



PROPOSAL FOR A NEW FIELD OF TECHNICAL ACTIVITY

PROPOSER:

KATS

DATE OF CIRCULATION:

2023-08-09

CLOSING DATE FOR VOTING:

2023-11-01

A proposal for a new field of technical activity shall be submitted to the Office of the CEO, which will process the proposal in accordance with [ISO/IEC Directives, Part 1, Clause 1.5](#).

Furthermore, a proposal will be considered as complete if every information field is complete and follows the guidelines for proposing and justifying a new field of activity given in the [ISO/IEC Directives, Part 1, Annex C](#).

TITLE

(Please see the [ISO/IEC Directives, Part 1, Annex C, Clause C.4.2](#))

Urban Logistics

SCOPE

(Please see the [ISO/IEC Directives, Part 1, Annex C, Clause C.4.3](#))

Standardization in the field of urban logistics technology and services, including but not limited to terms, functions, assessments and evaluations, and requirements for economical, efficient and eco-friendly urban logistics.

The goal of the technical committee is to help build urban logistics technologies and services that are sustainable, socially and economically responsible.

Standardization activities are technologies and services for efficient and sustainable urban logistics required for cities that are constantly evolving and expanding due to rapid population growth and digital transformation.

Excluded: Standardization covered by

- ISO/TC 22 - Road vehicles
- ISO/TC 34 - Food products
- ISO/TC 92 - Fire safety
- ISO/TC 101 - Continuous mechanical handling equipment
- ISO/TC 122 - Packaging
- ISO/TC 176 - Quality management and quality assurance
- ISO/TC 204 - Intelligent transport systems
- ISO/TC 262 - Risk management
- ISO/TC 268 - Sustainable cities and communities
- ISO/TC 283 - Occupational health and safety management

ISO/IEC JTC 1 - Information technology
ISO/TC 308 - Chain of custody
ISO/TC 315 - Cold chain logistics
ISO/TC 321 - Transaction assurance in E-commerce

and newly established TC on Innovative Logistics.

PURPOSE AND JUSTIFICATION (Please use the field immediately below or attach an annex.)

(Please see the [ISO/IEC Directives, Part 1, Annex C, Clause C.4.13](#))

Logistics is consisted of technologies and services to deliver goods between the point of origin and the point of consumption while meeting the requirements of customers and/or corporations. The logistics activities usually involve the integration of information flow, materials handling, production, packaging, inventory, transportation, warehousing, and often security.

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According to ResearchAndMarket.com, the global logistics market is expected to grow by 95.42 billion US dollars by 2024, factored with increasing cross-border trade, rise in the use of multimodal transport, fresh food delivery, and growing e-commerce market.

The logistics industry is involved in a huge number of market players with numerous operations and interfaces throughout the supply chain. With increasing globalization and the expansion of the global market, however, there are more challenges to be considered ever before. The logistics industry must run more secure, safe, healthy, and environmentally friendly operations while continuously improving its overall performance. This is clearly a big challenge especially for SMEs and many developing countries.

Take Walmart, for example, which deals with over 100,000 suppliers — a massive network of manufacturers, distributors, and subcontractors, from different countries with varying laws and regulations.

Driven by digitization and socio-economic trends further fuelled by the COVID-19 pandemic, e-commerce is now experiencing dramatic growth. The EU's e-commerce market is expected to grow at a annual growth rate (CAGR) of 6.3% between 2019-23 (Statista).

