

INTERNATIONAL STANDARD

ISO
21849

First edition
2006-12-01

Aircraft and space — Industrial data — Product identification and traceability

*Aéronautique et espace — Données industrielles — Identification des
produits et traçabilité*



Reference number
ISO 21849:2006(E)

© ISO 2006

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

This document is a preview generated by EVS

© ISO 2006

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	2
4 Product/part identification and traceability process.....	3
4.1 General provisions	3
4.2 Product/part identification and traceability decision tree diagram	4
4.3 Conformance classes.....	5
5 Conformance Class 1.....	5
5.1 Purpose.....	5
5.2 Detailed requirements	6
6 Conformance Class 2	9
6.1 Purpose.....	9
6.2 Detailed requirements	10
6.3 Recommended process	10
7 Data formats	10
7.1 General.....	10
7.2 Text Element Identifiers	11
7.3 EAN.UCC Application Identifiers.....	11
7.4 ASC MH10 Data Identifiers.....	12
8 Product/part marking.....	12
8.1 Direct.....	12
8.2 Label or nameplate	12
8.3 Marking symbology	12
8.4 Marking layout.....	13
8.5 Human translation	14
8.6 Extended data content	15
8.7 Limited marking space procedure	16
8.8 General requirements for permanent product/part identification	17
8.9 Detailed requirements for symbols.....	17
Annex A (normative) Data dictionary: Essential data elements.....	19
Annex B (normative) Data dictionary: Optional/other data elements	28
Annex C (informative) Life cycle traceability.....	46
Annex D (normative) EAN.UCC Application Identifier (AI) equivalencies	48
Annex E (normative) ASC MH10 Data Identifier (DI) (codified in ISO/IEC 15418) equivalencies	49
Annex F (normative) Encoding comparison.....	51
Annex G (informative) Legacy part identification schema.....	52
Annex H (informative) Data exchange.....	53
Annex I (informative) RFID tag	55
Annex J (informative) Quality level, directly marked matrix symbols	57
Bibliography	58

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 21849 was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*.

This first edition of ISO 21849 cancels and replaces ISO/TS 21849:2003, which has been technically revised.

Introduction

The accuracy of data collected and exchanged by trading partners can be improved by using automatic identification technologies in lieu of manual key entry. Automatic identification technologies include matrix symbologies, linear bar code and radio frequency identification (RFID) tags.

Employment of automatic identification technology provides an accurate, timely and efficient method of data entry and facilitates data transfer and storage for computerized information management systems.

This International Standard defines and establishes a repeatable process and data structure for product identification and traceability that supports life cycle management of a product regardless of ownership and configuration changes. Use of the product identification and traceability guidelines described in this International Standard will enable repeatable processes for error free data entry, part tracking, dispatch, inventory, maintenance, import/export, detection of unapproved parts and repairs. Most importantly, a repeatable process and data structure will allow industry partners to share data efficiently. The macro-processes of product data management, asset management, configuration management, reliability and maintenance management, and product performance management will be the direct beneficiaries of the product identification and traceability schema defined in this International Standard.

Establishment of a common set of data and well-defined definitions and formats for product identification and traceability provides the base on which to build specific requirements for the exchange of product life cycle information. The specific requirements that the product identification and traceability schema defined in this International Standard fulfils are as follows:

- to provide a unique, permanent identification for the life of the product;
- to provide a schema which meets engineering, operational, and logistics identification and traceability needs;
- to use machine-readable media to obtain accurate and timely data;
- to provide a schema which is independent of marking, symbology and recording media technology; and
- to provide a structure which allows data to be exchanged without the use of data mappers (cross-reference/translation tables), throughout an enterprise and with trading partners, while taking advantage of the World Wide Web.

The focus of this International Standard is industrial products within the aircraft and space sectors. Industrial products have a life cycle measured in years, normally are repairable, often are upgraded to a new configuration, and change of ownership over their life cycle is commonplace. Normally industrial products are not sold in the retail marketplace.

The decision to use automated identification processes should be a cooperative effort by trading partners within an industry and between industries to achieve more timely data input, data accuracy and the achievement of increased productivity while concurrently decreasing costs.

This document is a preview generated by EVS

Aircraft and space — Industrial data — Product identification and traceability

1 Scope

This International Standard specifies the requirements for a product identification and traceability schema for life cycle management of aircraft and space products/parts. It specifies the minimum essential identification information needed for traceability of a product for its life cycle. It also provides the data structures for use with automatic identification technologies that support product/part life cycle data management activities.

This International Standard defines a structure and rules for establishing a unique identifier for product/part identification and traceability. The rules and structure provide sufficient options to support various business practices. They provide the minimum amount of standardization required to support interoperability, improved business processes and efficiency across multiple users and applications of machine-readable media technologies.

This International Standard also defines and establishes repeatable processes to allow efficient exchange of product data for life cycle product/part traceability, configuration, reliability, maintenance, and product performance management purposes.

It specifies the data carriers appropriate for representing the product data in a machine-readable form and associated dimensional and quality parameters.

Industries or trading partners will need to develop specific implementation guidelines to employ the principles defined in this International Standard.

Although primarily intended for aircraft and space products/parts, this International Standard may be used for other products/parts where desired.

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/IEC 646, *Information technology — ISO 7-bit coded character set for information interchange*

ISO 8601, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO 10303-239, *Industrial automation systems and integration — Product data representation and exchange — Part 239: Application protocol: Product life cycle support*

ISO/IEC 15415, *Information technology — Automatic identification and data capture techniques — Bar code print quality test specification — Two-dimensional symbols*

ISO/IEC 15416, *Information technology — Automatic identification and data capture techniques — Bar code print quality test specification — Linear symbols*

ISO/IEC 15417, *Information technology — Automatic identification and data capture techniques — Bar code symbology specification — Code 128*

ISO/IEC 15418, *Information technology — EAN/UCC Application Identifiers and Fact Data Identifiers and Maintenance*

ISO/IEC 15434, *Information technology — Automatic identification and data capture techniques — Syntax for high-capacity ADC media*

ISO/IEC 15459 (all parts), *Information technology — Unique identifiers*

ISO/IEC 16022, *Information technology — Automatic identification and data capture techniques — Data Matrix bar code symbology specification*

ISO/IEC 16388, *Information technology — Automatic identification and data capture techniques — Bar code symbology specifications — Code 39*

ISO/IEC 18004, *Information technology — Automatic identification and data capture techniques — QR Code 2005 bar code symbology specification*

ISO/IEC 19762-1, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to AIDC*

ISO/IEC 19762-2, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 2: Optically readable media (ORM)*

Common Support Data Dictionary (CSDD), Air Transport Association

Extensible Markup Language (XML) 1.0, W3C

General EAN.UCC Specifications, EAN International

SAE AS9132 (EN9132) (SJAC9132), *Data Matrix Quality Requirements for Parts Marking*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762-1, ISO/IEC 19762-2 and the following apply.

3.1

alphanumeric character set

character set that contains both letters and digits and may contain special characters

[ISO/IEC 2382-4]

3.2

conformance class

category of data representation specified in terms of the variability allowed for the data content

3.3

data delimiter

character or set of characters which separates data elements in a string of data elements

3.4

Enterprise Identifier

code uniquely assigned to an enterprise by an issuing agency that is assigned by the registration authority of ISO/IEC 15459