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Air cargo equipment — Interline pallet nets

Équipement pour le fret aérien — Filets de palettes pour transport aérien

Reference number
ISO 4170 : 1987 (E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4170 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles.*

This second edition cancels and replaces the first edition (ISO 4170 : 1980), of which it constitutes a technical revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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Air cargo equipment — Interline pallet nets

1 Scope and field of application

This International Standard specifies dimensional, structural and environmental requirements for nets used to secure cargo on aircraft pallets meeting the requirements of ISO 4171.

This International Standard establishes four basic sizes of pallet nets as given in the table.

Table — Sizes of pallet nets

Size code in accordance with ISO 8097	Pallet size (see ISO 4171)
A	2 235 mm × 3 175 mm (88 in × 125 in)
B	2 235 mm × 2 743 mm (88 in × 108 in)
L	1 534 mm × 3 175 mm (60.4 in × 125 in)
M	2 438 mm × 3 175 mm (96 in × 125 in)

2 References

ISO 4171, *Interline air cargo pallets.*

ISO 7166, *Aircraft — Rail and stud configuration for passenger equipment and cargo restraint.*

ISO 8097, *Aircraft — Minimum airworthiness requirements and test conditions for certified air cargo unit load devices.* [1)]

IATA, *Unit Load Devices (ULD) Technical Manual.*

3 Basic requirements

3.1 Configuration

The net assembly shall include netting, adjustment hardware and pallet attachment fittings. (See figure 1.)

3.2 Construction

3.2.1 Weatherproofing

Net construction shall be rugged and weather-resistant, thus minimizing maintenance and original cost.

3.2.2 Fittings and appurtenances

All fittings and appurtenances shall be within the maximum allowable contour appropriate to the aircraft installation. The thickness of the fittings and appurtenances between the heights of 150 mm and 760 mm above the top of the base shall not exceed 50 mm; elsewhere the thickness shall not exceed 25 mm.

NOTE — The IATA ULD Technical Manual may be referred to for specific contours.

3.2.3 Structural strength

Net construction shall have sufficient structural strength to withstand, without permanent detrimental deformation, the static loads and impact shock encountered in normal carrier service.

3.2.4 Assembly construction

The net assembly shall be constructed so that it adequately encompasses the pallet load and attaches to fittings on all four edges of the pallet in accordance with the appropriate configuration shown in ISO 8097.

3.2.5 Hardware

3.2.5.1 The net hardware shall be designed and constructed so that it can be easily operated in confined areas.

1) *De facto* NAS 3610.

3.2.5.2 All hardware shall be securely attached to prevent it being lost.

3.2.5.3 Free ends that pass through adjusting buckles shall be equipped with stops.

3.2.5.4 Provision shall be made to enable the net to be tensioned evenly over the cargo. If a mechanical advantage facility is provided to achieve the tension, the release of the tensile force shall be achieved by an operating force not greater than 16 % of the tensioning force and it shall be possible to release the force using a gloved hand.

3.2.5.5 Pallet attachment fittings shall conform with ISO 7166.

3.2.6 Netting mesh and configuration

3.2.6.1 The net design shall ensure a minimum installation time and shall be of a configuration such as to minimize the possibility of incorrect installation.

3.2.6.2 The net shall be constructed in such a manner that entanglement during installation and storage is minimized.

3.2.6.3 Nets shall be adequately treated to minimize shrinkage.

3.2.6.4 All netting ends shall be suitably prepared to prevent fraying.

3.2.6.5 The material used for netting shall meet the appropriate regulatory standards for nylon or polyester and its treatment. If other materials are used, they shall meet equivalent standards for material and treatment.

3.2.6.6 If netting is made from nylon, polyester or other textile material, consideration should be given to take account of strength degradation resulting from wear and exposure to ultraviolet radiation. (See figure 2.)

3.2.6.7 Nets shall restrain load within the maximum allowable contours, as shown in IATA ULD Technical Manual, Specification 50/0, Appendix D.

3.2.6.8 The net mesh shall be capable of restraining boxes with dimensions of 250 mm × 300 mm × 300 mm (10 in × 12 in × 12 in).

3.2.7 Reefing adjustment

The net shall be constructed so as to provide adjustment in the vertical range from 610 mm (24 in) to a height of 3 m (118 in) or height appropriate to the aircraft installation.

3.2.8 Colour

The colour of the net material and hardware shall be optional. However, contrasting colours may be used to distinguish net components for simplifying attachment of the net to the pallet.

