Vehicle
Certification
Agency

# GUIDANCE FOR THE APPLICATION OF EN12972:2007

# INTRODUCTION

This document provides guidance to some of the sections of EN12972:2007 and should be used by an Appointed Inspection Body (AIB) when undertaking inspections. The guidance provides help in explaining what various clauses in the Standard should achieve. Generally most of the following guidance is the same as those given in the VCA document "Procedures for Inspection Bodies – Testing and Inspection of UK Tanks.

The Guidance is applicable to:

- All RID/ADR tanks (6.8 and 6.10), road tankers under the IMDG Code (IMO4, 6 8)
- All portable tanks (6.7 RID/ADR/IMDG Code) and IMO portable tanks (including Offshore portable tanks MSC/Circ.860)
- Dual marked tanks (normally ADR 6.8 / IMDG 6.7).

This document does not apply to procedures for UK tanks except New UK tanks constructed to EN 12493 Annex C (see note 4.1 in UK procedures).

DfT/VCA requires that this Guidance is used as a basis for accreditation and appointment of inspection bodies.

It is recognised that:

- some sections of the standard are not appropriate for certain tank types,
- some tank types are not covered either at all or inadequately and
- there are sections where guidance can be usefully given to aid inspections

This document is subject to review upon the publication of the 2018 version of the standard.

# THE PURPOSE OF THIS GUIDANCE

The purpose of the Guidance is to ensure that tanks including their filling / loading and unloading systems are safe to operate.

As technology changes and as AIBs find other issues on which guidance is needed the document will be kept under review and revisions issued from time to time.

Other regulations may also affect the operation of tanks e.g. for the purposes of loading or discharge and may be taken into account during inspections. These additional requirements may be recorded on the VCA certificate database in the notes field.

Appointed Inspection Bodies AIBs shall have access to and make use of the current edition of RID, ADR or the IMDG Code as may be applicable to the tanks that they inspect.

Note 1: RID and ADR are available online at the OTIF and UN websites
Note 2: The ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air permit certain portable tanks (6.7) to be carried in aircraft. ICAO requires tanks to comply with 6.7 when they are authorised.

# APPLICATION OF STANDARD IN RID/ADR AND THE IMDG CODE

NOTE 1.1.5 of RID/ADR 2017 states:
"1.1.5 Application of standards

Where the application of a standard is required and there is any conflict between the standard and the provisions of RID/ADR, the provisions of RID/ADR take precedence. The requirements of the standard that do not conflict with RID/ADR shall be applied as specified, including the requirements of any other standard, or part of a standard, referenced within that standard as normative."

The guidance seeks to avoid any such conflict, but any issues of interpretation not addressed herein must be taken up with VCA DGO

Note: A similar provision is included in the IMDG Code (1.1.1.6)

**CERTIFICATES**
All certificates issued in accordance with EN12972:2007 will be published from the VCA database. Other documents related to the inspection shall be retained by the AIB

Note; Copies of certificates and reports shall be retained with the tank record by owners and/or operators of tanks (see 4.1.3 below).

**GUIDANCE TO EN 12972:2007**

| 12972 Clause | Guidance |
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| 3 | **Supplementary definitions and terms that must be taken into account by UK AIBs**<br><br>**Additional relevant definitions taken from ADR (2017)**<br><br>**NOTE 1: Only those definitions which are not in ADR or require clarification are included here**<br><br>*"Fixed tank" means a tank having a* ***capacity greater than 1 000 litres*** *which is permanently attached to a vehicle (which then becomes a tank-vehicle) or is an integral part of the frame of such vehicle;*<br><br>**NOTE 2: An AIB believing they have a fixed tank <1000L must consult VCA DGO before any approval/inspection/testing**<br><br>**Additional UK definitions relevant to the application of standard**<br><br>'Inspector' Individual employed by and carrying out inspections for an inspection body.<br><br>'Inspection body' Body appointed by the competent authorities in accordance with the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 and The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations Northern Ireland 2010 as amended; also referred to as AIB |

