



IEEE Standard for Logistics Operation Process in a Smart Factory

IEEE Computer Society

Developed by the
Smart Manufacturing Standards Committee

IEEE Std 2934™-2022

STANDARDS

IEEE Standard for Logistics Operation Process in a Smart Factory

Developed by the

Smart Manufacturing Standards Committee
of the
IEEE Computer Society

Approved 16 June 2022

IEEE-SA Standards Board

Abstract: Logistics operation processes in a smart factory, including the process composition such as warehousing, packaging, shipment or transportation; implementation conditions; process quality evaluation; and process improvement are defined in this standard. Methods for management organization, facility layout, equipment requirements, information systems, employee requirements, emergency management and evaluation in a smart factory are also defined in this standard.

Keywords: IEEE 2934™, operation process, smart factory, smart logistics

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Copyright © 2022 by The Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 16 September 2022. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by The Institute of Electrical and Electronics Engineers, Incorporated.

PDF: ISBN 978-1-5044-8870-9 STD25533
Print: ISBN 978-1-5044-8871-6 STDPD25533

IEEE prohibits discrimination, harassment, and bullying.

For more information, visit <https://www.ieee.org/about/corporate/governance/p9-26.html>.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Important Notices and Disclaimers Concerning IEEE Standards Documents

IEEE Standards documents are made available for use subject to important notices and legal disclaimers. These notices and disclaimers, or a reference to this page (<https://standards.ieee.org/ipr/disclaimers.html>), appear in all standards and may be found under the heading “Important Notices and Disclaimers Concerning IEEE Standards Documents.”

Notice and Disclaimer of Liability Concerning the Use of IEEE Standards Documents

IEEE Standards documents are developed within IEEE Societies and subcommittees of IEEE Standards Association (IEEE SA) Board of Governors. IEEE develops its standards through an accredited consensus development process, which brings together volunteers representing varied viewpoints and interests to achieve the final product. IEEE Standards are documents developed by volunteers with scientific, academic, and industry-based expertise in technical working groups. Volunteers are not necessarily members of IEEE or IEEE SA and participate without compensation from IEEE. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

IEEE makes no warranties or representations concerning its standards, and expressly disclaims all warranties, express or implied, concerning this standard, including but not limited to the warranties of merchantability, fitness for a particular purpose and non-infringement. In addition, IEEE does not warrant or represent that the use of the material contained in its standards is free from patent infringement. IEEE standards documents are supplied “AS IS” and “WITH ALL FAULTS.”

Use of an IEEE standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard.

In publishing and making its standards available, IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity, nor is IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing any IEEE Standards document, should rely upon his or her own independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

IN NO EVENT SHALL IEEE BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO: THE NEED TO PROCURE SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE PUBLICATION, USE OF, OR RELIANCE UPON ANY STANDARD, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND REGARDLESS OF WHETHER SUCH DAMAGE WAS FORESEEABLE.

Translations

The IEEE consensus development process involves the review of documents in English only. In the event that an IEEE standard is translated, only the English version published by IEEE is the approved IEEE standard.

Official statements

A statement, written or oral, that is not processed in accordance with the IEEE SA Standards Board Operations Manual shall not be considered or inferred to be the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that the presenter's views should be considered the personal views of that individual rather than the formal position of IEEE, IEEE SA, the Standards Committee, or the Working Group. Statements made by volunteers may not represent the formal position of their employer(s) or affiliation(s).

Comments on standards

Comments for revision of IEEE Standards documents are welcome from any interested party, regardless of membership affiliation with IEEE or IEEE SA. However, **IEEE does not provide interpretations, consulting information, or advice pertaining to IEEE Standards documents.**

Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Since IEEE standards represent a consensus of concerned interests, it is important that any responses to comments and questions also receive the concurrence of a balance of interests. For this reason, IEEE and the members of its Societies and subcommittees of the IEEE SA Board of Governors are not able to provide an instant response to comments, or questions except in those cases where the matter has previously been addressed. For the same reason, IEEE does not respond to interpretation requests. Any person who would like to participate in evaluating comments or in revisions to an IEEE standard is welcome to join the relevant IEEE working group. You can indicate interest in a working group using the Interests tab in the Manage Profile and Interests area of the [IEEE SA myProject system](#).¹ An IEEE Account is needed to access the application.