3.2.9 Special marking

The net shall be clearly marked to facilitate rigging on the pallet. If the net operation is not omnidirectional, top and bottom, and inside and outside shall be indicated. Character markings or colour coding may be used to facilitate rapid attachment of net fittings to the pallet.

3.2.10 Weight[1] limits

The tare weight of the net assembly shall be kept to a minimum consistent with the requirements and limits of sound design practices.

3.3 Ratings

The net, when attached to the pallet, shall be designed to restrain the following gross weights[1] according to the appropriate configuration shown in ISO 8097:

Net A: 6 804 kg (15 000 lb)

Net B: 3 629 kg (8 000 lb)

Net L: 3 175 kg (7 000 lb)

Net M: 6 804 kg (15 000 lb)

NOTE — For corresponding pallet sizes, see the table.

3.4 Design loads

Design loads are given for reference and guidance purposes in the annex.

3.5 Airworthiness

For airworthiness requirements, ISO 8097 shall be consulted.

4 Environmental criteria

4.1 Materials

4.1.1 The net design and construction should take into consideration environmental degradation which will occur over the service life. (See figure 2.)

NOTE — A future International Standard dealing with the environmental degradation of textiles is currently being prepared.

4.1.2 The structural and operational integrity of the net shall be maintained at temperatures from − 55 to + 70 °C (− 65 to + 160 °F).

4.1.3 All components of the net shall be protected against deterioration or loss of strength in service due to weathering, corrosion or other causes where the type of material used requires such protection.

1) The term "weight" is used throughout this International Standard, instead of the correct technical term "mass", in order to conform to current commercial usage (see clause 6).

4.1.4 The net shall be designed so that it will withstand handling common to air/land freight terminal and ramp operations.

4.2 Materials and processes

4.2.1 In order to provide for maximum service life, consideration should be given to the materials and processes used in the construction to take into account the extremely hard usage to which the net will be subjected. All metal parts should be suitably protected against corrosion. All non-metallic materials which are liquid-absorbent should be sealed or treated to prevent liquid absorption.

4.2.2 The materials used shall be flame-resistant in accordance with appropriate regulatory requirements.

5 Production nets

In order to show compliance with its specification standard, commercial inspection, and quality control methods and practices shall be used to ensure that production units are not inferior to the article tested. Where changes are made to production units and product similarity cannot be clearly established, the first product so changed shall be retested to prove compliance with its specification.

6 Marking requirements

All nets covered by this International Standard shall be marked in accordance with the following requirements:

Manufacturer:	....	
	(Name)	(Country)
Part number:		
Date of manufacture:		
Service life:		
Tare weight: ....kg	....................lb	

The markings shall be shown on the outside of the net in such a manner that good readability is ensured under all phases of handling.

NOTE — All weights to be rounded off to the next highest 0,5 kg or full pound.

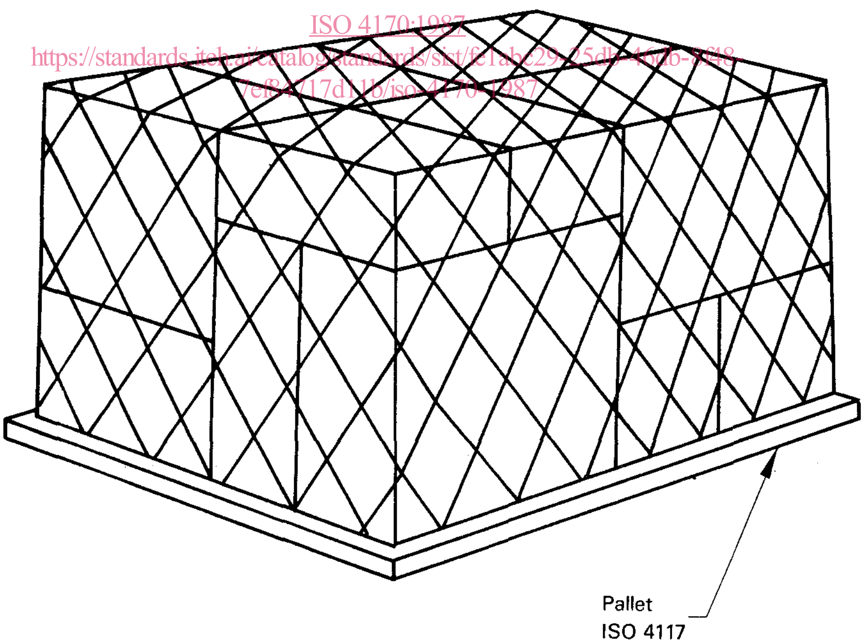

Figure 1 — Net assembly (typical design — pattern optional)

