TECHNICAL SPECIFICATION

ISO/TS 26683-1

First edition
2012-05-15

Intelligent transport systems — Freight land conveyance content identification and communication (FLC-CIC) —

Part 1:
Context, architecture and referenced standards

Systèmes intelligents de transport — Identification et communication du contenu des marchandises transportées par voie terrestre —

Partie 1: Contexte, architecture et normes référencées

© ISO 2012

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/TS 26683-1:2012
https://standards.iteh.ai/catalog/standards/sist/266113d5-3e38-48f9-a332-
42759749562a/iso-ts-26683-1-2012

COPYRIGHT PROTECTED DOCUMENT

Contents

Page

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.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of document:

— an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;

— an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

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/TS 26683-1 was prepared by Technical Committee ISO/TC 204, *Intelligent transport systems*.

ISO/TS 26683 consists of the following parts, under the general title *Freight land conveyance content identification and communication (FLC-CIC)*:

— *Part 1: Context, architecture and referenced standards*

— *Part 2: Application interface profiles*

The following parts are under preparation:

— *Part 3: Handling of cargo stress information during road transport*

— *Part 4: Security profile*

Introduction

In a scenario of land international transport and logistics, it is often difficult for a consignor and a consignee to know the physical real-time location of cargo after consigning the cargo to a transport and logistics service provider. Where a cargo is transferred from one haulier to another, obtaining information of the manifest at a detailed level is often difficult. Auditing the actual content of a consignment en route; and monitoring cargo stress measurement information during road transport; is also difficult, especially in the case of sealed land conveyances such as sealed intermodal containers. It is a different task to that of progressing order administration from consignor to consignee.

Seamless exchange of accurate, complete, and timely data at transportation hand-offs has always been important for efficiency and accountability. There is now a growing understanding of needs for security of transport information, and for transfer of information related to security against terrorism as well as theft and traditional contraband.

There is no single organization responsible for standards through the intermodal supply chain. To achieve a coherent set of standards requires coordination among the various international organizations working on pieces of these standards.

This part of ISO/TS 26683 specifies the data concepts applicable to the movement of freight and its intermodal transfer. It focuses on a single "thread" of the overall end-to-end supply chain. These data concepts include information entities (data elements), aggregated/associated information entities (groups of data elements) and messages that comprise information exchanges at transport interfaces along the chain of participants responsible for the delivery of goods from the point of origin through to the final. This work is integrated closely with 'Universal Business Language (UBL)' espoused by OASIS and refers to the UN/CEFACT standards (Data Elements TDED, Core Components Technical Specifications and Library CCL).

ISO 17687 provides a consistent context for the presentation and storage of 'Dangerous Goods'/HAZMAT information. ISO 17687 is designed to support the automated identification, monitoring and exchange of emergency response information regarding dangerous goods carried on board road transport vehicles. However, ISO 17687 does not specify nor even imply that any particular on-board or off-board systems should be capable of performing such monitoring, data retention, or communications. ISO 17687 deals with the on board information but not the media used for transmitting the information, nor the means of collating and transferring the information. ISO 17687 identifies that such communications are beyond the its scope.

However in domestic land transport, particularly where no border crossings are involved, and except in the case of 'Dangerous Goods'/HAZMAT loads, a trucker usually does not have to report cargo manifest information to any regulator. A trucker receives an order from the client with delivery date/time and location and, except in the case of 'Dangerous Goods'/HAZMAT, may not necessarily be given any detailed cargo information. The haulier may or may not use a wireless tracking system for its vehicles, and such systems may or may not carry any detailed consignment/cargo details. In these situations real-time land transport cargo monitoring is often not possible and, in respect of auditing the content of the load and monitoring cargo condition information, even where possible, has limitations.

There are also many situations where the tractor and trailer combination changes during the course of a journey from consignor to consignee.

