ECTA Best Practice Guideline:

Equipment master data

Version 1.1: 30 September 2022

Revisions		
Guideline	Update description	Date
Version 1.0	Initial version	06-December-2021
Version 1.1	Extra appendix: ADR next inspection date	30-september-2022

Table of Contents

1. Introduction 5
2. Definition of the equipment types in scope 5
   2.1 Box container 6
   2.2 Tank container 6
   2.3 Tank trailer 7
   2.4 Tautliner (Curtain Side Trailer) 8
3. Who needs equipment master data and for what purpose? 8
   3.1 Actors involved 8
   3.2 What drives the purpose to share equipment master data? 9
   3.3 When are equipment master data exchanged and how frequent 10
4. Equipment master data framework 11
   4.1 Explaining the equipment master data template structure 11
   4.2 The equipment master data template and file 11
5. Equipment Master data implementation guideline 12
   5.1 How to share equipment reference data across actors? 12
   5.2 How to keep equipment master data up to date? 13
   5.3 What are challenges of sharing equipment master data digitally? 13
6. Equipment Master data Use case example 14
   ECLIC Use Case example : eECD and equipment master data fields 14
7. Contact lists and WG participants 16
8. Appendix 1: Revision of ADR inspection dates on equipment 17

Disclaimer

This document is intended for information only and sets out a best practice guideline for companies who want to exchange equipment master data in a digital way. The information provided in this guideline is provided in good faith and, while it is accurate as far as the authors are aware, no representations or warranties are made with regards to its completeness and extra guideline revisions might be made at any time. It is not intended to be a fully comprehensive guideline. Each company, based on their individual decision-making process, may apply this guideline, in full or partly and no responsibility will be assumed by ECTA to the information contained in this guideline.

Overview of Figures

Figure 1 Box container (High Cube) 6

Figure 3 Liquid bulk tank container 7

Figure 4 Liquid bulk tank trailer 7

Figure 5 Tautliner 8

Figure 6 Overview of an overall “end to end“ chemicals logistics process 9

Figure 7 Overview of options for sharing equipment master data 13

Overview of Tables

Table 1 Summary overview related to the usage and purpose of equipment master data 10

Table 2 The structure of the equipment master data template 11

Lexicon table	
Actor	A company executing logistics activities and exchanging data or other information along the logistics chain; The involved actors are described in the ECTA guideline.
API	Application Programming Interface. A software intermediary that allows two applications to talk to each other.
ECD - eECD	ECD stands for EFTCO Cleaning Document ; eECD equals electronic EFTCO Cleaning Document.
ECLIC	European Chemical logistics Information Council. This Council is governing a neutral data sharing platform in support of specific Chemical Use Cases - www.eclic.eu
ECTA	European Chemical Transport Association – www.ecta.com
EFTCO	European Federation of Tank Cleaning Organizations – www.eftco.org
Equipment Master Data	Equipment master data describes the more detailed data specifications of equipment to transport goods in a safe and compliant way. It is also called equipment reference data.
SULID guidelines	Sulid stands for Site Unloading & Loading Information Documents and refers to the BEST PRACTICE GUIDELINES FOR SAFE LOADING AND UNLOADING OF ROAD FREIGHT VEHICLES". This guideline can be found via www.ecta.com/publications.
IoT	Internet of things (e.g. devices, sensors) real time connected to the worldwide web.
LSP	Logistic Service Providers.

1. Introduction

To bring chemical logistics to the next level in terms of safety, quality and sustainability, the digital exchange of standardized and structured logistics equipment master data is gaining in importance and momentum. Today, the checks and sharing of equipment data is done through human paper exchanges and/or physical paper checklists which are different per (un)loading site. In future, such exchange of the most common standard equipment reference data will be done digitally and will help customers and suppliers to better address the more complex business needs and equipment requirements at both loading and unloading places. In that respect, ECTA refers to the former bulk liquid, solid and packed goods SULID guidelines where a list of equipment related questions have already been described.

While the digital sharing of the most re-occurring equipment master data attributes is still within its infancy within chemical logistics, companies should start looking at new ways of collaborating that improves the operational accuracy and efficiency and avoids retyping of such equipment master data at check-in places or where such equipment checks can be anticipated and automated. In addition, companies should look at ways to enable faultless compliance with equipment and dangerous goods regulations.

