SLOVENSKI STANDARD
SIST-TP CEN ISO/TR 20491:2022

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Vezni elementi - Osnove o vodikovi krhkosti v jeklenih pritrdilnih elementih (ISO/TR 20491:2019)

Fasteners - Fundamentals of hydrogen embrittlement in steel fasteners (ISO/TR 20491:2019)

Mechanische Verbindungselemente - Grundlagen der Wasserstoffversprödung in Verbindungselementen aus Stahl (ISO/TR 20491:2019)

Fixations - Principes de la fragilisation par l'hydrogène pour les fixations en acier (ISO/TR 20491:2019)

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21.060.01 Vezni elementi na splošno Fasteners in general

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December 2021

ICS 21.060.01

English Version

Fasteners - Fundamentals of hydrogen embrittlement in steel fasteners (ISO/TR 20491:2019)

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Contents

Page

European foreword

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The text of ISO/TR 20491:2019 has been approved by CEN as CEN ISO/TR 20491:2021 without any modification.

TECHNICAL REPORT

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Contents

Page

Foreword

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This document was prepared by Technical Committee ISO/TC 2 *Fasteners*, Subcommittee SC 14, *Surface coatings*.

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Introduction

High strength mechanical steel fasteners are broadly characterized by tensile strengths (R_m) above 1 000 MPa and are often used in critical applications such as in bridges, engines, aircraft, where a fastener failure can have catastrophic consequences. Preventing failures and managing the risk of hydrogen embrittlement (HE) is a fundamental consideration implicating the entire fastener supply chain, including: the steel mill, the fastener manufacturer, the coater, the application engineer, the joint designer, all the way to the end user. Hydrogen embrittlement has been studied for decades, yet the complex nature of HE phenomena and the many variables make the occurrence of fastener failures unpredictable. Researches are typically conducted under simplified and/or idealized conditions that cannot be effectively translated into *know-how* prescribed in fastener industry standards and practices. Circumstances are further complicated by specifications or standards that are sometimes inadequate and/or unnecessarily alarmist. Inconsistencies and even contradictions in fastener industry standards have led to much confusion and many preventable fastener failures. The fact that HE is very often mistakenly determined to be the *root cause* of failure as opposed to a *mechanism* of failure reflects the confusion.