



**THE NETHERLANDS
SPECIAL MILITARY AVIATION REGULATIONS**

**AIRCRAFT INTERNAL TRANSPORTATION OF
CARGO IN RELATION TO OCCUPANT SAFETY**

NLD-SMAR-3

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**MILITARY AVIATION AUTHORITY
THE NETHERLANDS (MAA-NLD)**

Status page

	Pages	Version
Title page	1	1.0
Status page	2	1.0
Table of contents	3	1.0
Requirements	4 to 13	1.0
Appendix 1	14 to 26	1.0

Table of contents

Status page	2
Table of contents.....	3
SUBPART A - General.....	4
NLD-SMAR-3.05. Scope of application.....	4
NLD-SMAR-3.10. Definitions	4
SUBPART B - Requirements for the air operator	6
NLD-SMAR-3.15. Liaison with third parties within the Ministry of Defence	6
NLD-SMAR-3.16. Liaison with suppliers from outside the Ministry of Defence	6
NLD-SMAR-3.17. Qualification procedure	7
NLD-SMAR-3.20. Arrangement requirements for the transport of cargo in an aircraft.....	7
NLD-SMAR-3.25. Registration and assessment of non-conformities air transported material...9	
NLD-SMAR-3.30. Approved loading instructions.....	10
NLD-SMAR-3.35. Load restraint	11
NLD-SMAR-3.40. Required passages and evacuation routes.....	11
NLD-SMAR-3.45. Alternative operating procedures in the military context	12
Final clauses	13
Appendix 1 to NLD-SMAR-3.35 and 3.40 Load restraints and evacuation routes.	14
CH-47D and CH-47F Requirements for load restraint.....	14
C-130H and C-130H-30 Requirements for load restraint.....	17
C-130H and C-130H-30 Required evacuation routes	19
NH90 Requirements for load restraint.....	23
NH90 Required evacuation routes	24
AS-532 Requirements for load restraint.....	26
AS-532 Required evacuation routes	26

SUBPART A - General

NLD-SMAR-3.05. Scope of application

- a. The Netherlands Special Military Aviation Regulations-3 (NLD-SMAR-3) prescribes regulation, applicable to holders of an MAA-NLD organisation approval, and to other stakeholders inside the Netherlands Military Aviation System (NLD-MAS).
- b. The aircraft interior is not always optimised for the simultaneous transport of occupants and material. However, the operator remains responsible to take all necessary precautions to ensure an acceptable level of safety for all aircraft occupants. The NLD-SMAR-3 prescribes requirements for transportation of cargo as internal load with occupants present. The objective of this regulation is to contribute to the improvement of occupant safety by ensuring that the operator, owner and sender of the material designated as internal load comply with this regulation.

NLD-SMAR-3.10. Definitions

(+GM)

In accordance with NLD-MAD 1.

- a. Air-transportable material
Material that is intended to be regularly transported as internal load by an air operator.
- b. Approved loading instructions
Loading instructions that are approved to be compliant with NLD-SMAR-3.30.
- c. Crew / Aircrew
Crew / Aircrew in accordance with the definition in NLD-MAD 1.
- d. Critical system
Systems in the cargo items that are at risk of being damaged during or after an aircraft accident in such a way as to endanger the safety of the occupants during or after the accident.
- e. Evacuation routes
Passages in the passenger compartment/cargo hold to enable the occupants to quickly exit the aircraft in the event of an emergency.
- f. Flight crew member
Flight crew member in accordance with the definition in NLD-MAD 1.
- g. Load
Cargo and/or luggage.
- h. Load restraint
The securing of loads in such a way that they cannot shift and/or tilt under the influence of relevant g-loads.

- i. Material
Items that are transported unpacked, as a cargo item. This is common for large cargo items, such as vehicles. Items like crates, boxes, containers, bags, etc. in which smaller goods can be packed, but which themselves are not packaged for transportation, are also material. For the determination of the obligation for qualification in accordance with NLD-SMAR-3.17, the maximum permitted laden weight of the material, if applicable, shall be considered.
- j. Non-Dutch Armed Forces managed material
Material that is not managed by the Dutch Armed Forces.
- k. Occupants
All people on board the aircraft during the flight.
- l. Passenger
Occupant who is not a member of the crew.
- m. Passages for the crew
Passages that enable the crew to perform their duties.
- n. Qualified air-transportable material
Material that is qualified in accordance with NLD-SMAR-3.17.
- o. Rated load
The maximum force that a lashing device or lashing provision can reliably withstand, with a positive margin to breakage in accordance with the standard applicable to the lashing device or lashing provision.
- p. Ultimate load
The minimum (g-)load that the secured cargo shall be able to withstand without breaking loose. Deformation and displacement of the cargo is permitted but may not present a hazard.
- q. User documentation
Documentation belonging to qualified air-transportable material, mentioning data and instructions for safe air transport of that material.

