TATA STEEL

TATA

Tata Steel Technical Standard

S1 76 81 01 The marking of medium carriers

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Information and changes

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Contents

1. GENERAL

1.1. Purpose

This Standard describes the marking of both underground and aboveground medium carriers. We understand these to be medium carriers on the industrial site Tata Steel IJmuiden (TSIJ):

- Carriers for solid, liquid or gaseous substances
- Pipes and instrumentation
- Reservoirs:
    - Pressure vessel;
    - Storage tank;
    - Process tank;
    - Silo;
    - Bunker;
    - Concrete basin.

The markings in this standard are mandatory and aim to ensure that the people who work with medium carriers receive the required information about the content unambiguously.

This standard does not apply to mobile pressure containers (gas cylinders).

1.2. Responsibility owner

The owner of a media carrier must comply with the regulations contained in this standard until the "end of life" (decommissioning and remediation).

1.3. Legislation

Piping systems must be marked according to the 92/58/EEC directive of the European Parliament.

Medium carriers must be marked according to the European Community directive 1272/2008.

Regulation (EC) No. 1272/2008) on the classification, labelling and packaging -(CLP) is based on the Globally Harmonized System - (GHS) of the United Nations.

The ADR is the pan-European agreement for international transport of dangerous goods on the road and storage of dangerous substances from the PGS-15 guideline. ADR means 'Accord européen relatif au transport international de marchandises Dangereuses par Route'. The implementation of this guideline is better known as the Kemler board consisting of two numbers above each other. The top number is the hazard identification number and the bottom number is the substance number.

For determining the colours for marking media carriers Tata Steel IJmuiden (TSIJ) uses the NEN 3050. TSIJ uses two deviations, for the medium Oxygen: dark blue RAL5010 and for Acids: Orange RAL 2008.

1.4. Safety

For safety and visibility, medium carriers must be provided with a marking. With piping, the marking must be clearly visible depending on the diameter of the media carrier and distance to the point of access. See the table in section 3.1.3. At the same time, the flow direction and medium flows must be clearly indicated around valves and instrumentation. This marking must be applied to all connections, on both sides of valves and instrumentation, appliances, baffle plates, wall passages and at all points where it is important to be able to determine the nature of the medium. Several standard signs have been specified for reservoirs, see paragraph 3.2.3.

In case of doubt about the application, contact the department SPME-PTC-MCE-HPM.

2. MARKING DESIGN

2.1. Designation

The medium designation must correspond with the medium designations given in the Chemical Substances System (CSS) of TSIJ.

2.2. Classification

All media are divided into groups according to their general properties. Each group is indicated by a colour, based on NEN 3050. TSIJ uses two deviations, for the medium oxygen: dark blue RAL5010 and for acids: Orange RAL 2008.

3.2

The colours are listed in the Technical Standard S1719301 “Application of colours and safety colours”.

If differentiation of media within one group is necessary/desired, this must be done in a different manner than by means of colour coding. The distinction will be specified after consultation with the department SPME-PTC-MCE-HPM.

2.3. Hazard Statement

To indicate the nature of the hazard, when a medium is released, the hazard statements are used in accordance with Classification Labelling Packing (CLP). The GHS (Globally Harmonized System) codes are displayed below the CLP pictogram.

CLP Pictogram	Hazard class (CLP)
Explosive  GHS01	Unstable explosive substances Explosive - subclasses 1.1, 1.2, 1.3 and 1.4 Self-decomposing substances or mixtures - types A and B Organic peroxides - types A and B
Flammables  GHS02	Flammable gasses - category 1 Flammable aerosols - categories 1 and 2 Flammable fluids - categories 1, 2 and 3 Flammable solid substances - categories 1 and 2 Self-decomposing substances or mixtures - types B, C, D, E and F Pyrophoric fluids - category 1

