TECHNICAL SPECIFICATION

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Packaging — Codification of contents for inventories for shipments of household goods and personal effects —

Part 2:
XML messaging structure for electronic transmission of inventory data

Emballages — Codification du contenu pour inventaires pour les expéditions des biens d'équipement ménager et d'effets personnels —

Partie 2: Structure de messagerie XML pour la transmission électronique de données d'inventaire

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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 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 122, *Packaging*.

A list of all parts in the ISO 17451 series can be found on the ISO website.

This document is based upon ANSI/HHGFAA NCC 2008-001-2010 and has been revised during the ISO standards development process. *ANSI/HHGFAA NCC* 2008-001-2010 will be withdrawn upon publication.

Introduction

This document provides a standard format, which enables household goods movers and forwarders, to exchange shipment related information with each other and with other industry stakeholders in language, software and hardware agnostic format – XML.

When used with ISO 17451-1, which provides the international moving industry with a common codified language, this document will enable users to communicate this information regardless of their language of choice and, as a result, promote transparency and visibility for these shipments. A secondary motivation for the development of this document is to encourage standardization and, in turn, efficiency within the industry.

The layout of the proposed electronic shipment XML is governed by an XML schema document, Inventory XSD.

Packaging — Codification of contents for inventories for shipments of household goods and personal effects —

Part 2:
XML messaging structure for electronic transmission of inventory data

1   Scope

This document specifies a common XML structure for the transmission of inventory information for shipments of household goods and personal effects between moving companies and their external partners. The Inventory XSD defined in Clause 5 specifies the XML structure to be used.

Each XML document corresponds to one shipment carried by land, sea or air.

2   Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 17451-1:2016, *Packaging — Codification of contents for inventories for shipments of household goods and personal effects — Part 1: Numeric codification of inventories*

3   Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
extensible markup language
XML
markup language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable

3.2
inventory
complete list of items in a particular *shipment* (3.4)

3.3
occurrence
term used to express the number of possible instances of a data element and allows an element to be specified as mandatory, optional, or can appear up to a set number of times

Note 1 to entry: More information on *occurrence is* specified in 4.2.

3.4
shipment
HHG items transported and/or stored under the terms of a single bill of lading, waybill, or contract of carriage irrespective of the quantity or number of containers, packages, or pieces

3.5
shipper
person/transferee who is the owner of the *shipment* (3.4) or authorized agent of the owner

3.6
xml schema definition
XSD
world wide web consortium (W3C) recommendation that specifies how to formally describe the elements in an *extensible markup language (XML)* (3.1) document

4   Application

4.1   General information

The XML messaging structure for electronic transmission of inventory data is intended to be adopted by software applications together with the numeric codes established in ISO 17451-1 for the benefit of the international moving industry. The software application will utilize the numeric codes to classify the inventory and use the XML to transmit the data to an external system. Storing and transmitting the numeric codes in the application will also allow the translation of data into different languages.

Once implemented, users will be able to create standardized electronic inventories that can be exchanged between different software systems, applications, companies and external stakeholders involved in the international transport chain for a shipment of household goods and personal effects. Users shall utilize the XML schema prescribed in this document to collect information related to the shipment of household goods and personal effects and transmit it in a standardized format.

ISO 17451-1 provides the codification of items and their condition, the transportation modes and associated data relating to a shipment of household goods and personal effects. The relevant codes can be found in the following annexes and information regarding their use can be found in ISO 17451-1:2016, Clause 4:

a)   Annex A: Household goods (HHG) items and HHG generic items;

b)   Annex B: Packaging types;

c)   Annex C: Methods of preparation of HHG;

d)   Annex D: Transport modes;

e)   Annex E: Locations of packing and/or delivery of the HHG items;

f)   Annex F: Exceptions or damage to HHG items;

g)   Annex G: Locations of exceptions or damage to HHG items.

The code lists have been set up in the following languages:

—   English;

—   German;

—   Spanish;

—   French.

The order in which the numeric codes have been organized in ISO 17451-1 does not dictate the structure for how they can be organized in a user's software program or application. For instance, it makes more sense to indicate the location of loading (e.g. living room) before specifying the household goods item (e.g. table – coffee) when using a software application.

The numeric codes for the HHG items (ISO 17451-1:2016, Annex A), HHG packaging types (ISO 17451-1:2016, Annex B), and HHG location (ISO 17451-1:2016, Annex E) have been structured hierarchically in three levels to provide maximum flexibility for users. Each specific description is accompanied by its own unique code so users can integrate the most basic level descriptions (e.g. Indoor Furniture), as well as the most specific level description like "Bed – Bunk" for their customer's benefit. It would be practical, for instance, to show a list of all the HHG items typically found in a dining room (e.g. Chair – Dining, Table – Dining, Buffet, Cabinet – China) once the user had first identified the location of loading as the Dining Room.

Structuring the codes in ISO 17451-1:2016, Annexes A, B, and E in a three-level arrangement also allows the use of generic terms by defaulting to "not further specified". For example, after indicating the location of loading as "Bedroom", the user should be able to identify the HHG items in that location as "Bed", "Bed – Bunk", "Bed – Child", etc. In this example, "Bed" is the more generic version and it is not necessary to input more information. In this case, the next level of information is not mandatory and the description will default to "not further specified".

Whenever the option "other" is chosen, additional information is requested and is mandatory. This additional information cannot be translated because there is no accompanying code and the user shall input the description in a format specified by the software application.

When setting up user-specific software applications, the vendor can use the codes which are relevant for the environment. For a European moving company, it might not be appropriate to include a "Tatami room" on its location list. On the other hand, it is definitely important for a moving company specializing in serving Japanese clients. As a result, the software provider will need to cater to specific country, regional, or customer requirements with respect to the codes specified in ISO 17451-1.

4.2   Occurrence

In this document, there are four types of occurrences, which indicate the possible responses to an element.