SUBPART B - Requirements for the air operator

NLD-SMAR-3.15. Liaison with third parties within the Ministry of Defence

(+GM)

- a. The air operator shall establish working agreements with all relevant organisational elements within the Dutch Ministry of Defence (MoD-NLD). The working agreements must be concluded under the following conditions:
 1. presenting cargo:
 - i. cargo must be presented to the aircraft in such a condition that the safety of the aircraft, the personnel and the passengers is guaranteed during loading, the flight and the unloading;
 - ii. the cargo must be presented in accordance with the provisions of the MAR-OPS Subpart R concerning the carriage of dangerous goods by air by military aircraft;
 - iii. in case of qualified air-transportable material (see point 2) all procedures, conditions and limitations as stated in the associated applicable user documentation shall be applied;
 2. the qualification of material in accordance with NLD-SMAR-3.17, to ensure that the material meets the minimum conditions for safe air transport;
 3. managing material qualified in accordance with NLD-SMAR-3.17, to ensure that it continues to meet the qualification requirements.
- b. The air operator shall be able to demonstrate that:
 1. the working agreements have been established with the organisational units concerned;
 2. the working agreements contain quality requirements regarding the performance to be delivered;
 3. the air operator's accountable manager has the mandate to monitor the relevant organisational units concerning the regulations to be followed.
- c. The air operator shall document procedures in the Operations Manual for the implementation of this paragraph.

NLD-SMAR-3.16. Liaison with suppliers from outside the Ministry of Defence

(+GM)

- a. When the air operator presents built-up pallets presented as a unit offered by outside MoD suppliers, the air operator shall ensure that the requirements of the NLD-SMAR-3 are met.
- b. The air operator shall document procedures in the Operations Manual for the implementation of this paragraph.

NLD-SMAR-3.17. Qualification procedure

+(GM)

- a. Material intended to be transported regularly as internal load by an air operator and falling into one or more of the following categories, shall be qualified for air transport by the air operator:
 - 1. Material that needs to be secured to more than two lashing points in the aircraft in order to meet the requirement for forward load restraint and that is not transported under a cargo net;
 - 2. Material with integral lashing points on the frame used for securing in the aircraft;
 - 3. Material that is transported in activated state during the flight;
 - 4. Material that is used to carry people during the flight.
- b. Qualified air-transportable material shall be registered in a system that can be consulted by users and air operators.
- c. For qualified air-transportable material, user documentation shall be prepared that includes the following information:
 - 1. Identification of any lashing points, including specification of the load capacity of each lashing point; and
 - 2. Instructions for putting and securing the material in a safe condition for transport; and
 - 3. A statement as to whether occupants may remain in the material during the flight, specifying the permitted seating and/or berthing locations; and
 - 4. Any restrictions relating to the transport of material; and
 - 5. Maintenance and repair instructions.
- d. Excluded from the requirements of a, b and c is incidental material and material that is not managed by the Dutch armed forces.
- e. The air operator shall document procedures in the Operations Manual for the implementation of items a, b and c of this paragraph.

NLD-SMAR-3.20. Arrangement requirements for the transport of cargo in an aircraft

(+GM)

- a. Material for which no approved loading instructions have been established shall be loaded in accordance with the general loading instructions specified in the documentation of the aircraft concerned. This also applies to material for which the approved loading instructions cannot be performed, for example, due to defects of the material or the aircraft.
- b. Material for which approved loading instructions have been established compliant to NLD-SMAR-3.30 shall be loaded in accordance with these loading instructions.
- c. It is not allowed for occupants to remain in the material during the flight, except in case of qualified air-transportable material in accordance with the conditions laid down in the user documentation.

- d. The following restrictions shall be observed for material that is not qualified air-transportable material, and needs to be secured to more than two lashing points in the aircraft to meet the requirement for forward load restraint, and is not transported under a cargo net:
 - 1. the material may not carry passengers; and
 - 2. passengers may only be seated behind the material as seen in the flying direction; and
 - 3. critical systems (ref NLD-SMAR-3.10) in the material and in any adjacent cargo item shall be protected against damage due to the material breaking free; and
 - 4. the transport shall be registered in accordance with NLD-SMAR-3.25.
- e. The restrictions in point d. also apply to qualified air-transportable material for which the approved loading instructions cannot be performed due to defects of the material or the aircraft and which needs to be secured to more than two lashing points in the aircraft to meet the requirement for forward load restraint and is not transported under a cargo net.
- f. The restrictions in point d. also apply to built-up pallets presented as a unit and not assembled by the air operator itself, unless NLD-SMAR-3.16 is met.
- g. If the occupants in the aircraft are divided into separated groups by the arrangement of the cargo (i.e. there are no connecting emergency evacuation routes in accordance with NLD-SMAR-3.40), each group of occupants, whether located inside or outside the cargo, shall:
 - 1. have unhindered access to the emergency equipment prescribed in the applicable MAR-OPS requirements; and
 - 2. be accompanied by a member of the air crew who can communicate with a member of the flight crew;
 - i. if occupants remain inside the cargo during the flight, communication shall be possible between the persons inside the cargo and the air crew outside the cargo; and
 - ii. the communication capabilities shall provide for both standard and emergency situations.
- h. Rapid evacuation of all occupants, including any occupants in the cargo itself, shall be possible. Every occupant, other than a Person with Reduced Mobility in accordance with MAR-OPS 1.260/3.260, shall be able to move independently from his assigned seat to outside the aircraft. Evacuation routes, if required, shall comply with NLD-SMAR-3.40.
- i. Emergency lighting, markings and signs shall not be blocked by the cargo such that evacuation is hindered.
- j. Passengers shall be able to see the emergency exit markings applicable to them from their assigned seat position, sitting or standing.
- k. If exits are not available for emergency evacuation (e.g. due to insufficient accessibility or absence of a cross aisle as specified in SMAR-3.40), occupants shall be briefed accordingly before the flight.

