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Transportable gas storage devices — Hydrogen absorbed in reversible metal hydride

Appareils de stockage de gaz transportables — Hydrogène absorbé dans un hydrure métallique réversible

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by ISO/TC 197, *Hydrogen technologies.*

This second edition cancels and replaces the first edition (ISO 16111:2008), which has been technically revised.

The following clauses have been modified with respect to the previous edition: 2; 3.4; 3.5; 3.9; 3.10; 3.11; 3.12; 3.13; 3.14; 3.15; 3.16; 3.17; 3.18; 3.19; 3.20; 3.21; 3.22; 4.1; 4.3; 5.2.1; 5.3; 5.5; 5.8; 6.2; 6.3; 7.2; 8.1 and Annex D.

The main changes compared to the previous edition concern the following:

— service temperature conditions have been described in further detail (4.3.2);

— shell design has been extended to ISO 11119-3 standard reference (5.3);

— drop test conditions have been modified (6.2.4);

— acceptance criteria have been modified for leak testing (6.2.5);

— hydrogen cycling conditions have been modified (6.2.6);

— new warning labelling has been proposed (7.2);

— information in safety data sheets has been updated (8.1).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

As the utilization of gaseous hydrogen evolves from the chemical industry into various emerging applications, such as fuel for fuel cells and internal combustion engines and other specialty hydrogen applications, the importance of new and improved storage techniques has become essential. One of these techniques employs the absorption of hydrogen into specially formulated alloys. The material can be stored and transported in a solid form, and the hydrogen later released and used under specific thermodynamic conditions. This document describes the service conditions, design criteria, type tests, batch tests and routine tests for transportable hydride-based hydrogen storage systems, referred to as “metal hydride assemblies” (MH assemblies). Types of MH assemblies may serve as: fuel cell cartridges; hydrogen fuel storage containers; high-purity hydrogen supplies as well as other uses.