Occurrence value	Explanation
0–1	A value may or may not be assigned for this element. Therefore, this element is optional.
1	A value shall be assigned for this element. Therefore, this element is required.
0-unbounded	Multiple values may be assigned for this element although there is no requirement to assign any value.
1-unbounded	Multiple values may be assigned for this element with at least one value assigned.

An element defined with optional occurrence values (0-1 or 0-unbounded) can have sub-elements which may require mandatory values. Thus, a "DeliveryAddress" has been defined as optional but when providing the "address" element, the street, city and country information is required.

4.3   Using codes from ISO 17451-1:2016, Annexes A, B, and E

Leading zeros are to be shown.

The codes in ISO 17451-1:2016, Annexes A, B and E are structured hierarchically. When sending the codes in the relevant XML elements, they have to be concatenated without any spaces, dots, etc. Thus, ISO 17451-1:2016, Annex A provides HHG item codes; when sending Computer Desktop, the code shall be sent as "007003001".

5 Inventory XSD

Inventory XSD is the root node of the **XSD** to represent the information provided in a digital inventory. The XSD layout is shown in Figure 1.

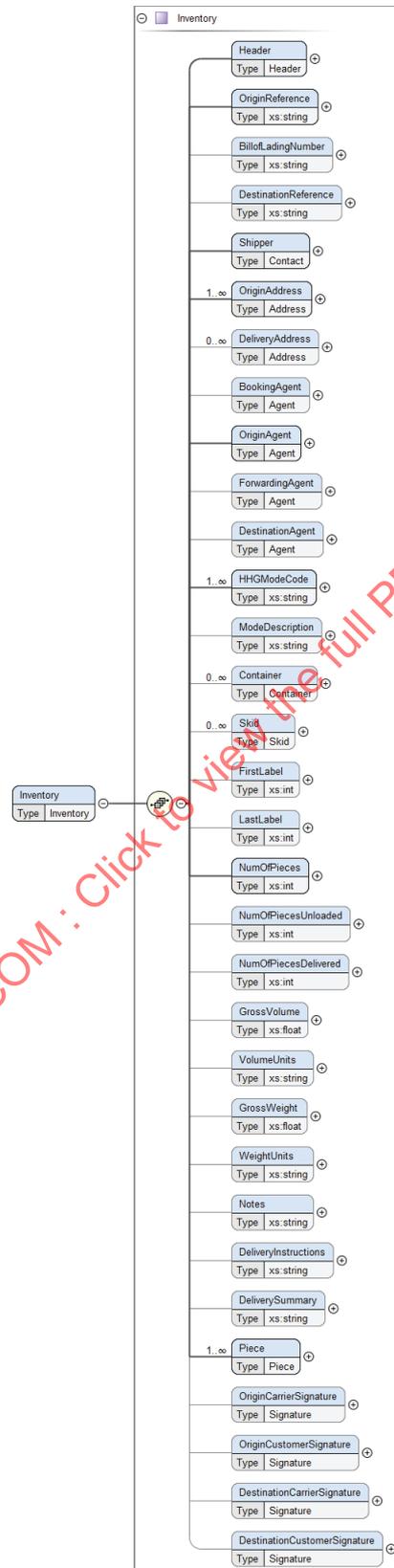**Figure 1 — Inventory element structure**

Table 1 — Inventory element information

Element name	Description	Mandatory	Occurrence
Header	Document header. The structure of this element is outlined in 6.1.	Yes	1
OriginReference	Shipment reference assigned by the origin agent	Yes	1
BillofLadingNumber	Government bill of lading number or any other official reference number	No	0-1
DestinationReference	Shipment reference number assigned by the destination agent	No	0-1
Shipper	This element describes contact related information pertaining to the shipper at origin. The structure of this element is outlined in 6.2.	Yes	1
OriginAddress	This element contains the details of all the pick-up addresses the goods have been gathered from at the origin. The structure of this element is outlined in 6.3.	Yes	1-unbounded
DeliveryAddress	This element contains the details of all the addresses the goods will be delivered to at destination. The structure of this element is outlined in 6.3.	No	0-unbounded
BookingAgent	This element contains the details of the booking agent. The structure of this element is outlined in 6.4.	No	0-1
OriginAgent	This element contains the details of the origin agent. The structure of this element is outlined in 6.4.	Yes	1
ForwardingAgent	This element contains the details of the forwarding agent. The structure of this element is outlined in 6.4.	No	0-1
DestinationAgent	This element contains the details of the destination agent. The structure of this element is outlined in 6.4.	No	0-1
HHGModeCode	Mode code according to ISO 17451-1:2016, Annex D. If multiple modes are to be used, the primary transport mode shall be stated at least.	Yes	1-unbounded
ModeDescription	If appropriate code cannot be found in ISO 17451-1:2016, Annex D and "other" is selected, this element shall be used to further describe the mode.	No	0-1
Container	This element contains the details of a container carrying the shipment. The structure of this element is outlined in 6.5.	No	0-unbounded
Skid	This element contains the details of an LCL container in which the shipment is transported. The structure of this element is outlined in 6.6.	No	0-unbounded

