



# AEROSPACE STANDARD

**AS1492™****REV. C**

Issued 1982-03  
Reaffirmed 2012-09  
Revised 2023-01

Superseding AS1492B

(R) Interline Air Cargo Pallet Nets

## RATIONALE

AS1492C has been revised from AS1492B in both format and wording to be harmonized with ISO 4170( ). Reference to AS36100 in addition to NAS3610 has been added.

Pallet nets designated in the prior revision of this specification as Type III pallet nets were not covered by NAS3610 but are now covered by AS36100 as Type 2 pallet nets. The performance and test requirements for the pallet nets contained in AS36100 are more comprehensive than those specified in the prior revision of this specification and thus the need for inclusion of Type III pallet nets in this specification has been removed.

### 1. SCOPE

This document establishes dimensional, structural, and environmental requirements for Type II/2 interline pallet nets. Type II/2 covers NAS3610/AS36100 code sizes.

#### 1.1 Purpose

This aerospace standard establishes minimum requirements for pallet nets used to transport cargo in an approved aircraft cargo compartment with a restraint system that conforms to the flight cargo restraint requirements of Title 14 CFR Part 25, except for the 9.0 g forward ultimate inertia force of § 25.561 (b)(3)(ii) and using pallets that meet the requirements of AS1491. The minimum essential criteria are identified by the use of the key word "shall." Recommended criteria are identified by the key word "should" and while not mandatory, are considered to be of primary importance in providing safe air transport of palletized cargo. Deviation from the recommended criteria should occur only after careful consideration, extensive testing, and thorough service evaluation have shown alternate methods to be satisfactory.

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## 1.2 Nominal Sizes (see Table 1)

**Table 1 - Type II/2 pallet net sizes**

| Code Size | Pallet Size                         |
|-----------|-------------------------------------|
| A         | 2235 x 3175 mm (88 x 125 inches)    |
| B         | 2235 x 2743 mm (88 x 108 inches)    |
| G         | 2438 x 6058 mm (96 x 238.5 inches)  |
| K         | 1534 x 1562 mm (60.4 x 61.5 inches) |
| L         | 1534 x 3175 mm (60.4 x 125 inches)  |
| M         | 2438 x 3175 mm (96 x 125 inches)    |
| N         | 1562 x 2438 mm (61.5 x 96 inches)   |
| Q         | 1534 x 2438 mm (60.4 x 96 inches)   |
| R         | 2438 x 4978 mm (96 x 196 inches)    |
| S         | 1562 x 2235 mm (61.5 x 88 inches)   |
| T         | 3175 x 4978 mm (125 x 196 inches)   |
| U         | 1397 x 2438 mm (55 x 96 inches)     |

## 1.3 Basic Pallet Net Configuration

### 1.3.1 Contours

The pallet net mesh and hardware shall not exceed the vertical planes located 50 mm (2 inches) inside the pallet edges or maximum contour vertical sides as defined in IATA Specification 50/0.

### 1.3.2 Adjustment

Pallet nets used over bulk cargo shall be adjustable for variable heights from 610 mm (24 inches) to maximum contour height as defined in IATA Specification 50/2.

### 1.3.3 Pallet Nets Used Over Containers or load Formers (Igloos)

Pallet nets used over containers or load formers shall maintain all hardware within the maximum ULD contour as defined in IATA Specification 50/0. Pallet nets used over load formers shall have hardware which allows a minimum adjustment range of 150 mm (6 inches) (IATA Specification 50/2).

## 2. REFERENCES

### 2.1 Applicable Publications

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply (except where specified by Technical Standard Order). The applicable issue of other publications shall be the issue in effect on the date of the purchase order (design acceptance). In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

#### 2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

|          |   |
|----------|---|
| AIR1490  | Environmental Degradation of Textiles   |
| ARP1334  | Ground Equipment Requirements for Compatibility with Aircraft Unit Load Devices |
| ARP36103 | Air Cargo Unit Load Devices - Center of Gravity Control Methods                 |
| AS1491   | Interline Air Cargo Pallets.  |

|                        |  |
|------------------------|--|
| AS [and EN/JIS-Q] 9100 | Quality Management Systems - Requirements for Aviation, Space, and Defense Organizations |
| AS [and EN/JIS-Q] 9102 | Aerospace First Article Inspection Requirement   |
| AS33601                | Track and Stud Fitting for Cargo Transport Aircraft, Standard Dimensions for             |
| AS36100                | Air Cargo Unit Load Devices - Performance Requirements and Test Parameters               |
| AS36101                | Air Cargo Unit Load Devices - Load Distribution Model                                    |
| AS36102                | Air Cargo Unit Load Devices - Testing Methods  |

#### 2.1.2 AIA Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, [www.aia-aerospace.org](http://www.aia-aerospace.org).

|         |  |
|---------|--|
| NAS3610 | Cargo Unit Load Devices, Specification for |
|---------|--|

#### 2.1.3 ISO Publications

Copies of these documents are available online at <https://webstore ansi.org/> or International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, Tel: +41 22 749 01 11, [www.iso.org](http://www.iso.org).

|             |   |
|-------------|---|
| ISO 4116    | Air cargo equipment - Ground equipment requirements for compatibility with aircraft unit load devices       |
| ISO 4170    | Air cargo equipment - Interline pallet nets   |
| ISO 4171    | Air cargo equipment - Interline 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 |
| ISO 21100   | Air cargo unit load devices - Performance requirements and test parameters                                  |
| ISO/TR 8647 | Environmental degradation of textiles used in air cargo restraint equipment                                 |