Comments on standards should be submitted using the [Contact Us](#) form.²

Laws and regulations

Users of IEEE Standards documents should consult all applicable laws and regulations. Compliance with the provisions of any IEEE Standards document does not constitute compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Data privacy

Users of IEEE Standards documents should evaluate the standards for considerations of data privacy and data ownership in the context of assessing and using the standards in compliance with applicable laws and regulations.

Copyrights

IEEE draft and approved standards are copyrighted by IEEE under US and international copyright laws. They are made available by IEEE and are adopted for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making these documents available for use and adoption

¹Available at: <https://development.standards.ieee.org/myproject-web/public/view.html#landing>.

²Available at: <https://standards.ieee.org/content/ieee-standards/en/about/contact/index.html>.

by public authorities and private users, neither IEEE nor its licensors waive any rights in copyright to the documents.

Photocopies

Subject to payment of the appropriate licensing fees, IEEE will grant users a limited, non-exclusive license to photocopy portions of any individual standard for company or organizational internal use or individual, non-commercial use only. To arrange for payment of licensing fees, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400; <https://www.copyright.com/>. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Updating of IEEE Standards documents

Users of IEEE Standards documents should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. An official IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect.

Every IEEE standard is subjected to review at least every 10 years. When a document is more than 10 years old and has not undergone a revision process, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE standard.

In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit [IEEE Xplore](#) or [contact IEEE](#).³ For more information about the IEEE SA or IEEE's standards development process, visit the IEEE SA Website.

Errata

Errata, if any, for all IEEE standards can be accessed on the [IEEE SA Website](#).⁴ Search for standard number and year of approval to access the web page of the published standard. Errata links are located under the Additional Resources Details section. Errata are also available in [IEEE Xplore](#). Users are encouraged to periodically check for errata.

Patents

IEEE Standards are developed in compliance with the [IEEE SA Patent Policy](#).⁵

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken by the IEEE with respect to the existence or validity of any patent rights in connection therewith. If a patent holder or patent applicant has filed a statement of assurance via an Accepted Letter of Assurance, then the statement is listed on the IEEE SA Website at <https://standards.ieee.org/about/sasb/patcom/patents.html>. Letters of Assurance may indicate whether the Submitter is willing or unwilling to grant licenses under patent rights without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination to applicants desiring to obtain such licenses.

³Available at: <https://ieeexplore.ieee.org/browse/standards/collection/ieee>.

⁴Available at: <https://standards.ieee.org/standard/index.html>.

⁵Available at: <https://standards.ieee.org/about/sasb/patcom/materials.html>.

Essential Patent Claims may exist for which a Letter of Assurance has not been received. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims, or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

IMPORTANT NOTICE

IEEE Standards do not guarantee or ensure safety, security, health, or environmental protection, or ensure against interference with or from other devices or networks. IEEE Standards development activities consider research and information presented to the standards development group in developing any safety recommendations. Other information about safety practices, changes in technology or technology implementation, or impact by peripheral systems also may be pertinent to safety considerations during implementation of the standard. Implementers and users of IEEE Standards documents are responsible for determining and complying with all appropriate safety, security, environmental, health, and interference protection practices and all applicable laws and regulations.

