Guidance on the design, construction and testing of standard rail tank cars for the transport of chemicals in bulk

cefic

Responsible Care

INTRODUCTION

This document provides guidance on the design and construction of Rail Tank Cars (RTC's) and associated equipment commonly used for the transport in bulk of chemicals.
This document does NOT address the transport of solids or of products with specific requirements e.g. ethylene oxide, ammonia, etc.

The design and construction of RTC's must, as a minimum, be in compliance with the international regulations concerning the Carriage of Dangerous Goods by Rail (RID) (see http://www.otif.org/en/dangerous-goods.html) and with the European Directive 2010/35 on Transportable Pressure Equipment and other domestic regulations where applicable.

This guidance contains recommendations on top of what is already legally required.

The document is split into 2 columns:

A. Liquids (with a focus on chemicals i.e. non-oil products)

B. Gases (limited to liquefied flammable gases e.g. LPG, propane, butane, butadiene, propylene, etc. but excluding gases that have specific requirements such as ethylene oxide, chlorine, etc.)

Text that is common to both liquids and gases has been highlighted in blue.

This document replaces the previous version of the Cefic Guidelines issued in 2003.

A. LIQUIDS	B. GASES (liquefied flammable)
CONTENTS 1. Tank design and construction 2. Equipment 2.1 Manhole/manlid 2.2 Pressure/vacuum relief 2.3 Earthing 2.4 Bottom discharge 2.5 Top discharge 2.6 Thermometers/manometers 2.7 Controlled ventilation valves (Auto vent system) 3. Walkways/platforms 4. Heating/insulation 5. Underframe 6. External painting/cladding 7. Placarding and marking 8. End protection 9. Testing, inspection and certification 10. Information/data to be submitted to the lessee (consignor) prior to putting into use RTC's	**CONTENTS** 1. Tank design and construction 2. Equipment 2.1. Manhole/manlid 2.2. Pressure relief 2.3. Earthing 2.4. Bottom discharge 2.5. (Not applicable) 2.6. Thermometers/manometers 2.7. (Not applicable) 3. (Not applicable) 4. Sunshield 5. Underframe 6. External painting 7. Placarding and marking 8. End protection 9. Testing, inspection and certification 10. Information/data to be submitted to the lessee (consignor) prior to putting into use RTC's

1. TANK DESIGN AND CONSTRUCTION	**1. TANK DESIGN AND CONSTRUCTION**
See RID requirements in RID 6.8.2.1	See RID requirements in RID 6.8.2.1 and 6.8.3.1
Materials of tank construction, including coatings, valves, fittings, gaskets etc. shall be suitable for the specified products.	Materials of tank construction, including coatings, valves, fittings, gaskets etc. shall be suitable for the specified products.
For the shells of RTC's, which are intended for carrying different products, suitable stainless steel is recommended because of its resistance to a wide variety of chemicals. Compared with carbon steel, stainless steel might, in some cases, also have a positive influence on the product quality (e.g. colour) and leak-proofness of the bottom outlet/valve system of the RTC (no rust in seats of valves).	
The materials of shells (or protective linings), including all other components, which are in contact with the product, shall not contain substances liable to react dangerously with the product, or form dangerous compounds or degrade the material properties or quality of the carried products.	The materials of shells (or protective linings), including all other components, which are in contact with the product, shall not contain substances liable to react dangerously with the product, or form dangerous compounds or degrade the material properties or quality of the carried products.
New or treated stainless steel tanks must be properly pickled and passivated.	
For new tanks, all load bearing attachments shall have backing plates of a material compatible with the tank shell, thick enough to distribute incoming forces to an uncritical limit. Backing plates shall be fully welded to the shell and shall have all corners well rounded. Also a small boring is recommended for stress release.	For new tanks, all load bearing attachments shall have backing plates of a material compatible with the tank shell, thick enough to distribute incoming forces to an uncritical limit. Backing plates shall be fully welded to the shell and shall have all corners well rounded. Also a small boring is recommended for stress release.
The tank must be designed for a calculation pressure as required by RID (see RID 6.8.2.1.14). It is recommended to have a design pressure of not less than 4 bar gauge. Atmospheric (vented) tanks even if allowed by national and international regulations, are not recommended. Vacuum relief valves shall not be fitted. Hermetically closed shells without vacuum relief valves shall be designed to withstand a minimum underpressure of 0.4 bar. Internal components such as baffle plates, internal reinforcements, internal ladders, shall not be fitted. Internal heating coils should be avoided if external heating is sufficient for the products carried.	The tank must be designed for a calculation pressure as required by RID (see RID 4.3.3.2.5). Measures should be taken (see RID 6.8.2.1.7.) to protect the shells against the risk of deformation as a result of a negative internal pressure (vacuum).It is recommended that the tanks are designed to withstand an underpressure of 1bar.

