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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 43209-2023

**Automation systems and integration - Virtual reconstruction
technical requirements for smart production lines**

自动化系统与集成 智能生产线虚拟重构技术要求

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. Please note that

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1 Scope

GB/T 43209-2023 sets the technical requirements for the virtual reconstruction of smart production lines. Reconfiguring a line for a new product is normally done by trying it: the line stops, the cells are rearranged, and the problems are found on the floor. Virtual reconstruction moves that to a model built from the line's own data, which only works if the physical layer really can report its state and really is reconfigurable, which is why the standard puts requirements on the plant as well as on the software. It sets the overall architecture with its physical layer, virtual control layer and reconstruction function layer, the process definition, and the requirements on each layer - data acquisition capability, network, device reconfigurability and manufacturing cell division at the physical layer, and the corresponding requirements above it. It took effect on 1 April 2024.

This document specifies the overall architecture, process definition, physical layer requirements, virtual control layer (data model) of intelligent production line virtual reconstruction technology. block, simulation module, monitoring module) technical requirements and reconstructed functional layer technical requirements. This document applies to the planning, design, implementation and application of intelligent production lines and related systems.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document.

GB/T 37973-2019 Information Security Technology Big Data Security Management Guide

GB/T 39334.2-2020 Digital simulation of mechanical product manufacturing process Part

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 production line A collection of equipment dedicated to the production of a specific quantity of product or product line. [Source: GB/T 20720.1-2019,3.1.33]

3.2 smart production line smart production line Apply instrumentation and automation technology, information technology, simulation technology, monitoring technology, and optimization technology to equipment, products, resources, and supporting facilities In the implementation unit, data, simulation models and algorithms are used to plan, implement, manage, monitor and optimize the production line.

3.3 The mapping of the physical production line in the virtual space can accurately reflect the events of the physical production line.

3.4 The process of reorganizing the manufacturing resources of the production line, redefining the process, layout, production scheduling, logistics, optimizing production, etc.

3.5 Use the data provided by the intelligent production line to simulate the production line equipment, processes, products, activities, status, etc., and analyze the production line process, Layout, production scheduling, logistics, etc. are optimized in real time.