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

Part 3: Environmental performance evaluation data aggregation process

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

Partie 3: Processus d'agrégation des 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).

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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 5, *Interoperability, integration and architectures of enterprise systems and automation applications*.

A list of all parts in the ISO 20140 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.

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Introduction

ISO 20140 specifies a method for evaluating the energy efficiency and other factors of a manufacturing system that influence the environment, such as energy consumption, waste and release.

ISO 20140 is applicable to manufacturing systems for discrete, batch, and continuous manufacturing.

ISO 20140 focuses on manufacturing systems that have a hierarchical structure.

ISO 20140 can be used for:

— benchmarking the environmental performance against a generic reference manufacturing system or comparing between different manufacturing systems;

— alternative studies for improving environmental performance;

— setting targets for improving environmental performance;

— visualizing the environmental performance of a manufacturing system under operation.

Expected users of ISO 20140 are:

a) managers who are responsible for the environmental conditions of a manufacturing system;

b) engineers who design manufacturing processes for products;

c) engineers who design a manufacturing system;

d) engineers and foremen who are responsible for manufacturing products.

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

Part 3: Environmental performance evaluation data aggregation process

1 Scope

This document specifies an aggregation process that provides aggregated environmental performance evaluation data in accordance with a given environmental performance evaluation specification conforming to ISO 20140-2, by using a set of environmental performance evaluation data conforming to ISO 20140-5.

This document does not specify any aggregation processes specific to particular implementations of manufacturing systems.

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, *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.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
aggregated environmental performance evaluation data
aggregated EPE data
numerical representation of *environmental influence* (3.4) caused by a *manufacturing process* (3.8) in a given type of environmental influence and in a given mode

Note 1 to entry: Aggregated EPE data is the total value of a set of *converted EPE data* (3.3) associated with every *constituent activity* (3.2) involved in the given manufacturing process.

[SOURCE: ISO 20140-2:2018, 3.1, modified — Note 1 to entry has been added.]

3.2
constituent activity
part of a given *manufacturing process* (3.8) identified by a piece of equipment used and a specific period of time

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3.3
converted EPE data
numerical representation of *environmental influence* (3.4) of a specified type caused by a specified *constituent activity* (3.2) in a specified mode

3.4
environmental influence
result of *manufacturing process* (3.8) that can cause environmental impacts and that is considered throughout the lifecycle of the manufacturing system associated with the process

Note 1 to entry: Environmental influence, such as energy consumed and CO_2 emitted, can cause environmental impacts, such as global warming and sea level rise.

EXAMPLE Amount of electric energy consumed; amount of CO_2 emitted; amount of hazardous substance discharged.

[SOURCE: ISO 20140-2:2018, 3.3]

3.5
environmental KPI
key performance indicator that represents *environmental performance* (3.6)

[SOURCE: ISO 20140-2:2018, 3.4]

3.6
environmental performance
measurable results related to environmental aspects

[SOURCE: ISO 14045:2012, 3.5]

3.7
environmental performance evaluation data
EPE data
data that are used to evaluate the *environmental performance* (3.6)

[SOURCE: ISO 20140-5:2017, 3.6, modified — The words "that can be used for environmental performance evaluation" have been replaced with "that are used to evaluate the environmental performance".]

3.8
manufacturing process
structured set of activities involving a flow and/or transformation of material, information, energy, or any other element

[SOURCE: ISO 18435-1:2009, 3.16, modified — The words "set of processes in manufacturing" have been replaced with "structured set of activities" and the word "control" has been deleted.]

4 Mathematical formulae

$\beta < \gamma 1, \gamma 2, \ldots >$ represents a variable β that is identified by attributes $\gamma 1, \gamma 2, \ldots$ in the angle brackets.

$f(\varepsilon 1, \varepsilon 2, \ldots) \rightarrow \delta$ δ represents the result of an operation specified by a function f and its arguments (i.e. $\varepsilon 1, \varepsilon 2, \ldots$).

5 Overview

This clause describes the roles of an EPE data aggregation process in relation to other parts of ISO 20140.

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