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| | 'Intermediate inspection' Inspection carried out between the initial inspection and the first periodic inspection or between two periodic inspections<br><br>'Protective lining or coating' Lining or coating protecting a metallic tank material against corrosive attack by the substances to be carried<br><br>**NOTE 3: This does not apply to lining or coating used only to protect the substance to be carried.**<br><br>'Major repair' Repair without which the safety of the tank or structure would have been compromised. This will include:<br>- repair following an accident; or<br>- the rectification of a significant deterioration in condition; and<br>- any repair that requires hot work to the containment part of the tank where the safety of the vessel has been impaired.<br>The design of a proposed repair or modification shall be assessed for conformity and shall meet the provisions of ADR applicable at the time it is made. An Exceptional Check certificate shall be issued in respect of the major repair or modification. For all parts of the tank not affected by the modification, the documentation of the initial type approval remains valid.<br><br>The definition is in ADR 1.2 but the note in 4.3.2.1.7 shall be taken into account. Any hot work done to or affecting the containment part of the tank (i.e. the shell including its integral openings, neck rings, closures and piping) and any structure repair or modification that may have impaired the compliance of the tank to comply with ADR 6.8 and 9.7 shall also be regarded as a major repair, irrespective of its purpose<br><br>'Tank record' File containing all the important technical information such as the original design documentation, previous inspection reports and records of repairs and maintenance which shall be retained by the owner or the operator of the tank (NOTE: see 5.2).<br><br>'Offshore portable tank'<br>Means a portable tank specially designed for repeated use for transport of dangerous goods to, from and between offshore facilities. An offshore portable tank is designed and constructed in accordance with IMO MSC/Circ.860 "Guidelines for the approval of containers handled in open seas" |
| 3.8 | **NOTE: The Directive quoted has been superseded by Commission Directive** 2010/35/EC |
| 4.1 | ***For all type approval certificates***<br><br>This provides guidance on identifying substances permitted in tanks.<br>A statement that "the tank has been approved for the carriage of…" shall appear. Then:<br>a. If the tank is intended for a single substance, the UN number, Class, Packing Group (PG) and **all relevant** tank provisions shall be listed. e.g. UN1744, Bromine, Class 8, PG I, Special Provision(s) TU14, TU33, TC5, TE21, TT2, TM3, TM5.<br>b. If the tank is designed for a group of similar substances e.g. fuels (UN1202, 1203, 1223, 1863, ) the UN number Class, PG and **all relevant** tank provisions of each substance which the Type Approval AIB has approved for carriage in the tank shall be listed. |

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| | **NOTE: where fuels are considered as a group of similar substances, the addition of ethanol can affect compatibility and this statement should be qualified by AIBs as appropriate.**<br>c. For general purpose dangerous goods tanks, either:<br>I. a list of substances for which the tank has been approved as above, or<br>II. The tank code together with a list of substances for which the tank is **not** suitable (i.e. incompatible) or for which it was not possible to investigate compatibility exhaustively, e.g.<br><br>"All substances for which L4BN is identified in column 12 of table A of part 3.2.1 of ADR, with the exception of:<br>UN1754, Chromic Acid Solution, Class 8, PGII.<br>UN1757, Chromic Flouride Solution, Class 8, PG II. Etc, Etc."<br>If type approval covers a range of component options (e.g. gasket materials), not all of which are compatible with every substance the tank is approved to carry, the appropriate component option shall be identified against each substance or group of substances listed on the certificate. |
| 4.1.3 | **NOTE 1: This piece of Guidance applies to all paragraphs referring to documentation (4.2.2, 4.3.2, 4.4.2, 4.5.7, and 5.2) as appropriate**<br>**NOTE 2: ADR provides for the owner or the operator to retain the tank records. It must be agreed and recorded which party will retain the records. AIBs should ensure that it is clear who is retaining the records.**<br>The tank record including the inspection files should be available for the life of the tank. On transfer of ownership, the tank records must be transferred to the new owner. At the end of the tank's working life, the owner disposing of the tank must retain the tank records for at least 15 months<br>Owners /operators of tanks should maintain a file of inspection records and include the Initial Inspection record, a history of at least 6 years for road tanks and 8 years for rail tanks, where the tank is at least 6/8 years old.<br><br>The record should include all maintenance and repairs of the tank shell, its mountings or service equipment (in the case of portable tanks and offshore tanks records concerning repairs to the frames shall be maintained) that take place and the inspector shall review the documents to assess the history of the tank between inspections and ensure that no exceptional inspections have been overlooked.<br>**AIBs should remind owners and operators of tanks of the ADR requirements relating to the retention of the maintenance record so that copies of the record, including all necessary documents issued in accordance with RID/ADR 6.8.2.4.5 or 6.8.3.4.16, shall be made available by the owner or operator to the AIB for tests, inspections and checks on tanks on the occasion of periodic, intermediate inspections or exceptional checks.(**RID/ADR 4.3.2.1.7, 4.5.2.1)<br><br>**NOTE 1: electronic records are acceptable provided they are complete and readily accessible**<br>**NOTE 2: Where a tank:**<br>- **is outside its inspection date; and or** |

