AMPP SP21466-2024
Approved June 4, 2024

Materials Sustainability Framework Based on Corrosion Management System

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Document History:

2024-06-04: Approved by AMPP Standards Committee (SC) 13, Corrosion Monitoring and Measurement

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Foreword

This general standard can be used by material performance and protection personnel and corrosion control personnel involved with operating plants and infrastructure, e.g., contractors involved in corrosion management, corporate sustainability report developers, and regulatory agencies. Specific practices are not covered for every situation because of the complexity and differences of all industries to which material sustainability can be exposed.

This standard may be utilized to integrate material sustainability management into an organization's existing corrosion management system or to establish stand-alone procedures for assessing the organization's material sustainability. Some processes covered in this standard may already be implemented by an organization in which case an organization can review and modify their existing processes to address the elements identified in this standard.

Rationale

AMPP's vision statement approved in 2023 is to provide "A world built and protected with safe, reliable, sustainable materials." Furthermore, one of AMPP's objectives for achieving the goal of sustainability is to "Enhance industry's ability to adopt sustainable business practices." An industry standard for material sustainability based on the corrosion management system framework, therefore, becomes timely to provide a common basis for organizations to assess their performance in following material sustainability and materials stewardship best practices. Due to its wide industry application of material sustainability concept and practices, this first AMPP standard on material sustainability is created as a general standard to pave the way for future AMPP standards that can cover specific material sustainability topics, products, and industries in the future while also putting materials stewardship, including asset integrity and corrosion management system frameworks, into an even broader strategic context.

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Referenced Standards and Other Consensus Documents

Unless specifically dated, the latest edition, revision, or amendment of the documents listed in the table below shall apply.

AMPP/NACE/SSPC, www.ampp.org:	
NACE SP0113 NACE SP21430	Pipeline Integrity Management Methods Selection and Implementation Standard Framework for Establishing Corrosion Management Systems
NACE/ ASTM G193	Standard Terminology and Acronyms Relating to Corrosion
NACE SP21412/ SSPC-CPC 1	Corrosion Prevention and Control Planning
American Petroleum Institute (API), www.api.org:	
API RP 580	Risk-Based Inspection Program
API RP 581	Risk-Based Methodology
ASTM International, www.astm.org:	
ASTM E2432	Standard Guide for General Principles of Sustainability Relative to Buildings
ASTM E2986	Standard Guide for Evaluation of Environmental Aspects of Sustainability of Manufacturing Processes
ASTM E2114	Standard Terminology for Sustainability Relative to the Performance of Buildings
ASTM E2129	Standard Practice for Data Collection for Sustainability Assessment of Building Products
ASTM E3200	Standard Guide for Investment Analysis in Environmentally Sustainable Manufacturing
British Standards Institution (BSI), www.bsigroup.com:	
PAS 2050	Specification for the assessment of the life cycle greenhouse gas emissions of goods and services
PAS 2060	Specification for the demonstration of carbon neutrality
PAS 2080	Carbon management in buildings and infrastructure
European Standards, www.en-standard.eu:	
EN 15804	Sustainability of construction works Environmental product declarations Core rules for the product category of construction products
EN 15978	Sustainability of construction works Assessment of environmental performance of buildings Calculation method
International Organization for Standardization (ISO), www.iso.org:	
ISO 14020	Environmental statements and programmes for products – Principles and general requirements
ISO 14025	Environmental labels and declarations — Type III environmental declarations — Principles and procedures
ISO 14040	Environmental management — Life cycle assessment — Principles and framework
ISO 14044	Environmental management — Life cycle assessment — Requirements and guidelines
ISO 14067	Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification
ISO/TS 14072	Environmental management — Life cycle assessment — Requirements and guidelines for organizational life cycle assessment
ISO 14097	Greenhouse gas management and related activities — Framework including principles and requirements for assessing and reporting investments and financing activities related to climate change
ISO 15392	Sustainability in buildings and civil engineering works — General principles
ISO 15684-5	Buildings and constructed assets – Service life planning – Part 5: Life-cycle costing
ISO 17889-1	Ceramic tiling systems — Sustainability for ceramic tiles and installation materials — Part 1: Specification for ceramic tiles

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ISO 21930	Sustainability in buildings and civil engineering works — Core rules for environmental product declarations of construction products and services
ISO 21931-1	Sustainability in buildings and civil engineering works — Framework for methods of assessment of the environmental, social and economic performance of construction works as a basis for sustainability assessment — Part 1: Buildings
ISO 55000	Asset management — Overview, principles and terminology
ISO 55001	Asset management Management systems – requirements
ISO 55002	Asset management – Management systems – Guidelines for the application of ISO 55001
International Sustainability Standards Board (ISSB), sasb.org/standards:	
N/A	Metal and Mining Sustainability Accounting Standard
N/A	Iron and steel producers Sustainability Accounting Standard
N/A	Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning
N/A	Oil and gas – exploration and production Sustainability Accounting Standard
N/A	Oil and gas – refining and marketing Sustainability Accounting Standard

In AMPP standards, the terms *shall* and *must* are used to state requirements and are considered mandatory. The term *should* is used to state something that is recommended, but is not considered mandatory. The term *may* is used to state something considered optional.

Section 1: Scope

This standard aims to provide a framework for users and their respective organizations in assessing both the material sustainability and material stewardship of their operations using recognized industrial methods, resources, and practices built on the corrosion management framework. Some of these methods, resources, and practices are already covered in the corrosion management system framework; however, some are expanded upon within this standard using a material sustainability maturity model beyond the corrosion management framework. Therefore, this standard aims to empower material and corrosion professionals to better deliver value from a life cycle and circular economy standpoint while leveraging existing and emerging tools to support assets, operations, enterprises, stakeholders, and communities through the value chain.

1.1 Material Sustainability

This standard is built upon the most widely accepted definition of sustainable development by the Brundtland Commission to the United Nations in 1987: “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”[1] Sustainability is generally considered to be the intersection of economic performance, social performance, and environmental performance, as shown in Figure 1.

Material sustainability is focused on optimization of a material’s value from its economic performance, social performance, and environmental performance when it is designed, sourced, processed, manufactured into products, maintained throughout the product lifecycle, and redirected at its end-of-life. Material sustainability is also connected to material stewardship where materials are introduced into and managed by society towards long-term objectives at optimal environmental, economic, and social impacts, often in a holistic corrosion and asset integrity management context.

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