- l. The position of occupants in the aircraft relative to the cargo shall be such that there is no risk of injury due to protrusions, sharp edges or hard surfaces. Protrusions, sharp edges and hard surfaces on the load shall be shielded where necessary before transport to reduce this hazard. Sufficient distance shall be maintained between occupants and cargo to prevent occupants from being injured as a result of cargo and/or occupants shifting under the influence of the g-loads described in NLD-SMAR-3.35.
- m. The cargo shall be secured in accordance with the requirements for load restraint as stated in NLD-SMAR-3.35.
- n. The cargo shall be placed in the aircraft in such a way that the air crew in their assigned seats has a view of all passengers. When necessary, the commander shall assign seats to the air crew different from their standard seats in such a way that this condition can be met, however balanced against the fulfilment of their other duties. The aircrew shall be able to communicate with each flight crew member from their assigned seats.
- o. Cargo shall be sufficiently accessible during the flight for inspection and for detection and fighting a fire, unless transported within an enclosed cargo compartment equipped with a fire suppression system. Passages for the crew shall meet the conditions in NLD-SMAR-3.40.
- p. Occupants, both inside and outside the cargo, shall be protected from parts of the cargo that may swing open or be ejected in the event of rapid decompression. Doors, windows, hatches, etc. shall be opened or locked in a secured position.
- q. Systems in the cargo that are not approved for in-flight use shall be deactivated to a safe condition.
- r. Luggage shall be transported in accordance with the requirements for the transport of cargo as laid down in this SMAR, regardless of the quantity or location on board the aircraft.
- s. During flights over water, the cargo shall be secured in such way that in event of ditching, the cargo cannot float or become detached due to water intrusion, if it might result in the obstruction of the evacuation of the occupants.
- t. The air operator shall document procedures in the Operations Manual for the implementation of this paragraph.

NLD-SMAR-3.25. Registration and assessment of non-conformities air transported material

(+GM)

- a. The air operator shall periodically assess whether:
 - 1. the existing approved loading instructions and material qualifications are still suitable and sufficient for the operation; and
 - 2. the cooperation with cargo suppliers is sufficient.
- b. For the purposes of the assessment referred to in point a, the air operator shall register:
 - 1. the lack of approved loading instructions, material qualifications and cooperation procedures for regular transports; and
 - 2. non-conformities in the application of the existing approved loading instructions, material qualifications and cooperation procedures.

- c. If non-conformities are found, the air operator shall implement improvements to correct the non-conformities.
- d. The air operator shall document procedures in the Operations Manual for the implementation of this paragraph.
- e. The air operator shall document procedures in the Operations Manual for the implementation of this paragraph.

NLD-SMAR-3.30. Approved loading instructions

(+GM)

- a. For all material that is to be transported inside the aircraft which:
 - 1. at the maximum allowable laden weight needs to be secured to more than two lashing points in the aircraft to meet the requirement for forward load restraint; and
 - 2. is not incidental material or material not managed by Dutch Armed Forces; and
 - 3. is not transported under a cargo net,

the air operator shall establish and approve suitable loading instructions. The instructions are specific to the aircraft type and the material to be transported.
- b. The air operator shall establish procedures in the Operations Manual to implement the provisions laid down in point a.
- c. The loading instructions shall ensure that:
 - 1. the material is secured in accordance with the requirements for load restraint as established in NLD-SMAR-3.35, and
 - 2. sufficient distance is maintained between occupants and cargo to prevent occupants from being injured as a result of shifting of the cargo and/or the occupants under the influence of the g-loads prescribed in NLD-SMAR-3.35.
- d. If parts of the material could break off or collapse under applicable g- or rapid decompression loads, resulting in collisions with occupants or critical systems or in the blockage of evacuation routes, the loading instructions shall also include instructions for securing or safely stowing these parts. The same applies to all the equipment, cargo and luggage on and in the material.
- e. The loading instructions shall unambiguously specify the type of lashing devices (lashing straps, chains, etc.) to be used.
- f. When calculating the distribution of forces over the lashing devices, the elasticity of the lashing devices shall be taken into account. The construction of the aircraft may be assumed to be infinitely rigid. If the deformation of the construction of the material (e.g. as a result of vehicle suspension travel or plastic deformation) affects the distribution of forces, this deformation shall be taken into account in the calculation. The material is assumed to have six degrees of freedom and is only restrained in its movement as a result of the prescribed g-load by the reaction forces of the lashing devices and the support through the floor. Both the equilibrium of forces and the equilibrium of moments shall be demonstrated. Friction over the floor may not be included in the calculations.

- g. A theoretical analysis or practical test shall be conducted to demonstrate compliance with the arrangement requirements of NLD-SMAR-3.20.
- h. Procedures and conditions concerning the positioning and configuration of the material necessary to comply with the provisions of NLD-SMAR-3.20 shall be included in the loading instructions.
- i. For qualified air-transportable material, all procedures, conditions and limitations as stated in the relevant applicable user documentation shall be included in the loading instructions.
- j. Approved loading instructions shall be prepared in accordance with the requirements of this NLD-SMAR-3, unless the MAA-NLD has approved an alternative standard operating procedure in accordance with SMAR-3.45.

