BS ISO 16049-1:2013

BSI Standards Publication

Air cargo equipment — Restraint straps

Part 1: Design criteria and testing methods

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National foreword

This British Standard is the UK implementation of ISO 16049-1:2013. It supersedes BS ISO 16049-1:2001, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ACE/57, Air cargo and ground support equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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INTERNATIONAL STANDARD

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Air cargo equipment — Restraint straps —

Part 1: Design criteria and testing methods

Équipement pour le fret aérien — Sangles d'arrimage —

Partie 1: Critères de conception et méthodes d'essai

Reference number
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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 20, *Aircraft and space vehicles,* Subcommittee SC 9, *Air cargo and ground equipment.*

This second edition cancels and replaces the first edition (ISO 16049-1:2001), which has been technically revised.

ISO 16049 consists of the following parts, under the general title *Air cargo equipment — Restraint straps*:

— *Part 1: Design criteria and testing methods*

— *Part 2*: *Utilization guidelines and lashing calculations*

Introduction

This part of ISO 16049 specifies the design criteria and testing methods applicable to air cargo restraint straps to be used for tie-down of unitized or non-unitized cargo on board civil transport aircraft.

Throughout this part of ISO 16049, the minimum essential criteria are identified by use of the key word "shall". Recommended criteria are identified by use of the key word "should" and, while not mandatory, are considered to be of primary importance in providing safe restraint straps. Deviation from recommended criteria should only occur after careful consideration, extensive testing, and thorough service evaluation have shown alternative methods to be satisfactory.

The requirements of this part of ISO 16049 are expressed in the applicable SI units, with approximate inch-pound units conversion between brackets for convenience in those countries using that system.

INTERNATIONAL STANDARD **ISO 16049-1:2013(E)**

Air cargo equipment — Restraint straps —

Part 1: Design criteria and testing methods

1 Scope

This part of ISO 16049 specifies the design criteria and testing methods adequate to guarantee the ultimate load and operational dependability of cargo restraint strap assemblies with a typical rated ultimate tension load capability of 22 250 N (5 000 lbf), as used by the airline industry in order to restrain on board civil transport aircraft during flight:

a) cargo loaded and tied down onto airworthiness approved air cargo pallets, themselves restrained into aircraft lower deck, main deck or upper deck cargo systems and meeting the requirements of ISO 8097 (NAS 3610) or ISO/PAS 21100, or

b) non-unitized individual pieces of cargo, or pieces of cargo placed onto an unrestrained ("floating") pallet into either lower deck, main deck or upper deck containerized cargo compartments of an aircraft.

The same restraint strap assemblies can also be used in other applications such as:

c) non-containerized (bulk loaded) baggage and cargo compartments,

d) to ensure cargo restraint inside an airworthiness approved air cargo container.

NOTE The ultimate loads allowable on the attachment points available in most aircraft bulk compartments and inside most air cargo containers are significantly lower than 22 250 N (5 000 lbf). This results in the restraint arrangement's ultimate load capability being dictated by the weakest element, i.e. the attachment points. Typical 22 250 N ultimate load restraint straps will therefore be in excess of the requirements for such applications.

Compliance with this part of ISO 16049 provides one means of cargo restraint straps airworthiness approval by Civil Aviation Authorities under TSO / ETSO C-172, in addition to the other requirements therein.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 4117, *Air and air/land cargo pallets — Specification and testing*

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*[1)]

ISO/TR 8647, *Environmental degradation of textiles used in air cargo restraint equipment*

ISO 9788, *Air cargo equipment — Cast components of double stud fitting assembly with a load capacity of 22 250 N (5 000 lbf), for aircraft cargo restraint*

ISO 10254, *Air cargo and ground equipment — Vocabulary*

1) Endorsement of NAS 3610.