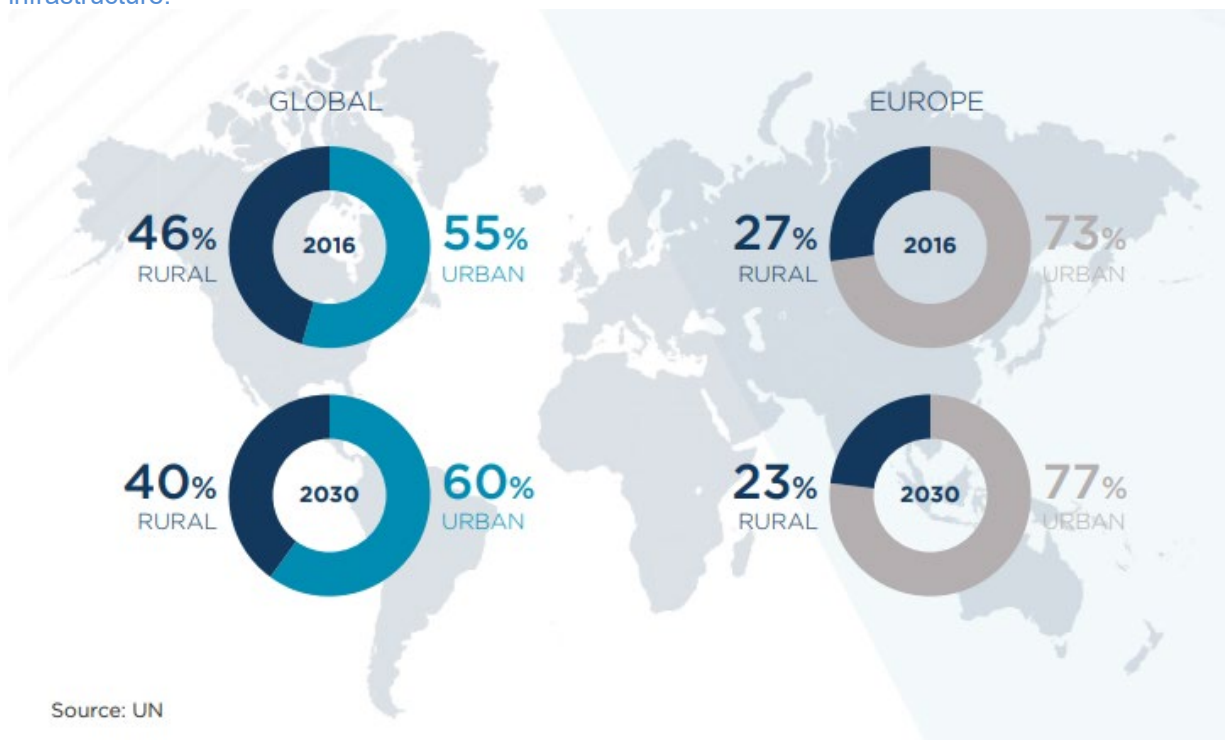
The rapid increase in cargo volume in cities and metropolitan areas causes traffic congestion, air pollution, noise, and logistics costs, ultimately increases costs and various types of risks. An efficient urban logistics system is required to maintain and enhance the city's competitiveness, which is an important factor in the city's economy and improves employment and living conditions.

Demographic trends indicate an increasing concentration of urban logistics activities such as last mile delivery in urban areas. According to the latest UN statistics, 55% of the world's population currently lives in urban areas, and this figure is expected to reach 60% by 2030. In Europe, 77% of the population is expected to live in cities by 2030. (See Figure 1)

This trend creates many new economic concepts in urban societies. Some notable trends are:

- A rise of the on-demand economy. The on-demand economy refers to an economic activity that is technology-based and provides consumers access to a product or service immediately upon request. The growth of the on-demand economy is disrupting many sectors, from food delivery to other sectors such as groceries, music and video, learning and education, healthcare and, of course, logistics.
- The sharing economy on the one hand enables better distribution and use of idle resources, reducing carbon footprint and resource use, while increasing access to previously unaffordable goods and services and creating shared goods or infrastructure.
- The crowdsourcing economy refers to the involvement of individuals or organizations that provide services or provide products by offering tangible goods, services, ideas and/or technologies.