Table 1 *(continued)*

Element name	Description	Mandatory	Occurrence
FirstLabel	The number of the first label of the shipment	No	0-1
LastLabel	The number of the last label of the shipment	No	0-1
NumOfPieces	Number of pieces in the shipment	Yes	1
NumOfPiecesUnloaded	Number of pieces unloaded at destination warehouse	No	0-1
NumOfPiecesDelivered	Number of pieces delivered to consignee at destination	No	0-1
GrossVolume	Total gross volume of the packed items in the shipment	No	0-1
VolumeUnits	Volume units (e.g. cbm, cft)	No	0-1
GrossWeight	Total gross weight of the packed items in the shipment	No	0-1
WeightUnits	Weight units (e.g. kg, lb)	No	0-1
Notes	Inventory related notes	No	0-1
DeliveryInstructions	Delivery instructions provided by origin agent	No	0-1
DeliverySummary	Delivery summary captured by destination agent	No	0-1
Piece	Details of a packed piece. The structure of this element is outlined in 6.7.	Yes	1-unbounded
OriginCarrierSignature	Signature of origin carrier. The structure of this element is outlined in 6.15.	No	0-1
OriginCustomerSignature	Signature of customer at origin. The structure of this element is outlined in 6.15.	No	0-1
DestinationCarrierSignature	Signature of destination carrier. The structure of this element is outlined in 6.15.	No	0-1
DestinationCustomerSignature	Signature of customer at destination. The structure of this element is outlined in 6.15.	No	0-1

6   XSD complex types

6.1   Header

Header is an element type that provides information about the system transmitting inventory data. The XSD layout is shown in Figure 2.
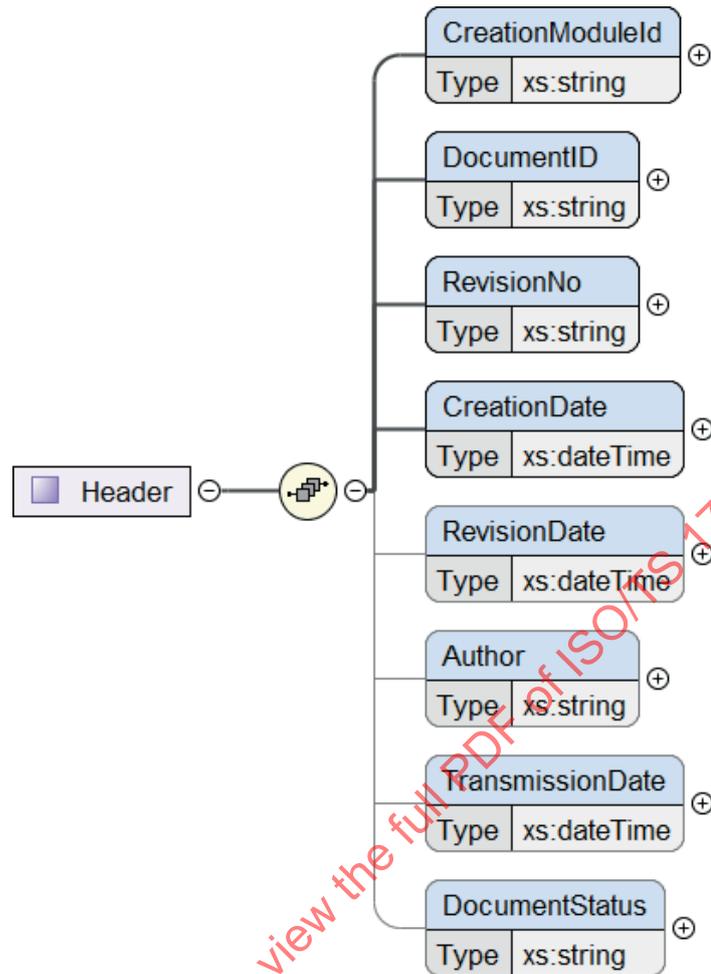
Figure 2 — Header element structure

Table 2 — Header element information

Element name	Description	Mandatory	Occurrence
CreationModuleId	Name of the application/module that created the document	Yes	1
DocumentID	Unique document identified. Can only be unique from creator's perspective	Yes	1
RevisionNo	Revision number	Yes	1
CreationDate	Date and time of document creation	Yes	1
RevisionDate	Date and time of the current document revision	No	0-1
Author	Document author	No	0-1
TransmissionDate	Date and time of transmission	No	0-1
DocumentStatus	Document status to specify whether this document is meant to be used in production, test or any other capacity	No	0-1

6.2 Contact

6.2.1 General

Contact is an element type that provides the detail of a person (shipper or agent) contact information. The XSD layout is shown in Figure 3.
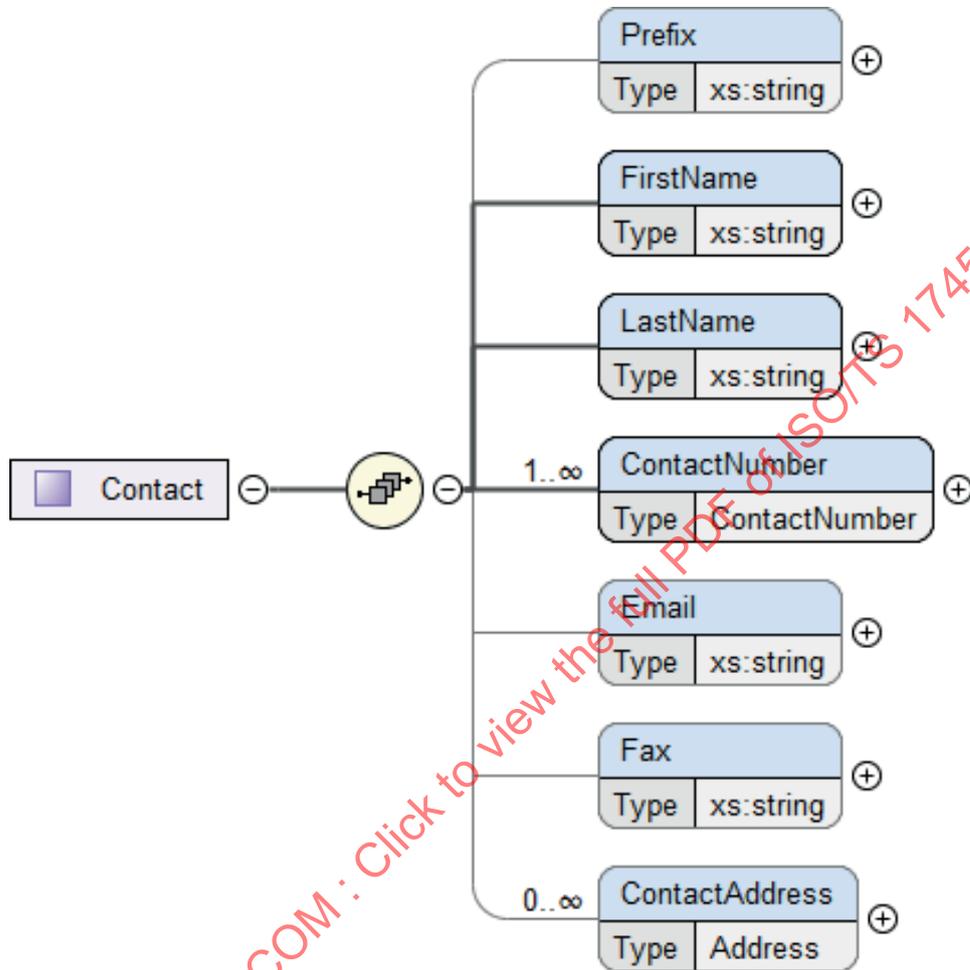