Participants

At the time this IEEE standard was completed, the Logistics Operation Process in a Smart Factory Working Group had the following membership:

Zhenchao Yu, *Chair*
Chunyang Yang, *Vice-Chair*
Weihua Liu, *Secretary*

<i>Organization</i>	<i>Name of Designated Representative</i>
Ansteel Group Co., Ltd.....	Haiyun Hou
China Electronics Standardization Institute.....	Lin Hu
China Metallurgical Information and Standardization Institute.....	Lanbing Liu
Haier Internet of clothing (Tianjin) Intelligent Ecological Research Institute.....	Yan Dou
Henan Multimodal Transport Co., Ltd.....	Liang Niu
Huawei Technology Co., Ltd.....	Chunyang Yang
JD Logistics.....	Haifeng Yang
RRS Supply Chain Technology Co., Ltd	Zhenchao Yu
Thinkgo IoT Technology Co., Ltd.....	Zongqing Jiang
Tianjin University.....	Weihua Liu
Xi'an Jiaotong University.....	Feng Wu

The Working Group gratefully acknowledges the contributions of the following participants:

Hongjie Duan	Xianling Qiao	Shuang Wei
Yuxian Li	Chuanlong Sun	Wei Wei
Yanjie Liang	Xiaofeng Sun	Xiaoyu Yan
Shangsong Long	Xinmin Tian	Zhenyuan Xu
	Liuqing Wang	

The following members of the entity balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

0xSenses Corporation	China Metallurgical Information	Lenovo Group Limited
1QB Information Technologies	and Standardization Institute	Schneider Electric
1stCycle Corporation	CRRC Zhuzhou Institute Co.,	Thinkgo IoT Technology Co.,
China Electronics	Ltd.	Ltd.
Standardization Institute	Haier Group	Tianjin University
	Huawei Technologies Co., Inc.	Xi'an Jiaotong University
	JD.com, Inc.	

When the IEEE-SA Standards Board approved this standard on 16 June 2022, it had the following membership:

David J. Law, *Chair*
Ted Burse, *Vice Chair*
Gary Hoffman, *Past Chair*
Konstantinos Karachalios, *Secretary*

Edward A. Addy
Ramy Ahmed Fathy
J. Travis Griffith
Guido R. Hiertz
Yousef Kimiagar
Joseph L. Koepfinger*
Thomas Koshy
John D. Kulick

Johnny Daozhuang Lin
Kevin Lu
Daleep C. Mohla
Andrew Myles
Damir Novosel
Annette D. Reilly
Robby Robson
Jon Walter Rosdahl

Mark Siira
Dorothy V. Stanley
Lei Wang
F. Keith Waters
Karl Weber
Sha Wei
Philip B. Winston
Daidi Zhong

*Member Emeritus

Introduction

This introduction is not part of IEEE Std 2934-2022, IEEE Standard for Logistics Operation Process in a Smart Factory.

The efficient operation of smart factories and the effective control of production costs needs to be supported by reasonable logistics processes. Under the guidance of system engineering principles and methods, the standardization of logistics processes can promote the organic matching of logistics smart equipment and logistics management technology to achieve increased operational efficiency and improve the quality of logistics operations and factory operational performance.

Contents

1. Overview	14
1.1 Scope	14
1.2 Purpose	14
1.3 Word usage	14
1.4 Structure of this standard	15
2. Normative references	15
3. Definitions and Abbreviations	15
3.1 Definitions	15
3.2 Abbreviations	16
4. Logistics process composition of a smart factory	16
4.1 Overall process composition of logistics operations	16
4.2 In-plant logistics operations	16
4.3 Out-of-plant logistics auxiliary operation links	18
5. Implementation conditions of logistics operation process	20
5.1 Management organization and responsibilities	20
5.2 Facilities layout	20
5.3 Equipment requirements	24
5.4 Information system	31
5.5 Employee requirements	34
5.6 Emergency management	34
6. Process quality evaluation and process improvement	35
6.1 Quality evaluation of logistics operation process	35
6.2 Improvement method of logistics operation process	35
Annex A (informative) Bibliography	38
Annex B (informative) Some cases of logistics operation process in SF	39