This ECTA guideline aims to create a structured and standard equipment master data framework that can be used and re-used as a chemical industry framework across all actors. This equipment master data framework is a first version and will further evolve over time. New revisions will be updated on an “ad hoc” basis and will be shared on the ECTA website (www.ecta.com).

In Chapter 2, the equipment definitions and types that are described and are in scope are mainly used in chemical logistics transport. Next, and because it is very important to explain the use cases of equipment master data, the actors are described who need equipment master data, when they need it and for what purpose.

In Chapter 4, the equipment master data reference framework and the equipment master data fields are described in more detail. This framework is maintained as a separate template from this guideline so easier updates are possible. Thereafter, some practical implementation reflections, opportunities and challenges are explained as the authors see them today from a transport company perspective. The guideline is concluded with a practical use case.

2. Definition of the equipment types in scope

As this a first ECTA guideline associated with equipment master data and the concept of exchanging equipment master data digitally and paperless and it is a quite new subject within the chemical industry, the scope of this ECTA guideline is limited to those equipment types that come into closest contact with the (chemical) product. More specifically this guideline is focused on box containers, bulk tank containers, bulk trailers and tautliners which are commonly used to transport bulk and packed chemical goods. The equipment types or vehicles used to move the individual tank containers or trailers like e.g. a truck, tractor or chassis are out of scope.

In addition, to such equipment, different digital IoT sensors or devices (e.g. temperature controllers) can be mounted, however, these sensor devices are not in scope of this ECTA guideline, because such

devices might be removable from the equipment and are used to monitor and/or track the status of the equipment via operational telematics data.

Find below the definitions of each equipment type in scope.

2.1 Box container

A **box container** is the most standard container type and can be used for temporary storage or transporting goods via road, ship, or train. The container meets the ISO standards and has a length from 20ft up to 45ft.

Several adaptions can be made to a box container, so that several types of goods can be transported. For example, a box container can consist of a liner bag, so that dry bulk goods can be transported. This is also a called *liner bag box container* or a *bag-in-box container*. Cleaning of such a box container is done by changing the liner bag with a new one. Besides this, a box container can also be taller, so that extra capacity can be offered. This is called a *high cube box container*.

A box container is uniquely identifiable by an international standardized code, which is a combination of the owner code, the letter 'U' for all freight containers, six numbers, and a check digit which validates the combination.

Figure 1 Box container (High Cube)

2.2 Tank container

A **tank container** is defined as a container that can be used to transport bulk goods, e.g. liquid and dry chemicals. In this case, the container is the packaging of the product.

The tank container is inside a frame, so that the container is protected and can be used in intermodal transport, a combination of transport via road, water, and rail. Furthermore, the frame meets the ISO standards and has a length from 20ft to 40ft. Because there are many different types of goods, there are also different types of bulk tank containers. For example a reefer tank which can cool the product or a swap body tank where the tank is longer than the frame (23ft or 25ft).

A bulk tank container is uniquely identifiable by an international standardized code, which is a combination of the owner code, the letter 'U' for all freight containers, six numbers, and a check digit which validates the combination.

Figure 2 Liquid bulk tank container

2.3 Tank trailer

A **tank trailer** (also called **tanker truck, bulk trailer** or **tanker) ,** is defined as a vehicle designed to carry chemical liquids or dry bulk products in the form of powder or pellets. Many tank trailer variants exist due to the wide range of products in the chemical Industry. The tank is firmly connected to the chassis. A tank trailer may be insulated, temperature controlled, pressurized and designed as single compartment or multi compartment and can be equipped with several assets, e.g, pumps, couplings, or other connecting pieces for loading or unloading. The trailer is also equipped with hoses to be connected to the loading/unloading tank.

A tank trailer is uniquely identifiable by its licence plate nr + licence plate country code and/or an optional internal equipment code. A tank trailer is mostly accompanied by a truck driver and only used for road transport. A bulk tank trailer is typically equipped with different pumps and auxiliaries to handle products in liquid, powder or pellet form.

Figure 3 Liquid bulk tank trailer

2.4 Tautliner (Curtain Side Trailer)

Tautliner or **curtain side trailer** are used as generic names for curtain sided trailers and are typically used for palletized and packed dangerous and non-dangerous goods. The curtains are permanently fixed to a runner at the top and detachable rails/poles at front and rear, allowing the curtains to be drawn open and forklifts can be used all along the sides for easy and efficient loading and unloading.

A tautliner is uniquely identifiable by its licence plate nr + licence plate country code and/or an optional internal carrier equipment code. A tautliner is mostly accompanied equipment by a truck driver however it can also be used in combined transport combinations.

