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Requirements for contactless delivery services in cold chain logistics

Exigences relatives aux services de livraison sans contact dans la logistique de la chaîne du froid

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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This document was prepared by Technical Committee ISO/TC 315, *Cold chain logistics.*

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Introduction

Contactless delivery services reduce direct face-to-face contact between personnel in logistics. Contactless delivery services are useful for people who require such services but worry about the spread of infection and foodborne illness.

Contactless delivery services in cold chain logistics can be standardized to avoid face-to-face contact, effectively prevent and control the spread of virus infection, and protect the health of consumers.

Requirements for contactless delivery services in cold chain logistics

1 Scope

This document specifies requirements for refrigerated delivery service providers to deliver goods directly from the last contactless refrigerated goods operation areas at distribution centres to recipients through contactless cold chain, depending on customers' needs. This document does not apply to the transfer of goods between distribution centres.

This document includes requirements for:

— refrigerated delivery service providers;

— facilities and the equipment involved in contactless refrigerated delivery;

— the operation process;

— the handling of abnormal conditions.

This standard is also applicable to scenarios that need contactless cold chain delivery under special circumstances, such as epidemics.

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 23412, *Indirect, temperature-controlled refrigerated delivery services — Land transport of parcels with intermediate transfer*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 23412 and the following apply.

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

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

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

3.1
refrigerated goods
goods with original packaging or transportation packaging that have been refrigerated to within a defined service delivery temperature specified by the *refrigerated delivery service provider* (3.2) and agreed to by service users in order to be carried or sent by refrigerated delivery services

Note 1 to entry: Refrigerated goods includes both chilled goods and frozen goods.

3.2
refrigerated delivery service provider
company or organization providing the refrigerated delivery services

[SOURCE: ISO 23412:2020, 3.12]

3.3
contactless
condition wherein there is no direct contact between people, by means of wearing masks, gloves and other isolation devices or keeping a safe distance from each other when working on the same *refrigerated goods* (3.1), as well as not direct contact with the refrigerated goods' packing or its transportation packaging, by means of wearing masks, gloves and other isolation devices or keeping a safe distance from refrigerated goods during the delivery of the refrigerated goods

3.4
contactless refrigerated delivery
delivering goods directly from the last *contactless* (3.3) *refrigerated goods* (3.1) *operation area* (3.7) of a *distribution centre* (3.6) to a recipient in a contactless manner within a required temperature range

Note 1 to entry: The transfer of goods between distribution centres is not included in this definition.

Note 2 to entry: The required temperature range is specified by the *refrigerated delivery service provider* (3.2) and agreed to by service users in order to be carried or sent by the refrigerated delivery service.

3.5
thermally insulated container
mobile container constructed to reduce the rate of heat transmission, in which temperature can be controlled and accommodate multiple *refrigerated goods* (3.1) in the process of delivery

Note 1 to entry: Thermally insulated containers include thermally insulated containers with or without refrigerating sources. Thermally insulated containers with a power source can be used by charging or connecting to power supply. Thermally insulated containers without power sources do not require power for refrigeration.

[SOURCE: ISO 23412:2020, 3.7, modified — Note 1 to entry has been added, and content related to materials has been deleted.]

3.6
distribution centre
last site before delivering to recipients, with functions of receival, storage and delivery of *refrigerated goods* (3.1)

3.7
operation area
area exclusively set up by *refrigerated delivery service providers* (3.2) to deal with *contactless* (3.3) *refrigerated goods* (3.1) in a *distribution centre* (3.6), which includes a *loading* (3.8) and *unloading area* (3.9), a *channel of incoming and outgoing* (3.10), a *storage area* (3.11) for refrigerated goods, and any related facilities and equipment

3.8
loading area
one part of an *operation area* (3.7) which is only used to load the *contactless* (3.3) *refrigerated goods* (3.1)

3.9
unloading area
one part of *operation area* (3.7) which is only used to unload the *contactless* (3.3) *refrigerated goods* (3.1)