List of Figures

Figure 1—The overall process of logistics operation in a SF	16
Figure 2—Raw material receiving operation process.....	17
Figure 3—Logistics in production operations	17
Figure 4—Finished product off-line operation process	18
Figure 5—Raw material warehousing operation process	18
Figure 6—Raw material warehousing operation process	19
Figure 7—Finished product warehousing process	19
Figure 8—Finished goods out of the warehouse process.....	19
Figure 9—U-shaped logistics line layout	21
Figure 10—I-shaped logistics line layout.....	22
Figure 11—L-shaped logistics line layout.....	22
Figure 12—Schematic diagram of intelligent warehousing workstations	24
Figure 13—Schematic diagram of labeled pallets	24
Figure 14—Schematic diagram of labeled bins.....	25
Figure 15—Schematic diagram of rail guided vehicle (RGV).....	25
Figure 16—Schematic diagram of automatic guided vehicle (AGV).....	25
Figure 17—Schematic diagram of intelligent guided vehicle (IGV)	26
Figure 18—Schematic diagram of manipulator	26
Figure 19—Schematic diagram of automatic sorting line	26
Figure 20—Schematic diagram of automatic conveyor line.....	27
Figure 21—Schematic diagram of telescopic conveyor	27
Figure 22—Schematic diagram of shuttle	28
Figure 23—Schematic diagram of hoist	28
Figure 24—Schematic diagram of stacker	28
Figure 25—Schematic diagram of unmanned forklift	28
Figure 26—Schematic diagram of crane	29
Figure 27—Schematic diagram of unmanned clasp ing car	29
Figure 28—Schematic diagram of RFID reading device.....	30
Figure 30—Schematic diagram of automatic packing machine	30

Figure 31—Schematic diagram of intelligent turnover box	30
Figure 32—Information system application architecture	32
Figure 33—PDCA cycle.....	36
Figure B.1—Intra-factory logistics operation process.....	39
Figure B.2—Out-of-factory logistics operation process	40
Figure B.3—Functional area map	42
Figure B.4—Information system architecture diagram of home appliance manufacturing enterprise	43
Figure B.5—In-plant operation process	45
Figure B.6—Flow chart of logistics operations outside the factory.....	46
Figure B.7—Schematic diagram of vehicle scheduling	47
Figure B.8—Function area map	49
Figure B.9—System integration architecture diagram of ICT enterprise SF	50
Figure B.10—In-plant logistics process	52
Figure B.11—Raw materials entering the factory	52
Figure B.12—Production logistics	53
Figure B.13—Finished product off-line	53
Figure B.14—Operation flow of off-site logistics	53
Figure B.15—Storage of raw materials	54
Figure B.16—Distribution of raw materials.....	54
Figure B.17—Warehousing of finished products	55
Figure B.18—Delivery of finished products	55
Figure B.19—Function partition diagram	56
Figure B.20—Information system architecture of automobile manufacturing enterprises.....	57

List of Tables

Table 1—Environmental requirements for warehouse equipment 31

Table 2—Energy requirements for smart warehouse equipment..... 31

Table B.1—Evaluation index system of logistics operation process in home appliance manufacturing enterprises 45

Table B.2—Evaluation dimensions of logistics operation process 51

Table B.3—Evaluation index system of the logistics operation process of automobile manufacturing enterprises 59

IEEE Standard for Logistics Operation Process in a Smart Factory

1. Overview

1.1 Scope

This standard defines logistics operations processes in a smart factory (SF), including process composition such as warehousing, packaging, shipment or transportation; implementation conditions; process quality evaluation; and process improvement. This standard also defines methods for management organization, facility layout, equipment requirements, information systems, employee requirements, emergency management, and evaluation in a SF.

1.2 Purpose

Standardized logistics operation processes play an important role for the efficient operation of smart factories. This standard aims to promote standardized construction and operational efficiency in discrete manufacturing by optimizing the logistics operation process.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).^{6,7}

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals *is recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals *is permitted to*).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (*can* equals *is able to*).

⁶The use of the word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.

⁷The use of *will* is deprecated and cannot be used when stating mandatory requirements; *will* is only used in statements of fact.