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| | - **no tank records exist,**<br>**an AIB shall carry out a full appraisal of the tank history, available records shall be assessed and recorded to determine its status.**<br>Where an AIB is satisfied that sufficient evidence exists to categorise the tank (e.g old certificates that align with any marks on the tank) then<br>A Periodic Inspection shall take place.<br>Detailed records of the inspection and any history shall be prepared<br>.<br>See Note in 5.2 |
| 4.2.2 | See Guidance to 4.1.3 (above) |
| 4.3.2 | See Guidance to 4.1.3 (above) |
| 4.4.2 | See Guidance to 4.1.3 (above) |
| 4.5 | Exceptional checks may only be performed by an AIB that has been accredited and appointed to inspect tanks after accident, alterations or repairs that may have impaired the safety of the tank and / or the service equipment or compliance to original ADR/RID/IMDG Type Approval |
| 4.5.2 | The "Like for Like" replacement of service equipment, namely the equipment for filling and emptying, breather devices, safety interlocks, measuring instruments, level indicators, heating and insulating devices etc. with equipment of the same specification during service and maintenance operations would not normally be considered a repair requiring an Exceptional Check. "Like for Like" shall be assessed with reference to type approval documentation and the Initial Inspection certificate or original manufacturers drawings/data sheets<br><br>The replacement or testing per clause 5.8.7.1 of breather devices does require the tank to undergo a leakproofness test. Tanks approved for the carriage of UN1203 (special provision TU9) shall require; a vapour tightness test ≥75% of set relieving pressure or 55 kPa, whichever the higher to comply with EC Directive 94/63 Article 5 1a and 1c.*<br><br>*Note: for this purpose, a tank is to be considered suitable for the conveyance of petrol if its initial inspection certificate identifies UN 1203 or where it makes reference to a tank code applicable to petrol (e.g. LGBF) and does not specifically exclude UN 1203.<br><br>**NOTE 1: When a maintenance organisation performs tasks that could affect the tank's containment function, e.g. removal and reinstallation or replacement of any items of service equipment, it is good practice to carry out a leakproofness test (or vapour tightness test if appropriate) and this should be noted in the maintenance record**<br>**NOTE 2: The change of breather valves is not considered to be an exceptional check of 4.5.2 of EN 12972**<br>**NOTE 3: It should not be assumed that service equipment found on a tank is type approved for use with that tank. Reference should always be made to the type approval documents and tank records. Where type approval documents identify a particular make, model and dimensions of a component, fitting a component of identical make, model and** |