Figure 3 — Contact element structure

Table 3 — Contact element information

Element name	Description	Mandatory	Occurrence
Prefix	Title/salutation (Mr., Ms., etc.)	No	0-1
FirstName	First name	Yes	1
LastName	Last name	Yes	1
ContactNumber	This element contains details for contact telephone numbers. The structure of this element is outlined in 6.2.2.	Yes	1-unbounded
Email	Email address	No	0-1
Fax	Fax number	No	0-1
ContactAddress	This element contains contact address information details. This element is of the type address described in 6.3.	No	0-unbounded

6.2.2 Contact numbers

Contact numbers is an element type that provides details for various contact telephone numbers for a person. The XSD layout is shown in Figure 4.
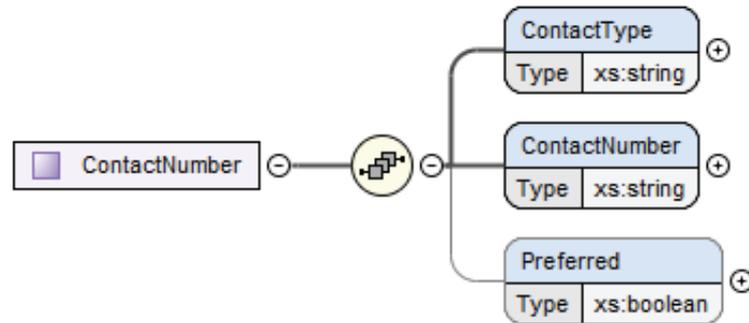

Figure 4 — Contact numbers element structure

Table 4 — Contact numbers element information

Element name	Description	Mandatory	Occurrence
ContactType	Type of contact number, for example, home, mobile, cell, office, etc.	Yes	1
ContactNumber	Phone number with country and area code	Yes	1
Preferred	Flag to indicate whether this is a preferred number to call	No	0-1

6.3   Address

Address is an element type that provides the details of a location address. The XSD layout is shown in .
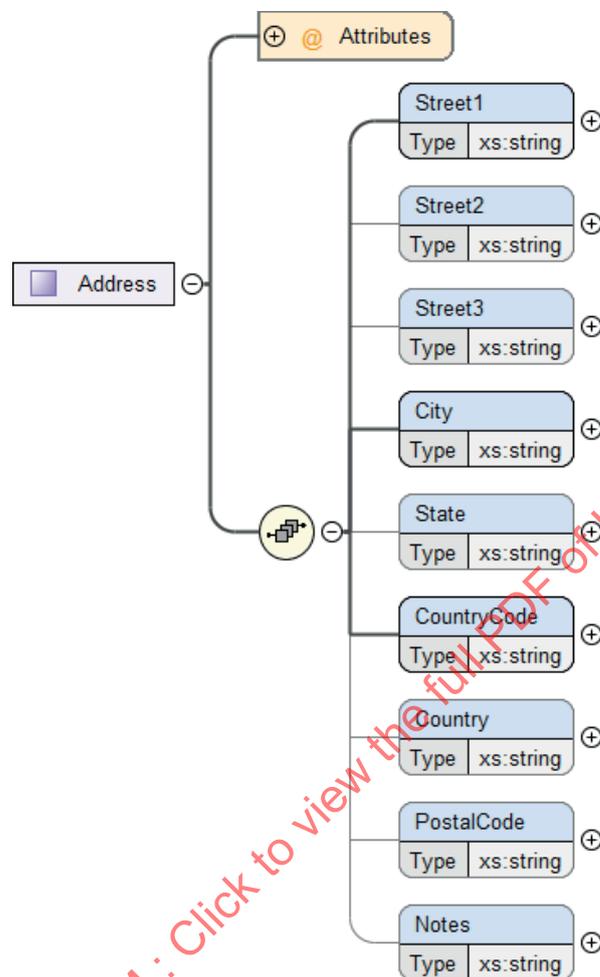

Figure 5 — Address element structure

Table 5 — Address element information

Element name	Description	Mandatory	Occurrence
AddressId	Used by other elements of the shipment document to reference a particular occurrence element of the type address	No	0-1
Street1	Line 1 of street address	Yes	1
Street2	Line 2 of street address including floor/level	No	0-1
Street3	Line 3 of street address	No	0-1
City	City	Yes	1
State	Province or state	No	0-1
CountryCode	ISO 3166-1 alpha-2 Country codes	Yes	1
Country	Name of country	No	0-1
PostalCode	Zip or postal code	No	0-1
Notes	Address related notes. Typically used for directions or access related notes	No	0-1