1.4 Structure of this standard

This standard introduces the logistics operation process of the SF from two perspectives of in-plant logistics and out-of-plant logistics. This standard also introduces the implementation of the logistics operation process specification from the aspects of management organization, facility layout, equipment requirements, information systems, employee requirements, and emergency management. In addition, this standard introduces the evaluation and improvement methods of logistics operation processes. Finally, in [Annex B](#), three case studies are conducted on the logistics process in SFs of a home appliance manufacturing company, an information and communication technology (ICT) company, and an automobile company.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they shall be understood and used, so each referenced document is cited in the text and its relationship to this document can be explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

This standard does not include any normative references.

3. Definitions and Abbreviations

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.⁸

3.1 Definitions

smart factory (SF): Through the application of artificial intelligence technology to product design, process, production, and other processes, the manufacturing factory can reflect perception, interconnection, collaboration, learning, cognition, decision-making, control, execution capabilities, etc., in its key links or processes.

smart finished goods warehouse: A warehouse that provides finished goods storage function for the final demand of customers and the arrangement of end dispatch vehicles.

smart lineside warehouse: A warehouse that aims to provide high-end, efficient, and smart integrated logistics solutions for production lines, with smart replenishment and distribution capabilities, and provides raw material supply for production lines by using modern means, such as unmanned vehicles and artificial intelligence.

smart logistics: A logistics service model based on the Internet of Things, which comprehensively uses smart technology and smart equipment to perceive, identify, and track the logistics service process to achieve real-time response, intelligent optimization, and efficient control.

smart warehouse (SW): A smart warehouse consists of civil construction, smart mechanical and electrical facilities and equipment, and various information systems, with high storage capacity per unit area and the ability to achieve rapid and accurate cargo handling, stacking, sorting, and distribution operations.

⁸*IEEE Standards Dictionary Online* is available at: <http://dictionary.ieee.org>.

3.2 Abbreviations

DMS	decision management system
LES	logistics execution system
MES	manufacturing execution system
OMS	order management system
SD	sale decision
SF	smart factory
TMS	transportation management system
WMS	warehouse management system

4. Logistics process composition of a smart factory

4.1 Overall process composition of logistics operations

The smart logistics operation process includes seven links, among which the in-plant operations include raw material receipt, logistics in production operations, and finished products off-line. Out-of-plant logistics auxiliary operation links include raw materials online, raw materials distribution, finished goods out of storage, and finished goods into storage. In Figure 1, the arrows represent the business flow and information flow between various links, and the judgment criterion is whether the smart detection is qualified.

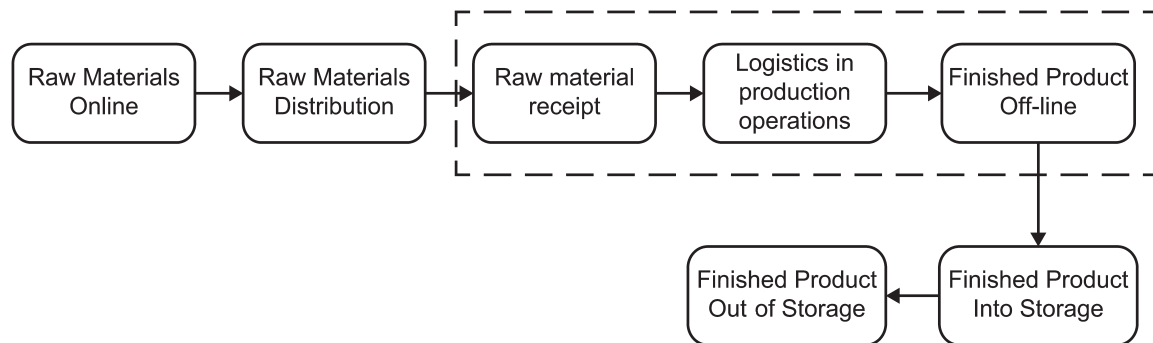


Figure 1—The overall process of logistics operation in a SF

4.2 In-plant logistics operations

4.2.1 Raw material receipt

The process of the raw material receiving operation is shown in Figure 2.