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| | **dimensions is considered a like-for-like replacement. Alternatively, where a component is identified by reference to a recognised technical specification or code or standard, replacement with a component conforming to the same technical specification or code or standard would be acceptable, subject to its settings and capacities being identical. When the service equipment originally type approved with the tank cannot be identified by model or design standard, an Exceptional Check shall be performed to assess the suitability of any alternative.** |
| 4.5.4 | At the time of modification only those parts affected by the modification shall be reassessed against the provisions of ADR at the time of the modification.<br><br>**NOTE: when tanks are individually modified in service and the modification is assessed as above, the original type approval document would not normally be revised. However, if the modification is to be applied to new build tanks, the type approval shall be revised or a supplementary TA certificate issued.** |
| 4.5.5 | Repairs or alterations to the structure supporting or protecting the tank, or the means of attachment of the tank to the frame or chassis, which do not directly affect the tank shell or the containment function, shall be inspected by a competent person, and authorised AIB in the case of portable tanks*, using appropriate methods to ensure that the work has been completed to an acceptable standard. This may include NDT inspections as necessary.<br>* a person or AIB authorised to undertake CSC inspections<br><br>If the repair or replacement of the frame involves hot work likely to affect the tank shell, it shall be subject to an Exceptional Check in accordance with 4.5.3.<br><br>**NOTE 1: When relying on a CSC inspection (Convention on Safe Containers) the AIB shall note when the inspection was carried out and by whom. The CSC certificate reference shall be entered in the appropriate field in the VCA database.**<br><br>**NOTE 2: For offshore containers subject to IMO MSC/Circ.860 the frame must be inspected by the AIB inspecting the tank and a record shall be entered in the VCA tanks certification database** |
| 4.5.7 | **NOTE: Where a tank has a plate which clearly shows that it was constructed to ADR standards but type approval/initial inspection documents are unavailable, it is incumbent on the AIB to categorise the tank, establish the fitness for purpose and issue an Exceptional check report and certificate indicating how this was established. A summary explanation must appear on the certificate. This activity is not limited to bodies approved for conformity** |
| 5.1 | Entry to the compartment must only be carried out after suitable risk assessment and implementation of appropriate precautions, as required by the Confined Spaces Regulations 1997(SI1713) ('Safe work in confined spaces' ACOP L101, 3rd edition 2014)<br><br>**NOTE: AIBs must specify detailed procedures for safe working** |
| 5.2 | See Guidance to 4.1.3 (above) |
| 5.2 | Where documentation is missing or not available during an inspection the |

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| | inspector must consult his supervisor and decide whether the inspection can continue or a certificate can be issued. If a certificate is issued despite the missing document(s) a note must be included on the VCA tanks certification database and a written justification must be retained by the AIB. If in doubt the VCA Dangerous Goods Office must be consulted<br><br>Examples of critical missing documents are given below, the list is not exhaustive.<br><br>**For type approval**<br>Missing specifications and drawings.<br><br>**For initial inspections**<br>The type approval certificate, detailed documentation and service equipment certification/type approvals<br><br>**For periodic, intermediate inspections and exceptional checks**<br><br>**NOTE 1: A Certificate of an Exceptional check shall be available where an AIB Expert identifies evidence of any repair which could have affected the safety of the tank.**<br>Whenever possible replacements shall be obtained for missing documents, such as the type approval certificates, Replacement type approval or inspection certificates shall be produced by the AIB who originally issued them to confirm the usage of the tank.<br><br>**NOTE 2: Where a tank has a plate which clearly shows that it was constructed to ADR standards but there are no type approval/initial inspection documents available, it is incumbent on the AIB to establish the fitness for purpose of the tank and issue an Exceptional check report indicating how it has established this.** |
| 5.2.1.2 | Generally the dangerous goods transport regulations do not contain information on the compatibility of substances for any type of containment system. The main duty lies with the consignor (ADR 1.4). However in the case of tanks, it is important that AIBs and manufacturers are able to advise on compatibility issues and that a suitable list is available<br>(see Guidance at 4.1.1 above) |
| 5.3.4 | Structural equipment for fixed tanks, demountable tanks, shall include, where appropriate:<br>- Tank supports and 5th wheel frame ,<br>- Lateral/roll over impact protection ,<br>- Dynamic loaded components i.e. heads, surge plates, partitions ,<br>- Top service equipment protection ,<br>- Service equipment protection outside of protection zones |
| 5.3.7 | This section does not apply to 6.7 tanks |
| 5.3.7.1 | This first paragraph of this clause states:<br>"*The non-destructive testing of the welds shall be by radiographic or ultrasonic methods. ~~Welds which cannot be tested by ultrasonic or radiographic methods because of the design or the position of the weld may be tested by dye penetrant or magnetic particle inspection.~~*"<br><br>**NOTE 1: This second sentence does not comply with ADR and may not be used.** |