In the case of intermodal use, the tautliner features Crane Protection Plates on the outside of the curtain to be lifted during intermodal use. An additional feature each intermodal unit has a standardized ILU Code in order to be identified in communication with the intermodal stakeholders.

Figure 4 Tautliner

3. Who needs equipment master data and for what purpose?

3.1 Actors involved

In this chapter, the different logistics actors are described that ask for master data. These actors are involved in the regular exchange of equipment master data, be it via paper documents or via exchanging equipment information digitally. Each of these actors need equipment information to be able to execute their activities within an overall “end to end” chemicals logistics process. Considering this “end to end” process, the following list of actors are identified.

- Transport subcontractors
- Cleaning stations
- Depots
- Loading places – loader of the goods

- Terminals (sea, rail, inland water ways, hubs,..)
- Unloading places – receiver of the goods and end client
- Transport contracting parties and 4PL's
- Authorities (police, ADR control, fire brigade…)
- Insurance companies

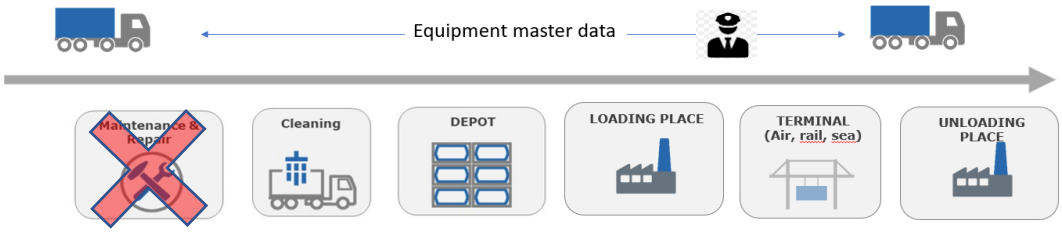

Figure 5 Overview of an overall "end to end" chemicals logistics process

Note: Maintenance and equipment repair shops require a full detailed equipment specifications sheet which goes way beyond the purpose of re-occurrent equipment master data sharing. Therefore, this actor has not been taken in scope to keep the oversight of equipment master data fields being shared. Even more, to ensure there is respect for data ownership and data governance within an "end to end" digital supply chain, it is important to understand which equipment data subsets are shared with which actor(s) so the data value capture is done by the data owner.

3.2 What drives the purpose to share equipment master data?

Driven by logistics collaboration efficiencies, new regulations and more complex combined transport flows, the need for a "continuous" digital exchange of timely and accurate equipment master data is further increasing. Therefore, a digital standard data set of equipment master information and definitions, is required per equipment type. Such standard equipment master data set brings several benefits such as :

- avoiding truck drivers needing to re-type equipment data on a daily basis
- avoiding equipment data errors and misunderstandings between the actors
- supporting the design of common IT systems and common system interfaces
- reducing the overall operating costs
- speeding up the exchange of information
- pro-actively processing gate in/gate out equipment checks

Despite the overall benefits of sharing equipment master data fields, in the new digital world it is as important for every transport company to remain in control of both their own equipment assets and related equipment master information. In other words, it is key that a transport company understands

which equipment data is shared when, with who and for what purpose and stays in control of the equipment data being shared. The latter is also called "Use Case driven data sharing" whereby each specific Use Case describes the data fields being shared with specific actors and for a specific purpose.

3.3 When are equipment master data exchanged and how frequent

Considering the "end to end" chemical logistics process (Figure 6), equipment master data is very often exchanged at every actor handover point. For example at the following points:

- Before or at gate In or Out entries
- Before or at loading and unloading location
- During transit between drivers
- Before or at a cleaning or heating location

A summary overview is provided by the table below which is applicable to all equipment types.

Table 1 Summary overview related to the usage and purpose of equipment master data

Actors involved?	**For what Purpose?**	**When required?**	**Frequency**
Client/Loader/Receiver of the goods	(Un)loading Operations support -Payload calculation	Before (un)loading	Every transport order
Depot-Terminal-Transport Subcontractor	Subcontracting- Storage - Heating	Before depot or terminal entry	On order request
Train/Ship operator	Transport Operations	Before arriving at terminal/by booking	Every intermodal transport order
Cleaning Station	Cleaning Operations	Before cleaning/by booking	Every transport order with cleaning
Customer or 4PL (transport contracting party)	Identification	Before (un)loading	Every transport order
Authorities	Equipment inspections	During control - during transit	On request
Insurance company	Identification + requested data	After an accident/incident	On request

4. Equipment master data framework

4.1 Explaining the equipment master data template structure

To exchange equipment master data in a standard, accurate and consistent way, it is crucial that common equipment data field definitions are defined per equipment type. A descriptive data field definition and common understanding is not enough because digital connotations also have to be added to allow systems to talk to each other without human interference. Without any form of standardization, the IT system connectivity becomes enormously complex and adds costs that can be avoided.