3.10
channel of incoming and outgoing
channel of the *operation area* (3.7) which is only used to move *contactless* (3.3) *refrigerated goods* (3.1) into or out from the *storage area* (3.9)

3.11
storage area
part of *operation area* (3.7) used to store *contactless* (3.3) *refrigerated goods* (3.1)

3.12
self-service pick-up cabinet
logistics terminal facilities with a self-service pick-up function and a low-temperature store function, set up near the community or the residential buildings close to recipients

3.13
contactless delivery service user
person or organization requesting a *contactless* (3.3) *refrigerated delivery* (3.4) service and agreeing to its terms and conditions in order to send contactless *refrigerated goods* (3.1) to a recipient (3.14)

[SOURCE: ISO 23412:2020, 3.4, modified — Content related to "contactless" has been added]

3.14
monitoring equipment
tools which can be used for tracking movements during cold chain logistics

Note 1 to entry: This may include, for example, thermometers, trace and track equipment, and temperature recorders.

4 Requirements for contactless refrigerated delivery service providers

4.1 The contactless refrigerated delivery service provider shall:

a) have a refrigerated delivery service description that clearly describes that the refrigerated delivery service provides the temperature-controlled delivery of refrigerated goods;

b) implement a procedure to check the presence and the validity of the business licence(s) or the documentation, and to undertake further action required, where it is necessary for the refrigerated delivery service provider to obtain a business licence(s) to operate a refrigerated delivery service;

c) make publicly available its contact details for the purpose of addressing any enquiries, complaints or feedback that potential and current delivery service users, and/or refrigerated goods recipients can have;

d) determine the terms and conditions for delivery of refrigerated goods, including, as a minimum, their maximum size, maximum mass, packaging conditions, as well as pre-cooling and pre-freezing conditions by the delivery service users;

e) define the items not accepted, including a list of items possibly prohibited by law, and any items not accepted by the refrigerated delivery service provider for delivery.

4.2 The contactless refrigerated delivery service provider shall establish managements for contactless refrigerated delivery service which includes but is not limited to the following:

a) Facilities and devices management: It shall define the equipment of facilities and devices and the measures to be taken to ensure normal operation of contactless facilities and devices.

b) Information management: It shall ensure that handover information (including temperature of the refrigerated goods, contactless measures taken to load the refrigerated goods, etc.) can be recorded on the information management system, that the functions of information inquiry and traceability, customer feedback, abnormalities warnings, etc. are available. The contactless refrigerated delivery service provider shall also ensure customer information security, and must not disclose data involving consumers to third parties. Paper records regarding relevant information in the delivery process shall be filed immediately.

NOTE Regulations can apply regarding the storage of paper and electronic records. Refer to the relevant regulatory authority for further information.

c) Contactless management: It shall define the measures to be taken to ensure that there is no direct contact between people when they work on the same refrigerated goods and no direct contact with the refrigerated goods' own packing or its transportation packaging throughout the process of contactless refrigerated delivery.

d) Hygiene management: It shall define the hygiene requirements for the areas and tools, facilities or devices involving contactless refrigerated delivery, cleaning, disinfection and other requirements to meet the hygiene requirements.

e) Traceability management: It shall establish a traceability of information management platform to ensure the contactless measures taken during the process of delivery are recorded and traceable.

f) Personnel management: Personnel performing pre-health checks should have the relevant qualifications or training.

4.3 Refrigerated delivery service providers should set an operation area exclusively to deal with contactless refrigerated goods at the distribution centre, which includes:

a) a loading and unloading area;

b) a channel of incoming and outgoing;

c) a storage area of refrigerated goods;

d) related facilities and equipment.

If the operation area is mix-used for both contactless refrigerated goods and non-contactless refrigerated goods, the area shall be disinfected and isolated prior to each contactless delivery operation.