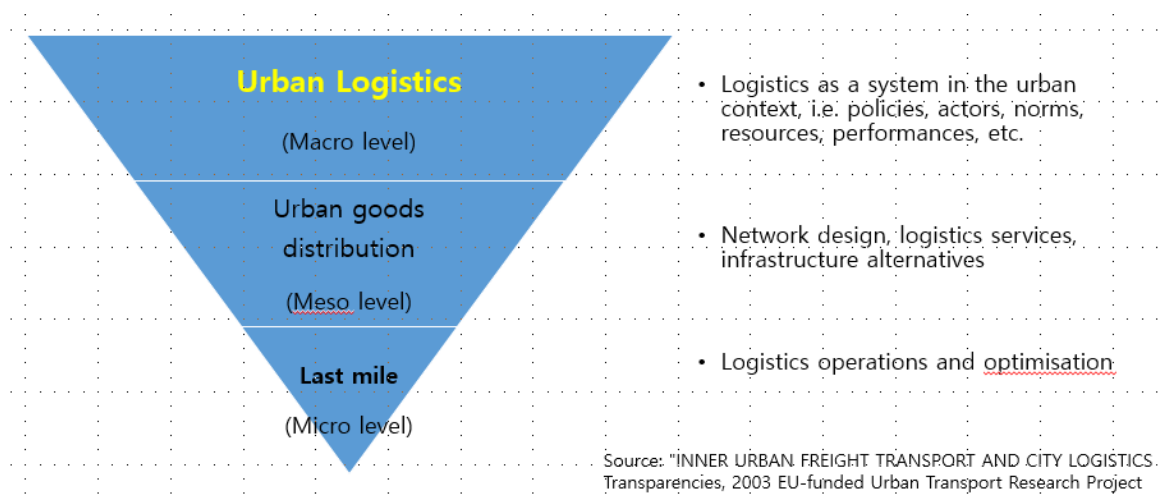
These economic concepts are closely related to urban logistics. Logistics in a city is often customer-centric rather than business-centric in direct contact with customers. Online purchases and last-mile delivery are increasingly concentrated in cities. Processes, infrastructure and services related to urban logistics must be optimized, taking into account the ever-increasing population of cities and the complexity of their infrastructure.



<Fig 1> Population projections in urban areas of the world

Source: Report from Urban Logistics, Cushman & Wakefield. <https://www.cushmanwakefield.com/-/media/cw/emea/united-kingdom/insights/download-pdfs/2017-cushman-wakefield-urban-logistics-report.pdf>

The vertical hierarchies of urban logistics are as follows:



<Fig 2> The concept of vertical hierarchies of urban logistics

Especially after the COVID-19 pandemic and digital transformation, the development of urban logistics faced the following challenges.

- (Rapidly increasing urbanization rates worldwide) Growing demand for urban logistics due to increase in urban population and e-commerce.
- (Urban environmental pollution problems due to inefficient logistics) Increased need to create a sustainable urban logistics ecosystem by improving logistics efficiency and solving environmental problems
- (Chronic high-cost, low-efficiency logistics) Urban logistics (including last mile) accounts for about 50% of total distribution costs.
- (Responding to digitization and technological progress) Change from 'labor-intensive industry' to 'technology-intensive industry' through the digitalization of logistics activities using 4th industrial technologies such as big data, IoT, artificial intelligence, and block chain.
- (Harmony between cities and global supply chains) The issue of increasing logistics efficiency between cities is highlighted by expanding the scope of cross-border purchasing and trade.
- (Improvement of living convenience) Improving the convenience of people's lives and improving working conditions through continuous improvement of urban logistics services and transportation efficiency

Although there are some TCs and standards in ISO covering packaging and logistics means, there are no harmonized international standards for urban logistics technologies and services. In this area, the need for standardization was discovered belatedly as various logistics technologies and services developed worldwide due to the rapidly changing value chain of urban logistics and changes in market demand.

It's time to start standardizing for urban growth, shifting consumer awareness, and harmonious and efficient linking of global and urban supply chains. The new TC will contribute to increasing the overall value of the city by promoting innovation in urban logistics technology and services, protecting logistics workers and consumers, increasing the efficiency of urban logistics, and helping to solve urban environmental problems.

The proposed TC will focus on urban logistics technologies and service standards so as not to overlap with the scope of existing TCs. Additionally, the new committee will work closely with existing TCs as well as various national and industry stakeholders to develop new standards where appropriate.

