Heat Treatment Services—Batch Type for Equipment Used in the Petroleum and Natural Gas Industry

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Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001, standards@api.org.

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Introduction

Changes from the Second Edition to the Third Edition

This standard is the result of updating the requirements from API 20H, Second Edition. This revision is developed based on input from the technical experts on the API 20H Task Group. The Third Edition moves this standard to a higher level of service for the petroleum and natural gas industry.

Highlights of significant changes between the Second and Third Editions include:

— Added new definitions.

— Revised material class to operation types, to better document facility capabilities.

— Revised “heat treatment supplier” to “heat treatment facility” within the document.

— De-linking of material types from operation class and heat treatment specification levels (HSLs) in Table 2.

— Revised “Heat Treatment Facility Qualification” section.

— Removed processing class qualification limitations.

— Added option to extend period between temperature uniformity surveys (TUSs) for HSL-2.

— Updated heat treatment facility capability documentation requirements.

— Separation of equipment calibration and TUS requirements into discreet sections.

— Added requirements for when furnace temperature exceeds set-point temperature during heating while performing the TUS.

— Revised furnace repair requirements.

— Consolidated sections across the document where multiple clauses had similar requirements.

— Updated water quench bath temperature conversions.

— Removed “Manufacturing Process Specification” requirements.

— Updated records to be maintained by the heat treatment facility.

— Added material handling requirements for stainless steels and corrosion resistant alloys.

Heat Treatment Services—Batch Type for Equipment Used in the Petroleum and Natural Gas Industry

1 Scope

1.1 Purpose

This standard identifies requirements for heat treatment facility qualification, processing, identification and traceability, and documentation of heat treatment services for use in the petroleum and natural gas industries when referenced by an applicable equipment specification.

1.2 Applicability

The requirements of this standard apply to batch heat treatment operations that establish or may affect the final mechanical properties, or microstructure, and may include stress relief operations. This standard applies to heat treatment facilities for heat treatment operations on materials such as, carbon steel, micro-alloy steel, low-alloy steel, stainless steel, and nickel-based alloys. Case hardening, induction hardening, and flame hardening are not covered by this standard.

1.3 Heat Treatment Specification Levels (HSLs)

This standard establishes the requirements for three heat treatment specification levels (HSLs). These HSL designations define different levels of heat treatment technical, quality, and qualification requirements.

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 addenda) applies.

API Specification Q1, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*

ASTM E230/E230M,[1] *Standard Specification for Temperature-Electromotive Force (EMF) Tables for Standardized Thermocouples*

IEC 60584-1,[2] *Thermocouples – Part 1: EMF specifications and tolerances*

ISO 9001,[3] *Quality Management Systems – Requirements*

SAE AMS2750,[4] *Pyrometry*

SAE AMS-H-6875, *Heat Treatment of Steel Raw Materials*

3 Terms, Definitions, Acronyms, and Abbreviations

For purposes of this standard, the following terms, definitions, acronyms, and abbreviations apply.

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1 ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428, www.astm.org.

2 International Electrotechnical Commision (IEC), IEC Secretariat, 3 rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland, www.iec.ch.

3 International Organization for Standardization, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, www.iso.org.

4 SAE International, 400 Commonwealth Drive, Warrendale, Pennsylvania 15096, www.sae.org.