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Freight containers – Electronic seals – Part 6: Message sets for transfer of data between seal reader and host computer – (COSEAL)

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Content

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
3.1 Message data elements.....	2
3.2 Message data elements description	2
4 Message structure and description	3
4.1 Message structure description.....	3
4.2 Message file structure.....	4
Bibliography.....	5

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.

International Standard ISO 18185, Part 6 was prepared by Technical Committee 104, Freight Containers, Subcommittee SC 4, Identification and communication, Working Group WG2, Automatic Identification Equipment (AEI) for containers and container related equipment.

Attention is drawn to the possibility that some of the elements of this part of ISO 18185 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 18185 consists of the following parts, under the general title *Freight containers— Electronic seals*:

- *Part 1: Communication protocol*
- *Part 2: Application requirements*
- *Part 3: Environmental characteristics*
- *Part 4: Data protection*
- *Part 6: Message sets for transfer between seal reader and host computer*
- *Part 7: Physical layer*

Introduction

This International Standard was prepared by ISO Technical Committee 104/Subcommittee 4/Working Group 2, using the drafting conventions of ISO/IEC Directives, Part 2.

This standard provides a system for the identification and presentation of information about freight container electronic seals. The identification system provides an unambiguous unique identification of the container seal, and its status.

The presentation of this information is provided through a radio-communications interface providing seal identification and a method to determine whether a freight container seal's integrity has been compromised.

Freight containers – Electronic seals – Part 6: Message sets for transfer between seal reader and host computer (COSEAL)

1 Scope

This part of the ISO 18185 establishes a standard message guideline for data transmission between the electronic seal reader and the local host computer system. The purpose is to provide transmission of accurate and complete seal data to ensure efficiency and accountability (audit trail) related to the seal verification process. This standard message is also to provide for seamless integration with any other standard data format for transmission to single or multiple remote host(s) as well as simple ex-/import processes within a system and/or between systems. This message includes the data requirements related to security against terrorism as well as theft and traditional contraband.

It consists of,

- Data element directory for the development of messages;
- Message structure guideline for data transmission

This International Standard applies to all electronic seals used on:

Freight containers covered by International Standards ISO 668, parts 1 to 5 of ISO 1496, and ISO 8323 and should, wherever appropriate and practicable, also be applied to freight containers other than those covered by these International Standards.

This International Standard is to be used in conjunction with the following standards:

ISO 18185-1, Freight containers — Electronic seals — Part 1: Communication protocol

ISO 18185-2, Freight containers — Electronic seals — Part 2: Application requirements

ISO 18185-3, Freight containers — Electronic seals — Part 3: Environmental characteristics

ISO 18185-4, Freight containers — Electronic seals — Part 4: Data protection

ISO 18185-7, Freight containers — Electronic seals — Part 7: Physical layer

Message sets to remote hosts from the local hosts are developed under the umbrella of the UN/CEFACT and published as the United Nations Directories for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT message sets), Joint Transport Group (JM4) and therefore not covered by this standard. These Directories will include the COSEAL data elements from releases 06B for CODECO, COARRI and COPARN.

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 6346, Freight containers – Coding, identification and marking.

ISO 9897:1997, Freight containers – Container equipment data exchange.

ISO 9735, Electronic data interchange for administration, commerce and transport (EDIFACT) – Application level syntax rules.

United Nations Directories for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT message sets), Joint Transport Group (JM4), CODECO, COARRI and COPARN, release 00B and onwrds

ISO 17712, Freight containers – Mechanical seals

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9897-8 Container Equipment Data Exchange (CEDEX) - Message Sets and ISO 9735, Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) – Application level syntax rules apply.

This message is part of a total set of container industry related messages. These messages serve to facilitate the overall data exchange related to container equipment.

3.1 Message data elements

Table 1 – Mandatory message data elements

Name of the data element	Size
Reader location	9 chars
Date/Time of reading	12 chars
Seal Tag ID	32 chars
Tag manufacture ID	4 chars
Seal Tag Type	3 chars
Date/Time of seal locking	12 chars
Date/Time of seal opening	12 chars
Seal Status indication	1 char
Battery low status indication	1 char

3.2 Message data elements description

Seal Tag ID: the ID field (serial number) for the seal. The seal number is assigned by the user or the manufacturer and is programmed by the manufacturer. This ID is equal to serial number marked on the exterior (casing) of the seal.

Seal Manufacturer ID: is the tag component manufacturer ID permanently programmed into the seal during manufacturing and assigned in accordance with ISO/TS 14816.