The expected effects of the proposed new technical committee are

- Helping improve social, economic, and sustainable urban logistics
- Improving the stable and sustainable quality of logistics processes and services
- Helping continue sustainable growth of urban logistics market
- Reducing the risk of workplace accidents
- Helping respond to changed value chain of logistics due to continuous digital transformation
- Reducing overall logistics costs and burdens globally

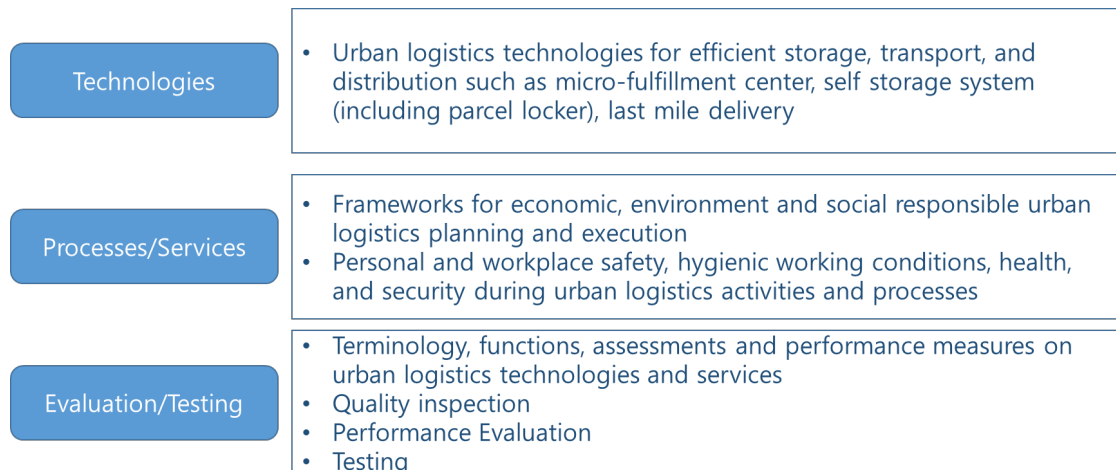
PROPOSED INITIAL PROGRAMME OF WORK (Please use the field immediately below or attach an annex)

Please see the [ISO/IEC Directives, Part 1, Annex C.4.4 and C-4.5](#))

For each item, the initial work programme shall define the deliverable type and target dates. The initial work programme shall also assign priorities to the different items.

The proposed TC will focus on urban logistics technologies and service standards so as not to overlap with the scope of existing TCs. Additionally, the new committee will work closely with existing TCs as well as various national and industry stakeholders to develop new standards where appropriate.

Initial programs of work are as follows.



The standards to be developed will be extended, not limited to:

A few examples include smart retail and storage facilities, non-contact delivery service, back-end logistics, urban micro-fulfillment, safety of urban logistics workers, and more.

- Evaluation of logistics technology and services according to changes in the urban development value chain
- Terms, performance criteria and testing methods for urban logistics technologies and items such as micro-fulfillment center, self-storage, unmanned store, etc.
- Quality measurement of urban logistics operations and services

Some potential items are

- General requirements, structures and quality inspection methods for unmanned parcel locker
- Terminology, functions and general requirements of urban logistics technologies and services
- Assessments and performance - Measurement of quality of service for urban logistics

RELATION OF THE PROPOSAL TO EXISTING INTERNATIONAL STANDARDS AND ON-GOING STANDARDIZATION WORK

- The proposer has checked whether the proposed scope of the new committee overlaps with the scope of any existing ISO or IEC committee or JTC1 sub-committee
- If an overlap or the potential for overlap is identified, the affected committee has been informed and an agreement has been reached between proposer and committee on
 - i. modification/restriction of the scope of the proposal to avoid overlapping,
 - ii. potential modification/restriction of the scope of the existing committee to avoid overlapping.
- If agreement with the existing committee has not been reached, please explain why the proposal should be approved.
- Have proposals on this subject been submitted into an existing committee and rejected? If so, what were the reasons for rejection?

No

LISTING OF RELEVANT DOCUMENTS (SUCH AS STANDARDS AND REGULATIONS) AT INTERNATIONAL, REGIONAL AND NATIONAL LEVEL

(Please see the [ISO/IEC Directives, Part 1, Annex C, Clause C.4.6](#))