	Pyrophoric solid substances - category 1 Substances or mixtures susceptible to Self-heating categories 1 and 2 Substances or mixtures that develop flammable gases in contact with water - categories 1, 2 and 3 Organic peroxides - types B, C, D, E and F
Fire propagating (oxidising)  GHS03	Oxidising liquids - categories 1, 2 and 3 Oxidising solid substances - categories 1, 2 and 3 Oxidising gases - category 1
Compressed gas  GHS04	Gases under pressure (compressed, liquid, strongly cooled or dissolved)
Corrosive  GHS05	Corrosive substances for metals - category 1 Skin corrosion/irritation - category 1A, 1B and 1C Serious eye damage/eye irritation - category 1)
Toxic  GHS06	Acute toxicity - categories 1, 2 and 3

Harmful  GHS07	Acute toxicity - category 4 Skin corrosion/irritation - category 2 Serious eye damage/eye irritation - category 2 Inhalation or skin allergens - skin allergens category 1 Target organ toxicity on single exposure - category 3 Irritation of the respiratory tract narcotic effects Not used: - With the "skull and crossbones" pictogram - For skin or eye irritation if: 1) the "corrosion" pictogram also appears 2) the "health hazard" pictogram is used to indicate inhalation allergens Inhalation or skin allergens - inhalation allergens category 1
Harmful to health long-term  GHS08	Inhalation or skin allergens - inhalation allergens category 1 Reproductive cells mutagenicity - categories 1A, 1B and 2 Carcinogenicity - categories 1A, 1B and 2 Reproductive toxicity - categories 1A, 1B and 2 Target organ toxicity - single exposure - categories 1 and 2 Target organ toxicity - repeated exposure - categories 1 and 2 Aspiration hazard - category 1
Environmentally hazardous  GHS09	Acute toxicity (aquatic environment) - category 1 Chronic toxicity (aquatic environment) - categories 1 and 2

3. REQUIREMENTS REGARDING MARKING

Markings for media are divided into three paragraphs, piping systems, reservoirs and instrumentation. Text and information on all markings will be in Dutch.

3.1. Piping Systems

3.1.1. Imprint

Most media are listed in a table, see Attachment C "Piping markings". In this table the conditions of the imprint are determined per medium and with which article number it can be ordered. For missing media markings, please contact PME-PTC-MCE-HPM.

On the marking to be applied is minimally listed:

- The designation of the medium that is transported through the pipeline, see paragraph 2.1;
- The medium colour associated with the medium;
- The possible CLP hazard pictograms of the medium that is transported through the pipeline, according to the suppliers "Material Safety Data Sheet" (MSDS) (see the Chemical Substances System TSIJ);
- The flow direction of the medium in the pipeline;

If the conditions in the medium carrier deviate from the operating temperature outside the limits of -5°C to 60°C, the operating temperature must be stated.

In addition to the pipe marking, the tag codes of piping, valves and instrumentation must also be applied on or near the items mentioned. See section 3.3.

3.1.2. Material

The self-adhesive pipe marking on the roll should be UV-resistant. This is because of the better visibility and longer life than labels. The self-adhesive layer (glue) on this pipe marking must not be chloride or fluoride-containing. Any plasticizers in this self-adhesive layer must not affect standard polyurethane and epoxy coatings.

3.1.3. Dimension

Depending on the outer diameter of the piping, incl. Insulation, the following minimum dimensions for the roll are used:

Diameter < 75 mm		Diameter 75-200 mm		Diameter 200-450 mm	
Width ROLL ± 50mm	Length ROLL X	Width ROLL ± 100mm	Length ROLL X	Width ROLL ± 150mm	Length ROLL X

The letter height must be adjusted to the maximum printable dimension on the sticker. For the marking of pipes with a diameter >=DN500, the font size depends on the situation. In case of doubt, always contact the department SPME-PTC-MCE-HPM.

3.1.4. Method and placing

3.1.4.1 General

- The surface on which the marking is applied must be dry, clean and free of grease and the preservation must be free from defects.
- The applied marking must continue to comply with the design during the use phase.
- The marking is applied to the visible sides of the pipeline in the form of self-adhesive material.
- The markings shall be applied at the appropriate height and location in relation to the field of vision, taking into account any obstacles, either at the entrance to the risk area or in the immediate vicinity of a particular risk object to be signalled, and in a well-lit and easily accessible and visible location.
- A pipeline marking must be replaced for an "BUITEN BEDRIJF" (OUT OF ORDER) marking if the piping system is permanently and demonstrably no longer functional and no longer contains media and/or residues.

