ASME STANDARDS TECHNOLOGY, LLC

STP-PT-096-1

ELEVATED TEMPERATURE MATERIAL PROPERTY COMPILATION FOR DESIGN-BY-ANALYSIS

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Errata
to
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Elevated Temperature Material Property Compilation for Design-By-Analysis Process Piping

The following corrections have been made to the first revision of STP-PT-096:

Page	*Location*	*Change*
. . .	Copyright page	Date of Issuance corrected by errata from "August 8, 2022" to "September 2023"
All	. . .	Document number on all pages corrected by errata from "STP-PT-096" to "STP-PT-096-1"
11	Table 4-1	Equation corrected by errata from $\log(t_r) = C_{avg} + \frac{1}{T}\left(b_1 + b_2\log(\sigma) + b_3\log(\sigma)^2 + b_4\log(\sigma)^3\right)$ to $\log(t_r) = C_{avg} + \frac{1}{T+460}\left(b_1 + b_2\log(\sigma) + b_3(\log(\sigma))^2 + b_4(\log(\sigma))^3\right)$
12	Table 4-2	Equation corrected by errata from $\log(\dot{\varepsilon}_0) = -C_{avg} - \frac{1}{T}\left(a_1 + a_2\log(\sigma) + a_3\log(\sigma)^2 + a_4\log(\sigma)^3\right)$ to $\log(\dot{\varepsilon}_0) = -C_{avg} - \frac{1}{T+460}\left(a_1 + a_2\log(\sigma) + a_3(\log(\sigma))^2 + a_4(\log(\sigma))^3\right)$
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FOREWORD

The goal of this publication is to organize and compile high-temperature material property data for select alloys, to be used in the ASME Boiler and Pressure Vessel Code. The authors acknowledge, with deep appreciation, the activities of ASME staff and volunteers who have provided valuable technical input, advice, and assistance with review of, commenting on, and editing of, this document.

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ABBREVIATIONS AND ACRONYMS

API – American Petroleum Institute
ASME – American Society of Mechanical Engineers
ASTM – American Society for Testing and Materials
BPVC – Boiler and Pressure Vessel Code
DBA – Design-By-Analysis
ECCC – European Collaborative Creep Committee
EPRI – Electric Power Research Institute
ISO – International Standards Organization
LM – Larson-Miller
LMP – Larson-Miller Parameter
MPC – Materials Properties Council
NASA – National Aeronautics and Space Administration
NIMS – National Institute of Material Science (Japanese)
NRIM – National Research Institute (Japanese)
NSMH – Nuclear Systems Materials Handbook
N&T – Normalized and Tempered
PRG – Peer Review Group
Q&T – Quenched and Tempered
STP – Standards Technology Publication
WRC – Welding Research Council

1 INTRODUCTION

E^2G | The Equity Engineering Group, Inc. was contracted by ASME Standards Technology, LLC (ASME ST-LLC) to compile high-temperature material property data for select alloys, to be used in the ASME Boiler and Pressure Vessel Code (BPVC). It is expected that the properties compiled in this project will be used to support continued and expanded use of elevated temperature design-by-analysis (DBA), to support initiatives such as advanced ultra-supercritical fossil power generation and Gen IV high-temperature nuclear reactor, among other applications. The data collected as part of this project will be utilized in Sections I, III, and VIII of the BPVC. During the course of this project, periodic milestones were shared with ASME for distribution and review by the project's Peer Review Group (PRG).

In 2012, ASME developed a materials properties database in support of the BPVC's development and maintenance. E^2G was contracted to update and modify this material property database for various materials. The goal of this project was to collect, interpret, qualify, analyze, and prepare elevated temperature material properties for various materials relevant to the BPVC. This unified effort is intended to ensure a baseline consistency between different parts of the BPVC and to leverage funds and resources to the maximum extent through avoidance of duplicate efforts.