NLD-SMAR-3.35. Load restraint

(+GM)

- a. Cargo shall be loaded and secured in accordance with the corresponding approved instructions and limitations stated in the applicable manuals when cargo is transported in:
 - 1. enclosed cargo or luggage compartments that form part of the aircraft's type design (or type-certification configuration) approved by the MAA-NLD; or
 - 2. approved or accepted containers or net/pallet combinations, approved or accepted by the MAA-NLD.
- b. All other cargo shall be secured at least against the applicable g-loads stipulated in Appendix 1 to NLD-SMAR-3.35.
- c. Only lashing devices which are demonstrably compliant with a standard or specification accepted by the MAA-NLD and which are accompanied by applicable instructions for use and maintenance may be used to restrain the cargo.
- d. Lashing devices and the lashing points in the aircraft and on the cargo may not be loaded in excess of their rated load when the cargo is subjected to the applicable g-loads as set out in Appendix 1 to NLD-SMAR-3.35.
- e. Each lashing device shall be marked with its rated load.

NLD-SMAR-3.40. Required passages and evacuation routes

(+GM)

- a. Passages for the crew.
 - 1. Obstacle-free passages shall be established along the load to enable the crew to perform their duties. These passages may be combined with the required evacuation routes specified under point b.
 - 2. The dimensions of the passages for the crew shall be such that all tasks can be performed properly.
 - 3. In the assessment of the obstacle-free passage for the crew, lashing devices (lashing straps, lashing chains) do not need to be considered as obstacles. However, the crew shall ensure that passage remains feasible without large effort.

4. An interruption along the length of the obstacle-free passage is permitted, provided that a member of the crew is permanently present both fore and aft of the interruption and that all of the crew's duties can be properly performed. This also includes checking the load in the area where the passage is interrupted.
- b. The following conditions apply for the use of evacuation routes:
1. If an occupant, coming from his assigned seat, must move alongside the load to reach the emergency exit available for him, a suitable, uninterrupted, obstacle-free evacuation route along the load shall be kept free for him.
 2. The dimensions of the obstacle-free evacuation routes shall comply with the conditions laid down in Appendix 1 to NLD-SMAR-3.40 for the aircraft type concerned. The required dimensions shall be guaranteed taking into account the possible deformation and/or shifting of the cargo under the influence of the loads prescribed in NLD-SMAR-3.35.
 3. In the assessment of the minimum obstacle passage of evacuation routes, lashing devices (lashing straps, lashing chains) do not need to be considered as obstacles, as long as:
 - i. they are easily visible in daylight and, when the cabin emergency lighting is on, in the dark; and
 - ii. the lashing devices in the passage do not exceed 40 cm above the floor; and
 - iii. a person can put both feet on the floor between the lashing devices at least every 50 cm; and
 - iv. the crew shall ensure that passage remains feasible without large effort; and
 - v. passengers are warned of the presence of the lashing devices during the safety briefing.

NLD-SMAR-3.45. Alternative operating procedures in the military context

(+GM)

- a. An air operator may find that for operations in the military context, taking into account an increased threat level, time pressure or limited resources, it is necessary to develop standard operating procedures that differ from the requirements of this NLD-SMAR. In this case, the air operator may submit grounds for derogating from the standard operating procedures, and may submit a request for approval to the MAA-NLD. The air operator shall include the reasoning why the alternative standard operating procedures are necessary as well as the applicable conditions.
- b. After obtaining approval from the MAA-NLD, the air operator shall document the approved alternative standard operating procedures in the Operations Manual, accompanied by the applicable conditions.
- c. Approved alternative standard operating procedures may also be applied during training and exercise flights, in which the aforementioned necessity is simulated.

Final clauses

This Special Military Aviation Regulation is known as NLD-SMAR-3.

This Special Military Aviation Regulation shall enter into force from the day after the date of issue on the MAA-NLD internet/intranet.

This Special Military Aviation Regulation will be binding in its entirety and directly applicable to all (Military) Aviation Organisations who are involved in any way with or are acting within the Netherlands Military Aviation System (NLD-MAS).

The Hague, 18 November 2022

For the Minister of Defence,
The Director Military Aviation Authority – The Netherlands

J.P. Apon
Air Commodore



Appendix 1 to NLD-SMAR-3.35 and 3.40 Load restraints and evacuation routes.

(+GM)

CH-47D and CH-47F Requirements for load restraint

a. G-loads for cargo transport.

During flights without passengers the cargo shall be secured against the g-loads shown in table 1.

Table 1: **Minimum g-loads for load restraint for flights without passengers (Ultimate Load)**

Direction	CH-47
Upward	2
Forward	4
Sideward	1.5
Rearward	2

b. G-loads for combi-transport.

1. In addition to point a, the cargo shall be secured during flights with passengers against the g-loads shown in table 2 in all directions in which passengers or evacuation routes are located relative to the cargo.

Table 2: **Minimum g-loads for transport of cargo in combination with passengers (Ultimate Load)**

Direction	CH-47
Upward	4
Forward	8
Sideward	8
Rearward	2

2. If, during flights with passengers, a cargo item contains critical systems or is placed adjacent to another cargo item that contains critical systems, that cargo item shall be secured against the g-loads shown in table 2 in all directions in which these critical systems are vulnerable. Unless the critical systems can be secured in a 'safe' state it is not considered a critical system anymore.