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| | **NOTE 2: For in-service inspections, ultrasonic and radiographic methods of non-destructive testing shall initially be attempted. Where repairs on welds cannot physically be tested by these methods – e.g. due to the design or position of the weld – dye penetrant or magnetic particle inspection methods are permitted, and AIBs shall note this on their reports with justification.**<br><br>**NOTE 3: For new construction where welds cannot be tested in accordance with ADR the AIB shall contact the Competent Authority**<br><br>Where NDT is used, to assess major repairs, the type and extent should be in accordance with the original tank construction standards or pressure vessel code. Where the original specification is unknown, the inspector may carry out such testing as is appropriate depending on the type of tank and the requirements in force when the tank was manufactured under UK CDG regulations<br><br>RID/ADR 2017 permits NDT for routine in-service inspection of fixed tanks only under 6.8.4 TT11. The provision is limited to butane (UN1011) and propane (UN1078) fixed tanks |
| 5.3.7.4 | For tanks conforming to RID/ADR/IMDG Chapter 6.7, weld joint efficiencies shall be in accordance with the adopted Tank pressure vessel design code accepted by the Competent Authority for issuing Type Approval<br><br>See DfT Notice 27 |
| 5.4 | When tank interiors are inspected adequate records shall be kept to identify findings during the inspection and may be written notes, photos or videos. |
| 5.4.1 | **NOTE 1: This section provides general guidance. Tanks for certain substances may have specific inspection requirements set down in the regulations e.g. Bromine.**<br><br>**NOTE 2: The International Tank Container Organisation (ITCO) produces a guide, "Acceptable Container Condition" (2017) which contains guidance on a number of aspects of inspection applicable to all tanks. Copies can be obtained through https://international-tank-container.org/en/publications**<br><br>In particular the examination should include:<br><br>**Corrosion: (examples include)**<br>Surface: small areas of light surface corrosion are permitted, provided minimum required thickness is maintained and there is no pitting.<br>Structural: surge plate - corrosion, reinforcement rings, mouse holes venting openings, cleaning rings<br>Structural: partition - corrosion, cleaning ring<br><br>Corroded thickness of surge plates, partitions and/or external rings may have impact on tank compliance to ADR 6.8.2.1.20<br><br>**Pitting: (examples include)**<br>Corrosion craters or pits which may be open or closed, evident by small |

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| | blisters, must be reported so that remedial action can be taken to ensure the minimum thickness is maintained<br><br>**Delamination: (examples include)**<br>Bulges with or without corrosion beneath paint area. Test by depressing the area to determine weakness. Ensure that the minimum thickness is maintained.<br><br>**Weld defects: (examples include)**<br>Hairline cracks or fractures in any paintwork along the line of the weld.<br>Stress cracks or fractures emanating from the weld area.<br>Corrosion of the weld or the weld joint area<br><br>**Stress fractures (examples include)**<br>Hairline cracks or fractures tank shell, Partition, Surge Plates, openings between compartments, supporting structure or chassis attachments<br><br>**Unsatisfactory or "unofficial" repairs**<br>The type(s) and location(s) of unsatisfactory or unofficial repairs should be recorded on inspection documents and an assessment made as to the suitability of the repair(s) and the continued integrity and safety of the vessel and whether it should ordinarily (under these guidelines) have required an exceptional check should be conducted. If so, arrange for an examination by a suitably accredited and appointed body<br><br>**General**<br>Non-destructive testing methods may be used but the conditions of ISO 9712 Level II / ASNT Level II shall be met<br><br>Internal inspection should be carried out by physical entry into the tank whenever it is practicable to do so. Otherwise, inspection shall be accomplished with suitable remote visual inspection equipment inserted through a manway or other suitable opening. Inspections performed remotely shall be capable of detecting the same level of defect that would otherwise be detected by the close examination made possible by entry into the tank<br><br>Internal inspection by remote means.<br>Internal inspection by remote means. AIBs may not use remote inspection techniques for internal inspection unless it has been subjected to satisfactory scrutiny by UKAS<br>The choice of remote equipment will be influenced by the environment in which it is to be used and the knowledge and training of the operator<br>Considerations when selecting video systems for remote viewing include:<br>- Camera and monitor resolution<br>- Monitor size<br>- Anti-glare Screen (if being operated in sun-light)<br>- Colour imaging with sufficient Contrast / Brightness range<br>- Adequate Illumination<br>- Sufficient manoeuvrability and reach to examine the entire internal surface in detail<br><br>Where a video system is used, it should be demonstrably effective. Any recordings should form part of the assessment (see 5.4 above). |

