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| **IECEx TEST REPORT**  **ISO 17268**  **Gaseous hydrogen land and vehicle refuelling connection devices** | |
| 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 17268:2020, Third Edition |
| Test procedure : | IECEx System |
| Test Report Form Number : | ExTR-ISO17268-1A (released 2024-06) |
| Related Amendments, Corrigenda or ISHs | N/A |
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| 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. | |

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| Introduction:  This purpose of this document was to utilise the standard format of a clause-by-clause ExTR for the purposes of guided informative discussion on the hydrogen safety systems technical report, for use by a ExTB / ExCB applying for a hydrogen dispenser (or other applicable) scope extension. Comments on each clause can be included as remarks, and a pass verdict given where an appropriate understanding of the requirements has been achieved. |

| **ISO 17268** | | | |
| --- | --- | --- | --- |
| **Clause** | **Requirement – Test** | **Result – Remark** | **Verdict** |
|  | | | |
| 1 | Scope | | |
|  | | | |
| 2 | Normative references | | |
|  | | | |
| 3 | Terms and definitions | | |
|  | | | |
| 4 | General construction requirements | | |
| 4.1 | (Safety, durability and maintainability) |  |  |
| 4.2 | (Improper refuelling prevention) |  |  |
| 4.3 | (Good engineering practice) |  |  |
| 4.4 | (Design and construction) |  |  |
| 4.5 | (Materials) |  |  |
| 4.6 | (Nozzle connection) |  |  |
| 4.7 | (Receptacle mounting) |  |  |
| 4.8 | (Protective caps) |  |  |
| 4.9 | (Communications hardware) |  |  |
| 4.10 | (Incompatible refuelling hazards) |  |  |
| 4.11 | (Over-pressurization testing) |  |  |
|  | | | |
| 5 | Nozzles | | |
| 5.1 | (Dimensional requirements) |  |  |
| 5.2 | Nozzle types | | |
| 5.2 a) | Type A |  |  |
| 5.2 b) | Type B |  |  |
| 5.2 c) | Type C |  |  |
| 5.3 | (Life cycles) |  |  |
| 5.4 | (Venting) |  |  |
| 5.5 | (Means for attachment) |  |  |
| 5.6 | (Nozzle envelopes) |  |  |
| 5.7 | (Solid contamination protection) |  |  |
| 5.8 | (Ambient temperature operability) |  |  |
| 5.9 | (Freezing time limit) |  |  |
| 5.10 | (Receptacle check valve opening prevention) |  |  |
| 5.11 | (Intuitiveness of use) |  |  |
| 5.12 | (Gas delivery protection) |  |  |
| 5.13 | (>1.0 MPa pressure disconnection prevention) |  |  |
| 5.14 | (Gas flow prevention when disconnected) |  |  |
| 5.15 | (Unpressurised nozzle locking and unlocking force and torque) |  |  |
| 5.16 | (Pressurised Type A and B nozzle locking and unlocking force and torque ) |  |  |
| 5.17 | (Communication hardware endurance to Clause 7 tests ) |  |  |
|  | | | |
| 6 | Receptacles | | |
| 6.1 | (Dimensional requirements) |  |  |
| 6.2 | (Test failure) |  |  |
| 6.3 | (Design for life cycles and years ) |  |  |
| 6.4 | (Mounting dimensions restrictions) |  |  |
| 6.5 | (Internal check valve) |  |  |
| 6.6 | (Means for attachment to vehicle fuel system) |  |  |
| 6.7 | (Solid contamination protection and ingress protection when disconnected) |  |  |
| 6.8 | (Attachment to vehicle) |  |  |
| 6.9 | (Gas temperature range) |  |  |
|  | | | |
| 7 | Design verification test procedures | | |
|  | | | |
| 7.1 | General requirements |  |  |
|  | | | |
| 7.2 | Test conditions |  |  |
|  | | | |
| 7.3 | Nozzle tests |  |  |
|  | | | |
| 7.4 | Receptacle tests |  |  |
|  | | | |
| 7.5 | User — Machine interface |  |  |
|  | | | |
| 7.6 | Dropping |  |  |
|  | | | |
| 7.7 | Leakage at room temperature |  |  |
|  | | | |
| 7.8 | Valve operating handle |  |  |
|  | | | |
| 7.9 | Receptacle vibration resistance |  |  |
|  | | | |
| 7.10 | Abnormal loads |  |  |