6.4 Agent

Agent is an element type that provides agent data about a company who is involved in the shipping process. The XSD layout is shown in Figure 6.
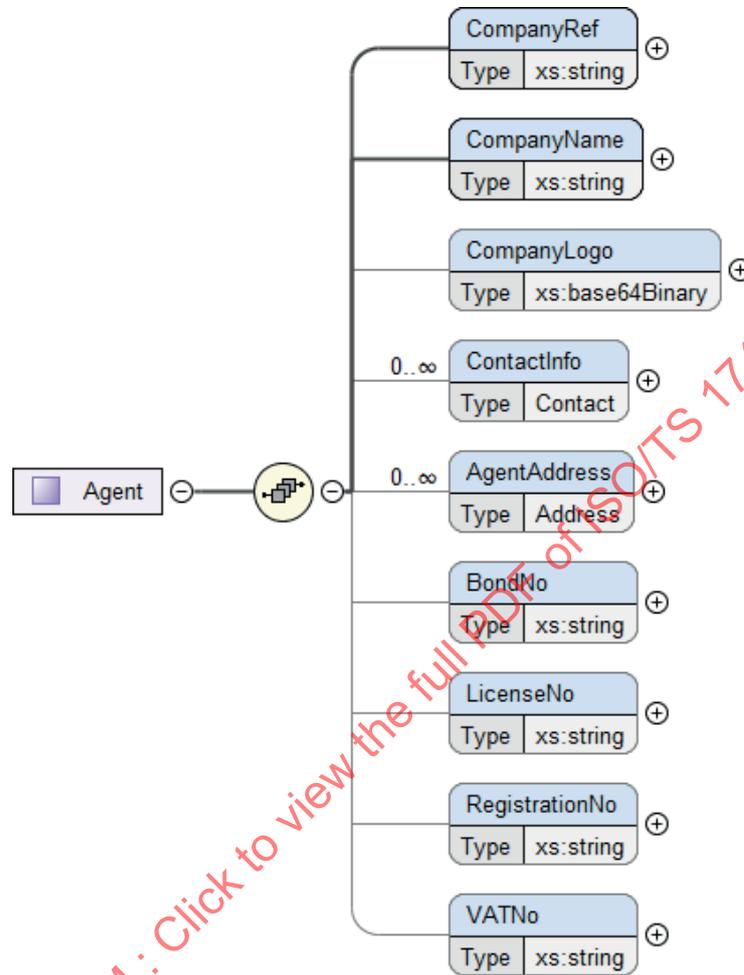

Figure 6 — Agent element structure

Table 6 — Agent element information

Element name	Description	Mandatory	Occurrence
CompanyRef	Company reference number	Yes	1
CompanyName	Legal company name	Yes	1
CompanyLogo	Company logo	No	0-1
Contact	Contact information of the person to be contacted with regard to this shipment. The structure of this element is outlined in 6.2.	No	0-unbounded
AgentAddress	Address details of the agent. The structure of this element is outlined in 6.3.	No	0-unbounded
BondNo	Bond registration number	No	0-1
LicenseNo	Export/import license number	No	0-1
RegistrationNo	Business registration number	No	0-1
VATNo	VAT registration number	No	0-1

6.5   Container

Container is an element type that provides the details of a container (sea container, airvan, or truck) carrying at least one piece of the shipment. The XSD layout is shown in Figure 7.
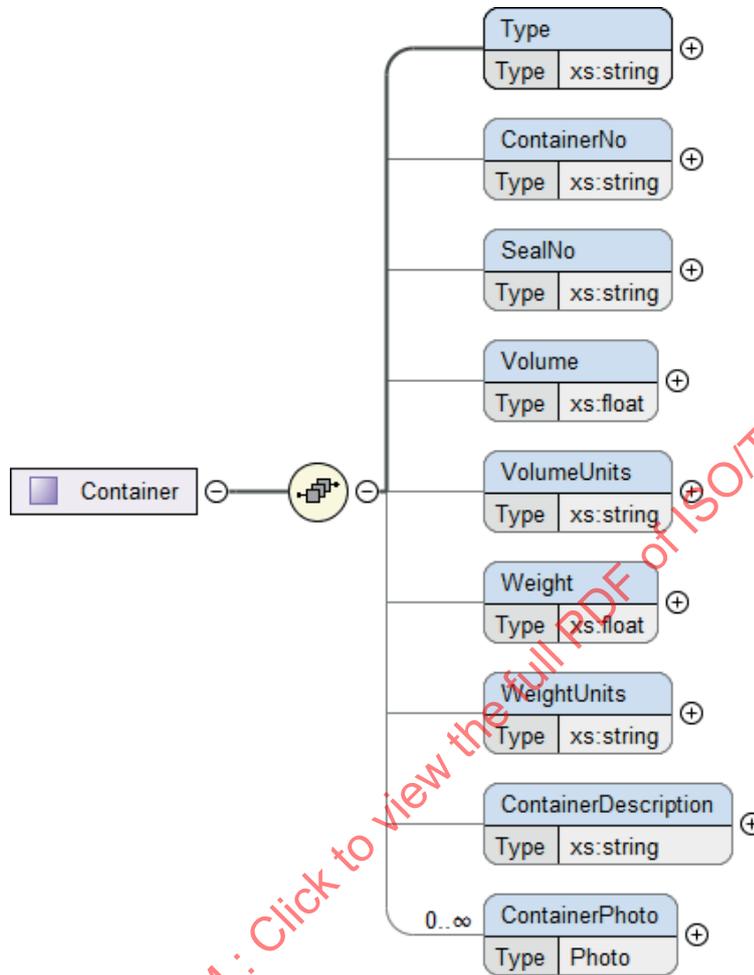