The structure of the equipment master data framework is described in below table.

Table 2 The structure of the equipment master data template

Column(s)	Column title	Explanation
A-B	Equipment (Sub) Category	Describes the general equipment attributes.
C	Master data field	Describes the master data field including the unit of measure.
D	Field type	Indicates the "content type" of the data field e.g. drop down field, number, integer, text.
E	Specification	Describes the length of the field or the maximum number of digits.
F	Definition	Further information of the data field with unit of measure.
G-L	Use Case examples	Describing specific Use cases where equipment master data is being shared.
N-AA	Possible Values	Used in case of a dropdown list where only specific values are allowed.

4.2 The equipment master data template and file

The equipment master data template is maintained as a separate excel file separately from this ECTA guideline and this is to ensure template revisions can be made more easily when required. Each tab in the excel framework represents an equipment type and describes the typical applicable equipment master data fields for a specific equipment type and per Use Case. The Use Cases addressed in the equipment master data template are:

- Use Case 1: Equipment master data fields in support of an electronic eECD and shared with the cleaning station & loading place.
- Use Case 2: Equipment master data fields in support of the Check-in at the loading place
- Use Case 3: Equipment master data fields in support of intermodal transport booking

For each Use Case, the template indicates if an equipment master data field is applicable (="x") or is not applicable (="N/A"). Furthermore, the template indicates if this specific data field is Mandatory ("M") or Optional "O" for the actor to perform its service action within this Use Case.

Segmenting the equipment master data framework per Use Case allows companies to start sharing data while keeping the trust & interoperability. On the top of this framework, extra data governance rules need to be agreed between the actors to ensure data are not being re-used or monetized for other purposes.

As explained in the intro, exchanging equipment master data is still in its infancy and updates of this template might be required as we move forward and learn from new Use cases.

The latest version of the equipment master data template can be found here. In case, you have comments feel free to contact ECTA at info@ecta.com.

5. Equipment Master data implementation guideline

5.1 How to share equipment reference data across actors?

Currently, equipment master data is usually stored and maintained in a transport management system or equipment database repository. The required equipment data is subsequently shared manually or electronically with all actors during the "end to end" transport execution process. The different equipment master data sharing options are described in Figure 7 and range from a basic "Manual" data exchange (=option 1) to a "highly automated & system integrated" exchange" (=option 5).

In a digital future, it can be assumed that transport management systems or platforms will allow sharing equipment information with those actors who need them in a much smarter way. To do that, a standardized "equipment master data digital twin" is created in the cloud that allows unlocking of specific equipment master data via API calls in function of the requirements and needs of each actor (Option 4). This way, the carrier remains in full control of its own equipment data by establishing technical mechanisms to steer data flow in the way that the data owner decides which actors can see which type of data within the platform. In a further next step (Option 5), it can be imagined that the logistics process starts to control itself by sending proactive auto-notification messages to the equipment operator for instance to increase payloads, avoid problems or rejects at (un)loading sites or increase compliancy across the "end to end" logistics chain.

Options 4 and 5 are cloud-based API solutions and are most advanced in terms of data sharing technology. They do fit a more broad, digital cross-company collaboration strategy where different actors are able to exchange data bi-laterally or within an ecosystem or internet enabled data space. The real value is created when opensource API connections are made allowing exchange of data beyond the boundaries of one single company using the internet. Such digital collaboration solutions can only become efficient and effective when all actors use equally harmonized data field definitions

along with an “end to end” interoperable business process. Other challenges related to data sharing are addressed below (point 5.3) and in the equipment master data Use case example.