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| | **NOTE 1: The AIB will require clear systems and procedures to be in place in order to satisfy the requirements for accreditation and appointment to use remote cameras . UKAS shall witness the equipment in operation at the accreditation visit**<br><br>**NOTE 2: the remote inspection equipment must be able to identify pitting, particularly on the "wash lines", near discharge valves and local to welded brackets (some guidance is given in the ITCO guide)** |
| 5.5 | This section is intended for an inspection of any structural fitting that may affect the tank's integrity but should include<br><br>**External Leaks;**<br>- Damp patches.<br>- Discoloured paintwork.<br>- Drips.<br>- Service Equipment including; valves, pumps, filters, hoses and piping<br>- Manlids and openings<br>- Opening ends (6.10 tanks)<br><br>**Corrosion**;<br>- Surface: small areas of light surface corrosion are permitted, provided minimum thickness is maintained and there is no pitting.<br>- Pitting: corrosion craters or pits which may be open or closed, evident by small blisters, must be reported so that remedial action can be taken to ensure that the minimum thickness is maintained.<br><br>**Cracking**;<br>- Any fractures (hairline cracks), of the tank shell, service equipment, piping and supporting structure<br><br>Mechanical **Damage**<br>- Longitudinal protection members (valance), roll over protection, top service equipment protection<br>- Side service equipment protection<br>- Safety interlock devices<br>- Rear door opening mechanisms<br><br>Deformations **or dents**<br>Size, depth and location should be recorded on inspection documents and an assessment made as to the continued integrity and safety of the shell, piping or service equipment.<br><br>Unsatisfactory **or "unofficial" repairs**<br>The types and location should be recorded on inspection documents and an assessment made as to the suitability of the repair and continued integrity and safety of the vessel of whether it should ordinarily (under these guidelines) have required an exceptional check shall be considered. If so, arrange for the examination by a suitably accredited and appointed body<br><br>Grinding **operations to remove local corrosion**<br>Evidence of sanding or grinding operations having been used to remove local corrosion or substance staining should be assessed with respect to the remaining thickness.<br><br>**Tank Structure** |