3.1.4.2 Above ground pipelines

- The number of pipeline stickers to be applied to a pipeline depends on the length and situation of these pipelines.
- For the maximum distance between pipeline stickers see the following table:

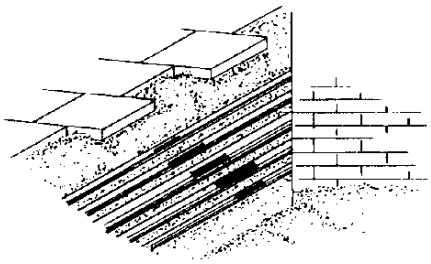
Diameter	Maximum distance
<DN200	10 meters
>=DN200 & <DN500	15 meters
>=DN500	Special (**)

- In any case, it is necessary to apply pipeline stickers at operating points, valves and instrumentation, junctions and branch lines.
- In case of passages through walls of buildings, a pipeline sticker must be placed on both sides within 1 meter of the wall.
- The pipeline stickers must be applied in such manner that they are visible from all directions from where the pipeline can be approached.

** : For the marking of pipelines with a diameter>=DN500, the spacing distance depends on the situation. In case of doubt, always contact the department SPME-PTC-MCE-HPM.

3.1.4.3 Underground pipelines

- At pit/manhole locations, the underground pipelines must be fitted with a pipeline sticker.
- In case of underground pipelines, a maximum distance of 6 meters must be maintained for the distance between the pipeline stickers.
- If there are multiple pipelines next to each other, then the stickers must be placed in one line, see figure.



3.1.5. Examples

3.2. Reservoirs

Reservoirs must be, according to legislation provided with identification, namely: product name, registration number, content, medium colour and, if applicable, CLP hazard pictograms and the Kemler sign.

The minimum requirements listed below are mandatory. The business unit has permission to provide additional information on the reservoir when they consider this necessary. For this purpose, the height of the design can be expanded with a strip at the bottom and items such as the phone number of the shift manager, the location, the response location emergency services number and the TATA emergency number can be added. The marking applied, must continue to comply with the design during the use phase.

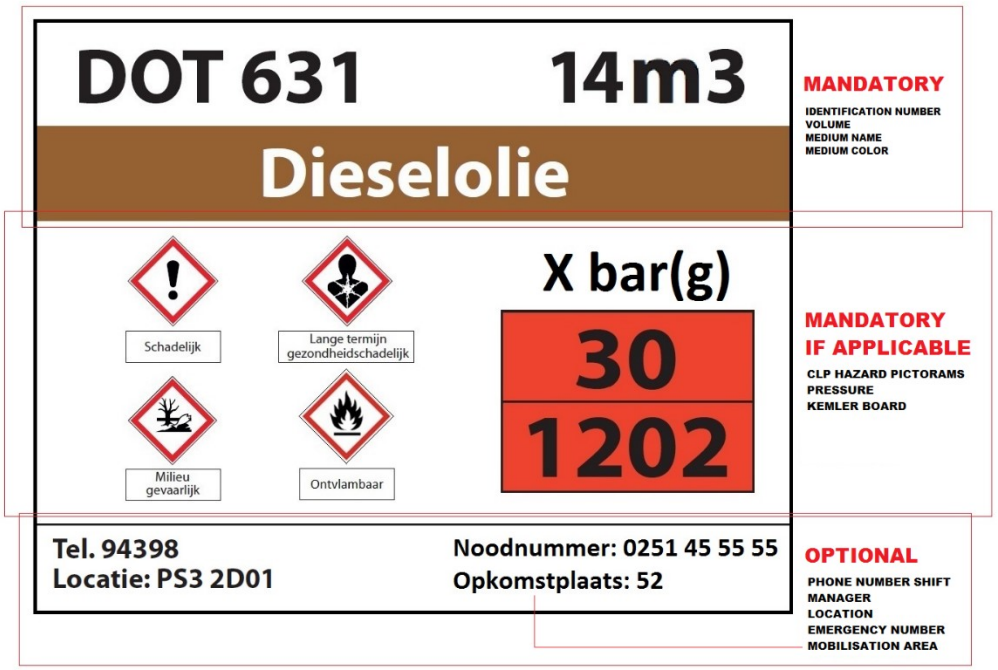
3.2.1. Imprint

Mandatory:
- Identification number (unique ID) in accordance with the maintenance management system;
- The volume of the reservoir;
- The name of the medium according to the chemical substances chart (see Chemical Substances Information System);
- The medium colour associated with the medium;