The smart purchasing system shall automatically place orders for required materials according to the enterprise production plan. Suppliers shall make appointments and deliveries according to the supplier management system as well as production requirements. The quality and quantity of raw materials shall be tested and double-checked by smart inspection devices and compared and verified with the discriminatory standards, and the raw materials that do not have problems shall be directly stored, while the raw materials with problems are rejected and removed from the order. Then, the smart storage system shall automatically assign the corresponding shelf space to the raw materials. The raw materials are automatically transported by conveyor lines, rail-guided vehicles (RGVs), automatic-guided vehicles (AGVs), etc., to the system's designated storage location. After storage, the smart warehouse (SW) management system automatically updates the data of the incoming raw materials.

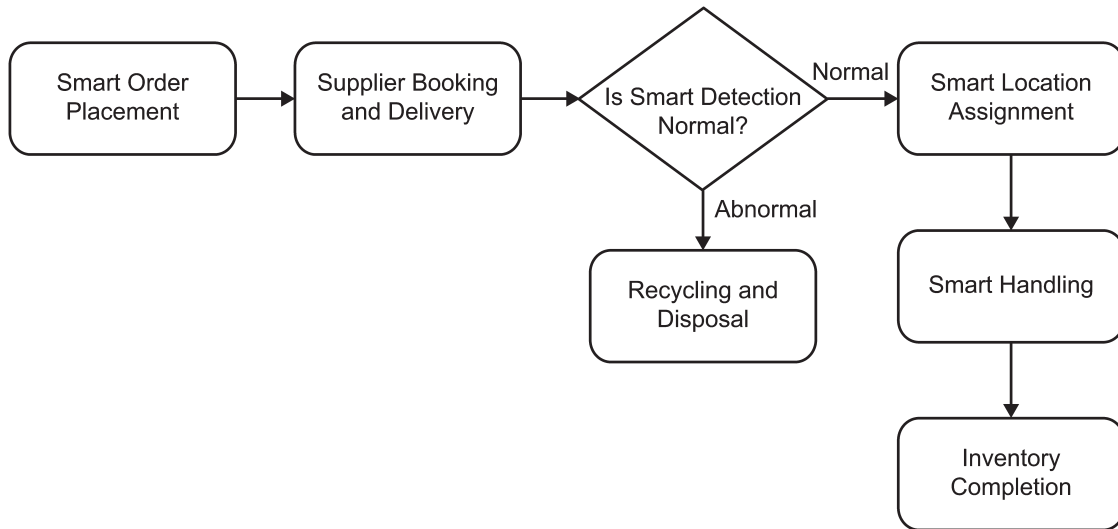


Figure 2—Raw material receiving operation process

4.2.2 Logistics in production operations

The logistics in production operations process is shown in [Figure 3](#).

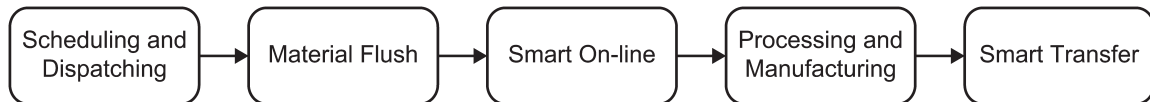


Figure 3—Logistics in production operations

Scheduling is according to the production plan and operation progress. Material is set in the line-side warehouse according to the scheduling plan and production schedule. RGVs and AGVs are used for material online according to the production scheduling and schedule and according to the operation sequence. Intelligent equipment is used to process products according to processing process requirements. When the material is finished processing, intelligent handling equipment is used to transfer to the next production site according to the arrangement of the process.

4.2.3 Finished product off-line

The finished product off-line operation process is shown in [Figure 4](#).