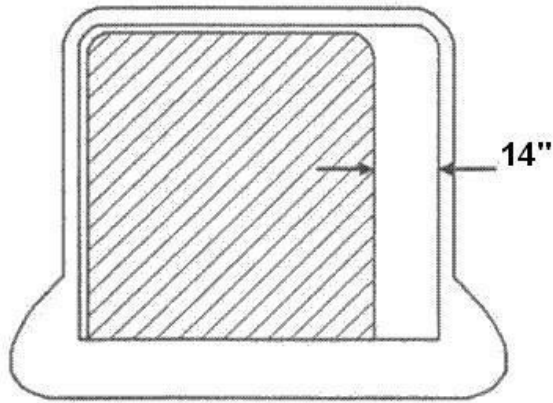
c. G-loads for qualification of material.

Material to be qualified shall be able to withstand the loads shown in table 1 or 2 without breakage, depending on whether the intended use is cargo transport or combi-transport respectively. Critical systems in the material items to be qualified shall be able to withstand a minimum downward load of 8g without breakage.

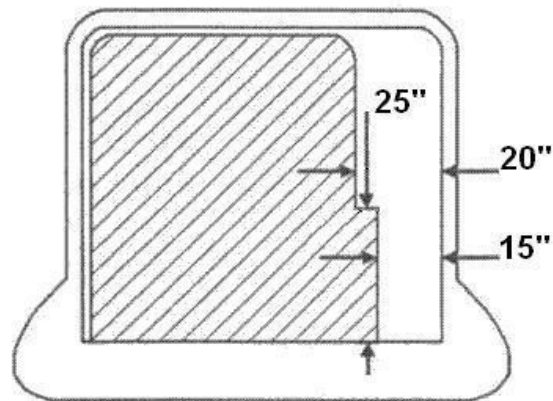
CH-47D and CH-47F Required evacuation routes

a. Evacuation routes (see figure A).

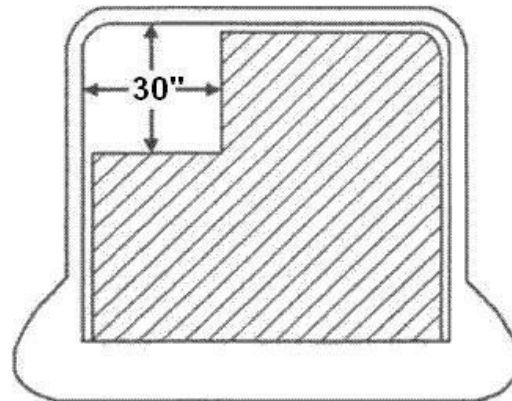
1. For evacuation routes in the longitudinal direction of the helicopter, intended for a maximum of 10 occupants, the obstacle-free passage from the floor to the ceiling shall be at least 14 inches (356 mm) wide.
2. For evacuation routes in the longitudinal direction of the helicopter, intended for more than 10 occupants, the obstacle-free passage from the floor to 25 inches (635 mm) height shall be at least 15 inches (381 mm) wide, above which the passage shall be at least 20 inches (508 mm) wide.
3. When point a.1 cannot be met, an acceptable alternative is a crawl way over the cargo 30 inches (762 mm) wide and 30 inches (762 mm) high, exclusively for use only by a group of up to 10 occupants consisting of crew.
4. Between the emergency exits in the front part of the cabin, if required as an emergency exit pair, there shall be a cross aisle with an obstacle-free passage of at least 20 inches (508 mm) width, from the floor to the ceiling.



Minimum evacuation space for groups of maximum 10 persons



Minimum evacuation space for groups more than 10 persons



Alternative minimum evacuation space for groups of maximum 10 persons, consisting of crew only

Figure A: **Minimum dimensions of evacuation route CH-47D/F**

C-130H and C-130H-30 Requirements for load restraint

(+GM)

a. G-loads for cargo transport.

During flights without passengers the cargo shall be secured against the g-loads shown in table 3.

Table 3: **Minimum g-loads for load restraint for flights without passengers (Ultimate Load)**

Direction	C-130
Upward	2
Forward	3
Sideward	1.5
Rearward	1.5

b. G-loads for combi-transport.

1. In addition to point a, the cargo shall be secured during flights with passengers against the g-loads shown in table 4 in all directions in which passengers or evacuation routes are located relative to the cargo.

Table 4: **Minimum g-loads for transport of cargo in combination with passengers (Ultimate Load)**

Direction	C-130
Upward	3
Forward	9
Sideward	3
Rearward	1.5

2. The forward g-load as stated in table 4 is allowed to be reduced to 8g for cargo on HCU6E or 463L pallets with matching 10000 lb cargo nets or equivalent pallet/net combinations.
3. If, during flights with passengers, a cargo item contains critical systems or is placed adjacent to another cargo item that contains critical systems, that cargo item shall be secured against the g-loads shown in table 4 in all directions in which these critical systems are vulnerable, unless the critical systems can be secured in a 'safe' state.
4. When the C-130 LOX system is charged during flights with passengers the cargo shall be restrained against 9 g in the forward direction at all times to protect the cargo bay Oxygen Selector Valve and related pipework. The relief stated under point 2 for palletized cargo does not apply under this condition.

c. G-loads for qualification of material.

Material to be qualified shall be able to withstand the loads shown in table 3 or 4 without breakage, depending on whether the intended use is cargo transport or combi-transport respectively. Critical systems in the material items to be qualified shall be able to withstand a minimum downward load of 6g without breakage.