Seal Tag type: The seal tag type, in compliance with the high security seal requirements as defined in ISO 17712, is permanently programmed into the seal as well as marked on the exterior (casing) of the seal.

Date and time of seal locking: The date and time when the seal was locked in the format CCYYMMDDHHMM (UTC), as defined in ISO 8601.

Date and time of opening: The date and time when the seal was opened in the format CCYYMMDDHHMM

(UTC), as defined in ISO 8601.

Seal Status indication: the status bit that indicates if the seal mode is locked or open (tampering control).

Battery low status indication: the status bit that indicates when the battery is below the threshold, as defined in ISO 18185-2.

4 Message structure and description

The COSEAL record structure is based on a simple position oriented flat file.

4.1 Message structure description

4.1.1 POSITION column:

Represents the first position of the data element in the flat file

4.1.2 WIDTH column:

Represent the size of the data element in the Flat file. If the data element has no value it will be represented in the flat file by blanks.

4.1.3 TYPE column:

CHARACTER	(C)	alpha/numeric text
NUMERIC	(N)	numeric field
LOGICAL	(L)	True or False (to support software validation flags)
DATE/TIME	(D)	CCYYMMDDHHMM

4.1.4 Value column:

The value indicators, M and F, in the table represent the minimum requirements to fulfill the needs of the message structure. They may not be sufficient for all implementations. The value indicator O represent the optional data elements for messaging control and accountability purposes.

Value indicators description:

<u>Value</u>	<u>Description</u>
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M	Mandatory data element.
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F	Functional data element depending on a condition as defined in 18185-2
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O	Optional data element indicates that this item is to be used at the discretion of the supporting systems.
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4.1.5 Party addresses:

Addresses in accordance with ISO 9897 Annex J as published by Bureau International des Containers (BIC)

4.1.6 Disallowed Characters:

The + : ' and ? characters are not allowed in any data elements, as they are reserved UN/EDIFACT characters and can cause the message failure when mapped to such message types.

4.2 Message file structure:

COSEAL

#	NAME	POSITION	WIDTH	TYPE	VALUE	DESCRIPTION
1	COMPLETE	1	1	L	M	Confirms message completed "T" when all mandatory data elements are populated. Cannot be transmitted if "F" - also to be used as message failure alarm trigger.
2	SENT_COSEAL	2	1	L	O	Flags F/T before/after send. This data element is to prevent reader system from resending if T.
3	SENT_DATE_TIME	3	12	D	M	Date/time message sent. For reader audit trail.
4	REC_COSEAL	15	1	L	O	Flags F/T before/after receive. This flag is to Prevent host from re-receiving if T.
5	REC_DATE_TIME	16	12	D	M	Date/time message received. For host audit trail.
6	EXPORTED	28	1	L	O	Default F, flags T after export
7	EXP_DATE_TIME	29	12	D	O	Date/time of export
8	IMPORTED	41	1	L	O	Default F, flags T after import
9	IMP_DATE_TIME	42	12	D	O	Date/time of import
10	TRNSXN	54	14	C	O	Unique transaction number
11	READER_ADDR	68	9	C	M	9 digit ISO 9897 BIC-LOCODE of sending reader.
12	READ_DATE_TIME	77	12	D	M	Date/time of seal reading
13	SEAL_TAG_ID	89	32	C	M	Unique seal serial number
14	TAG-MANUF_ID	121	4	C	M	Seal tag manufacturer ID ISO/TS 14816
15	SEAL_TAG_TYPE	125	3	C	M	Type of seal ISO 17712
16	LOCK_DATE_TIME	128	12	D	F	Date/time of seal locking
17	OPEN_DATE_TIME	140	12	D	F	Date/time of seal opening
18	SEAL_STAT_IND	152	1	C	M	Status to indicate seal locked/open
19	BATTERY_IND	153	1	C	M	Battery status indicator ISO 18185-2
**	Total	**	154	**	**	

Bibliography

- [1] ISO 9897:1997, Freight containers – Container equipment data exchange
- [2] ISO 9897-8, Freight containers – Container equipment data exchange, Message Sets (expected 2007)
- [2] ISO 9735, Electronic data interchange for administration, commerce and transport (EDIFACT) – Application level syntax rules.
- [3] United Nations Directories for Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT message sets), Joint Transport Group (JM4), CODECO, COARRI and COPARN, release 06B and onwards (expected 2H/2006)
- [4] ISO 17712, Freight containers – Mechanical seals (expected 2007)