#### 2.1.4 IATA Publications

Available from International Air Transport Association, Publications Assistant, 800 Place Victoria, P.O. Box 113, Montreal, Quebec H4Z 1M1, Canada, Tel: 1-514-874-0202, [www.iata.org](http://www.iata.org).

|  |                                    |
|--|------------------------------------|
| IATA ULDR Standard Specification Number 50/0 | ULD General Technical Requirements |
| IATA ULDR Standard Specification Number 50/1 | Aircraft Pallet                    |
| IATA ULDR Standard Specification Number 50/2 | Aircraft Pallet Net                |

## 2.1.5 U.S. Government Publications

United States Federal Test Method Standard 406, Plastics - Methods of Testing

Federal Aviation Administration Technical Standard Order TSO C90 – Cargo Pallets, Nets and Containers

Federal Aviation Regulations 14 CFR Part 21 – Certification Procedures for Products and Parts

Federal Aviation Regulation Title 14 CFR Part 25, Airworthiness Standards: Transport Category Airplanes

(Advisory Circular 21.1B – Production Certificates (Quality Control data requirements))

(Federal Aviation Administration Order 8120.2B – Production approval and Surveillance Procedures)

(Federal Aviation Administration Order 8120.12 – Use of 'Other Parties' to Supplement Supplier Control Program)

## 2.2 Definitions

**CONTAINER (AIR CARGO -):** A rigid structure which interfaces directly with the aircraft cargo handling and restraint system and alone performs all the functions of a unit load device.

**PALLET (AIR CARGO -):** A unit load device consisting of a flat platform with flat undersurface of standard dimensions, on which goods are assembled and secured by a pallet net before being loaded as a unit onto the aircraft, and which interfaces directly with the aircraft handling and restraint system.

**NET (AIR CARGO -):** A webbing or rope net for restraining load onto an air cargo pallet.

**RESTRAINT SYSTEM:** Equipment for supporting and restraining unit load devices in an aircraft against the ground/flight loads. It usually consists of such items as side guides and locks for securing unit load devices to the aircraft structure. It does not include unit load devices, barrier nets and tie-down straps.

**UNIT LOAD DEVICE (ULD):** Device for grouping, transferring and restraining cargo for transit.

## 3. CONSTRUCTION

### 3.1 General Construction

The pallet net assembly shall include pallet netting, adjustment hardware, and pallet attachment fittings. Attachment locations and details are defined in NAS3610/AS36100 for the applicable Type II/2 code sizes.

### 3.2 Mesh Configuration

Pallet net design objectives shall be to provide a minimum installation time and a configuration that shall minimize the possibility of improper installation. The pallet net shall be constructed in such a manner that pallet netting entanglement during installation and storage is minimized. Pallet netting shall be adequately treated to minimize shrinkage.

### 3.3 Materials

The material to be used for pallet netting and hardware shall meet the appropriate regulatory standards for cargo aircraft restraint per Federal Aviation Regulation Title 14 CFR Part 25.

### 3.4 Hardware and Tensioning

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

- 3.4.2 All hardware shall be securely sewn into the pallet netting or otherwise attached to prevent loss. Loose pallet netting ends that pass through adjusting buckles (if used) shall be equipped with stops.
- 3.4.3 Provision shall be incorporated to enable the pallet net to be tensioned evenly over the cargo. If a mechanical advantage facility is provided to achieve this tension, the release of the tensile force shall be achieved by an operating force not greater than 16% of the tension force.

### 3.5 Tie Down Fittings

All pallet net fittings shall incorporate tie down stud(s) per AS33601 for attachment to pallets. Single stud tie-down fitting attachments shall have a minimum ultimate load capacity of 8.9 kN<sup>1</sup> (2000 pounds) in all directions, horizontal to a vertical. Double stud tie-down fitting attachments shall have a minimum ultimate load capacity of 17.8 kN<sup>1</sup> (4000 pounds) in all directions, horizontal to vertical. The load application point shall be 21 mm (0.83 inch) or less from the head end of the stud.

### 3.6 Color

Color of the pallet net material shall be optional. However, contrasting colors may be used to distinguish pallet net components for simplifying the installation of the pallet net to the pallet.

### 3.7 Special Marking

The pallet net shall be clearly marked to facilitate rigging on the pallet. If the pallet net operation is not omnidirectional, forward/aft and side shall be indicated. Character marking or color coding may be used to facilitate rapid attachment of pallet net fittings to the pallet. See Section 6 for additional marking requirements.

### 3.8 Fraying

All pallet netting ends shall be treated to prevent fraying.

### 3.9 Strength Sample

An additional 1.8 m (6 feet) of the primary pallet net material should be attached to the pallet net for periodic strength sampling purposes. The sample should be attached in a location which will not interfere with pallet net operation, nor shall it dangle loosely.

- 3.9.1 The sample shall be marked, "TEST SAMPLE."

## 4. DESIGN LOADS

### 4.1 Maximum Gross Weight

- 4.1.1 The Type II/2 pallet net shall be able to restrain the maximum gross weight listed in Table 2.

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<sup>1</sup> 1 N = 0.225 lbf  
1 kN = 10<sup>3</sup> N