- ISO/TC 268 - Sustainable cities and communities
- (ISO/TC 268/SC 2 - Sustainable cities and communities - Sustainable mobility and transportation)
- ISO/TC 315 - Cold chain logistics
- ISO/TC 154 - Processes, data elements and documents in commerce, industry and administration
- ISO/TC 204 (WG 7 General fleet management and commercial/freight)
- ISO 26000: Guidance on social responsibility
- ISO 28000:2007: Specification for security management systems for the supply chain
-
- Standards in CEN/TC320 - Transport - Logistics and services
- Standards in CEN/TC331 - Postal services
- Standards in CEN/TC273 - Logistics (currently, inactive)
- Standards in CEN/TC119 - Swap bodies for combined goods transport
-
- GS1 standards (e.g. Product Classification (GPC), GS1 Global Data Model, GS1 Digital Link)
- Korean standards on logistics, packaging, transport and information flow
- Enterprise Certification, Association for Supply Chain Management (ASCM)

* CEN (TC320 & TC331): Standards that have already been developed in relation to urban logistics may be established into ISO standards and a standard cooperation system between relevant TCs in CEN and ISO should be established.

Europe's Horizon 2020 (ALICE) project on urban logistics such as Zero Emissions Urban Freight in main European Cities, Physical Internet pilot implementations well-functioning and extended in industry practice, etc. also provides useful and insightful documents

The scopes and differences of the most relevant TCs in ISO are compared below.

ISO TCs	SCs / WGs	Title	Scope	Gap
ISO/TC 268	ISO/TC 268/SC 2 - Sustainable cities and communities - Sustainable mobility and transportation	Sustainable cities and communities	Focusing on development of requirements, frameworks, guidance and supporting techniques and tools related to the achievement of sustainable development to help all Cities and Communities and their interested parties in both rural and urban areas become more sustainable.	Mainly focusing on the field of sustainable mobility and transportation for passenger movements. The sustainable development approach based on ISO 37101 remains similar
ISO/TC 315		Cold chain logistics	Standardization in the field of cold chain logistics	New TC will excluded the field of cold chain logistics
ISO/TC 154		Processes, data elements and documents in commerce, industry and administration	Business, and administration processes and supporting data used for information interchange between and within individual organizations and support for standardization activities in the field of industrial data.	New TC will exclude the activities in TC154. New TC will mainly focusing on physical specifications, technologies and services within/between urban area.
ISO/TC 204	WG 7 - General fleet management and Commercial/freight	Intelligent Transport System	Overall system aspects and infrastructure aspects of intelligent transport systems (ITS)	New TC will exclude the activities in TC204. New TC will cooperate with WG7 for information frameworks and electronic information exchange guidelines developments

LISTING OF RELEVANT COUNTRIES WHERE THE SUBJECT OF THE PROPOSAL IS IMPORTANT TO THEIR NATIONAL COMMERCIAL INTERESTS

(Please see the [ISO/IEC Directives, Part 1, Annex C, Clause C.4.8](#))

Urban logistics is concerned with all the different activities involving cargo flows, workers, and consumers from the beginning to the end of ever-expanding regional and global supply chains. The proposed new activities are relevant for all countries.

LISTING OF RELEVANT EXTERNAL INTERNATIONAL ORGANIZATIONS OR INTERNAL PARTIES (OTHER THAN ISO AND/OR IEC COMMITTEES) TO BE ENGAGED AS LIASONS IN THIS WORK

(Please see the [ISO/IEC Directives, Part 1, Clause C.4.9](#))

- Standards in CEN/TC320 - Transport - Logistics and services
- Standards in CEN/TC331 - Postal services
- Alice (Alliance for logistics innovation through collaboration in Europe)

IDENTIFICATION AND DESCRIPTION OF RELEVANT AFFECTED STAKEHOLDER CATEGORIES

(Please see [ISO Connect](#))

	Benefits/Impacts/Examples
Industry and commerce – large industry	E-commerce, logistics, distribution and retail businesses
Industry and commerce – SMEs	E-commerce, logistics, distribution and retail businesses
Government	All governments, city authorities
Consumers	All consumers
Labour	E-commerce, logistics, distribution and retail industries
Academic and research bodies	Logistics, retailing, Urban planning, SCM, etc
Standards application businesses	Standards related to city logistics, retailing, urban planning, etc
Non-governmental organizations	Global city logistics, intechopen, and many sustainable urban logistics related organizations
Other (please specify)	Relevant stakeholders such as urban freight distribution operators, planners and governors, etc

EXPRESSION OF LEADERSHIP COMMITMENT FROM THE PROPOSER

(Please see the [ISO/IEC Directives, Part 1, Annex C, Clause C.4.12](#))

If accepted, KATS (Korea) is willing to undertake the work of secretariat and fully support the new committee including chairmanship and secretariat.