RTC's without underframe ("Selbsttragende Kesselwagen") and RTC's, of which the tank is welded to the underframe over the full length, are not recommended.	RTC's without underframe ("Selbsttragende Kesselwagen") and RTC's, of which the tank is welded to the underframe over the full length, are not recommended.
Tanks must have drainage with flush welding seams at the surface of the bottom.	Tanks must have drainage with flush welding seams at the surface of the bottom.
The tanks shall be designed to be explosion proof.	
The identification plate has to be properly fixed on the outside of the tank shell and all information has to be readable. The initial test data may not be overwritten by other test data (see RID 6.8.2.5.1 and EN 12561-1).	The identification plate has to be properly fixed on the outside of the tank shell and all information has to be readable. The initial test data may not be overwritten by other test data (see RID 6.8.2.5.1 and EN 12561-1).
2. EQUIPMENT	**2. EQUIPMENT**
See RID requirements in RID 6.8.2.1	See RID requirements in RID 6.8.3.2
The following standards are recommended:	The following standards are recommended:
EN 12561-1:2011 Marking of tank wagons for the carriage of dangerous goods	EN 12561-1:2011 Marking of tank wagons for the carriage of dangerous goods
EN 12561-2:2011 Bottom emptying devices for liquid products including vapour return	EN 12561-3:2011 Bottom filling and emptying devices for gases liquefied under pressure
EN 12561-4:2011 Top emptying and filling devices for liquid products	
EN 12561-5:2011 Devices for bottom emptying and top filling of liquid products	
EN 12561-6 :2011 Manholes	EN 12561-6 :2011 Manholes
EN 12561-7 :2011 Platforms and ladders	
EN 12561- 8:2011 Heating connections	
UIC leaflet 573 Technical conditions for the construction of tank wagons	UIC leaflet 573 Technical conditions for the construction of tank wagons
When one of these standards or leaflets is updated or replaced, the new version automatically applies.	When one of these standards or leaflets is updated or replaced, the new version automatically applies.
2.1 <u>Manhole/manlid</u>	**2.1 <u>Manhole/manlid</u>**
There are no specific requirements in RID.	There are no specific requirements in RID.
Minimum diameter of the manhole must be 500 mm.	Minimum diameter of the manhole must be 500 mm.
Manlids with swing bolts and butterfly nuts have to comply with standard EN 12561-6:2011. For RTC's, not loaded via the manhole, a closure with nuts is recommended.	

The closing mechanism of the manlid shall be designed in such a way that internal pressure in the RTC can be released safely before the lid can be fully opened. The manlid must be secured properly when opened to less than 120 degrees. No obstacles shall prevent proper closure of the manlid.	
The manlid shall be fitted with a joint ring, which must be compatible with the product being carried.	The manlid shall be fitted with a joint ring, which must be compatible with the product being carried.
The manlid shall be gas tight, complying with RID 6.8.2.4.3.	The manlid shall be gas tight, complying with RID 6.8.2.4.3.
Fittings or other pieces of equipment on hinged manlid covers are not acceptable. Hinged manlids must be sealable.	
2.2 <u>Pressure/vacuum relief</u> See RID requirements in RID 6.8.2.2 and 6.8.2.2.3 Pressure/vacuum relief valves shall NOT be fitted if not required.	**2.2 <u>Pressure relief</u>** See RID requirements in RID 6.8.3.2.9 Pressure relief valves shall NOT be fitted if not required.
2.3 <u>Earthing</u>	**2.3 <u>Earthing</u>**
See RID requirements in 6.8.2.27 and section 5.5 of EN 12561-2.	See RID requirements in 6.8.2.27 and section 5.6 of EN 12561-3.
All parts of the tank wagon shall be bonded by equipotential connections and shall be capable of being electrically earthed.	All parts of the tank wagon shall be bonded by equipotential connections and shall be capable of being electrically earthed.
Earthing lugs must be available on both sides of the RTC, next to the outlet nozzle.	Earthing lugs must be available on both sides of the RTC, next to the outlet nozzle.
In order to ensure proper bonding with the RTC, the earthing lug shall consist of a stainless steel plate of at least 40 mm x 80mm x 5mm , which must be welded directly onto equipment that is connected to the tank e.g. cradle for tee pipe, “Sattelleiste” (saddle bar) .	In order to ensure proper bonding with the RTC, the earthing lug shall consist of a stainless steel plate of at least 40 mm x 80mm x 5mm , which must be welded directly onto equipment that is connected to the tank e.g. cradle for tee pipe, “Sattelleiste” (saddle bar) .
The earthing plate may never be painted and must be properly marked with the international “earthing” symbol.	The earthing plate may never be painted and must be properly marked with the international “earthing” symbol.
For top loading / unloading, an extra earthing close to the top connections is recommended.	
2.4 <u>Bottom discharge</u>	**2.4 <u>Bottom discharge</u>**
<u>2.4.1 Bottom valves and operating mechanism</u>	**<u>2.4.1 bottom valves and operating mechanism</u>**
See RID requirements in RID 6.8.2.2	See RID requirements in RID 6.8.2.2.2 and 6.8.3.2.3