When the refrigerated goods arrive at the distribution centre, they should be unloaded at the unloading area [see 4.3 a)] and be transported to and from the storage area [see 4.3 c)] through the channel of incoming and outgoing [see 4.3 b)]. The refrigerated goods should be disinfected while unloading, after they arrive at the distribution centre. The material used for the disinfection should be selected to ensure no tampering of the organoleptic qualities of the goods as well as to ensure occupational health and safety of staff.

5 Facilities and equipment for contactless refrigerated delivery

5.1 General requirements

5.1.1 Refrigerated delivery service providers shall provide facilities and equipment to ensure that there is no direct contact between people when they are working on the same refrigerated goods and people's bodies do not directly touch the refrigerated goods' own packing or its transportation packaging when receiving, storing and transporting refrigerated goods either within the operation area or during the delivery of refrigerated goods from the operation area of the distribution centre to the recipient.

5.1.2 The facilities and equipment should be used exclusively for contactless refrigerated delivery. The facilities and equipment shall be disinfected immediately before and after each use.

5.2 Facilities and equipment at operation area

5.2.1 The operation area should be fitted with automated handing facilities and equipment as much as possible. Automated handing facilities and equipment include loading, unloading, sorting, stacking temperature control and detection devices, etc. Automated handing facilities and equipment operation should be used rather than manual.

5.2.2 The operation area shall be supplied with adequate protective equipment. Protective equipment includes but is not limited to protective suits, gloves, and masks, etc. Protective equipment can be disposable and discarded after one operation; it can also be reused. For multiple use, it shall be cleaned and disinfected after use (see 5.2.3). It shall be discarded if it fails to meet the requirements of contactless delivery.

5.2.3 The operation area should be supplied with disinfection materials covering physical disinfection and chemical disinfection. The storage area and the materials, facilities and equipment in the storage area should be disinfected in accordance with the hygiene management system [see 4.2 d)]. Regulations can apply regarding the storage of disinfection records. Physical disinfection materials include but are not limited to ultraviolet disinfection, plasma disinfection, and microwave disinfection lights, etc. Chemical

disinfection materials include but are not limited to chlorine-containing disinfectants, ozone, ethanol and other disinfectants. Regulations can apply regarding the storage of chemical disinfection materials.

5.3 Delivery vehicle

5.3.1 Vehicles used for the delivery of refrigerated goods from operation area to recipient can be refrigerated vehicles and non-refrigerated vehicles. The refrigerated delivery service providers shall ensure that refrigerated goods meet the temperature and contactless requirements agreed to by the delivery service provider and service user. The temperature requirements of refrigerated vehicles and non-refrigerated vehicles shall conform to ISO 23412:2020, 9.2.

5.3.2 A refrigerated vehicle exclusively used for contactless refrigerated delivery should be provided. The delivery vehicle shall be cleaned and disinfected before each loading of contactless refrigerated goods. The same delivery vehicle shall not be used to delivery contactless refrigerated goods and non-contactless refrigerated goods at the same time.

5.3.3 The inside walls of the delivery vehicle shall be flat, clean, non-toxic, harmless, odour-free and pollution-free. It shall be cleaned after each delivery.

5.3.4 When non-refrigerated vehicles are used for contactless refrigerated delivery, a thermally insulated container (see 5.4) shall be used.

5.4 Thermally insulated container

5.4.1 General requirements

5.4.1.1 The thermally insulated container shall have the function of thermal insulation or refrigeration which can meet the needs of the refrigerated delivery service. Thermally insulated containers with or without a power source can be provided for refrigeration purpose.

The refrigerated delivery service provider shall provide a calibrated temperature monitoring instrument into the thermally insulated container, in order to monitor its internal temperature. The internal temperature measured by the temperature monitoring instrument should be visible during delivery.

The temperature inside the thermally insulated container shall be checked and recorded. These records shall be retained for a defined period of time (for example, 12 months).

Monitoring equipment shall be calibrated against measurement standards defined by international or national standards.

5.4.1.2 The thermally insulated container shall be flat, clean, non-toxic, harmless, odour-free and pollution-free. It should be cleaned and disinfected after as well as before each use.

