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**Guidelines for intelligent plants construction-Part 2: Virtual
plant construction**

智能工厂建设导则 第2部分：虚拟工厂建设

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is Part 2 of GB/T 43064 "Guidelines for the Construction of Intelligent Factories". GB/T 43064 has been published in the following parts.

- Part 1: Physical factory intelligent system;
- Part 2: Virtual factory construction;

- Part 4: Preparation of smart factory design documentation.

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

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Introduction

In order to guide the construction of smart factories in a systematic manner according to scientific methods and rules, and guide enterprises to Gradually develop towards high-level smart factories, thereby promoting the transformation and upgrading of manufacturing enterprises, and formulate GB/T 43064 "Guidelines for the Construction of Smart Factories" GB/T 43064 is intended to solve the common problems encountered by enterprises in the process of building smart factories. It is planned to consist of four parts.

- Part 1: Physical factory intelligent system. The purpose is to specify the construction and

application requirements of the physical factory intelligent system.

- Part 2: Virtual factory construction. The purpose is to standardize and guide the creation and application of virtual factory models required for smart factory construction.

To improve the construction quality and application value of virtual factories.

- Part 3: Requirements for integration of virtual factories and physical factories. The purpose is to specify the requirements for integration of virtual factories and physical factories in the construction of smart factories.

The overall framework and technical architecture of the factory integration, and the integration content, data standards, integration interfaces, system implementation, system operation, etc. Provide technical guidance.

- Part 4: Preparation of smart factory design documents. The purpose is to standardize the construction, reconstruction, expansion and technical Preparation of design documents in the design of technological transformation projects.

Guidelines for building smart factories Part 2: Virtual Factory Construction

1 Scope

This document specifies the basic requirements for virtual factories, the construction of virtual factory models, and the application functions in smart factory construction activities.

This document applies to the construction of virtual factories for new construction, expansion and technological transformation projects of smart factories.

2 Normative references

GB/T 51362

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 physical plant

A general term for physical factories consisting of production equipment, public infrastructure and information infrastructure.

[Source. GB/T 43064.1-2023, 3.2]

3.2 Virtual Plant

A modeling platform or tool that maps the physical factory and has the functions of simulating, managing and controlling the key elements of the physical factory.

[Source. GB/T 40648-2021, 3.1, modified]

3.3

A model used to express and organize plant geometry, physical characteristics, performance characteristics, and functional characteristics.

3.4 Plant simulation model plantsimulationmodel

Models for analyzing, simulating, and predicting plant operations.

4.1 Construction Content

The construction of virtual factory should include model layer and application layer. The model layer is the factory entity, information resources, logic rule definition and The collection of descriptions and their relationships should include the factory information model that supports factory construction and the factory information model used for rule verification and solution optimization of factory construction activities.

The factory simulation model can include product information model and product simulation model as the main basis and input conditions for factory construction activities;