The tank shall be fitted with discharge pipework in the form of an outlet tee piece. The arm of the tee shall be directed to each side of the RTC and shall have a horizontal position.	The tank shall be fitted with discharge pipework in the form of two outlet tee pieces. The arms of the tee shall be directed to each side of the RTC and shall have a horizontal position.
Each bottom-filling or bottom-discharge opening shall be equipped with at least three mutually independent closures, mounted in series, comprising: - An internal bottom-valve, i.e. a stop-valve mounted inside the shell or in a welded flange or companion flange; - An external stop-valve or equivalent device, one at the end of each pipe;	Each bottom-filling or bottom-discharge opening shall be equipped with at least three mutually independent closures, mounted in series, comprising: - An internal bottom-valve, i.e. a stop-valve mounted inside the shell or in a welded flange or companion flange; - An external stop-valve or equivalent device, one at the end of each pipe;
- A closing device at the end of each pipe, which may be a screw threaded cap, a blind flange or an equivalent device.	- A closing device at the end of each pipe, which may be a screw threaded cap, a blind flange or an equivalent device.
The internal bottom-valve shall be operable from below. Its setting – open or closed – shall be capable of being verified. Internal bottom valve control devices shall be so designed as to prevent any unintended opening through impact or inadvertent act.	The internal bottom-valves (for liquid and gas phase) shall be operable from below. Its setting – open or closed – shall be capable of being verified. Internal bottom valve control devices shall be so designed as to prevent any unintended opening through impact or inadvertent act.
The internal bottom valve shall continue to be effective in the event of damage to the external control device.	The internal bottom valves shall continue to be effective in the event of damage to the external control device.
	Internal bottom valves shall be equipped with an instant-closing internal safety device which closes automatically in the event of an unintended movement of the shell. It shall also be possible to operate the closing device by remote control (see RID 6.8.3.2.3).
The bottom (DN 80 as a minimum) valve may be of a mechanical or hydraulic type provided the spring tension has a value of minimum 200 kg.	The bottom valves (DN 80 for liquid phase and DN 80 or DN 50 for gas phase) may be of a mechanical, hydraulic type provided the spring tension has a value of minimum 200 kg.
A marking, which clearly indicates the operating of the bottom valve, must be visible near the operating mechanism.	A label, which clearly indicates the operating instructions of the bottom valves must be attached to the tank near the operating mechanism.
For RTC's which may carry different products, the gaskets of the bottom valve must be made out of PTFE or equivalent material, which must be compatible with the products carried. Wagons equipped with PTFE gaskets only should be marked with gasket class 1.	
2.4.2 Bottom discharge connections	**2.4.2 Bottom discharge connections**
See RID requirements in RID 6.8.2.2.2	See RID requirements in RID 6.8.2.2.2
The outlet piece shall be fitted at each end with an	The outlets shall be fitted at each end with an outlet