C-130H and C-130H-30 Required evacuation routes

a. Evacuation routes (see figures B and C).

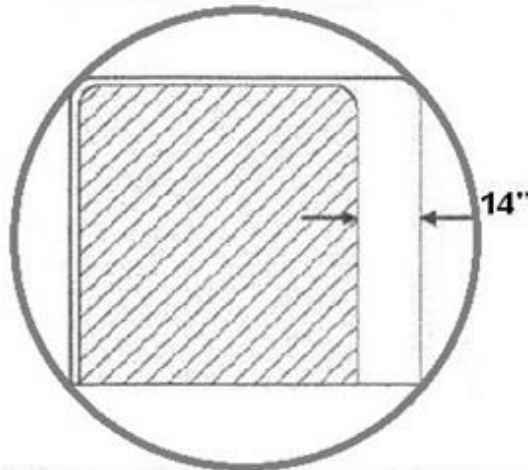
1. For evacuation routes in the longitudinal direction of the aeroplane, intended for a maximum of 10 occupants, the obstacle-free passage from the floor to the ceiling shall be at least 14 inches (356 mm) wide.
2. For evacuation routes in the longitudinal direction of the aeroplane, intended for more than 10 occupants, the obstacle-free passage from the floor to 25 inches (635 mm) height shall be at least 15 inches (381 mm) wide, above which the passage shall be at least 20 inches (508 mm) wide.
3. When point a.1 cannot be met, acceptable alternatives are a passage of 14 inches (356 mm) wide and 72 inches (1828 mm) high with bottom max. 36 inches (914 mm) above the floor, or a crawl way of 30 inches (762 mm) wide and 48 inches (1219 mm) high with bottom max. 60 inches (1524 mm) above the floor over/along the cargo, exclusively for use only by a group of up to 10 occupants consisting of crew. Overhanging cargo above this passage/crawl way is permitted.
4. In the area between the wheel wells, the centreline seats and sidewall seats may not be used simultaneously. The seats that are not in use shall be stowed or removed.
5. Between the emergency exits of each required emergency exit pair, determined in relation to the number and location of the passengers, there shall be a cross aisle with an obstacle-free passage of at least 20 inches (508 mm) width from the floor to the ceiling. Cross aisles along cargo items shall be established as close as possible to the corresponding emergency exits. If centreline seats are installed in line with the emergency exits, the cross aisle for the front pair of emergency exits may be established directly forward of the front centreline seats, and the cross aisle for the rear pair of emergency exits may be established between the ramp and the rear centreline seats.
6. Each occupant shall be able to reach at least one hatch in the roof of the aeroplane, which is kept sufficiently accessible so it can be opened, via an evacuation route from his assigned seat.

b. Maximum permissible number of occupants

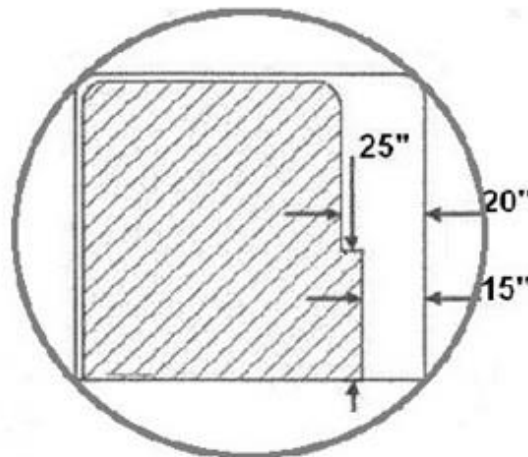
1. The maximum permissible number of occupants in the cargo hold, in addition to a maximum of 2 'acting' loadmasters, is dependent on the available emergency exits according to table 5. An 'acting' loadmaster in this context is a loadmaster charged with safety tasks pertaining to passengers, other crew members and/or cargo.
(Note: More than 2 'acting' loadmasters are permitted, but the number beyond 2 shall be deducted from the maximum permissible number of occupants in table 5.)
2. If the occupants are divided into separate groups in accordance with NLD-SMAR-3.20.e, the maximum size of a group is limited by the emergency exits available for that group in accordance with table 5.

Table 5: **Maximum permissible number of occupants in the cargo hold in addition to the two 'acting' loadmasters**

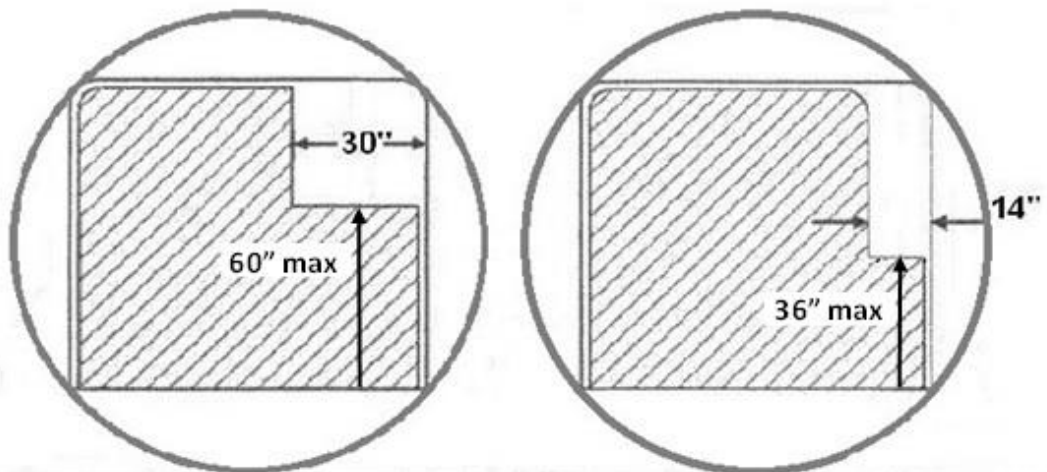
Type	Available emergency exits	Maximum permissible number of occupants
C-130H-30	Both paratroop doors	55
	Both Type III emergency exits	34
	Both paratroop doors and both Type III emergency exits	89
C-130H	Both paratroop doors	55
	Crew entrance door and Type IV emergency hatch	9
	Both paratroop doors, crew entrance door and Type IV emergency hatch	64