Further, even where such comprehensive systems are in place, they rely on the level of detail that exists within the central computer system, and without the ability to monitor the actual contents, there is no possibility to:

a) audit the actual contents of the consignment. This is particularly difficult in the case of a sealed intermodal container (ISO 668 and subsequent related standards for freight containers),

b) monitor the condition of the contents of the consignment (cargo stress measurement information).

The ISO 26683 series is therefore complementary to the context of ISO/TS 24533 and may well provide sources of data required by such systems, and an electronic auditing capability has yet to be embraced by ISO/TS 24533 . As has been seen above, ISO 17687 does not address the means by which its data is collected. ISO 26683 is complementary to ISO 7372.

Further detail concerning the complementary nature of the ISO 26683 series to ISO 24533, EFM, ISO 17687, IEEE 1512.3, UN/CEFACT, particularly UN/CEFACT UMM, ISO 7372, OASIS/UBL can be found in Clauses 5 and 6.

The ISO 26683 series provides a data agglomeration/aggregation capability as one means to capture and transfer information about the content of the cargo load and its condition to a central system. Therefore, ISO 26683 can also support both ISO/TS 24533 and ISO 17687/IEEE 1512.3 instantiations. ISO 26683 is designed to present data to end-to-end cargo application systems, it does not provide end-to-end (consignor to consignee) system design.

The ISO 26683 series envisages that a combination of existing technologies can be used to agglomerate/ aggregate relevant data and use a tractor/truck mounted communications means to realize real-time cargo visibility of land transport, and is thus not dependent on future technologies or technologies currently in research and development phases (although it will be suitable for future technical means to deliver its data).

This part of ISO 26683 provides context and high level architecture for all parts of the ISO 26683 series.

ISO 26683-2 defines application interface profiles to agglomerate/aggregate and transfer land cargo transport data to provide improved land cargo transport data and specifies one or more modes of transfer using available ICT technologies.

Part 3 will specify the handling of on-board cargo stress measurement information during road transport

Part 4 will provide a security profile requirement and definition.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO/TS 26683-1:2012
https://standards.iteh.ai/catalog/standards/sist/266113d5-3e38-48f9-a332-
42759749562a/iso-ts-26683-1-2012

Intelligent transport systems — Freight land conveyance content identification and communication (FLC-CIC) —

Part 1:
Context, architecture and referenced standards

1   Scope

This part of ISO 26683 provides the context for application interface profiles for the exchange of land transport data using current technologies and existing standards for item identification, package identification, container identification, and international standards and practices regarding freight and its movement. This part of ISO 26683 provides the following:

a)   a context of the relationship between ISO 26683 and other freight and fleet standards and defines the objectives for the ISO 26683 series. The explanation is provided as to how existing International Standards and Technical Specifications can be utilized to agglomerate/aggregate data concepts by using standardized application interface profiles and utilize them within the context of ISO 26683 and how ISO 26683 can be used to provide information/data to cargo management systems;

b)   descriptions of use cases of providing information to cargo tracking and tracing in end-to-end transport by exploiting identifiers, data carriers, EDI messages and data elements with respect to various types of cargo and transport means within an international intermodal/multimodal cargo movement context;

c)   an architecture for the collation and transfer of data agglomerated/aggregated from information contained in the transport load to transport operating systems, the objective being to enable efficient handling of truck/trailer identification and on-board cargo information for tracking, tracing and cargo monitoring purposes in a land cargo transport situation.

NOTE   ISO 26683 is designed to present information to end-to-end cargo application systems; it does not provide end-to-end (consignor to consignee) system design.

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.

In addition to the references listed below, Annex A identifies a large number of International Standards that may be used in the identification, labelling and communication with the contents of a land conveyance. Data may conform to any of the International Standards listed below, but shall conform to at least one of the International Standards listed below or in Annex A.

NOTE   This clause provides references for only those standards referenced in the main body of this document.

