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भारतीय मानक ब्यूरो

DRAFT FOR WIDE CIRCULATION

भारतीय मानक मसौदा

स्टील — उच्च शक्ति वाले स्टील्स की हाइड्रोजन एम्ब्रिटलमेंट प्रतिरोध का मूल्यांकन करने की मापन विधि
भाग 1: स्थिर भार परीक्षण

(*IS 17175 का पहला पुनरीक्षण*)

(ISO 16573 - 1 : 2020, संशोधित)

Draft Indian Standard

Steel — Measurement Method for The Evaluation of Hydrogen Embrittlement Resistance of High Strength Steels

Part 1: Constant Load Test

(*First Revision of IS 17175)*

(ISO 16573 - 1 : 2020, MOD)

ICS 77.040.99

Corrosion Protection and Finishes Sectional Committee, MTD 24

Last date of comment: 03/10/2025

NATIONAL FOREWORD

This draft standard which is a modified adoption of ISO 16573 – 1 : 2020 ‘Steel — Measurement method for the evaluation of hydrogen embrittlement resistance of high strength steels Part 1: Constant load test’ issued by the International Organization for Standardization (ISO), and subject to its finalization, is to be adopted by the Bureau of Indian Standards on the recommendation of the Corrosion Protection and Finishes Sectional Committee and approval of the Metallurgical Engineering Division Council.

This standard was originally published in 2020 as IS 17175 : 2020/ISO 16573 : 2015 ‘Steel – Measurement Method for the Evaluation of Hydrogen Embrittlement Resistance of High Strength Steels’. Later, ISO 16573 was published into two parts. This revision has been undertaken to align with latest parts of ISO standard. This standard is aligned with ISO 16573-1 : 2020 with certain technical modifications as

suggested by the Sectional Committee. A list of technical modifications is given in National Annex A.

This Indian Standard is published in two parts. Other part in this series is:

Part 2: Slow strain rate test

The main changes compared to the previous edition are as follows:

1) the addition of a note to provide the definition of ρ as the radius of the notch bottom. The definition of r was unclear and was used in a different way in 2b).
2) the temperature in 6.1 and Clause 7 where different, the temperature below −50 °C is used;
3) the addition of Figures of unbroken notched specimen and unbroken smooth specimen;
4) the addition of research papers in Bibliography.

The text of ISO standard has been approved as suitable for publication as in Indian Standard without deviations. Certain terminologies and conventions are, however, not identical with those used in Indian Standard. Attention is especially drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, it should be read as 'Indian Standard'

b) Comma (,) has been used as a decimal marker while in Indian Standards the current practice is to use a point (.) as the decimal marker.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis shall he rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (second revision)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

The scope of the standard is as follows:

SCOPE

This document provides a method for the evaluation of the resistance to hydrogen embrittlement (i.e. hydrogen delayed fracture) using constant loading test with hydrogen pre-charged specimens. The amount of hydrogen content absorbed in the specimens is analysed quantitatively by thermal desorption analysis such as gas chromatography, mass spectrometry and so on. In the case of hydrogen continuous charging such as hydrogen absorption in aqueous solution at free corrosion potential, hydrogen absorption in atmospheric corrosion environments and hydrogen absorption in high pressure hydrogen gas, the evaluation method is also briefly described. This method is mainly applicable to the evaluation of hydrogen embrittlement resistance of high strength steel bolts.

The complete document/text of ISO 16573-1 : 2020 'Steel — Measurement method for the evaluation of hydrogen embrittlement resistance of high

strength steels — Part 1: Constant load test' may be made available, on request to:

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National Annex A

(*National Foreword*)

Clause/Sub clause	Modifications
8.1 (c)	Replace “applied stress/tensile stress” with “applied stress/tensile strength”
11	Insert “k) actual stress ratio used should be reported”