Minimum evacuation space for groups of maximum 10 persons



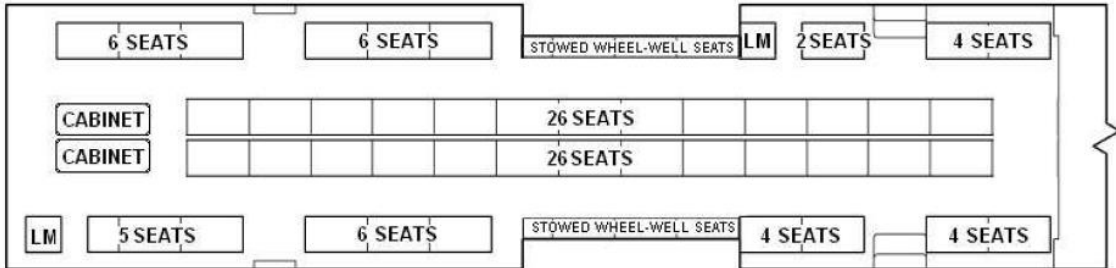
Minimum evacuation space for groups more than 10 persons



Alternative minimum evacuation spaces for groups of maximum 10 persons, consisting of crew only
(Ref. MIL-HDBK-1791)

Figure B: Minimum dimensions of evacuation route C-130
(Note: Cross-sections are facing aft)

C-130H-30



C-130H

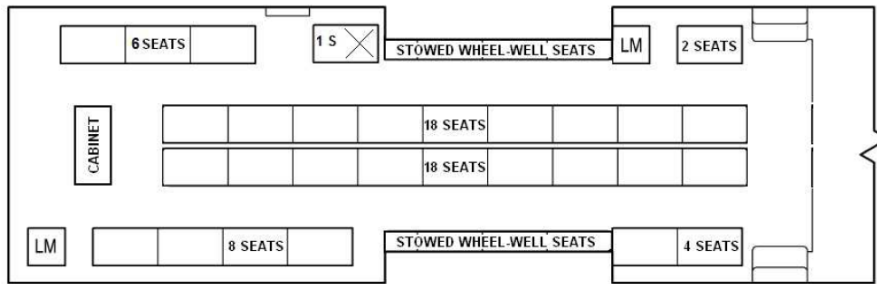


Figure C: Available seat positions in C-130 with installed 'cabinets'

NH90 Requirements for load restraint

a. G-loads for cargo transport.

During flights without passengers the cargo shall be secured against the g-loads shown in table 7.

Table 7: **Minimum g-loads for load restraint for flights without passengers (Ultimate Load)**

Direction	NH90
Upward	3
Forward	4
Sideward	3
Rearward	2

b. G-loads for combi-transport.

1. In addition to the obligation stated in point a, the cargo shall be secured during flights with passengers against the g-loads shown in table 8 in all directions in which passengers or evacuation routes are located relative to the cargo.

Table 8: **Minimum g-loads for transport of cargo in combination with passengers (Ultimate Load)**

Direction	NH90
Upward	4
Forward	16
Sideward	8
Rearward	2

2. If a cargo item contains critical systems or is placed adjacent to another cargo item that contains critical systems, during flights with passengers that cargo item shall be secured against the g-loads shown in table 8 in all directions in which these critical systems are vulnerable, unless the critical systems can be secured in a 'safe' state.

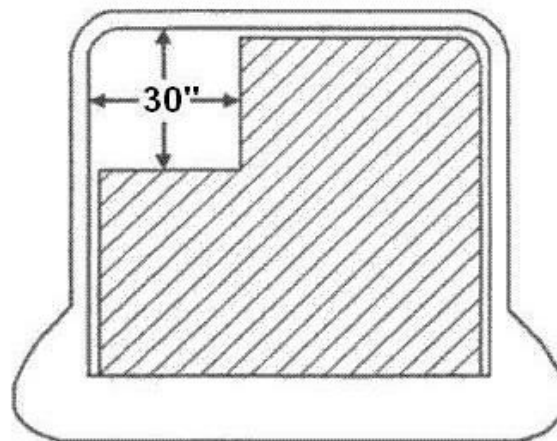
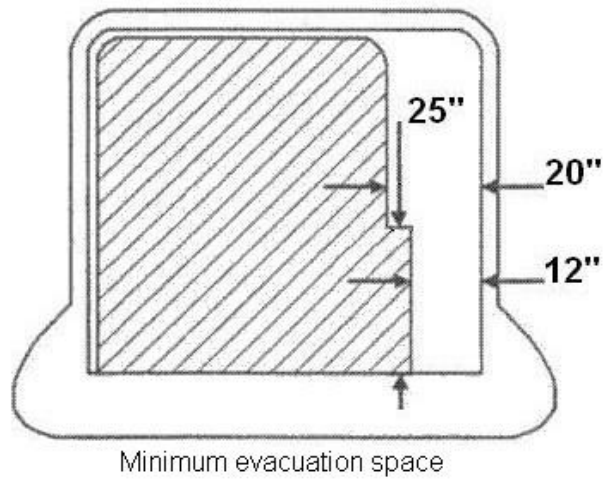
c. G-loads for qualification of material.