Mandatory if applicable:
- The relevant CLP hazard pictograms of the medium, according to the suppliers MSDS (see Chemical Substances System of TSIJ);
- The Kemler sign of the medium, if applicable;
- - If a reservoir is a pressure vessel with a safety pressure >0.5 bar, this pressure must be stated on the sign;

Optional:
- Telephone number shift manager;
- Location;
- TATA emergency number;
- The mobilisation area number.

Example of an imprint:



3.2.2. Material

- Depending on the situation, you can choose for:
  - Skybond or aluminium DOR[1] board print on vinyl and laminated which serves as UV filter, temperature resistant up to approx. 50 degrees Celsius; or
  - Skybond or aluminium DOR board print on KL1 foil of 3M and laminated which serves as UV filter, temperature resistant to approx. 50 degrees Celsius; or
  - Aluminium DOR or flat board print sublimated for high scratch resistance for indoor and outdoor applications, temperature resistant up to approx. 180 degrees Celsius.
  - Self-adhesive vinyl or KL1 marking that can be placed directly on the reservoir. The marking possesses, such colour and light technical characteristics that they are clearly visible and easy to understand.
- The self-adhesive marking must be UV resistant. This is because of the better visibility and longer life than labels.
- The self-adhesive layer (glue) on this marking must not be chloride or fluoride-containing. Any plasticizers in this self-adhesive layer must not affect standard polyurethane and epoxy coatings.
- The marking has such color and light technical characteristics that they are clearly visible and easy to understand.
- The sign can be supplied, mounted with an aluminium clamp on a reinforced thermally galvanized steel belled post with ground anchor.

3.2.3. Dimensions

Standard design 1 (1200 x 800 mm): Figure 1, 3 & 4

- This applies to a stored medium where all marking requirements must be displayed according to paragraph 3.2.1. See the design in Figure 1: Standard design 1. Mounted on two belled posts;

Standard design 2 (800 x 600 mm): Figure 2

- If the content of the tank is less than 10m3, standard design 2 with the dimension: 800x600mm can be chosen. Mounted on one belled post.

Standard design 3 (800 x 600 mm): Figure 6

- Applies if the content of the tank is less than 10m3;
- Applies to a tank which is under atmospheric conditions;
- Applies to a stored medium that does not fall under the scope of the ADR regulation and therefore has no Kemler designation;
- Applies to a medium that does not have a CLP notation;

The standard designs can be extended with a strip below the sign for information that is deemed necessary by the management. This can be up to two lines of text with a choice of the following information: the phone number of the shift manager, the location, the response location emergency services number and/or the TATA emergency number. See Figure 5.

[1] DOR: Double folded edges

3.2.4. Method and location

- The signs shall be installed at an appropriate height and at an appropriate location in relation to the field of vision, taking into account any obstacles, either at the entrance to the risk area or in the immediate vicinity of a particular risk object to be signalled, and in a well-lit and easily accessible and visible location;
- If a sticker is chosen: The surface on which the marking is applied must be dry, clean and free of grease and the preservation must be free from defects.
- The marking is applied to the visible sides;
- A marking is only removed once the system itself has been completely removed.