Intelligent inspection shall test and review the quality and quantity of finished products, compare and verify them with the discriminatory standards, and the qualified finished products shall be directly put into the finished product storage, while the unqualified finished products are recycled and processed. The finished goods with normal intelligent inspection results shall be automatically packaged with intelligent packaging equipment. According to the order requirements, the storage of finished products that need temporary storage is arranged. According to the warehousing instructions, the finished products shall automatically be transported to the storage position designated by the system through the conveyor line, RGV, AGV, unmanned vehicle, etc. Finished goods data is updated and warehousing is completed.

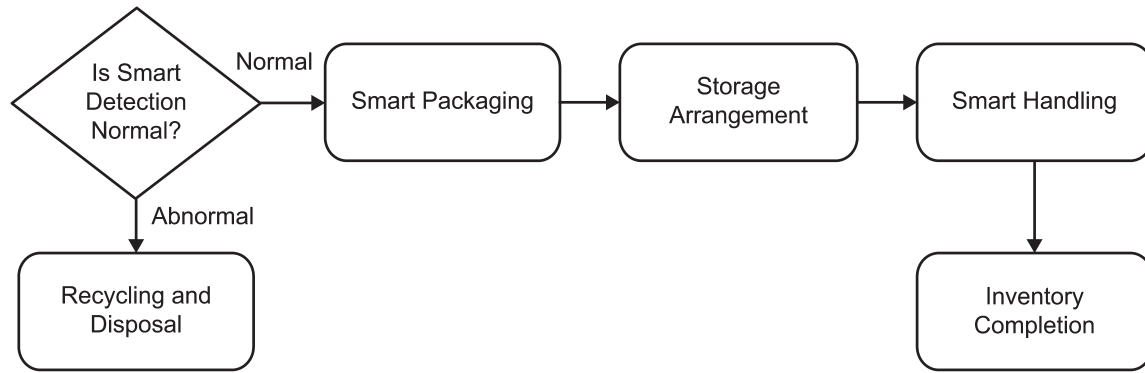


Figure 4—Finished product off-line operation process

4.3 Out-of-plant logistics auxiliary operation links

4.3.1 Raw materials warehousing

The process of the raw material warehousing operation is shown in [Figure 5](#).

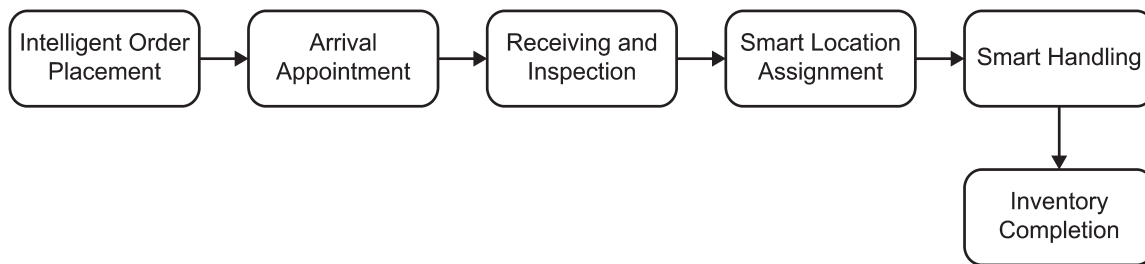


Figure 5—Raw material warehousing operation process

Intelligent identification of raw material requirements and automatic order placement is based on customer demand and current inventory.

The supplier makes an appointment with the raw material warehouse in advance for the arrival time based on the quantity, type, and time of the shipped raw materials.

Intelligent inspection devices are used to test and review the quality and quantity of raw materials, compare and verify them with the discriminatory standards and accept qualified raw materials, and return unqualified ones.

The intelligent storage management system shall automatically prompt whether the shelves are occupied and then recommend suitable shelves.

The bar codes on raw material boxes and pallets are scanned or the RFID automatic scanning method is used to automatically move the goods from the conveyor line, RGV, or AGV to the storage location guided by the system.

The intelligent warehouse management system updates data, and the raw materials warehousing process is completed.