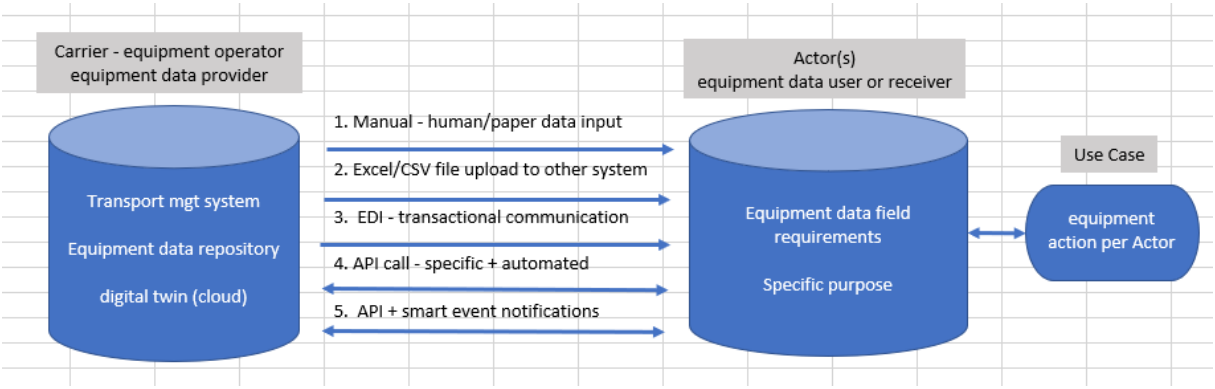

Figure 6 Overview of options for sharing equipment master data

5.2 How to keep equipment master data up to date?

It’s the responsibility of the equipment operator to maintain his own equipment master data fields so that the equipment is “fit for use” and the physical equipment status remains in sync with the digital status.

The best way to keep the equipment master up to date is to ensure there is a central equipment data repository from where the required equipment data can be shared with all actors. This data repository can reside in a TMS system and/or integrated cloud data repository. To keep the data up-to-date an organizational equipment master data tool is recommended.

5.3 What are challenges of sharing equipment master data digitally?

Exchanging equipment master data on paper or via EDI is not new. However, driven by future requirements and ecosystem integrations along the logistics chain, there is a need to share equipment master data more often with more actors. This creates some new challenges:

- Building trust with data sharing:
  - Ensure the ownership, control and maintenance of equipment master data remains under supervision of the equipment operators or asset owners.
  - Consider data sharing and APIs as drivers of growth and innovation.
  - Look beyond the boundaries of an individual company. Data sharing in an ecosystem modus goes beyond the typical bi-lateral EDI point to point connectivity.

- Ensure carriers remain owners of their equipment assets and reap the benefits of sharing equipment master data.
- Stay in control of the equipment data related service offerings.

- Creating Interoperability
  - A growing need for more equipment master data usage and standardization.
  - Ability to exchange equipment master data digitally & automatically at the right time for the right purpose.
  - Get your actors synchronized on a harmonized business process to allow further automations.

- Reducing IT complexity and costs
  - Manage the IT fragmentation and complexity by avoiding the need for equipment master data to be shared per actor with different IT applications and connectivity bridges.
  - Avoid continuous adaptation of IT systems and infrastructure + investments.
  - Organize maintenance and secured storage of equipment master data more centrally.
  - Avoid customized portals to maintain equipment master data.

6. Equipment Master data Use case example

ECLIC Use Case example : eECD and equipment master data fields

ECLIC stands for the European Chemical Logistics Information Council and aims to encourage digital collaboration amongst all actors along the chemical logistics chain to improve safety, sustainability, quality and costs. ECLIC is a non-profit association that was founded in 2018 by ECTA, essenscia, and EFTCO. Today, the ECLIC community represents more than 50 member companies (shippers, LSP's and cleaning stations) and is exchanging tens of thousands of electronic documents annually while making use of a standard set of equipment master data.

From the start, ECLIC selected a secure and neutrally governed IT data platform and launched a first digital use case whereby the EFTCO Cleaning Document or paper ECD got digitalized and dematerialized. The data fields required to replace this document with a fully digital data stream got mapped across all actors involved in the cleaning and acceptance process (shippers, loading stations, cleaning stations and transport companies). A new end-to-end digital, API, and cloud-based process was developed and launched in 2020.

To drive this cross-company interoperable eECD process, it was key to first align all data field definitions including the descriptions of the required equipment master data fields that are typically required within a tank cleaning process up to the acceptance of the eECD at the loading place. During this "end to end" process design, an equipment master data template got established that formed the basis of this ECTA guideline.