3.2.5. Examples

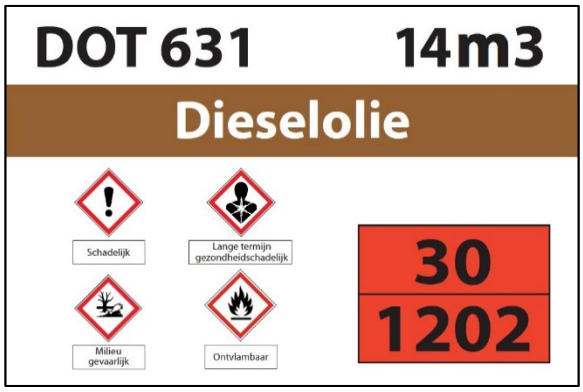


Figure 1: Standard design 1 1200x800mm

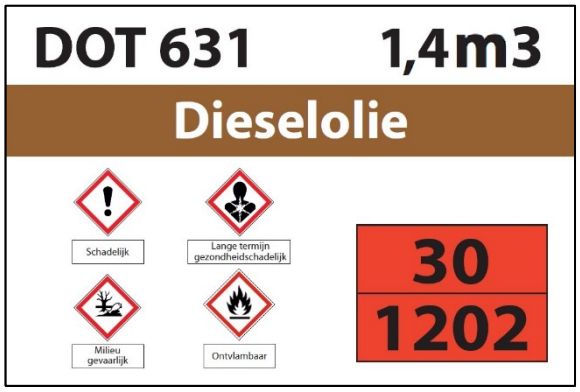


Figure 2: Standard design 2 800x600mm

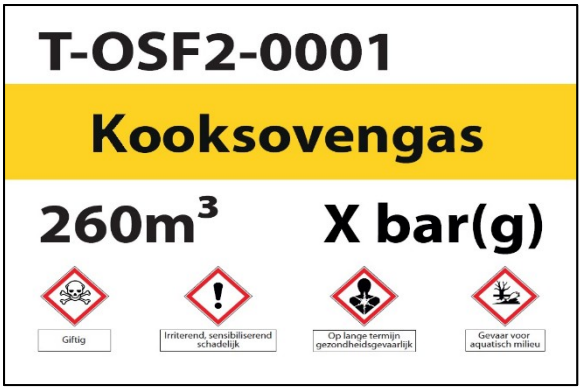


Figure 3: Standard design 1

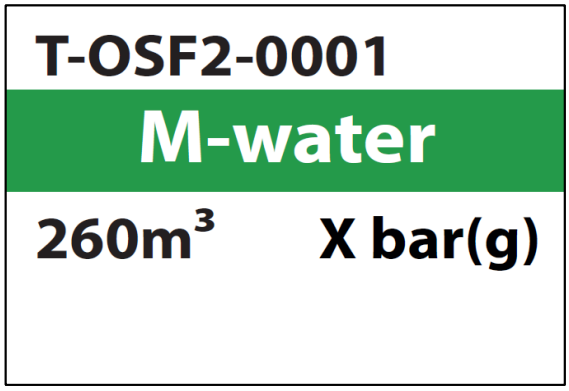


Figure 4: Standard design 1

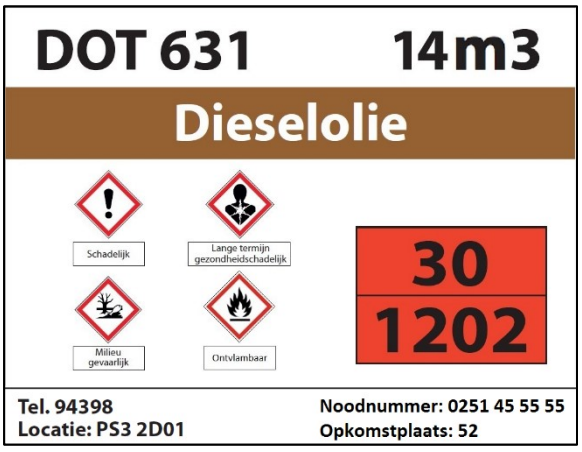


Figure 5: Standard design 1 + 100mm for the optional text

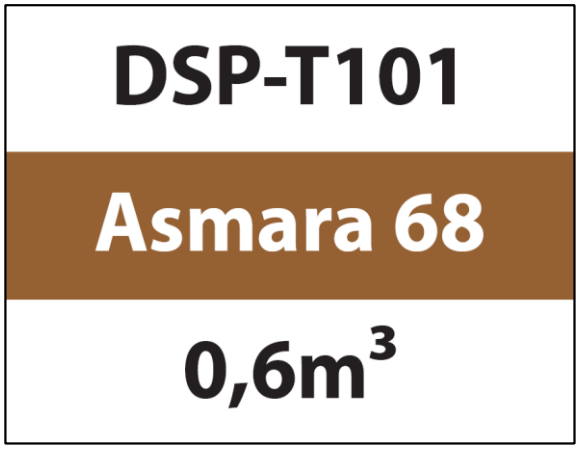


Figure 6: Standard design 3 800x600mm

3.3. Tag numbering valves, instrumentation & piping

3.2

Each valve, instrument or pipeline must have a locally mounted tag plate with tag number. See standard drawing: G35395.

Calamity valves are marked for visibility with an additional red tag plate with the text "Calamiteitenafsluiter".

3.3.1. Imprint

- The tag numbers, which must be placed with the valve, instruments and piping come from the (P&ID) diagram on which the relevant items are displayed. In consultation with the business unit, it must be determined which part of the tag numbers is to be displayed on the tag plate;

3.2

- Tag plates for “calamiteitenafsluiter” are red.
- Medium colour:
  - For Stell systems: first and last plate in medium colour, rest in white/black text.
  - Resopal plates: completely in medium colour, text in contrast colour (white or black)
- Deviating from the above only after consultation with the business unit.

3.3.2. Material

- Tag plates must be made of Resopal or similar material;
- Tag plates are executed in white with black text;
- Tag plates for “calamiteitenafsluiter” are red with white text.

3.3.3. Dimensions

- The size is 92 x 42 mm (length x height);
- The “calamiteitenafsluiter” tag plate size is 200 x 100 x 1,6 mm (length x height x thick);
- Tag plates are in Dutch;
- The font is Arial with a height of 17 mm.

3.3.4. Method and location

- The tag plate is mounted by means of a stainless-steel mounting bracket provided with an insulation strip;
- Tag plates are fixed by means of screws or pop rivets. Glue is not permitted;
- The applied marking must continue to comply with the design during the use phase.