outlet (side) valve which may be a globe valve ("Schrägsitz"), plug valve or a ball valve.	(side) valve which may be a globe valve ("Schrägsitz") plug valve or a ball valve. However, for carbon steel wagons, the use of globe valves is recommended.
The types of the outlet valves must be the same on both sides.	The types of the outlet valves must be the same on both sides.
The discharge end of the outlet tee piece may terminate in a 5 ½" Whithworth screw-thread which is commonly used, and a screw (blank) cap and chain. Flanges may also be fitted. The use of dry disconnect couplings is recommended. However, dry disconnect couplings should not be used on tanks with crystallisable or highly viscous substances and also not on carbon steel tanks as a second closure. For bottom loading and unloading systems, dry disconnect couplings may be used as secondary closure instead of the outlet valve. If special couplings are not yet fitted, adequate spacing must be foreseen to connect these onto the outlet valves in a later stage. Adaptors of 5 ½ Withworth thread to dry disconnect couplings are NOT recommended. Dry disconnect couplings should be fitted to a flange. All screw caps shall be fabricated from stainless steel or the same material as the tank. Plastic caps are allowed but not recommended. The screw caps must be fitted with suitable full-flat-face gaskets.	Types of connections currently used, and described below, are: - screw connections: e.g. WECO type - flange-type connections - dry disconnect couplings. When dry disconnect couplings are used, they should be fitted as third closure in downstream direction of the outlet valve.
The coupling device is connected to the connection pipe of the RTC with a flanged type connection.	The coupling device is connected to the connection pipe of the RTC with a flanged type connection. <u>Screw-connections</u>  WECO connection In this case, the RTC is equipped with "female" half-joints, generally of 3″ and 2″ diameter for the liquid and gas phases. The half-joint has an external

	thread which can be from the ACME or ISO type, and includes a gasket made of synthetic material compatible with the product to be carried. The joint is closed, during transport, by a threaded cap blocked by contact with the gasket. In order to ensure that the coupling has not been removed for unloading by means of flange connections, it is recommended to have a means to seal (e.g. a sealable bolt) the flange of the screw connections. <u>Dry disconnect couplings</u> Dry disconnect couplings (NATO standard 3756 type e.g. TODO, Mann Tek, ARTA, etc.), fitted as a third closure, are recommended, especially for gases with carcinogenic properties (e.g. butadiene) .  Dry disconnect coupling NATO standard 3756
2.4.3 General –bottom discharge The leakproofness of the service equipment shall be ensured even in the event of the RTC overturning (see RID 6.8.2.2.1). Gaskets shall be made of a material compatible with the substance carried (see RID 6.8.2.2.1). Outlet valves and bottom valve operation mechanisms shall be capable of being secured and sealed. All parts of valves, in contact with the product, must be free of grease.	**2.4.3 General Bottom discharge** The leakproofness of the service equipment shall be ensured even in the event of the RTC overturning (see RID 6.8.2.2.1). Gaskets shall be made of a material compatible with the substance carried (see RID 6.8.2.2.1). Outlet valves and bottom valve operation mechanisms shall be capable of being secured and sealed. All parts of valves, in contact with the product, must be free of grease.
2.5 Top Discharge The top connections shall, as a minimum, consist of: - Liquid phase (dip tube): DN 80 - Vapour return: DN 50 Both connections shall be fitted with: - a ball- or butterfly-valve and a blank flange, or - a dry break coupling. However, dry disconnect couplings should not be used on tanks of crystallisable or highly viscous	**2.5 Top Discharge** Not applicable

substances. These connections should be marked with the following codes: - 0Red for the liquid phase - Blue for the vapour return As additional top connection a filling nozzle with flange DN 150 is recommended. Other connections may be foreseen (e.g. for future fitting of an overfill protection system, temperature- or pressure gauges). Therefore an extra DN 80 flange connection is recommended. Where blind flanges, which are not preceded by a valve, are fitted on filling or discharging devices, the blind flanges shall be equipped with splash rings. If reasonable, inadequate spacing (approximately 140 mm) should be foreseen to connect future couplings onto the top valves (e.g. dry disconnect couplings)	
2.6 <u>Thermometers/manometers</u> Thermometers/manometers shall not be fitted except when specifically requested by the customer.	**2.6 <u>Thermometers/manometers</u>** See RID requirements in RID 6.8.3.2.2 Thermometers/manometers shall not be fitted.
2.7 <u>Controlled ventilation valves (Auto vent system)</u> The RTC may be equipped with an auto vent valve, which opens simultaneously, or preferably before the bottom valve is opened. The system may be of a mechanic and/or hydraulic design. The auto vent valve ("Zwangsbelüftungsventil") shall be connected onto a branch pipe with a diameter of not less than 50 mm, which extends from the top to the bottom of the tank. This vapour return line shall, at the bottom, be connected with a T-line which is fitted, on both sides of the RTC, with a blind flange DN 80 or a quick coupling with blind cap. A vacuum relief valve, fitted directly on the vapour line, may also be fitted to prevent implosion during discharge. The use of an external reinforcement ring, as a vapour line, on the tank is not recommended. It is recommended that vapour return lines are fitted with a device preventing liquids from entering the vapour return line. It must be clearly displayed (e.g. with white stripe or in writing) that an auto vent system is installed and active.	**2.7 <u>Controlled ventilation valves (Auto vent system)</u>** Not applicable

