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Industrial automation systems and integration — Numerical control systems for machine tools —

Part 2: Requirements for numerical control system integration

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Foreword

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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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 1, *Industrial cyber and physical device control*.

A list of all parts in the ISO 23218 series can be found on the ISO website.

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

Numerically controlled machine tools are effective production assets with an operations stock of more than four million units and still increasing.

While mechanical construction sets the base for accuracy and durability, the numerical control system (NC system) is the enabler to leverage the potential of the system.

The NC system comprises a powerful computing hardware, a sophisticated NC-Kernel, and an elaborated connectivity, stretching from internal process parameters to high level manufacturing execution system (MES) integration and beyond. It supports operation concepts from push buttons to sophisticated touch-panel systems.

Machine tools and their NC systems are used in harsh environments facing operational conditions such as vibrations, dirt, coolant spray and electromagnetical interferences. Purchasers and operators of machine tools require confidence on the appropriate quality, durability and usability in order to ensure intended use and productivity.

The ISO 23218 series addresses requirements for NC systems. This document provides requirements for NC system integration, and ISO 23218-1 specifically provides requirements for the NC system itself.

Expected users of this document include:

— design engineers working for a company that uses an NC system for machine tools, for developing a new and/or improving a current NC system for machine tools;

— design engineers working for a machine tools builder company, for developing and providing new and/or improving current machine tools by procuring an NC system;

— facility planning engineers, for procuring new and/or improving current machine tools with an NC system.

Industrial automation systems and integration — Numerical control systems for machine tools —

Part 2: Requirements for numerical control system integration

1 Scope

This document specifies requirements for the integration of numerical control systems (NC systems). It consists of technical and inspection requirements and test methods.

This document is applicable to all machine tools using NC systems not already covered by class C standards (including metal cutting machine tools, metal forming machine tools and woodworking machine tools) and for partial assemblies of machine tools (including cabinets and auxiliary devices) intended to be integrated into machine tools. It is also applicable to other production equipment using NC systems.

NOTE NC system integration with machine tools is performed mainly by machine tool builders using an NC system to control their machine tools, system integrators by assembling machine tools with the NC system to a production line, and machine tool users by upgrading their existing equipment.

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 2806, *Industrial automation systems — Numerical control of machines — Vocabulary*

ISO 23218-1, *Industrial automation systems and integration — Physical device control — Numerical control systems for machine tools — Part 1: Requirements for numerical control systems*

IEC 60204-1:2016, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements*

IEC/TS 60204-34:2016, *Safety of machinery — Electrical equipment of machines — Part 34: Requirements for machine tools*

IEC 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2806, ISO 23218-1 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/"