ISO 6346, *Freight containers — Coding, identification and marking*

ISO 7372, *Trade data interchange — Trade data elements directory*

ISO 13183, *Intelligent transport systems — Communications access for land mobiles (CALM) — Using broadcast communications*

ISO/TR 14813-2, *Transport information and control systems — Reference model architecture(s) for the TICS sector — Part 2: Core TICS reference architecture*

ISO 17261, *Intelligent transport systems — Automatic vehicle and equipment identification — Intermodal goods transport architecture and terminology*

ISO 17262, *Intelligent transport systems — Automatic vehicle and equipment identification — Numbering and data structures*

ISO 17263, *Intelligent transport systems — Automatic vehicle and equipment identification — System parameters*

ISO 17264, *Road transport and traffic telematics — Automatic vehicle and equipment identification — Interfaces*

ISO 17687, *Transport Information and Control Systems (TICS) — General fleet management and commercial freight operations — Data dictionary and message sets for electronic identification and monitoring of hazardous materials/dangerous goods transportation*

ISO 21210, *Intelligent transport systems — Communications access for land mobiles (CALM) — IPv6 Networking*

ISO 21212, *Intelligent transport systems — Communications access for land mobiles (CALM) — 2G Cellular systems*

ISO 21213, *Intelligent transport systems — Communications access for land mobiles (CALM) — 3G Cellular systems*

ISO 21214, *Intelligent transport systems — Communications access for land mobiles (CALM) — Infra-red systems*

ISO 21215, *Intelligent transport systems — Communications access for land mobiles (CALM) — M5*

ISO 21216, *Intelligent transport systems — Wireless communications — CALM using millimetre communications — Air interface*

ISO 21217, *Intelligent transport systems — Communications access for land mobiles (CALM) — Architecture*

ISO 21218, *Intelligent transport systems — Communications access for land mobiles (CALM) — Medium service access points*

ISO/IEC/IEEE 21451-1, *Information technology — Smart transducer interface for sensors and actuators — Part 1: Network Capable Application Processor (NCAP) information model*

ISO/IEC/IEEE 21451-2, *Information technology — Smart transducer interface for sensors and actuators — Part 2: Transducer to microprocessor communication protocols and Transducer Electronic Data Sheet (TEDS) formats*

ISO/IEC/IEEE 21451-4, *Information technology — Smart transducer interface for sensors and actuators — Part 4: Mixed-mode communication protocols and Transducer Electronic Data Sheet (TEDS) formats*

ISO/IEC/IEEE 21451-7, *Information technology — Smart transducer interface for sensors and actuators — Part 7: Transducer to radio frequency identification (RFID) systems communication protocols and Transducer Electronic Data Sheet (TEDS) formats*

ISO/TS 24533, *Intelligent transport systems — Electronic information exchange to facilitate the movement of freight and its intermodal transfer — Road transport information exchange methodology*[1]

ISO 25111, *Intelligent transport systems — Communications access for land mobiles (CALM) — General requirements for using public networks*

ISO 25112, *Intelligent transport systems — Communications access for land mobiles (CALM) — Mobile wireless broadband using IEEE 802.16*

ISO 25113, *Intelligent transport systems — Communications access for land mobiles (CALM) — Mobile wireless broadband using HC-SDMA*

ISO/TS 26683-2, *Intelligent transport systems — Freight land conveyance content identification and communication (FLC-CIC) — Part 2: Application interface profiles*

ISO 29281, *Intelligent transport systems — Communications access for land mobiles (CALM) — Non-IP networking*

---

[1] To be published.