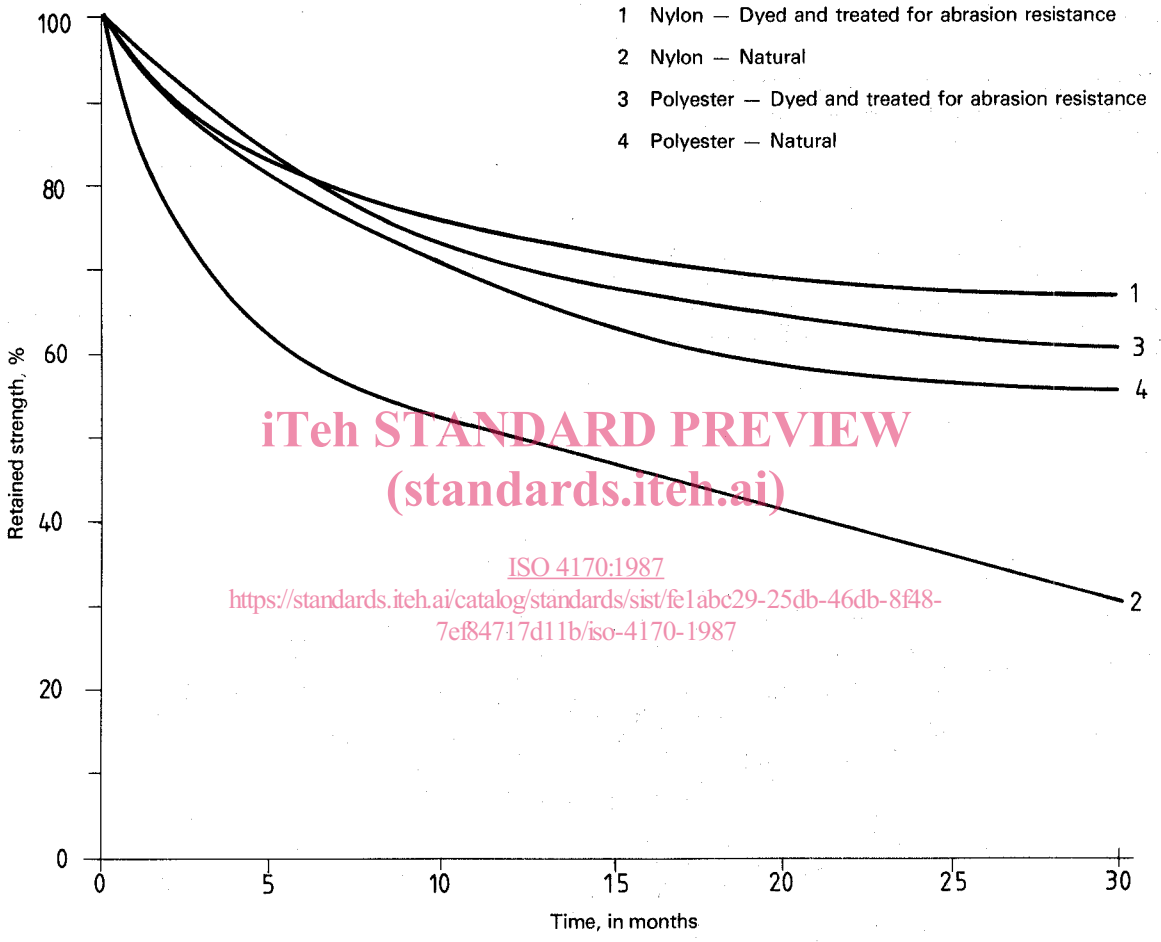

Figure 2 — Typical effect on strength of materials when exposed to weathering (natural elements)

Annex

Design loads

(This annex is for reference and guidance purposes only.)

A.1 The net assembly shall be tested to show compliance with performance requirements specified in ISO 8097.

The particular net configuration shall be tested for each of the load and restraint conditions applicable to that configuration, unless the critical combination is beyond doubt, in which case the net need only be tested for the most critical conditions.

A.2 Alternatively, compliance with ISO 8097 may be proven by analytical methods.

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