

Corrosion Under Insulation and Fireproofing

API RECOMMENDED PRACTICE 583
FIRST EDITION, MAY 2014



AMERICAN PETROLEUM INSTITUTE

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Corrosion Under Insulation and Fireproofing

1 Scope

This recommended practice (RP) covers the design, maintenance, inspection, and mitigation practices to address external corrosion under insulation (CUI) and corrosion under fireproofing (CUF). The document discusses the external corrosion of carbon and low alloy steels under insulation and fireproofing and the external chloride stress corrosion cracking (ECSCC) of austenitic and duplex stainless steels under insulation. The document does not cover atmospheric corrosion or corrosion at uninsulated pipe supports but does discuss corrosion at insulated pipe supports.

The purpose of this RP is to:

- help owner/users understand the complexity of the many CUI/CUF issues;
- provide owner/users with understanding on the advantages and limitations of the various nondestructive examination methods used to identify CUI and CUF damage;
- provide owner/users with an approach to risk assessment (i.e. likelihood of failure and consequence of failure) for CUI and CUF damage; and
- provide owner/users guidance on how to design, install, and maintain insulation systems to avoid CUI and CUF damage.

The practices described in this document apply to pressure vessels, piping, and storage tanks and spheres. The document discusses the factors impacting the damage mechanisms, the guidelines to prevent external corrosion/cracking under insulation, the maintenance practices to avoid damage, the inspection practices to detect/assess damage, and the guidelines for risk assessment of equipment or structural steel subject to CUI and CUF damage.

2 Normative References

The following referenced documents are indispensable for the application 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.

API 510, *Pressure Vessel Inspection Code: In-service Inspection, Rating, Repair, and Alteration*

API 570, *Piping Inspection Code*

API Recommended Practice 571, *Damage Mechanisms Affecting Fixed Equipment in the Refining Industry*

API Recommended Practice 572, *Inspection Practices for Pressure Vessels*

API Recommended Practice 574, *Inspection Practices for Piping System Components*

API Recommended Practice 575, *Guidelines and Methods for Inspection of Existing Atmospheric and Low-pressure Storage Tanks*

API Recommended Practice 580, *Risk-Based Inspection*

API Recommended Practice 581, *Risk-Based Inspection Technology*

API Recommended Practice 653, *Tank Inspection, Repair, Alteration, and Reconstruction*

API Technical Report 938-C, *Use of Duplex Stainless Steels in the Oil Refining Industry*