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| | Particular attention is to be taken to the condition of the materials and welds, with emphasis given to areas of concern such as cracks or corrosion liable to weaken the compartment, surge plates, partitions, shell, supports or lateral impact/roll over<br>Areas to be looked at shall include, where appropriate;<br>- Sole plates to tank longitudinal supporting structure, condition of weld.<br>- Welded chassis incorporated to tank shell<br>- Tank external rings used for lateral impact or roll over protection<br>- Tank external ring/horn sections to chassis<br>- Doubler plate supports to tank shell<br>- Doubler plates to sole plates.<br>- 5th wheel structure (inside / outside)<br>- Rear impact protection as required ADR<br>- Heating coil/system and attachments<br><br>**EXTERNAL INSPECTION OF UNINSULATED TANK**<br>To be performed at all Periodic, Intermediate and Exceptional check inspections to ensure there is no evidence of:<br>- corrosion;<br>- cracks;<br>- Significant deformations or dents;<br>- unsatisfactory or "unofficial" repairs;<br>- grinding operations to remove local corrosion.<br><br>**EXTERNAL INSPECTION OF INSULATED TANK**<br>To be performed at all Periodic, Intermediate and Exceptional check inspections for UK tanks. Sheathing, thermal or other insulation shall be checked for damage or repairs that may indicate signs of concealed damage. If necessary, remove insulation/cladding to the extent required to achieve a reliable appraisal of the condition of the tank.<br>Ensure there is no evidence of:<br>- leaks (product drips from cladding joints);<br>- cracks;<br>- impacts;<br>- holes;<br>- unsatisfactory or unofficial repairs;<br>- any defect that may lead to moisture containment of heat insulation.<br>- heating coil/heating panels, system |
| 5.5.1 | If the tank shows an indication of a reduction in wall thickness, the wall thickness shall be measured using calibrated equipment and compared with the minimum thickness given by the type approval documents, application ADR/RID/IMDG requirements or shall undergo a reassessment (4.1.3) where not defined. If the material is painted or lined, the equipment must be capable of reading the true metal thickness through the paint. Otherwise the coating is to be removed to ascertain an accurate measurement<br><br>**NOTE: Some of the standards listed in DfT note 27 may provide guidance on wall thicknesses at inspection (see 5.3.7.4 above).** |

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| 5.5.4 | Shells which are required to be fitted with at least one earth connection shall be clearly marked with the symbol ⏚ adjacent to the point capable of being electrically connected.<br>The earth connection shall be inspected for conformity with the design requirements. The electrical resistance between the earth connection and the metallic parts of the tank and equipment, including any frame and where applicable between the earth connection and the vehicle chassis shall be measured and, shall not exceed 10 ohms |
| 5.6.1 | The ambient water temperature shall be recorded<br><br>Note 1: Testing with water at 0°C can lead to consequences where the tank cannot be tested adequately in such low temperatures<br>Note 2: Care must be taken when testing stainless steel tanks to limit as is appropriate the chlorine content of water.<br>Note 3 The Drinking Water Inspectorate (DWI) set a maximum chlorine level of 1.5mg/litre for water leaving a treatment works. Generally, it appears, this is reduced during its transit through the water mains to a residual level of about 0.2mg/l at customer taps.<br><br>**NB:** The hydraulic pressure test is not a mandatory (except when Special Provisions TT5, TT6, TT10 are applicable) requirement for:-<br>- The intermediate inspection,<br>- After exceptional inspections where the application of heat has not been applied and with the agreement of the AIB<br>- For vacuum insulated refrigerated liquefied gas tanks when this test can be replaced by a leakproofness test and a measurement of the vacuum space which confirms that the vacuum is not lost as a result of the test.<br>- Tanks (6.8) for the dedicated carriage of powdery or granular substances - unless subject to an exceptional inspection which includes the application of heat.<br>- Portable tanks (6.7) designed and used for the carriage of a solid substances (non-toxic, non-corrosive)<br>- The hydraulic test can be replaced by a leakproofness test at an effective internal pressure at least equal to the maximum working pressure.<br><br>Where a test is not carried out for one of the reasons stated above a note shall be recorded in the certificate on the VCA database |
| 5.6.3.1 | When a hydraulic pressure test is performed as part of an Exceptional Check following repair or alteration, only the compartment(s) affected and the compartment(s) immediately adjacent to it/them need be tested. Each compartment shall be tested individually with the adjacent compartments empty<br><br>Note: In the case of tanks where the test pressure is 2 times the static pressure of the heaviest goods to be carried (or 2 times the static pressure of water if greater) the required test pressure shall be measured at the highest point of the tank or compartment. There shall be no reduction in pressure to compensate for the mass of liquid in the tank under test . |
| 5.6.4 | Water is normally to be used as the test fluid.<br><br>The footnote to RID / ADR paragraph 6.8.2.4.2 states: |

