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BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

भारतीय मानक **मसौदा**

क्रायोजेनिक वेस्सेल — बड़े परिवहन योग्य वैक्यूम-इंसुलेटेड क्रायोजेनिक वेस्सेल

भाग 1 डिजाइन, निर्माण, निरीक्षण और परीक्षण

(ISO 20421-1 का *संशोधित अधिग्रहण)*

Draft *Indian Standard*

CRYOGENIC VESSELS — LARGE TRANSPORTABLE VACUUM-INSULATED VESSELS

PART 1 DESIGN, FABRICATION, INSPECTION AND TESTING

(Modified Adoption of ISO 20421-1 *)*

ICS 23.020.40

Gas Cylinders Sectional Committee, MED 16	Last date of receipt of comment is **19 July 2024**

NATIONAL FOREWORD

(*Adoption clause to be added later*)

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

a) Wherever the words 'International Standard' appear, referring to this standard, they 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.

In this adopted standard, reference appears to certain International Standard for which Indian Standard also exist. The corresponding Indian Standard, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 3834-2, Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements	IS 15326 (Part 2) : 2022/ ISO 3834-2 : 2021, Quality requirements for fusion welding of metallic materials: Part 2 Comprehensive quality requirements (*second revision*)	Identical
ISO 9606-1, Qualification testing of welders — Fusion welding — Part 1: Steels	IS 7310 (Part 1) : 2019/ ISO 9606-1 : 2012, Qualification testing of welders — Fusion welding: Part 1 Steels (*first revision*)	Identical
ISO 9606-2, Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys	IS 7310 (Part 2) : 2019/ ISO 9606-2 : 2004, Qualification test of welders — Fusion welding: Part 2 Aluminium and aluminium alloys (*first revision*)	Identical
ISO 9712, Non-destructive testing — Qualification and certification of NDT personnel	IS 13805 : 2004, General standard for qualification and certification of non-destructive testing personnel — Specification (*first revision*)	Not Equivalent
ISO 10474:2013, Steel and steel products — Inspection documents	IS/ISO 10474 : 2013, Steel and Steel Products — Inspection Documents (First Revision)	Identical
ISO 15614-2, Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 2: Arc welding of aluminium and its alloys	IS 7273 : 1974, Methods of testing fusion welded joints in aluminium and aluminium alloys	Not equivalent

The technical committee has reviewed the provisions of the following International Standard referred in this adopted standard and has decided that it is acceptable for use in conjunction with this standard:

International Standard	*Title*

ISO 4126-2	Safety devices for protection against excessive pressure — Part 2: Bursting disc safety devices
ISO 5817	Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections
ISO 10042	Welding — Arc-welded joints in aluminium and its alloys — Quality levels for imperfections
ISO 10675-1	Non-destructive testing of welds — Acceptance levels for radiographic testing — Part 1: Steel, nickel, titanium and their alloys
ISO 14732	Welding personnel — Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials
ISO 15613	Specification and qualification of welding procedures for metallic materials — Qualification based on pre-production welding test
ISO 15614-1	Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys
ISO 17635	Non-destructive testing of welds — General rules for metallic materials
ISO 17637	Non-destructive testing of welds — Visual testing of fusion-welded joints
ISO 20421-2	Cryogenic vessels — Large transportable vacuum-insulated vessels — Part 2: Operational requirements
ISO 21010	Cryogenic vessels — Gas/material compatibility
ISO 21011	Cryogenic vessels — Valves for cryogenic service
ISO 21028-1	Cryogenic vessels — Toughness requirements for materials at cryogenic temperature — Part 1: Temperatures below -80 degrees C
ISO 21028-2	Cryogenic vessels — Toughness requirements for materials at cryogenic temperature — Part 2: Temperatures between -80 degrees C and -20 degree C
ISO 21013-3	Cryogenic vessels — Pressure-relief accessories for cryogenic service — Part 3: Sizing and capacity determination
ISO 23208	Cryogenic vessels — Cleanliness for cryogenic service
ASME VIII-2	Rules for construction of pressure vessels, Division 2, Alternative Rules
EN 13445-3	Unfired pressure vessels — Part 3: Design

The standard also makes a reference of technical deviation to the ISO standard. Details of which are given in National Annex A.

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 be 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.

NOTE: The technical content of the document has not been enclosed as these are identical with the corresponding ISO standard. For details, please refer the corresponding **ISO 20421-1 : 2019** or kindly contact:

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NATIONAL ANNEX A

(*National Foreword*)

LISTS OF TECHNICAL DEVIATIONS AND THEIR EXPLANATIONS

A-1 INSPECTION AND TESTING

A-1.1 ISO 20421-1 : 2019 "Cryogenic vessels — Large transportable vacuum-insulated vessels Part 1 Design, fabrication, inspection and testing" specifies requirements for the design, fabrication, inspection and testing of large transportable vacuum-insulated cryogenic vessels of more than 450 l volume, which are permanently (fixed tanks) or not permanently (demountable tanks and portable tanks) attached to a means of transport, for one or more modes of transport. In this national standard Clause D 3.3 & D 5.5.1 is contradictory with Clause D 5.3 wherein the Production test coupon (Production control test plates) need not to be taken.

Clause/Sub-clause	Modifications
D.5.5.1	Delete this clause

A-2 MATERIALS

Clause/Sub-clause	Modifications
D.3, Table D.1, column 1, row 7	Replace 'SA/A 240 340' with 'SA/A 240 304' as it is a typographical error.
D.3.3	Replace '15%' with '10 %' as per EN 13530-2.