Since the scope of the proposed TC is relatively wide, several sub-committees and working groups are needed and it is suggested to divide the roles according to the interests of each country and standard body

- The proposer confirms that this proposal has been drafted in compliance with iso/iec directives, part 1, annex c**

SIGNATURE OF THE PROPOSER

KATS

COMMENTS OF THE ISO CENTRAL OFFICE (IF ANY)

**General requirements and quality inspection methods for unmanned parcel
locker**

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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.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

An unmanned parcel locker has emerged as a new business model that can be used as a base to send and receive parcels. As the domestic unmanned parcel locker market is largely led by countless small and medium-sized companies, however, the types and functions of unmanned parcel lockers are varied. Unmanned parcel lockers have become sophisticated to be provided in various types including general lockers, specialized ones by industry (food (refrigerated/frozen, etc. temperature/duration setting, etc.)), those for medical purposes (hygiene and safety), and those for ordinary items (existing lockers). Meanwhile, the need for the development of standards (in terms of size, operation, inspection, etc. of unmanned parcel locker) related to the centre for unmanned parcel delivery service to allow "contactless" logistics service for safe and efficient delivery of products with the least contact between delivery personnel and customers became evident (in terms of size, operation, inspection, etc. of unmanned parcel locker). Still, the current unmanned parcel lockers are not linked with the cargo management system, serving the role of parcel storage boxes only.

Although the legal grounds for the unmanned parcel locker can be found regionally, there are no provisions on its performance and standards in detail, leading to failure to consider the spread and extensive use of unmanned parcel lockers. The development standards can be said to be the core standards of contactless logistics and distribution services and are designed to help both companies and consumers.

General requirements and quality inspection methods for unmanned parcel lockers

1 Scope

This document specifies general requirements and quality inspection methods for unmanned parcel lockers installed indoors to be used by the public (hereinafter referred to as "locker")

Note: This document applies to the collective cluster box units installed in apartment houses, subways, companies, and public facilities at room temperature (1~30 °C). Mailboxes, storage spaces, or containers for keeping personal belongings are excluded.

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.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 00000 and the following apply. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

unmanned parcel locker

locker that lets a user temporarily keep or receive items safely without the help of others

3.2

Cluster Box Unit

CBU

Individually installed box units to constitute a cluster

3.3

product quality inspection

procedure for confirming whether the completed machine, equipment, and system are appropriate for their purpose of use

3.4

installation quality inspection

procedure for confirming whether the installed or modified facility, machine, equipment, and system comply with the approved design and supplier recommendations

3.5

operation quality inspection

procedure for confirming whether the installed or modified facility, machine, equipment, and system operate as intended within the expected scope

4 General

4.1 Overview

A locker shall be designed and manufactured in compliance with the following requirements so that it can be used for the intended purpose accordingly:

- a) A locker shall be operable regardless of potential impact or pressure from outside
- b) A locker shall be designed to withstand the weight of the parcel to be stored, and the available size and weight of the parcel shall be marked in a way that enables easy recognition.
- c) A safety device shall be provided to respond to risks of fire, leak, electric shock, etc.
- d) A locker shall be installed in a place that does not interrupt the movement of pedestrians and goods
- e) A universal design shall be applied to the location and intensity of illumination of kiosk (control panel)
- f) so that children, the elderly, and people with disabilities do not have any problem using it.
- g) Safety and security facilities may be installed additionally for safe management and hacking prevention of the locker.
- h) A locker shall be fixed tightly so that it cannot be reversed due to vibration or impact
- i) A locker shall be used to store parcels weighing below 30kg, which is equivalent to the ordinary weight of light baggage, and the storage weight standards shall be marked
- j) As for lockers for storing refrigerated or frozen products, the standards for setting the temperature, duration, ways of checking the temperature, and limit of liability shall be marked.
- k) Manuals for cleaning and maintenance of locker shall be placed.
- l) A locker shall be installed in places with fine ventilation and drainage systems.