5.4.1.3 A thermally insulated container should be equipped specifically for contactless refrigerated delivery. If it is necessary to use the same thermally insulated container in turn with the non-contactless refrigerated delivered goods, the thermally insulated container shall be cleaned and disinfected before use. The same thermally insulated container shall not be used to deliver contactless refrigerated goods and non-contactless refrigerated goods at the same time.

5.4.2 Thermally insulated container without power source

If a thermally insulated container without a power source is used for delivery, cooling materials (see 5.5) shall be placed in the thermally insulated container.

5.5 Cooling materials

5.5.1 Cooling materials may include but are not limited to: dry ice, ice bags, and ice boxes, etc. Cooling materials shall:

a) meet the requirements of ISO 23412:2020, 9.4;

b) ensure that the storage in the thermally insulated container does not cause damage to the refrigerated goods;

c) be cleaned and disinfected before storage;

d) be cleaned and disinfected before and after each use.

5.5.2 The storage of cooling materials shall conform to ISO 23412:2020, 9.5.

5.5.3 Automatic loading and unloading equipment should be used as much as possible when putting and taking out the cooling materials into and from the thermally insulated container. If manual operation is required, the staff shall at least wear gloves, masks, etc. to protect from directly contacting the cooling materials.

5.6 Self-service pick-up cabinet

5.6.1 The refrigerated delivery service provider may provide a self-service pick-up cabinet. The self-service pick-up cabinet shall:

a) have the refrigeration functions suitable for the storage of refrigerated goods, which may realize conversion of different functions and temperatures;

b) have the corresponding functions of networking and information transmission, the ability to monitor and record the temperature in real time, to alarm when the temperature is abnormal, to monitor the opening and closing of the cabinet and transmit information;

c) be capable of video monitoring in order to ensure safety.

5.6.2 The self-service pick-up cabinet should be able to be opened by scanning a code as far as possible in order to avoid direct contact between personnel and itself.

6 Requirements for the operation of contactless refrigerated delivery

6.1 Handover

6.1.1 Handover when loading with delivery vehicle

6.1.1.1 Automatic loading equipment should be used as far as possible to load the refrigerated goods into delivery vehicles. If it is necessary to manually put refrigerated goods into delivery vehicles there shall be no contact between the handover personnel or between the handover personnel and the refrigerated goods. This shall be achieved by wearing gloves and masks, etc., when lifting, lowering or placing refrigerated goods.

6.1.1.2 After the refrigerated goods are loaded into the delivery vehicle, the handover parties shall confirm, but not be limited to, the following information:

a) temperature of the loaded refrigerated goods;

b) contactless measures taken to load the refrigerated goods.

The handover parties can confirm the above information through visual information tools, without direct contact. The handover can also be carried out by at least wearing gloves, masks and other contactless methods. After both parties confirm the handover information, the handover information shall be uploaded in the information management system [see 4.2 b)].

6.1.2 Handover when unloading with delivery vehicle

6.1.2.1 Automatic unloading equipment should be used as far as possible to unload refrigerated goods from delivery vehicles. If it is necessary to manually unload refrigerated goods from delivery vehicles, there shall be no contact between the handover personnel or between the handover personnel and the refrigerated goods. This shall be achieved by wearing gloves and masks, etc.

6.1.2.2 After the refrigerated goods are unloaded from delivery vehicles, both parties shall confirm the temperature, state and quantity of the refrigerated goods, etc. The handover parties can confirm the handover of refrigerated goods through visual information tools without direct contact. The handover can also be carried out by at least wearing gloves, masks and other contactless methods. After both parties confirm the handover, the handover information shall be uploaded in the information management system [see 4.2 b)].

6.1.3 Handover when loading with thermally insulated container

6.1.3.1 The refrigerated goods should be put into thermally insulated containers by means of mechanical arms, or other appropriate equipment, as far as possible. If it is necessary to manually put refrigerated goods into the thermally insulated containers, the handover personnel shall at least wear gloves, masks, etc. There shall be no contact between the handover personnel, between the handover personnel and refrigerated goods, and between refrigerated goods.