Figure 7 — Container element structure

Table 7 — Container element information

Element name	Description	Mandatory	Occurrence
Type	Container type (Container 20 ft, airvan, truck)	Yes	1
ContainerNo	Container number. For sea containers, this is the actual container number. For airvans and trucks, it's a carrier-specific identification number.	No	0-1
SealNo	Seal number	No	0-1
Volume	Volume of packed items in the container	No	0-1
VolumeUnits	Volume measurements units (e.g. cbm, cft)	No	0-1
Weight	Weight of packed items in the container	No	0-1
WeightUnits	Weight measurements units (e.g. kg, lb)	No	0-1
ContainerDescription	Description of the container conditions (e.g. damages)	No	0-1
ContainerPhoto	Image(s) of the container. The structure of this element is described in 6.14.	No	0-unbounded

6.6   Skid

Skid is an element type which provides the details of one "LCL container" (liftvan, pallet, skid, crate) carrying at least one piece of the shipment. The XSD layout is shown in Figure 8.
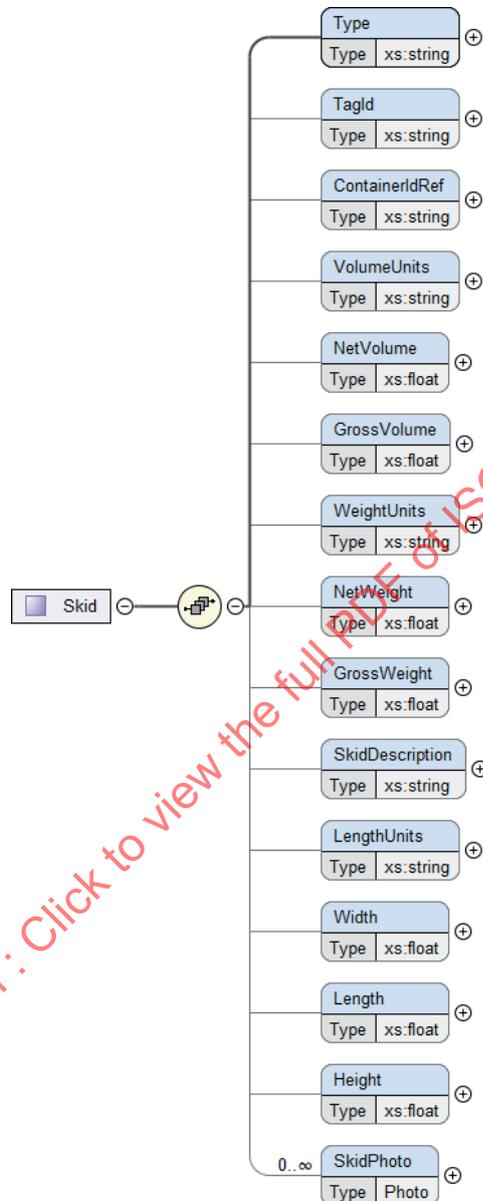

Figure 8 — Skid element structure

Table 8 — Skid element information

Element name	Description	Mandatory	Occurrence
Type	Skid type (liftvan, pallet, crate)	Yes	1
TagId	Tag number or id that identifies the skid. For LCLs this would typically be a sequential skid label number	No	0-1
ContainerIdRef	This element is used to link the skid to the container it's loaded into. The value of the reference id should correspond to the value of Container/ContainerNo of the applicable container	No	0-1

Table 8 *(continued)*

Element name	Description	Mandatory	Occurrence
VolumeUnits	Volume units (e.g. cbm, cft)	No	0-1
NetVolume	Net volume of packed items in Skid	No	0-1
GrossVolume	Gross volume of Skid with packed items	No	0-1
WeightUnits	Weight measurement units (e.g. kg, lb)	No	0-1
NetWeight	Net weight of packed items in Skid	No	0-1
GrossWeight	Gross weight of Skid with packed items	No	0-1
SkidDescription	Description of the skid conditions (e.g. damages)	No	0-1
LengthUnits	Length measurement units (e.g. cm, in)	No	0-1
Width	Width	No	0-1
Length	Length	No	0-1
Height	Height	No	0-1
SkidPhoto	Image(s) of the Skid. The structure of this element is described in 6.14.	No	0-unbounded

6.7 Piece

Piece is an element type that provides the details of one packed piece. A packed piece should be viewed as a package with unique label number. It may represent an individually packed piece of furniture (chair), a carton with small items (books, CDs, photos, bathroom items), a part of a piece of furniture (e.g. legs of a dining room table) or a custom crate with a valuable or bulky item (painting, mirror, fragile items). The XSD layout is shown in Figure 9.
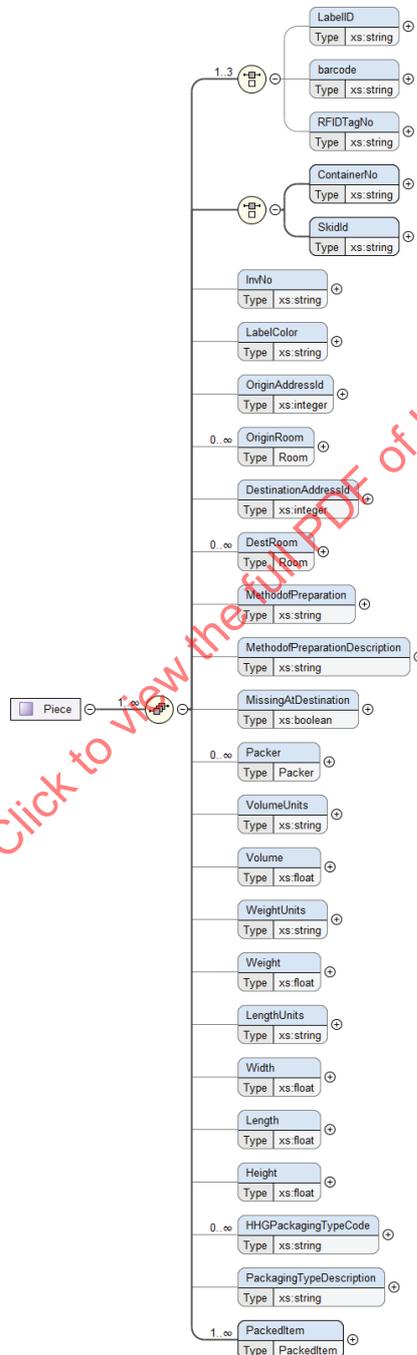

