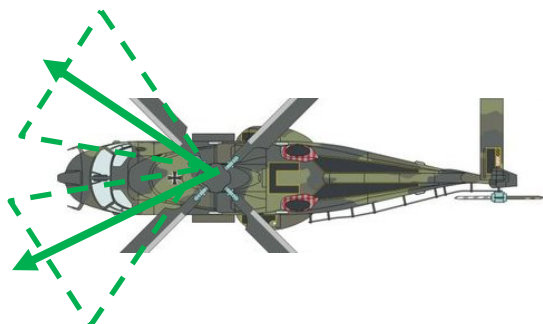
Depositing the rope and landing the helicopter on the rope:



- danger caused by rope nooses when the tail rotor draws near the rope;
- rope movement caused by down wash.
- be careful with skids and landing gear/undercarriages.



Helicopter with skids: Depositing of rope on take-off or landing area (symbolic illustration of a BELL 429, free picture from the web)



Helicopter with undercarriage: Depositing of rope on take-off or landing area (symbolic illustration of a NH90, free picture from the web)

Avoid sharp bends, knots or overtorquing of the rope.



Flying with empty cargo nets rigged to the helicopter implies high risks, since these might be pushed up by the air flow, especially at high descent rates.

Flying with cargo nets rigged to the helicopter implies fatal risks, if the net is loaded with plastic waste. The net can fly up like a sail; subsequently its ropes might end up in the tail or the main rotor. In this case, the risk potential is as high as with FIBC. Please also check AWA part 1, 5.3.1

Restoration / repackaging of the LN cargo net

Before return transport, first check the LN, then fold it up inside the helicopter.

Transport and storage

During transport by lorry, the LN must be stored in a bag, case or hung up on a hook and kept far from other equipment or hazardous substances which might damage it.

For storage in a warehouse, fold the net up and place it on a rack.

Possible inappropriate uses

(Ways of using the cargo net that are inappropriate and for which it is not designed)

Any use that is not in conformity with the regulations (inappropriate use) of the cargo net or its individual components 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.



Possible inappropriate uses are described in AWA part 1, 2.2.



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

Be careful to avoid other possible risks



Other possible risks are described in AWA part 1, 2.3.



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

Maintenance and repair



For cleaning instructions, please consult AWA part 3 MRO textiles, 6.2

For utilisability/criteria for withdrawal from service, please consult AWA part 3 MRO textiles, annex 4

For repair procedures, please consult AWA part 3 MRO textiles, annex 5

Your service partner

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

NATO NCAGE SAC17



Conditions for product use

This product has been manufactured in compliance with machinery directive 2006/42/EC, § 1 (1) d).

These instructions (AWA), in accordance with machinery directive 2006/42/EC, annex I, sections 1.7.4.1 and 1.7.4.2, as well as the EC declaration of conformity [...], are an integral part of this product and must be compiled in the user's or a generally accepted common language. However, only the original German version is legally binding. In absence of valid instructions for use and maintenance (AWA) or without adequate training prior to use of the product, the latter cannot be considered safe.

Gaining a good knowledge of the present AWA, including all its subparts, must be part of user training carried out by the producer, its authorised representative (qualified person) and the person responsible for training in the user's company.



In the case of lending, demonstration, display, sale, discount trading or user training, these instructions for use and maintenance (AWA) must be enclosed/attached.

Picture credits

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Question to the persons responsible for training and work materials:

Have you read, understood and given instructions on parts 1 to 4?



A&H Services offers an extensive inspection and testing service for all its in-house products.



Appeal

If you have questions, if a component is damaged, seems to have changed or might be damaged, whenever you have any observations or suggestions to make, please take a photograph and send it to us via email, MMS or SMS (no messages via WhatsApp, Facebook or similar).

In 90% of all cases we can answer immediately, thus saving you time and postal charges. Having an image will help us greatly and, together with your short description of the problem, it can usually be identified very quickly.