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Automation systems and integration — Evaluating energy efficiency and other factors of manufacturing systems that influence the environment —

Part 5: Environmental performance evaluation data

Systèmes d'automatisation et intégration — Évaluation de l'efficacité énergétique et autres facteurs de fabrication des systèmes qui influencent l'environnement —

Partie 5: Données d'évaluation de la performance environnementale

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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.

This document was prepared jointly by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 5, *Interoperability, integration, and architectures for enterprise systems and automation applications*, and Technical Committee IEC/TC 65, *Industrial-process measurement, control and automation*. The draft was circulated for voting to the national bodies of both ISO and IEC.

A list of all parts in the ISO 20140 series can be found on the ISO website.

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Introduction

ISO 20140 specifies an environmental performance evaluation (EPE) method for evaluating the energy efficiency and other factors of manufacturing systems that influence the environment (e.g. energy consumption, waste and release). The EPE method includes guidelines for analysing the usage of energy by the manufacturing system and the effects of the manufacturing system on the environment. The method described in ISO 20140 is used to perform systematically an EPE by analysing the manufacturing activities and the manufacturing system.

ISO 20140 is intended for discrete products/parts manufacturing systems used in manufacturing processes such as forming, machining, painting, assembling, testing for the production of products such as aircraft, automobile, electric appliances, machine tools and their components.

ISO 20140 focuses on applying the EPE method on a manufacturing system having a hierarchical structure comprised of work units, work centres and areas. The EPE method can be applied for quantifying the improvements in production management and individual manufacturing equipment operations in various manufacturing system configurations.

The EPE method and underlying concept of ISO 20140 can also be used as the foundation for EPE for continuous processes and batch processes.

ISO 20140 can be used for:

— benchmarking of environmental performance for a generic manufacturing system;

— performing studies of environmental performance for improving a current manufacturing process, reconfiguring a current manufacturing system/equipment and designing a new manufacturing system;

— comparing the environmental performance of different manufacturing systems producing the same product;

— setting the top level target of environmental improvement and the breakdown to constituent systems, work units and individual manufacturing equipment;

— improving the shop floor operations by visualizing the actual status of environmental performance.

Expected users of ISO 20140 are:

— managers for environmental conditions in a factory, site and enterprise;

— engineers for process planning of products;

— planners and designers for manufacturing systems;

— engineers and foremen that produce products by operating a manufacturing system.

ISO 20140-1 provides an overview and general principles of a method for evaluating the environmental performance of manufacturing systems.

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Automation systems and integration — Evaluating energy efficiency and other factors of manufacturing systems that influence the environment —

Part 5: Environmental performance evaluation data

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1 Scope

This document specifies the types of environmental performance evaluation (EPE) data, including their attributes, which can be used for evaluating the environmental performance of manufacturing systems based on the general principles described in ISO 20140-1. It also provides recommendations for mapping the EPE data on to information models specified by IEC 62264.

This document applies to discrete, batch and continuous manufacturing.

This document is applicable to entire manufacturing facilities and to parts of a manufacturing facility.

This document specifically excludes from its scope the syntax of the data and information models, the protocols to exchange data models, the functions that can be enabled by data models, and the activities in Level 1 and Level 2.

The scope of this document also includes indicating the differences among various data and information models and the differences among various representations of environmental performance by actual data.

This document refers to the semantics of the structured data and information models used by communication protocols. The semantics explain the meaning of the attributes and of the context information.

The following are outside the scope of this document:

— product life cycle assessment;

— EPE data that are specific to a particular industry sector, manufacturer or machinery;

— acquisition of data;

— the activity of data communication.

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 20140-1:2013, *Automation systems and integration — Evaluating energy efficiency and other factors of manufacturing systems that influence the environment — Part 1: Overview and general principles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20140-1 and the following apply.

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