Figure 9 — Piece element structure

Table 9 — Piece element information

Element name	Description	Mandatory	Occurrence
LabelID	This attribute reflects the number on the label affixed to the piece	No	0-1
Barcode	This attribute reflects the barcode on the label affixed to the piece.	No	0-1
RFIDTagNo	RFID tag details	No	0-1
ContainerNo	Reference to the number of the container carrying the piece.	No	0-1
SkidId	Reference to the tag id of the skid carrying the piece.	No	0-1
InvNo	Inventory number on the sticker if different from the sequential package number.	No	0-1
LabelColor	Label/sticker colour	No	0-1
OriginAddressId	Reference to the ID of the origin address from where this piece was packed	No	0-1
OriginRoom	Location of the piece at origin. The structure of this element is described in 6.9.	No	0-unbounded
DestinationAddressId	Reference to the ID of the destination address to where the piece is to be delivered	No	0-1
DestRoom	Intended unloading location of the piece at destination. The structure of this element is described in 6.9.	No	0-unbounded
MethodofPreparation	Method of preparation code according to ISO 17451-1:2016, Annex C	No	0-1
MethodofPreparationDescription	If appropriate code cannot be found in ISO 17451-1:2016, Annex C and "other" is selected, this element shall be used to further describe the HHG item.	No	0-1
MissingAtDestination	This element indicates whether this piece turned up missing at destination.	No	0-1
Packer	Name of the packer who packed this piece. The structure of this element is described in 6.10.	No	0-unbounded
VolumeUnits	Volume units (e.g. cbm, cft)	No	0-1
Volume	Piece volume	No	0-1
WeightUnits	Weight measurement units (e.g. kg, lb)	No	0-1
Weight	Piece weight	No	0-1
LengthUnits	Length measurement units (e.g. cm, in)	No	0-1

Table 9 *(continued)*

Element name	Description	Mandatory	Occurrence
Width	Package width	No	0-1
Length	Package length	No	0-1
Height	Package height	No	0-1
HHGPackagingTypeCode	HHG packaging type code according to ISO 17451-1:2016, Annex B	No	0-unbounded
PackagingTypeDescription	If appropriate code cannot be found in ISO 17451-1:2016, Annex B and "other" is selected, this element shall be used to further describe the packaging type.	No	0-1
PackedItem	Each PackedItem element contains details about one group of similar items in the package (books, CDs, DVDs, etc.). One can have any number of these elements in each piece. The structure of this element is described in 6.8.	Yes	1-unbounded

6.8 PackedItem

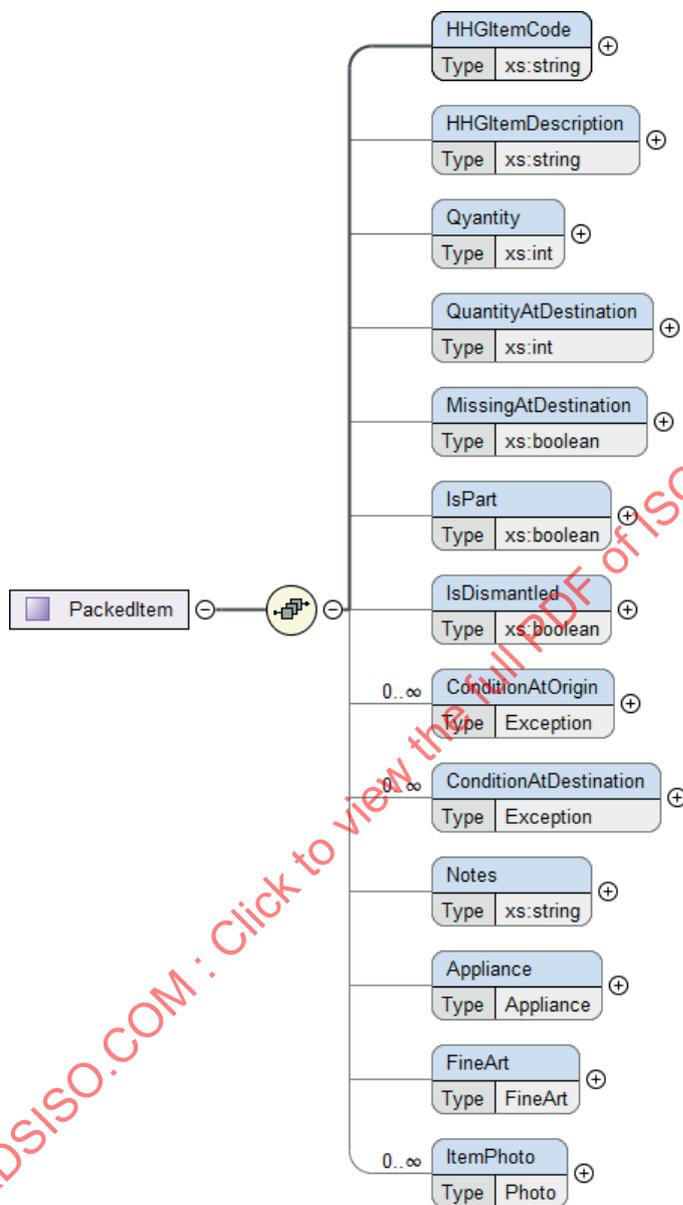PackedItem is an element type that provides the details of a HHG Item. The XSD layout is shown in Figure 10.