4.2 Locker materials

The materials to be used to manufacture the locker shall be determined within the scope that does not cause any trouble to protect items, and they shall meet the requirements for the mechanical and chemical properties stated in these standards.

4.3 Classification

Lockers shall be classified as follows according to the shape and purpose of use:

4.3.1 Storage input method

- a) Front input type: A method wherein multiple lockers in one/several row(s) is(are) placed and sending and receiving parcels are available on the front of lockers
- b) Reverse input type: A method wherein multiple lockers in one/several row(s) is(are) placed and sending and receiving parcels are available on the back of the lockers

4.3.2 Locker size

- a) Standard type: A locker that has the standard size stated in these standards
- b) Non-standard type: A variable locker that has an atypical size or whose size may be changed

4.3.3 Functions of locker

- a) General type: A locker that does not have extra functions other than storage of items
- b) Functional type: A locker with functions appropriate for the items or purposes

EXAMPLE Locker with temperature maintenance function for refrigerated and frozen items

4.3.4 Installation location of locker

- a) Indoor locker: Install inside the building
- b) Outdoor locker: Install outside the building

Note: Facilities surrounded by more than three walls with roof and ceiling or inside a building shall be considered indoor, and those whose more than two walls are open for natural ventilation shall be considered outdoor

4.4 Appearance of locker

The colours and finishes of the inside and outside of the locker shall be determined by the manufacturer. However, outdoor lockers shall be designed with measures to prevent insulation resistance and electric shock. They shall have a structure wherein rainwater shall not flow into the shelves, with anti-rust coating applied on locks and hinges.

4.5 Installation of locker

- a) After installation, lockers shall be fastened with bolts, etc. to be fixed tightly so that they are not moved. As for the facilities, they shall be fixed tightly by fastening their top or bottom with wall mounting plate after installation so that they neither move nor fall down.
- b) A locker shall be installed at a location that neither protrudes nor interrupts the passage of customers or users considering the movement of pedestrians.
- c) Components of the installed lockers shall be easily replaceable in case of damage or failure.
- d) CCTVs may be installed in response to incidents such as loss, theft, etc.

4.6 Door

- a) All boxes of the front input-type lockers shall have a separate door.
- b) Door hinges shall be hidden or designed not to be operable from the outside.
- c) Doors shall be designed to be opened, closed, and locked without joints or excessive gaps.
- d) All doors shall be open for over 90 degrees at the least for user convenience.
- e) Doors shall be designed to have even gaps between them at the least length so that they cannot be forced open by using a simple tool such as knife, screw driver, and thin metal scrap.

Note: Lockers with refrigeration or freeze functions shall have a structure that does not leak cold air and a sealing function that minimizes loss of cold air.

4.6.1 Identification

The door of the locker shall have a unique number or mark to allow users to identify each locker. In addition, the control panel (kiosk) shall have a feature wherein users can find the location of their item with voice or text for user convenience.

4.6.2 Information on locker and authentication

A user or an authorized user may send the information on the address of the selected locker via the locker operating system through linkage between user and locker and authentication procedure.

A device for authentication via password, QR code/barcode, biometrics, etc. may be installed for user convenience and safety. In such case, an automatic locking system after time lapse shall be installed when the door lock is released and the door is opened after authentication.

4.7 Size of individual box

The height of the cluster box unit (CBU) excluding leveller shall be less than 1,600mm from the bottom of the upper top box so that users can store and take out their items without any inconvenience.

The standard size of the individual box shall be as follows:

(Unit: mm, Inside diameter)

Locker Type	Size		
	Height	Width	Depth
Standard	360 +- 20	350+- 20	560+- 20
Small	Less than 360	350+- 20	560+- 20
Mid	360-550	350+- 20	560+- 20
Large	551-1,030	350+- 20	560+- 20

4.8 Operating system

Installation of system to operate the cluster box unit (CBU) and locker shall be optional, and it may have the following functions:

- a) A network operable to external servers such as wired LAN or wireless router, etc.
- b) A function that enables remote control of locker status check and system management
- c) A function of opening lockers remotely or resetting the system upon emergency
- d) A function that can check the history of use and items abandoned for a long time
- e) A function that enables checking the parcel delivery status via home network device for apartment houses, locker management server

5 Inspection method

5.1 General

Inspections on lockers largely consist of Product Quality (PQ), Installation Quality (IQ), and Operation Quality (OQ)

5.1.1 Product quality inspection

A locker shall not be damaged by corrosion but shall maintain good condition in general when seen with the naked eye.