ISO 29282, *Intelligent transport systems — Communications access for land mobiles (CALM) — Applications using satellite networks*

ISO 29283, *ITS CALM Mobile Wireless Broadband applications using Communications in accordance with IEEE 802.20*

IEEE 1512.3, *IEEE Standard for Hazardous Material Incident Management Message Sets for Use by Emergency Management Centers*

OASIS, *Universal Business Language v2.1*, http://docs.oasis-open.org/ubl/UBL-2.1.html

OASIS, *UBL Common Library — transport library*

OASIS, *UBL-CommonAggregateComponents-2.1*

CEFACT/TMG/N093, *UN/CEFACT Modelling Methodology (UMM)*:

— *UMM Foundation Module V1.0 (2006)*

— *UMM Base Module V1.0 (2006)*

— *User Guide UMM 1.0*

UN/CEFACT, *Core Components Library CCL 10B*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
application interface
communication point where one part of a system communicates with another in order to service an application

NOTE   The communication point is typically but not necessarily wireless in the scenarios of ISO 26683.

3.2
application interface profile
series and sequence of behaviour and protocols including where appropriate the identification of chosen classes, conforming subsets, options and parameters of those base standards necessary to accomplish a defined function at an interface in a particular way such that it can be used interoperably between two parties; profiles, which define conforming subsets or combinations of base profiles identify the use of particular options available in the base standards, and provide a basis for the development of uniform, internationally recognized, interoperability and conformance tests.

3.3
audit
methodical examination/verification/evaluation of the information associated with items in a cargo and other relevant data

3.4
authority
statutory body existing within a jurisdiction and a specific area of responsibility that administers legislation to regulate trade and/or monitors compliance with existing legislation

3.5
base standard
approved International Standard used as the basis of an application interface or an application interface profile

3.6
cargo
goods or produce transported, generally for commercial gain, by ship, aircraft, train, van or truck

NOTE   In modern times, containers are used in most intermodal long-haul cargo transport.

3.7
cargo stress measurement information
data collected from sensors associated with an item, container or conveyance that provides information about parameters that may affect the condition of the cargo

EXAMPLES   temperature, position/attitude (upright cargo), pressure, shock, dampness, etc.

3.8
carrier
party undertaking or arranging transport of goods between named points

[UN/TDED 3126: UN/CEFACT definition de 1001 code CA]

3.9
consignee
party to which goods are consigned/shipped

[UN/TDED 3132: UN/CEFACT definition de 3035 code CN]

3.10
consignment
separately identifiable amount of goods items (available to be) transported from one consignor to one consignee via one or more modes of transport and specified in one single transport document

3.11
consignor
shipper, sender, party which, by contract with a carrier, consigns or sends goods with the carrier, or has them conveyed by him

[UN/TDED 3336: UN/CEFACT definition de 3035 code CZ]

3.12
consolidation
grouping together of individual consignments of goods into a combined consignment for carriage

3.13
container
receptacle for the transport of goods, especially one readily transferable from one form of transport to another

[UN/TDED 3336: UN/CEFACT definition 8053 code CN Container]

3.14
conveyance
means of transport

3.15
data carrier
means or function which carries data objects from one point to other point

3.16
electronic freight manifest
electronic means of generating, storing, distributing, and accessing manifest-related data along the end-to-end supply chain

3.17
forwarder
forwarding agent
person or company that organizes shipments for individuals or other companies and may also act as a carrier.

3.18
freight
goods
any commodity transported

3.19
freight forwarder
party arranging the carriage of goods including connected services and/or associated formalities on behalf of a consignor or consignee

[UN/TDED 3336: UN/CEFACT definition de 3035 code FW]

3.20
goods
freight
any commodity transported

3.21
identifier
unique and unambiguous expression in a written format either by a code, by numbers or by the combination of both to distinguish variations from one to another among a class of substances, items or objects

3.22
intermodal freight container
large cargo-carrying object (of various formats) used for transport or storage conforming to ISO 6346; freight container designed and constructed to permit it to be used interchangeably in two or more modes of transport

3.23
ISO intermodal freight container
ISO intermodal container
ISO container
large cargo-carrying object used for transport or storage that conforms to ISO 668, Series 1 containers

3.24
international standardized profile
internationally agreed-to, harmonized document which describes one or more profiles