- The marking is applied on the visible side;
- The markings shall be applied at the appropriate height and location in relation to the field of vision, taking into account any obstacles, either at the entrance to the risk area or in the immediate vicinity of a particular risk object to be signalled, and in a well-lit and easily accessible and visible location;
- In the case of underground piping, no tag plates with pipeline numbers need to be placed;
- In case of 'cold' on the valve/instrument/ ... mounted brackets/tag plates, the valve/instrument must be provided with a corrosion resistant layer under the brackets/tag plates;
- With closed cabinets, a sticker may be used. A precondition for this is that this sticker is also legible in closed position. See 3.3.5;
- A marking must be replaced for an "OUT OF OPERATION" marking if the piping system is permanently and demonstrably no longer functional and no longer contains media and/or residues;

– A marking must be replaced for an "INSTALLATION UNDER NITROGEN" marking if the piping system can permanently and demonstrably no longer be functional and has therefore been placed under a nitrogen atmosphere.

3.3.5. Examples

4. REFERENCES

This Tata Steel Standard refers to:

Legislation / EU-regulations:

- Regulation EC No 1272/2008
- Directive 92/58/EEC
- Royal Decree 530
- ADR

Working conditions provision:

- Arbo (working conditions) decree article 8.4

Norm:

- NEN 3050 – 1972 + c1/2002

TSIJ Standard:

- S 1471201 Media definitions
- S 3105601 Corrosion control through preservation
- S 1917301 Application of colours

QHSE:

- 3.30 Colour standard

Chemical Substances System:

http://intranet.eu.tatasteel.com/irj/portal?NavigationTarget=navurl://e09162cbb1130a854c26f0e60a6163d0

5. DECLERATION

Version 1.0 up to 3.0

No English versions are available.

Version 3.1:

This document is the English version of the Dutch: Het markeren van mediumdragers rev.3.1.

Version 3.2:

Reference to standard drawing for tag numbers.
Reference to technical standard S1917301.
Tag plates and medium colour.