For RTC's which are equipped with vapour return lines, which are not (yet) connected onto an auto vent valve, a clear indication near the vapour return line must show that it is out of use.

3. WALKWAYS/PLATFORMS

There are no specific requirements in RID.

At least one walkway/platform of 'anti-slip safety grating' construction and a kick plate shall be provided on top of the tank to give safe access to the equipment and fittings.

The platform must cover the workplace around domes and connection points, if reasonable, and guarantee access to valves, connections, etc.

The construction shall comply with EN 12561-7:2011.

4. HEATING/ INSULATION

See RID requirements in RID 6.8.2.1.25.

For RTC's carrying products which may require heating (e.g. with a high freezing point or high viscosity), the tank, outlet line and bottom valve shall be insulated and heatable. Consideration should be given to indirectly heat the bottom valve by making use of the external heating coils of the tank.

The vapour return line shall be insulated or integrated into the tank insulation.

The recommended type of insulation is 100 mm thick standard insulation (Rockwool, glasswool or equivalent). The insulation must be of such material that it cannot react dangerously with the chemicals to be carried.

Preferably, only external heating coils shall be used.

3. WALKWAYS/PLATFORMS

Not applicable

4. SUNSHIELDS

See RID requirements in RID 6.8.3.2.14

The pressure rating of gas tanks depends on whether or not thermal insulation (sun shield) is provided.

The minimum test pressure for multipurpose LPG-type cars is:

- 2.5 MPa (25 bar) for tanks with sunshields;
- 2.7 MPa (27 bar) for tanks without sunshields.

The disadvantages of sunshields are:

- risk of coming loose and causing an accident;
- maintenance, risk of corrosion under sunshield which is not readily visible;
- maintenance costs, need to remove shields for inspection, painting;
- in case of fire, it is difficult to cool the tank.

The advantages of sunshields are:

The maximum working pressure of the heating system must be clearly indicated on the RTC. When multiple heating systems are fitted, the inlet connections of each circuit must be clearly marked with the name of the circuit. Inlet and outlet heating pipes shall be fitted with a closing valve in compliance with EN 12561-8:2011.	- cost of new built is a little lower (lower steel thickness of tank); - the tare weight is 200-300 kg lower because the thickness of the steel is lower (for C3 RTC's the design pressure without sunshield is 2 bar higher , no difference for C4 RTC's). For safety reasons, RTC's without sunshields are generally preferred.
5. UNDERFRAME	**5. UNDERFRAME**
All RTC's must have shunting hooks and shall have lashing devices to be suitable for rail-ferry traffic.	All RTC's must have shunting hooks and shall have lashing devices to be suitable for rail-ferry traffic.
Both ends of the RTC shall be provided with step-on platforms and handgrip. Very small "step-on's" and handgrips are not recommended.	Both ends of the RTC shall be provided with step-on platforms and handgrip. Very small "step-on's" and handgrips are not recommended.
Axle load, arc radius and axle distance are limited for certain customers and must be agreed upon before delivery.	Axle load, arc radius and axle distance are limited for certain customers and must be agreed upon before delivery.
6. EXTERNAL PAINTING/CLADDING	**6. EXTERNAL PAINTING/CLADDING**
Durable external painting is required for carbon steel RTC's, which are not insulated. It is recommended to clad insulated tanks with stainless steel cladding, at least around discharge connections and the area underneath. All joints in the cladding shall be weather-proofed with a suitable seal to prevent the ingress of water into the insulation. Insulated carbon steel tanks shall be painted under the insulation to avoid corrosion. Measures must be taken to prevent accumulating condensation within the insulation. Aluminium cladding is not acceptable around discharge connections and the area underneath.	Durable external painting is required.
7. PLACARDING AND MARKING	**7. PLACARDING AND MARKING**
See RID requirements in RID 6.8.2.5.2. For the placards (large danger labels) mounting plates are recommended. For the orange-coloured plate marking steel frames to hold the plates shall be provided at both sides of the RTC. It is recommended using steel orange-coloured plates with figures which remain legible after 15 minutes engulfment in fire. For product dedicated RTC's, the name of the substance carried or name of a group of substances, for the carriage of which the tank has been approved, shall be inscribed on each side of the tank or on a panel. For marking on freight wagons see EN 15877-1:2012.	See RID requirements in RID 6.8.3.5. For the placards (large danger labels) mounting plates are recommended. For the orange-coloured plate marking steel frames to hold the plates shall be provided at both sides of the RTC. Steel swing panels with the orange-coloured plates painted on it may also be used. It is however recommended to use steel orange-coloured plates with figures which remain legible after 15 minutes engulfment in fire. The name of the substance carried, for the carriage of which the tank has been approved, shall be inscribed on each side of the tank or on a panel. Swing panels shall be lockable and sealable. For marking on freight wagons see EN 15877-1:2012.