3.25
interoperability
ability of two or more systems to exchange information and to make mutual use of the information that has been exchanged (sometimes called "open systems")

3.26
ITS station
communication point for ITS system

3.27
land transport
mode of transport that is effected using roads and railways and may in some cases include use of inland waterways

cf. **transport** (3.37)

3.28
land transport conveyance
transport means to effect the land transport sector(s) of a cargo

3.29
manifest
specification of all cargo on board the transportation means (all modes) containing details of contents, shipper, consignee, and other details that may be required by customs or consular authorities

3.30
open system environment
comprehensive set of interfaces, services, and supporting formats, plus user aspects, for interoperability and/or portability of applications, data, or people, as specified by information technology standards and profiles

3.31
rollercage
cage with casters for transporting loose items

3.32
security
protection of information and data against danger, damage, loss and criminal activity so that unauthorized persons or systems cannot read or modify them and authorized persons or systems are not denied access to them

NOTE   Security has to be compared to related concepts: safety, continuity, reliability. The key difference between security and reliability is that security must take into account the actions of people attempting to cause destruction.

3.33
security profile
characterization of security requirements

3.34
shipment
identifiable collection of one or more goods items (available to be) transported together from the original shipper to the ultimate consignee

NOTE   A shipment may be transported in one or a multiple number of consignments.

3.35
taxonomy
classification scheme for referencing profiles or sets of profiles unambiguously

3.36
tracing
function of retrieving information concerning goods, goods items, consignments or equipment

3.37
transport
transportation
movement of people and goods from one location to another

NOTE   Transport is performed by modes, such as air, rail, road, water, cable, pipeline and space, and the field comprises the attributes of infrastructure, vehicles, and operations.

3.38
transport means
vehicles, trailers, vessels, aircraft, or combination thereof, used for the transport of goods to perform a journey

3.39
tracking
function of maintaining status information of goods, goods items, consignments or equipment

3.40
trucker
person who earns a living as the driver of a truck, usually a semi truck, box truck, or dump truck

NOTE   "Trucker" and "driver" are the common terms in the United States and Canada; "truckie" is used in Australia and New Zealand; and "lorry driver" or "driver" in Ireland and the United Kingdom.

3.41
visibility
ability to audit the content of a land conveyance while en-route or at strategic points of an overland journey

4   Abbreviated terms

For the purposes of this document, the following terms and definitions apply.

3GPP	third generation partnership project
AEI	automatic equipment identification
AVI	automatic vehicle identification
CALM	communication access for land mobiles
CEFACT	See UN/CEFACT
CCL	core component library
ebXML	electronic business eXtensible Mark-up Language
EAN	European Article Numbering Association
EDIFACT	electronic data interchange for administration, commerce and transport
EFM	electronic freight management
ERI	electronic registration identification
GSM	global system mobile
HAZMAT	hazardous materials/dangerous goods
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
ITS	intelligent transport systems
JTC1	ISO/IEC Joint Technical Committee 1
JWG	joint working group
LTE	(3GPP) long term evolution (sometimes called 4G)
OASIS	Organization for the Advancement of Structured Information Standards
OBE	on-board equipment
OBU	on-board unit
OCR	optical character recognition
PDC	personal digital cellular (Japanese advanced 2G mobile communications standard)

PHS	personal handy-phone system
RFID	radio frequency identification
RSU	road side unit
SOA	service oriented architecture
SOAP	simple object access protocol
SSL	secure sockets layer
TDED	trade data elements directory
TLS	transport layer security
UBL	universal business language (OASIS)
UIC	Union Internationale de Chemins de fer
ULD	unit load device (IATA container)
UMTS	Universal Mobile Telecommunications System
UN	United Nations (Organization)
UN/CEFACT	United Nations, through its Centre for Trade Facilitation and Electronic Business
UN/EDIFACT	United Nations electronic data interchange for administration, commerce and transport
UN/TDED	United Nations trade data elements directory
USDoT	United States Department of Transport
VIN	vehicle identification number
WCO	World Customs Organization
WSDL	web services description language
XML	eXtensible Mark-up Language

