|  |  |
| --- | --- |
| **IECEx TEST REPORT**  **ISO 19880-3**  **Gaseous hydrogen — Fuelling stations — Part 3: Valves** | |
| ExTR Reference Number : |  |
| ExTR Free Reference Number : |  |
| Compiled by + signature (ExTL) : |  |
| Reviewed by + signature (ExTL) : |  |
| Date of issue : |  |
| Ex Testing Laboratory (ExTL) : |  |
| Address : |  |
| Applicant’s name : |  |
| Address : |  |
| Standard : | ISO 19880-3:2018, First Edition |
| Test procedure : | IECEx System |
| Test Report Form Number : | ExTR-ISO19880-3-1A (released 2024-06) |
| Related Amendments, Corrigenda or ISHs | N/A |
| ***Copyright © 2024 International Electrotechnical Commission System for Certification to Standards Relating to Equipment for use in Explosive Atmospheres (IECEx System), Geneva, Switzerland. All rights reserved.***  This blank publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEx System is acknowledged as copyright owner and source of the material. The IECEx system takes no responsibility for, and will not assume liability for, damages resulting from the reader's interpretation of the reproduced material due to its placement and context. | |

|  |  |
| --- | --- |
| Possible test case verdicts: |  |
| - test case does not apply to the test item : N / A |  |
| - test item does meet the requirement : Pass |  |
| General remarks:  The test results presented in this Ex Test Report relate only to the item or product tested.   * "(see Attachment #)" refers to additional information appended to this document. * "(see appended table)" refers to a table appended to this document. * Throughout this document, a point “.” is used as the decimal separator.   The technical content of this Ex Test Report shall not be reproduced except in full without the written approval of the Issuing ExCB and ExTL. | |

