



AEROSPACE RECOMMENDED PRACTICE

ARP36104™**REV. A**

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Superseding ARP36104

Air Cargo Pallets and Nets Compatibility

RATIONALE

ARP36104A has been reaffirmed to comply with the SAE five-year review policy.

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1. SCOPE

1.1 Purpose

- 1.1.1 This SAE Aerospace Recommended Practice (ARP) provides the criteria to be applied in order to determine compatibility with each other of an air cargo pallet and air cargo pallet net airworthiness approved under either NAS 3610 [TSO C90c] or AS36100A [TSO pending] performance and testing requirements.
- 1.1.2 It is intended to provide air cargo carriers/operators with the means of determining both the geometric compatibility and the airworthiness approval compatibility of a given pallet with a given net, as well as any limitations to their approved maximum rated capacity resulting from their being used in conjunction with each other.

1.2 Field of Application

- 1.2.1 This Aerospace Recommended Practice is intended to apply to the most common airworthiness approved ("certified") air cargo pallets and nets combinations to be encountered on board civil transport aircraft.
- 1.2.2 It applies to all allowable pallet and net combinations where either the pallet or the net is approved under AS36100A [TSO pending] performance and testing requirements. It does not apply to combinations of pallet and net configurations that are only defined in NAS 3610 [TSO C90c], compatibility of which with each other shall be determined in accordance with the applicable NAS 3610 Rev.10 configuration drawing(s).
- 1.2.3 It does not apply to any non airworthiness approved ("non certified") pallets or nets, the use of which, where allowable, shall conform to the relevant provisions of the aircraft manufacturer's approved Weight and Balance manual for the aircraft type or sub-type concerned.
- 1.2.4 It is not intended for use on military transport aircraft. Nothing, however, precludes it being used for guidelines in this case, it pertaining to the military operator to identify and implement any additional applicable criteria.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. 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 U.S.A. and Canada) or 724-776-4970 (outside USA), www.sae.org

ARP5486 Air Cargo Pallets - Utilization Guidelines

AS36100A Air Cargo Unit Load Devices - Performance Requirements and Test Parameters [TSO pending]

2.1.2 U.S. Government Publications

Available from U.S. Government Printing Office, Mail Stop SSOP, Washington DC 20402-9325, Tel: 866-512-1800, or the FAA web site at www.airweb.faa.gov/rgl.

Federal Aviation Regulations Title 14 CFR (FAR) Part 21 - Certification Procedures for Products and Parts, Subpart O - Technical Standard Order Authorizations

FAA Technical Standard Order (TSO) C90 - Cargo Pallets, Nets and Containers

Federal Aviation Regulations Title 14 CFR (FAR) Part 25, Airworthiness Standards: Transport Category Airplanes

FAA Advisory Circular 120-59, Air carriers internal evaluation program

2.1.3 European Union Publications

Available from European Aviation Safety Agency, Postfach 10 12 53, D-50452 Koeln, Germany, Tel: +49-221-8999-000, www.easa.eu.int.

European Aviation Safety Agency CS-ETSO, Certification Specifications for European Technical Standard Orders

European Technical Standard Order (ETSO) C90 - Cargo Pallets, Nets and Containers

European Aviation Safety Agency CS-25, Certification Specifications for Large Aeroplanes

2.1.4 AIA Publications

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

NAS 3610 Cargo unit load devices - Specification for [Revision 10, 1990, TSO C90c]

2.1.5 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org or International Organization for Standardization, 1 rue de Varembe, Case postale 56, CH-1211 Geneve 20, Switzerland, Tel: +41-22-749-01-11, www.iso.org or any of the national Standards Institutes worldwide, Members of ISO.

ISO 8097 Aircraft - Minimum airworthiness requirements and test conditions for certified air cargo unit load devices [4th edition, 2001, ETSO C90c]

ISO 21100 Air cargo unit load devices - Performance requirements and testing parameters [in preparation, ETSO pending]

2.2 Terms and Definitions

For the purposes of the present ARP, the following terms and definitions apply unless otherwise defined in the document:

CIVIL TRANSPORT AIRCRAFT: An aircraft operated for civil commercial transport of passengers or freight, and capable of carrying air cargo unit load devices for baggage or freight.

INSTALLATION: The fact of installing a unit load device for flight into an aircraft's cargo compartment and restraint system.

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

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 net before being loaded as a unit onto the aircraft, and which interfaces directly with the aircraft handling and restraint system.

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 rollers, 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. It may consist of a pallet with a net or it may be a container.

3. GENERAL

3.1 Identification

Pallets and nets shall be identified and evaluated for compatibility by the airworthiness approval classification identifier code marked on them, e.g. :

"NAS 3610 - 2A3N" = Type 2, size A (2235 mm x 3175 mm, 88 in x 125 in), ULD configuration 2A3, Net [example for pallets or nets approved under TSO C90c based on NAS 3610 requirements], or

"AS36100 - 2A7P" = Type 2, size A (2235 mm x 3175 mm, 88 in x 125 in), ULD configuration A7, Pallet [example for pallets or nets approved under TSO [pending] based on AS36100A requirements].

NOTE: See NAS 3610 or AS36100A, as appropriate, for size codes and classification identifier decoding. Only Type 2 pallets and nets are considered within AS36100A and this ARP.

3.2 Ultimate Load Criteria

For each ULD configuration code, NAS 3610 or AS36100A, as appropriate, defines the maximum ultimate load criteria (maximum ultimate loads in each direction of restraint, maximum allowable center of gravity eccentricity and height) approved for that configuration, regardless of the aircraft of installation.

NOTES:

- a. NAS 3610 configurations generally define several sets of ultimate load criteria depending on the restraint system shown. Each AS36100A ULD configuration defines only one set of ultimate load criteria and one testing restraint condition.
- b. In order to avoid ambiguity, AS36100A ULD configurations were given the same code as NAS 3610 ones when both geometry and maximum ultimate load criteria are identical, and a different code whenever they present a difference.