5 Context

5.1 General context

In a scenario of land international transport and logistics, it is often difficult for a consignor and a consignee to know physical real-time location of cargo after consigning the cargo to a transport and logistics service provider. Where a cargo is transferred from one haulier to another, obtaining information of the manifest at a detailed level is often difficult. Auditing the actual content of a consignment en route and monitoring cargo stress measurement information during road transport is difficult, especially in the case of sealed containers such as sealed ISO intermodal containers.

In the international context, an ocean or air carrier is required to report cargo manifest information to related authorities, according to the standards designated by IMO (International Maritime Organization), ICAO (International Civil Aviation Organization)/IATA(International Air Transport Association); therefore, a party concerned in international air/ocean transport is able to track or trace cargo on a real-time basis.

Seamless exchange of accurate, complete, and timely data at transportation hand-offs has always been important for efficiency and accountability. There is now a growing understanding of needs for security of transport information, and for transfer of information related to security against terrorism as well as theft and traditional contraband.

ISO/TR 14813-2:2000 identifies a Commercial Vehicle functional domain including:

"*Transactions to maintain the TICS (ITS) information about a shipment from the time of the order by the consignor to the reception of goods by the consignee. The key TICS (ITS) transactions are to provide registers of service providers and to enable the goods to be tracked throughout intermodal journeys.*"

Deliverables in the ISO 26683 series shall be consistent with this definition.

5.2 Road transport information exchanges for supply chain freight time-sensitive delivery

Some international shipments are entirely by the highway mode, others begin and end with motor carrier service and travel on other modes in the course of the shipment. ISO/TS 24533 [Intelligent Transport Systems — Data dictionary and message set to facilitate the movement of freight and its intermodal transfer — Road transport information exchanges] for supply chain freight time-sensitive delivery (Road-Air Freight-Road) focuses attention on an international truck-air-truck thread through the supply chain where the interfacing modes' data structures and formats must accommodate each other to ensure efficiency and security from end to end, and shall be considered the reference for these aspects of road transport information exchanges for supply chain freight .

Rail, ocean transport, air and road are vital components of intermodal, international shipping. ISO/TS 24533 is focused on international end-to-end monitored supply chain operations where there is aggregated system visibility of all aspects of data to all parties involved.

ISO/TS 24533 specifies the data concepts applicable to the movement of freight and its intermodal transfer. It also addresses the business processes depicting the roles and responsibilities of the various participants in the international supply chain. While designed for international freight movements, it is as usable in domestic supply chains so long as the information/data is available.

ISO/TS 24533 focuses on a single "thread" of the overall end-to-end supply chain consisting of a road-air-road combination. These data concepts include data elements, data frames (groups of data elements) and messages that comprise information exchanges at road transport interfaces along the chain of participants responsible for the delivery of goods from the point of origin through to the final recipient as presented in Figure 1.

The scope includes motor transport data needs within the international supply chain to satisfy the requirements of both businesses and governmental organizations. ISO/TS 24533 is applicable to highway shipments that originate in one country and terminate in another. It may however also be applied to highway shipments that originate and terminate in a single country. ISO/TS 24533 is applicable to highway freight movements that interface with other modes and incorporates requirements set for those other modes.

If goods change to or from another mode between origin and destination, ISO/TS 24533 does not establish requirements for those other modes. However, it addresses the requirements of information exchange between the truck mode and another mode (e.g. air freight). Further, ISO/TS 24533 does not constrain the requirements of customs, regulatory, and safety bodies at border crossings. However, ISO/TS 24533 does include the data elements most likely to be required by Customs.

NOTE   It is intended that this thread may be generalized to address the various combination of segments that occur in the global supply chain.