| **ISO 19880-3** | | | |
| --- | --- | --- | --- |
| **Clause** | **Requirement – Test** | **Result – Remark** | **Verdict** |
|  | | | |
| 1 | Scope | | |
|  | | | |
| 2 | Normative references | | |
|  | | | |
| 3 | Terms and definitions | | |
|  | | | |
| 4 | General requirements | | |
|  | | | |
| 4.1 | General |  |  |
|  | | | |
| 4.2 | Intended use |  |  |
|  | | | |
| 4.3 | Material requirements |  |  |
|  | | | |
| 4.4 | Product quality |  |  |
|  | | | |
| 5 | General test methods | | |
|  | | | |
| 5.1 | General |  |  |
|  | | | |
| 5.2 | Test conditions | | |
| 5.2.1 | Test sample |  |  |
| 5.2.2 | Pressure |  |  |
| 5.2.3 | Normal test temperature |  |  |
| 5.2.4 | Specified test temperature |  |  |
| 5.2.5 | Test media |  |  |
| 5.2.6 | Test sequence |  |  |
|  | | | |
| 5.3 | Hydrogen gas pressure cycle test | | |
| 5.3.1 | General |  |  |
| 5.3.2 | Test method |  |  |
|  | | | |
| 5.4 | Leakage | | |
| 5.4.1 | General |  |  |
| 5.4.2 | External leakage test |  |  |
| 5.4.3 | Internal leakage test |  |  |
|  | | | |
| 5.5 | Worst case fault pressure cycle test |  |  |
|  | | | |
| 5.6 | Proof pressure test |  |  |
|  | | | |
| 5.7 | Hydrostatic strength test | | |
| 5.7.1 | Test pressure |  |  |
| 5.7.2 | Test method |  |  |
|  | | | |
| 5.8 | Excess torque resistance test |  |  |
|  | | | |
| 5.9 | Bending moment test |  |  |
|  | | | |
| 5.10 | Non-metallic materials test | | |
| 5.10.1 | General |  |  |
| 5.10.2 | Test method |  |  |
|  | | | |
| 5.11 | Cold gas in warm valve test |  |  |
|  | | | |
| 6 | Check valves | | |
|  | | | |
| 6.1 | Applicability |  |  |
|  | | | |
| 6.2 | Hydrogen gas pressure cycle test |  |  |
|  | | | |
| 6.3 | External leakage test |  |  |
|  | | | |
| 6.4 | Internal leakage test |  |  |
|  | | | |
| 6.5 | Worst case fault pressure cycle test |  |  |
|  | | | |
| 6.6 | Proof pressure test |  |  |
|  | | | |
| 6.7 | Hydrostatic strength test |  |  |
|  | | | |
| 6.8 | Excess torque resistance test |  |  |
|  | | | |
| 6.9 | Bending moment test |  |  |
|  | | | |
| 6.10 | Non-metallic material test |  |  |
|  | | | |
| 7 | Excess flow valves | | |
|  | | | |
| 7.1 | General |  |  |
|  | | | |
| 7.2 | Tests | | |
| 7.2.1 | Classification |  |  |
| 7.2.2 | Applicability |  |  |
| 7.2.3 | Hydrogen gas pressure cycle test |  |  |
| 7.2.4 | External leakage test |  |  |
| 7.2.5 | Internal leakage test |  |  |
| 7.2.6 | Worst case fault pressure test |  |  |
| 7.2.7 | Proof pressure test |  |  |
| 7.2.8 | Hydrostatic strength test |  |  |
| 7.2.9 | Excess torque resistance test |  |  |
| 7.2.10 | Bending moment test |  |  |
| 7.2.11 | Non-metallic material test |  |  |
| 7.2.12 | Operation cycle test |  |  |
| 7.2.13 | Operation test |  |  |
| 7.2.14 | Pressure impulse test |  |  |
|  | | | |
| 8 | Flow control valves | | |
|  | | | |
| 8.1 | General |  |  |
|  | | | |
| 8.2 | Tests | | |
| 8.2.1 | Applicability |  |  |
| 8.2.2 | Hydrogen gas pressure cycle test |  |  |
| 8.2.3 | External leakage test |  |  |
| 8.2.4 | Worst case fault pressure test |  |  |
| 8.2.5 | Proof pressure test |  |  |
| 8.2.6 | Hydrostatic strength test |  |  |
| 8.2.7 | Excess torque resistance test |  |  |
| 8.2.8 | Bending moment test |  |  |
| 8.2.9 | Non-metallic material test |  |  |
| 8.2.10 | Operation test under full pressure load |  |  |
|  | | | |
| 9 | Hose breakaway devices | | |
|  | | | |
| 9.1 | Specific design requirements | | |
| 9.1.1 | General |  |  |
| 9.1.2 | Electrical conductivity |  |  |
| 9.1.3 | Containment of/controlled relieving of hydrogen when uncoupled |  |  |
| 9.1.4 | Separation |  |  |
|  | | | |
| 9.2 | Tests | | |
| 9.2.1 | Applicability |  |  |
| 9.2.2 | Hydrogen gas pressure cycle test |  |  |
| 9.2.3 | External leakage test | | |
| 9.2.3.1 | General |  |  |