6.1.3.2 After the refrigerated goods are put into thermally insulated containers, both parties shall confirm the temperature, state and quantity of the refrigerated goods. The handover parties can confirm the handover of refrigerated goods through visual information tools without direct contact; the handover can also be carried out by at least wearing gloves, masks and other contactless methods. After both parties confirm the handover, the handover information shall be uploaded in the information management system [see 4.2 b)].

6.1.4 Handover when unloading with thermally insulated container

6.1.4.1 Refrigerated goods should be taken out of thermally insulated containers by means of a mechanical arm, or other appropriate equipment as far as possible. If it is necessary to manually take out the refrigerated goods from the thermally insulated containers, the handover personnel shall at least wear gloves, masks, etc. There shall be no contact between the handover personnel, between the handover personnel and the refrigerated goods, and between the refrigerated goods.

6.1.4.2 After taking out the refrigerated goods from the thermally insulated container, both parties shall confirm the temperature, state and quantity of the refrigerated goods. The handover parties can confirm the handover of refrigerated goods through visual information tools without direct contact. The handover can also be carried out by at least wearing gloves, masks and other contactless methods. After both parties confirm the handover, the handover information shall be uploaded in the information management system [see 4.2 b)].

6.2 Receiving and storage at distribution centre

6.2.1 General requirements

6.2.1.1 When the refrigerated goods arrive at the distribution centre, they shall be unloaded at the unloading area and be transported to the storage area through the incoming channel. The storage area

shall be separated from the non-contactless refrigerated goods storage area and located in an independent physical area. The incoming channel and unloading area of contactless refrigerated goods should be independent.

6.2.1.2 When refrigerated goods are unloaded, sorted, stacked and tested for temperature at operation area of distribution centre, there shall be no contact between personnel or between personnel and refrigerated goods.

6.2.1.3 The temperature of refrigerated goods and contactless measures taken when receiving and storing the refrigerated goods should be recorded.

6.2.2 Receiving of goods

6.2.2.1 Unloading should be carried out at the unloading area of a distribution centre. After the refrigerated goods are unloaded, their integrity shall be checked. The goods shall then be disinfected and immediately moved to the storage area through the incoming channel to storage area. If the unloading area and incoming channel are used for both contactless and non-contactless refrigerated goods, it shall be cleaned and disinfected and used exclusively whenever it is used for contactless refrigerated goods.

6.2.2.2 The unloading and handover of refrigerated goods at unloading area shall meet the requirements specified in 6.1.2.

6.2.2.3 After receiving the refrigerated goods, the outer packaging surface of each refrigerated good should be disinfected. It should use automatic disinfection means as far as possible. The material used for the disinfection should be selected in order to ensure there is no effect on the organoleptic quality and safety of the goods.

The refrigerated goods shall be isolated unloaded, moved and stored solely or be isolated if the refrigerated service provider and the services user agreed for it to be delivered solely.

6.2.3 Storage

6.2.3.1 The refrigerated goods can be stored at the storage area of the distribution centre that can be temperature controlled within the service delivery temperature. The temperature of the storage area shall be monitored and recorded according to the requirements of the provider.

6.2.3.2 The storage area shall be disinfected according to the requirements of the provider (for example, 24 hours). When new refrigerated goods arrive, they shall be disinfected. The disinfection should be recorded to the information management system [see 4.2 b)]. Records shall be traceable. Regulations can apply regarding traceability.

6.2.3.3 Intelligent sorting and stacking equipment and other automatic equipment should be equipped to automatically sort and stack the goods as far as possible. When manual sorting and stacking are needed, sorting personnel shall at least wear gloves and masks, etc., to avoid either their body directly touching the refrigerated goods or direct contact between people.

6.3 Delivery

6.3.1 Preparation before delivery

The delivery vehicle, thermally insulated container and cooling materials that need to be used to load refrigerated goods shall be arranged in accordance with the order attribute, recipient address and other elements as well as related facilities and equipment (see 5.2).