For quality inspections of product hardware, the following items shall be checked:

- a) Bubbles, bleach, or discoloration on the surface of the locker
- b) Distortion in the shape and structure of locker
- c) Normal operation of doors of lockers
- d) Network connection of operating system
- e) Connection of hardware related to communication and detailed operation of locker
- f) Operation of kiosk touch panel and barcode reader
- g) Operation of attached hardware including camera, payment terminal, printer, etc.
- h) (For refrigerated locker) temperature value via communication with refrigerator board
- i) For quality inspections of product software, the following items shall be checked:
 - A. Operation of kiosk program
 - B. Operation of operating system
 - C. Normal operation of remote control system, if any
 - D. State of access to database

5.2 Installation quality inspection

5.2.1 Pre-installation inspection

- a) Check whether the side where the locker is installed is flat (ex. gradient shall be less than 2°) to ensure the stability of locker and system operation and make the side flat by using a leveller, if necessary.
- b) Check the dimensions to ensure that there are spaces for the safe operation of each locker and additional rooms to use the service (we recommend having over 10% of enough space from the left, right, and top).
- c) Power: Check whether single circuits are installed in the distribution box connecting the power lines of lockers (ex. 2P 15A AC 220V, earth C-type)
- d) Check whether there are areas that generate dust, heat, and leaks within 2m where lockers are installed for the safe use of the system.
- e) Inspections on the wiring for the interoperability of separate system shall be conducted based on matters separately agreed upon according to the system specifications.
- f) Test the interoperability and current flow of power lines, check whether each wiring has at least 3m gap from the entrance, and mark the given function to each wire.

5.2.2 Installation

- a) Assemble the control panel and each locker set to install in the corresponding location.
- b) To install each set, fasten by considering gaps on the right and left as well as the overall proportions of the product.
- c) When the fastening of each set is completed, connect the inner wiring of the I/O board at the top/bottom.

5.2.3 Post-installation inspection

- a) Check the operation of the door sensor of each locker.
- b) Check the operation and function of lockers.

- c) Check the covers and wiring conditions of the product and complete the finishing work of the appearance.
- d) Test-run the entire systems to check whether they operate normally for inspection.
- e) Check whether the authentication number is sent normally for parcel delivery.
- f) Check whether customer authentication and locker opening operate normally.
- g) Check whether the auto execution of programs operates normally upon restarting the system
- h) Check whether related information is displayed normally upon linking with the home network

5.3 Operation quality inspection

5.3.1 Opening/Locking device

- a) Check whether the locker is open and closed normally.
- b) Check whether the opening and closing sensor of the locker operates normally.

5.3.2 Hardware maintenance

- a) Check the network connection status of the operating PC.
- b) Check the connection of hardware related to communication and detailed operation of the locker.
- c) Check the operation of kiosk touchpad and barcode reader.
- d) Check the operation of attached hardware including camera, payment terminal, printer, etc.
- e) (For refrigerated locker) check the temperature value via communication with the refrigerator board.

5.3.3 Software maintenance

- a) Check the operation of the kiosk program.
- b) Check the operation of remote access program for operating the PC.
- c) Check the operation of remote control program of boxes.
- d) Check the state of access to database.
- e) Check whether the use data of box users (locker no., time of use) is saved.

5.3.4 Other matters related to security and safety

Be sure to read the laws and regulations related to ICT security and safety.

6 Quality management system

6.1 Development of quality management system

The quality management system shall be established to ensure that the finished product complies with the design requirements and facilitate a series of quality management activities such as installation, operation, return, and collection.

6.2 Operation of quality management system

To facilitate the operation of the established quality management system, a company shall provide detailed guidelines for quality management, detailed plans to conduct quality management, improvement measures, education and training, etc.

The result of quality management shall be reviewed on a regular basis within the company. and measures shall be taken for improvement.

Bibliography

[1] To be added