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| | *"In special cases and with the agreement of the expert approved by the competent authority, the hydraulic pressure test may be replaced by a pressure test using another liquid or gas, where such an operation does not present any danger."*<br><br>Such "special cases" include but are not limited to circumstances where filling of the tank with water or another liquid is incompatible with the normal product fill, e.g. water is forbidden MOD fuel tanks, Sodium, Hydrogen Fluoride tanks may also present safety issues.<br><br>Where an inspection body intends to undertake a pressure test with another fluid, a detailed procedure shall be developed, based on the procedure for water. The procedure shall include a risk assessment to show that testing with the alternative fluid is carried out in such a manner that risks are minimised to the fullest extent practicable and that any remaining are appropriately managed. The procedure shall take account of factors such as differences in viscosity, density and surface tension and shall demonstrate the technical equivalence of the proposed method i.e. whether the method delivers the same or better result to that of testing with water.<br><br>The procedure shall be assessed by UKAS and identified in the accreditation schedule of the inspection body.<br><br>Where alternative fluids are used, a different decay rate may be appropriate and shall be defined in the inspection bodies' accredited procedures<br><br>Where pneumatic pressure testing is undertaken inspection bodies should take account of the following publication:<br><br>HSE – Safety in Pressure testing GS4 published by the HSE |
| 5.6.8 | Caution must be exercised when filling lagged vessels as traces of water on the ground may/could be caused by overfilling the tank before testing, allowing water to penetrate the insulation or indicate leakage through the heat insulation, or may be a leak in the vessel.<br>When leakage through the insulation is detected during testing, with a corresponding pressure drop, the insulation shall be removed and further inspection carried out. |
| 5.7 | It may be necessary to take account of the corrosion and temperature fluctuations when specifying the vacuum pressure requirements. |
| 5.7.1 | Where a tank has been designed for an external pressure of 1.0 barg (6.10), a vacuum test shall be performed with service equipment fitted to tank. The pressure achieved from service equipment shall be recorded after a minimum duration of 15mins, isolated and check of vacuum decay<br><br>**NOTE: there is no specific value to be achieved for the test but required to be performed to comply with EN12972:2007 clause 5.10.3** |
| 5.8.7 | EN12266 is a Valve Testing Standard; that can be used to determine the leak-rate for Service Equipment but is not applicable to vessels<br>More suitable methods may be found in:<br>BS EN 1779 Leak Testing – Criteria for Method and Technique Selection<br>BS EN 13184 Leak Testing – Pressure Change Method |

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| 5.11 | Inspect and report on:<br>- cracks;<br>- holes;<br>- impacts and deformations;<br>- excessive corrosion;<br>- unsuitable and unacceptable repairs;<br>- cracks in welds.<br>- Deterioration of ISO corner castings<br>- Damage to walkways and fixings<br>- Damage to access ladder<br><br>Any inspection and repair of the frame shall ensure it complies with the relevant guidance of the:<br><br>**Institute of International Container Lessors (IICL)**<br>1120 Connecticut Ave NW<br>Suite 440<br>Washington DC 20036-3946<br>USA<br><br>Telephone: (1) 202 223-9800<br>Fax: (1) 202 223-9810 |
| 5.12.3 | Tank plates shall be marked with the maximum gross capacity per compartment/tank as shown on the Initial certificate issued by the AIB |

Glossary
(Of some terms used in this document)

***EPRV*** Emergency Pressure Relief Valve (ADR/RID – N/A, IMDG – N/A, EN12972:2007 – N/A)

***PRV*** Safety Device (ADR/RID – Safety Valve, IMDG – Pressure Relief Device, EN12972:2007 – Safety Valve)

***Bursting Disc*** Safety Device (ADR/RID – Bursting Disc, IMDG – Frangible Disc, EN12972: 2007 – Bursting Disc)

***Breather Device*** Operational Device (ADR/RID – Breather Device, IMDG – N/A, EN12972: 2007 – Venting Device)

***Opening End*** Full or part diameter of shell, quick opening access for discharge of solids, viscous substances, personal access internally to shell/compartment

***Manway*** Personal access internally to shell/compartment, minimum diameter of 500mm (ADR/RID, IMDG tanks ≥2003)

***Opening*** Access internally to shell/compartment of no given diameter to permit visual or hand access

**NOTE**
Annexes in the earlier draft of this document are not being issued at this time