| 9.2.3.2 | Test method |  |  |
| 9.2.4 | Worst case fault pressure test |  |  |
| 9.2.5 | Proof pressure test |  |  |
| 9.2.6 | Hydrostatic strength test | | |
| 9.2.6.1 | General |  |  |
| 9.2.6.2 | Test method (coupled): |  |  |
| 9.2.6.3 | Test method (uncoupled): |  |  |
| 9.2.7 | Excess torque resistance test |  |  |
| 9.2.8 | Bending moment test |  |  |
| 9.2.9 | Non-metallic material test |  |  |
| 9.2.10 | Separation test | | |
| 9.2.10.1 | General |  |  |
| 9.2.10.2 | Test method |  |  |
| 9.2.11 | Impact test (applicable to rigid-mount devices) | | |
| 9.2.11.1 | General |  |  |
| 9.2.11.2 | Test method |  |  |
| 9.2.12 | Drop test | | |
| 9.2.12.1 | General |  |  |
| 9.2.12.2 | Test method |  |  |
| 9.2.13 | Twisting test | | |
| 9.2.13.1 | General |  |  |
| 9.2.13.2 | Test method |  |  |
| 9.2.14 | Cold gas in warm valve test |  |  |
|  | | | |
| 10 | Manual valves | | |
|  | | | |
| 10.1 | Construction and assembly |  |  |
|  | | | |
| 10.2 | Tests | | |
| 10.2.1 | Applicability |  |  |
| 10.2.2 | Hydrogen gas pressure cycle test |  |  |
| 10.2.3 | External leakage test |  |  |
| 10.2.4 | Internal leakage test |  |  |
| 10.2.5 | Worst case fault pressure test |  |  |
| 10.2.6 | Proof pressure test |  |  |
| 10.2.7 | Hydrostatic strength test |  |  |
| 10.2.8 | Excess torque resistance test |  |  |
| 10.2.9 | Bending moment test |  |  |
| 10.2.10 | Non-metallic material test |  |  |
| 10.2.11 | Maximum flow shut-off test | | |
| 10.2.11.1 | General |  |  |
| 10.2.11.2 | Test method |  |  |
| 10.2.12 | Operation test |  |  |
| 10.2.13 | Excess torque operation test |  |  |
|  | | | |
| 11 | Pressure safety valves (PSV) | | |
|  | | | |
| 11.1 | Applicability |  |  |
|  | | | |
| 11.2 | Hydrogen gas pressure cycle test |  |  |
|  | | | |
| 11.3 | PSV leakage tests | | |
| 11.3.1 | External leakage test |  |  |
| 11.3.2 | Seat leakage test |  |  |
|  | | | |
| 11.4 | Worst case fault pressure test |  |  |
|  | | | |
| 11.5 | Proof pressure test |  |  |
|  | | | |
| 11.6 | Hydrostatic strength test |  |  |
|  | | | |
| 11.7 | Excess torque resistance test |  |  |
|  | | | |
| 11.8 | Bending moment test |  |  |
|  | | | |
| 11.9 | Non-metallic material test |  |  |
|  | | | |
| 11.10 | Operation test |  |  |
|  | | | |
| 12 | Shut-off valve | | |
|  | | | |
| 12.1 | Classification |  |  |
|  | | | |
| 12.2 | Construction and assembly |  |  |
|  | | | |
| 12.3 | Tests | | |
| 12.3.1 | Applicability |  |  |
| 12.3.2 | Hydrogen gas pressure cycle test | | |
| 12.3.2.1 | General |  |  |
| 12.3.2.2 | Test method |  |  |
| 12.3.3 | External leakage test |  |  |
| 12.3.4 | Internal leakage test |  |  |
| 12.3.5 | Worst case fault pressure test |  |  |
| 12.3.6 | Proof pressure test |  |  |
| 12.3.7 | Hydrostatic strength test |  |  |
| 12.3.8 | Excess torque resistance test |  |  |
| 12.3.9 | Bending moment test |  |  |
| 12.3.10 | Non-metallic material test |  |  |
| 12.3.11 | Operation test under full pressure load |  |  |
| 12.3.12 | Maximum flow shut-off test | | |
| 12.3.12.1 | General |  |  |
| 12.3.12.2 | Test method |  |  |
| 12.3.13 | Cold gas in warm valve test |  |  |
|  | | | |
| 13 | Marking | | |
|  | | | |
| 13.1 | Marking information |  |  |
|  | | | |
| 13.2 | Marking method |  |  |
|  | | | |
| 14 | Component literature |  |  |

|  |
| --- |
| Measurement Section, including Additional Narrative Remarks (as deemed applicable) |

**Appendix A – Test Results**

|  |  |  |  |
| --- | --- | --- | --- |
| **A.XX <Insert Test Here>** | | | |
| **Lab Record:** |  | | |
| **Standard used and Clause:** |  | **Date of Test:** |  |
| **Sample No:** | **Description** | | |
|  |  | | |
|  |  | | |
| **Procedure (Brief Description of set-up used, values set)** | | | |
|  | | | |
| **Result** | | | |
|  | | | |