Material to be qualified shall be able to withstand the loads shown in table 7 or 8 without breakage, depending on whether the intended use is cargo transport or combi-transport respectively. Critical systems in the material items to be qualified shall be able to withstand a minimum downward load of 20g without breakage.

NH90 Required evacuation routes

a. Evacuation routes (see figure 7).

1. For evacuation routes the obstacle-free passage from the floor to 25 inches (635 mm) height shall be at least 12 inches (305 mm) wide, above which the passage shall be at least 20 inches (508 mm) wide.
2. When point a.1 cannot be met, an acceptable alternative is a crawl way over the cargo of at least 30 inches (762 mm) wide and 30 inches (762 mm) high, exclusively for use by crew.
3. Between the sliding doors there shall be a cross aisle with an obstacle-free passage of at least 20 inches (508 mm) width, from the floor to the ceiling.
4. Every occupant in the cabin shall be able to reach;
 - i. the sliding doors; and
 - ii. the emergency hatch at the back of the tail sectionvia an evacuation route from his assigned seat.



Alternative minimum evacuation space for groups of maximum 10 persons, consisting of crew only

Figure D: **Minimum dimensions of evacuation route NH90**

AS-532 Requirements for load restraint

a. G-loads for cargo transport.

There is no distinction between the requirements for cargo transport and combi-transport. The cargo shall be secured against the g-loads shown in table 9.

Table 9: **Minimum g-loads for load restraint (Ultimate Load)**

Direction	AS-532
Upward	3
Forward	6
Sideward	3
Rearward	3

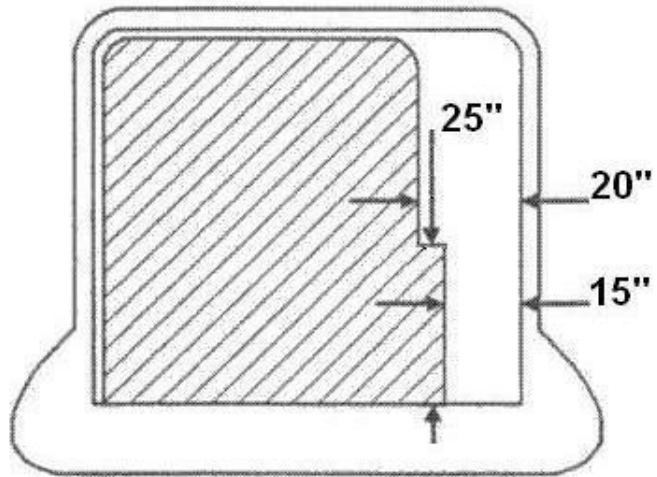
b. G-loads for qualification of material.

Material to be qualified shall be able to withstand the loads shown in table 9 without breakage. Critical systems in the material items to be qualified shall be able to withstand a minimum downward load of 6g without breakage.

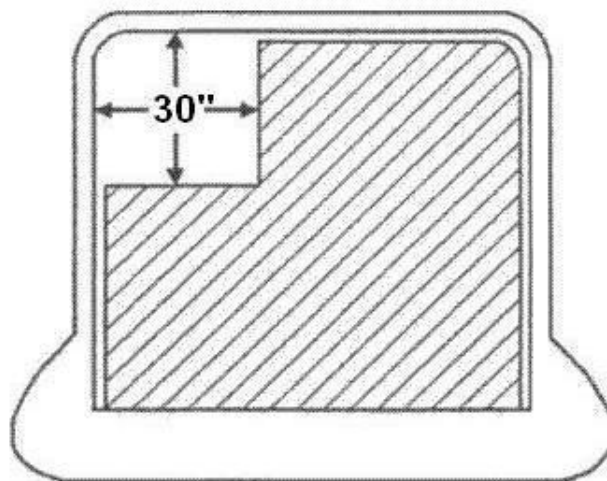
AS-532 Required evacuation routes

a. Evacuation routes (see figure E).

1. For evacuation routes the obstacle-free passage from the floor to 25 inches (635 mm) height shall be at least 15 inches (381 mm) wide, above which the passage shall be at least 20 inches (508 mm) wide.
2. When the obligation as stated in paragraph a.1 cannot be met, an acceptable alternative is a crawl way over the cargo of at least 30 inches (762 mm) wide and 30 inches (762 mm) high, exclusively for use by crew.
3. Between the sliding doors there shall be a cross aisle with an obstacle-free passage of at least 20 inches (508 mm) width, from the floor to the ceiling.
4. Every occupant in the cabin shall be able to reach the sliding doors or the rear emergency exits via an evacuation route from his assigned seat.



Minimum evacuation space



Alternative minimum evacuation space for groups of maximum 10 persons, consisting of crew only

Figure E: **Minimum dimensions of evacuation route AS-532**