Obviously, next to the importance of common understanding and interoperability of data fields, it became clear that exchanging any logistics data (like transport orders, products, safety data sheet details, previous load, cleaning data,…) is Intellectual Property or commercially sensitive. Data which seems to be less or not sensitive for a cleaning station or loading place might be very sensitive for a transport company and vice versa. The ECLIC data mapping process revealed that you can only build trust amongst the different actors when there are clear predefined data governance and data visibility rules established between the actors and IT providers. To cope with this request, ECLIC installed a neutral data governance model and makes a clear IT infrastructure distinction between its data platform (= where the equipment master data are stored and secured) and the IT application(s) (= any application builder that is using the open eECD API calls and related data once consent is given by the data owner).

More specifically for the eECD Use Case, it is important that by process and IT infrastructure platform design, the transport company and owner of the equipment master data remains at all times in control of his own data and knows with who, when, how frequent and for what purpose or Use Case his/her equipment data is shared. Simple re-use of equipment master data without consent of the data provider is not allowed.

As an example, the list of mandatory equipment master data for a tank container required within the digital eECD cleaning Use Case can be derived from the ECTA equipment master data excel framework. The same can be done for a bulk trailer.

Meanwhile, ECLIC has added in 2021 more equipment master data fields in preparation for other Use Cases. All these fields are currently “optional” however some equipment data fields might become mandatory in function of future Use Cases and provided the ECLIC data governance board and its members agree to share this extra equipment data amongst the actors within the ECLIC community. This approach allows all actors to gradually and steadily learn and explore how digital data sharing and data-driven collaborations can create extra value along the chemical logistics chain.

7. Contact lists and WG participants

Joep Aerts
Business Unit Director Liquid Logistics
Den Hartogh Logistics B.V.
T +31 88 162 00 00
jaerts@denhartogh.com

Michelle Slobbe
IT Manager Customer & Supplier Solutions
Den Hartogh Logistics B.V.
T +31 88 162 01 51
M +31 6 10 55 70 26
mslobbe@denhartogh.com

Thies Grage
Head of Digitalisation, Innovation & IT
HOYER Group
T +49 40 21044302
M +49 151 11442089
thies.grage@hoyer-groupl.com

Cedric Walti
Head of Digitalization
T +41 62 555 34 11
M +41 79 932 29 56
cedric.walti@bertschi.com

Peter Viebig
Business Development Manager
T. +49 (2843) 990054
M. +49 176 10909901
Peter.viebig@vervaeke.com

Michel Quéré
Directeur des Systèmes d'Information
T +33 (0) 475 00 67 81
michel.quere@gcatrans.com

Jonathan Richards
Business Applications Manager
T: +44 151 459 8888
Jonathan.Richards@suttonsgroup.com

Antoine Baron
Directeur des Systèmes d'Information
M. + 33 (0) 763883533
antoine.baron@groupesamat.com

Matthias Leibetseder
Innovation Manager
M +43 664 88 66 4334
Leibetseder@walter-group.com

Marrit Hopmans
Manager Data & Applications
Van den Bosch
T +31 413 217217
marrit-hopmans@vandenbosch.com

Kris Messelier
Head of sales bulk chemicals
T +32 69 34 37 63
kris.messelier@fockedey.be

Peter Devos
ECTA Managing Director
M +32 476 43 00 79
Peter.devos@ecta.com

8. Appendix 1: Revision of ADR inspection dates on equipment

A Tank trailer and tank container which are transporting dangerous goods over land and over sea, are typically subjected to ADR/IMDG inspections and this to comply with these transport regulations. In the equipment master data guideline version 1, two ADR periodic inspection date fields have been defined for both a tank container and tank trailer being the **ADR last inspection date** and the **Last inspection date of the ADR pressure test**.

While both fields are mandatory as per ADR legal guidelines and are, in most cases, also mentioned on the embossed metal plate attached to the equipment (see picture), there remains ambiguity when the next physical ADR inspection is due to comply with these ADR inspection rules. In certain cases, the last ADR inspection dates are mentioned of the equipment inspection report so that a physical check on the identification plates might be also misleading.

Besides, the next inspection date of a tank container or tank trailer is not only different per equipment type and its age of use, it is sometimes confused during pre-loading inspections with the annual ADR inspection date of the chassis or tractor. To take away any confusion, the revision of this guideline add an extra field called **"The next inspection date for ADR or ADR pressure test"**. This field is the next planned inspection date, be it for ADR or IMDG inspection or for ADR pressure test. This next inspection date is set by the equipment operator and has a YYYY.MM.DD date format. The equipment master data template is updated accordingly.