Figure 10 — PackedItem element structure

Table 10 — PackedItem element information

Element name	Description	Mandatory	Occurrence
HHGItemCode	HHG Item code according to ISO 17451-1:2016, Annex A	Yes	1
HHGItemDescription	If appropriate code cannot be found in ISO 17451-1:2016, Annex A and "other" is selected, this element shall be used to further describe the HHG item.	No	0-1
Quantity	Quantity of similar items, i.e. books, CDs, DVDs	No	0-1
QuantityAtDestination	Quantity of items at destination	No	0-1

Table 10 *(continued)*

Element name	Description	Mandatory	Occurrence
MissingAtDestination	This flag indicates whether the item was found missing at destination	No	0-1
IsPart	This flag indicates whether the item is part of a bigger item. For instance, if the item is a drawer and it is part of a chest of drawers. If yes, indicate further detail in the notes.	No	0-1
IsDismantled	This flag indicates whether the item has been dismantled at origin.	No	0–1
ConditionAtOrigin	Item damages/exceptions noted at origin. Each element corresponds to one exception/damage. This element is of the type exception and is described in 6.11.	No	0-unbounded
ConditionAtDestination	Item damages noted at destination. Each element corresponds to one exception/damage. This element is of the type exception and is described in 6.11.	No	0-unbounded
Notes	Item related notes	No	0-1
Appliance	Electronic appliance details. This element is of the type appliance and is described in 6.12.	No	0-1
FineArt	Fine art/antique item details. This element is of the type FineArt and is described in 6.13.	No	0-1
ItemPhoto	Each element corresponds to one photo. This element is of the type photo and is described in 6.14.	No	0-unbounded

6.9 Room

Room is an element type that provides the location in a residence where a piece was packed at origin or is to be placed at destination. The XSD layout is shown in Figure 11.
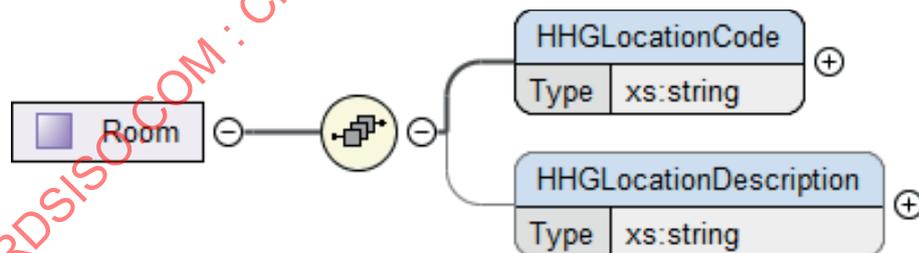

Figure 11 — Room element structure

Table 11 — Room element information

Element name	Description	Mandatory	Occurrence
HHGLocationCode	Room name code according to ISO 17451-1:2016, Annex E.	Yes	1
HHGLocationDescription	If appropriate code cannot be found in ISO 17451-1:2016, Annex E and "other" is selected, this element shall be used to further describe the location.	No	0-1

6.10 Packer

Packer is an element type that provides the name of the individual responsible for the preparation of the PackedItem. The XSD layout is shown in Figure 12.
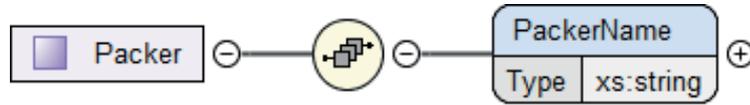

Figure 12 — Packer element structure

Table 12 — Packer element information

Element name	Description	Mandatory	Occurrence
PackerName	Name of Packer. User can provide a name in any format – initials, first name, and/or last name	Yes	1

6.11 Exception

Exception is a type that describes damage to a PackedItem. The XSD layout is shown in Figure 13.
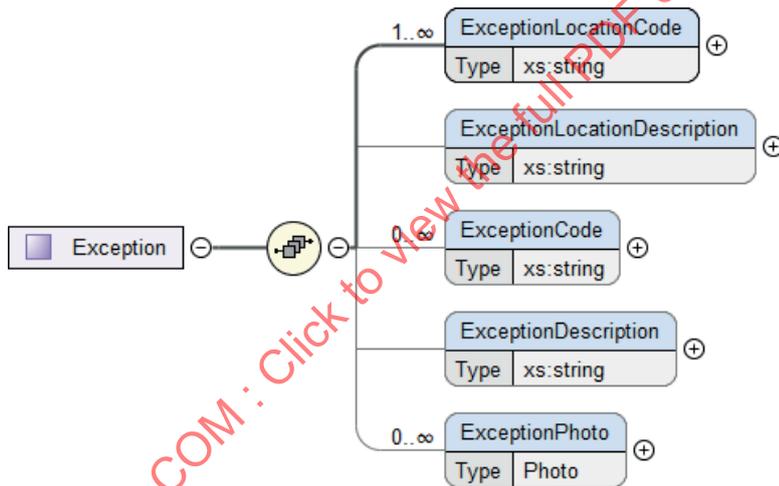

Figure 13 — Exception element structure

Table 13 — Exception element information

Element name	Description	Mandatory	Occurrence
ExceptionLocationCode	Damage/exception location code according to ISO 17451-1:2016, Annex G.	Yes	1-unbounded
ExceptionLocationDescription	If appropriate code cannot be found in ISO 17451-1:2016, Annex G and "other" is selected, this element shall be used to further describe the exception location.	No	0-1
ExceptionCode	Damage/exception type code according to ISO 17451-1:2016, Annex F.	No	0-unbounded
ExceptionDescription	If appropriate code cannot be found in ISO 17451-1:2016, Annex F and "other" is selected, this element shall be used to further describe the exception.	No	0-1
ExceptionPhoto	Image(s) of the exception. The structure of this element is described in 6.14.	No	0-unbounded