|  | | | |
| 7.11 | Low and high temperatures | | |
| 7.11.1 | Purpose |  |  |
| 7.11.2 | General |  |  |
| 7.11.3 | Leakage tests | | |
| 7.11.3.1 | (Leakage test conditions) |  |  |
| 7.11.3.2 | (Bubble leakage test) |  |  |
| 7.11.3.3 | (Leakage rate) |  |  |
| 7.11.4 | Operation tests |  |  |
|  | | | |
| 7.12 | Durability and maintainability | | |
| 7.12.1 | Purpose |  |  |
| 7.12.2 | Nozzle durability test |  |  |
| 7.12.3 | Receptacle check valve durability test |  |  |
| 7.12.4 | Receptacle durability test |  |  |
| 7.12.5 | Connected nozzle and receptacle durability test |  |  |
|  | | | |
| 7.13 | Sealing material aging test | | |
| 7.13.1 | Purpose |  |  |
| 7.13.2 | Oxygen aging test procedure |  |  |
| 7.13.3 | Ozone aging test procedure |  |  |
|  | | | |
| 7.14 | Non-metallic material hydrogen resistance test |  |  |
|  | | | |
| 7.15 | Electrical resistance |  |  |
|  | | | |
| 7.16 | Hydrostatic strength |  |  |
|  | | | |
| 7.17 | Corrosion resistance | | |
| 7.17.1 | Purpose |  |  |
| 7.17.2 | General |  |  |
| 7.13.3 | Nozzle test |  |  |
| 7.17.4 | Receptacle test |  |  |
|  | | | |
| 7.18 | Deformation |  |  |
|  | | | |
| 7.19 | Contamination test |  |  |
|  | | | |
| 7.20 | Thermal cycle test |  |  |
|  | | | |
| 7.21 | Pre-cooled hydrogen exposure test |  |  |
|  | | | |
| 7.22 | Misconnected nozzle test |  |  |
|  | | | |
| 7.23 | Upward/downward nozzle compatibility test | | |
| 7.23.1 | General |  |  |
| 7.23.2 | Upwards nozzle compatibility test |  |  |
| 7.23.3 | Downwards nozzle compatibility test |  |  |
|  | | | |
| 7.24 | Washout test |  |  |
|  | | | |
| 7.25 | User abuse test |  |  |
|  | | | |
| 7.26 | Freezing test |  |  |
|  | | | |
| 7.27 | Rocking test |  |  |
|  | | | |
| 7.28 | Communication test |  |  |
|  | | | |
| 8 | Instructions |  |  |
|  | | | |
| 9 | Marking | | |
| 9.1 | (Marking requirements) |  |  |
| 9.2 | (Optional information) |  |  |
|  | | | |
| Annex A  (Normative) | Receptacle/nozzle interface envelope | | |
| Figure A.1 | (Dimensions) |  |  |
|  | | | |
| Annex B  (Normative) | Hydrogen receptacles | | |
| Figure B.1 | H11 hydrogen receptacle |  |  |
| Figure B.2 | H25 hydrogen receptacle |  |  |
| Figure B.3 | H35 hydrogen receptacle |  |  |
| Figure B.4 | H35HF hydrogen receptacle (high flow for commercial vehicle applications) |  |  |
| Figure B.5 | H70 hydrogen receptacle |  |  |
| Figure B.6 | Seal part on the 70 MPa nozzle side |  |  |
|  | | | |
| Annex C  (Normative) | Loose fit test fixtures | | |
| Figure C.1 | H11 loose fit test fixture |  |  |
| Figure C.2 | H25 loose fit test fixture |  |  |
| Figure C.3 | H35 loose fit test fixture |  |  |
| Figure C.4 | H35HF loose fit test fixture |  |  |
| Figure C.5 | H70 loose fit test fixture |  |  |
|  | | | |
| Annex D  (Normative) | Tight fit test fixtures | | |
| Figure D.1 | H11 tight fit test fixture |  |  |
| Figure D.2 | H25 tight fit test fixture |  |  |
| Figure D.3 | H35 tight fit test fixture |  |  |
| Figure D.4 | H35HF tight fit test fixture |  |  |
| Figure D.5 | H70 tight fit test fixture |  |  |
|  | | | |
| Annex E  (Normative) | Wear pattern test fixtures | | |
| Figure E.1 | H11 wear pattern test fixture |  |  |
| Figure E.2 | H25 wear pattern test fixture |  |  |
| Figure E.3 | H35 wear pattern test fixture |  |  |
| Figure E.4 | H35HF wear pattern test fixture |  |  |
| Figure E.5 | H70 wear pattern test fixture |  |  |
|  | | | |
| Annex F  (Informative) | Example hex design | | |
| Figure F.1 | (Dimensions) |  |  |

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

**Appendix A – Action Items**

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| **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** | | | |
|  | | | |