8. END PROTECTION

Buffer override protection

See RID requirements in 6.8.4, in particular special provisions TE25.

Crash buffers

See RID requirements in 6.8.4 in particular special provision TE22.

In order to mitigate the consequences of major rail accidents, it is recommended to fit RTC's with energy absorbing elements (crash buffers) for specific substances.

9. TESTING, INSPECTION AND CERTIFICATION

See RID requirements in 6.8.2.4

Companies may require more frequent inspections depending on the nature of the product e.g. risk of polymerisation.

The RTC owner must submit test certificates to the lessee upon request.

Prior to putting into service, the lessor of the RTC shall carry out a technical and cleanliness inspection of the RTC.

The required cleanliness shall be defined by means of a national or international recognised "cleanliness Key" (e.g. UIP "Reinheitsschlüssel").

8. END PROTECTION

Buffer override protection

See RID requirements in 6.8.4, in particular special provision TE25.

Buffer override protection or an alternative head protection is recommended, if justified and feasible.

Crash buffers
See RID requirements in 6.8.4 in particular special provision TE22.

In order to mitigate the consequences of major rail accidents, it is recommended to fit RTC's with energy absorbing elements (crash buffers) for specific substances.

9. TESTING, INSPECTION AND CERTIFICATION

See RID requirements in 6.8.2.4 and 6.8.3.4

Initial and periodical tests and inspections of the tank must be carried out in accordance with RID 6.8.2.4 and 6.8.3.4 and EN 12972.

The RTC owner must submit test certificates to the lessee upon request.

Prior to putting into service, the lessor of the RTC shall carry out a technical and cleanliness inspection of the RTC.

The required cleanliness shall be defined by means of a national or international recognised "cleanliness Key" (e.g. UIP "Reinheitsschlüssel").

10. INFORMATION/DATA TO BE SUBMITTED TO THE LESSEE (CONSIGNOR) PRIOR TO PUTTING INTO USE RTC'S Up-to-date specification sheet including as a minimum: - arc radius - length of RTC - maximum axle distance - tare weight - capacity of the tank - allowable loading weights per loading category - design-, test- and working pressure - design temperature - maximum allowable underpressure - material of tank shell - working- and test pressure of heating - type of connections including type of valves - auto vent system - special features - type of gaskets fitted. Further information required: - construction year of the RTC - last inspection/revision and test date of tank and underframe - UIP cleanliness key.	**10. INFORMATION/DATA TO BE SUBMITTED TO THE LESSEE (CONSIGNOR) PRIOR TO PUTTING INTO USE RTC'S** Up-to-date specification sheet including as a minimum: - arc radius - length of RTC - maximum axle distance - tare weight - capacity of the tank - allowable loading weights per loading category - design- and test-pressure - design temperature - maximum allowable underpressure - material of tank shell - type of connections including type of valves - special features - type of gaskets fitted. Further information required: - construction year of the RTC - last inspection/revision and test date of tank and underframe - UIP cleanliness key. - The internal condition of the RTC: for gas RTC's returning from workshops and which have been degassed, it is suggested to request the RTC to be under nitrogen with 0,5 % oxygen maximum