



Designation: E3096 – 17

Standard Guide for Definition, Selection, and Organization of Key Performance Indicators for Environmental Aspects of Manufacturing Processes¹

This standard is issued under the fixed designation E3096; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide addresses Key Performance Indicators (KPIs) for environmental aspects of manufacturing processes.

1.2 This guide provides a procedure for identifying candidate KPIs from existing sources for environmental aspects of manufacturing processes.

1.3 This guide provides a procedure for defining new candidate KPIs that are not available from existing sources for environmental aspects of manufacturing processes.

1.4 This guide defines a methodology for selecting effective KPIs from a list of candidate KPIs based on KPI criteria selected from **Appendix X3** or defined by users.

1.5 This guide provides a procedure for normalizing KPIs, assigning weights to those KPIs, and aligning them to environmental objectives.

1.6 KPIs of Manufacturing Operation Management activities as defined in IEC 62264-1 are out of the scope since they are specifically addressed in ISO 22400-2.

1.7 How to evaluate environmental impacts is out of the scope since it is addressed in Guide **E2986**.

1.8 This guide can be used to complement other standards that address environmental aspects of manufacturing processes, for example, Guide **E2986**, Terminology **E2987/E2987M**, and Guide **E3012**.

1.9 *This guide does not purport to address the security risks associated with manufacturing and environmental information. It is the responsibility of the user of this standard to follow practices and establish appropriate information technology related security measures.*

1.10 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the*

responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1.11 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

E2114 Terminology for Sustainability Relative to the Performance of Buildings

E2986 Guide for Evaluation of Environmental Aspects of Sustainability of Manufacturing Processes

E2987/E2987M Terminology for Sustainable Manufacturing

E3012 Guide for Characterizing Environmental Aspects of Manufacturing Processes

2.2 IEC Standard:³

IEC 62264-1 Enterprise-control system integration—Part 1: Models and terminology

2.3 ISO Standards:⁴

ISO 14001 Environmental management—Requirements with guidance for use

ISO 14044 Environmental management—Life cycle assessment—Requirements and guidelines

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

¹ This guide is under the jurisdiction of ASTM Committee **E60** on Sustainability and is the direct responsibility of Subcommittee **E60.13** on Sustainable Manufacturing.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from International Electrotechnical Commission (IEC), 3, rue de Varembe, 1st Floor, P.O. Box 131, CH-1211, Geneva 20, Switzerland, <http://www.iec.ch>.

⁴ Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.