Grupa LOTOS S.A.	**TECHNICAL SPECIFICATION**	Spec. No
	Requirements for low-pressure and atmospheric storage tanks subject to UDT/ZDT approval	8300

Contents

1 Subject of specification 2
2 Scope of validity 2
2.1 Deviations 2
2.2 Order of Precedence 2
2.3 Exclusions 2
3 Design and Fabrication 3
4 Inspection of UDT 3
4.1 Technical documentation 3
5 Inspection of ZDT 5
5.1 Tanks subject to ZDT inspection 5
5.2 Technical requirements 6
5.3 Technical documentation 6
6 Relevant documents 6
7 Codes, standards and regulations 6
8 Record of changes 8

This document is the property of Grupa LOTOS SA.. Coping and giving it to other are forbidden without express written authority by Grupa LOTOS SA

1 Subject of specification

This specification and other documents referenced herein establish the minimum requirements for the design, fabrication, erection, inspection and tests for low-pressure and atmospheric storage tanks subject to UDT/ZDT inspection.

2 Scope of validity

This specification applies to the preparation of tender documents, inquiries and contracts for newly planned investment or modernization projects of Grupa LOTOS S.A.

It shall also be a basis for preparing both detailed specifications and inquiries for individual or package unit supplies.

2.1 Deviations

Any deviation from this specification and the relevant specifications, standards and related documents including proposals, which the bidder claims to be economically and / or technically superior solutions must be submitted in writing for review and approval by Grupa LOTOS S.A. Non-approved exceptions are not acceptable by Grupa LOTOS S.A.

The supplier must report in writing any ambiguity in this or any other specifications of Grupa LOTOS S.A. or non-compliance with the referred documents / standards and obtain a written explanation from Grupa LOTOS S.A.

2.2 Order of Precedence

In case of conflicts existing between this specification and other documents, the following order of precedence shall govern:

- The current Polish legislation
- Terms of purchase order / contract and other requirements agreed in writing Grupa LOTOS S.A.
- Data Sheets approved by Grupa LOTOS S.A.
- This specification
- Other Specifications
- Drawings and other documents
- Standards

2.3 Exclusions

This specification does not apply to tanks:

- for transportation of toxic and caustic materials as well as liquid inflammable materials

- for storage of liquid inflammable materials in volumes necessary for use, for example canisters, drums,
- packaging designed for storage and transportation
- factory packaging of pharmaceutical means and medical materials
- objects and devices containing caustic materials
- designed for radioactive materials.

3 Design and Fabrication

Design, fabrication, additional accessories, marking and operate condition shall meet requirements of the following regulations (tanks manufactured both, in Poland and abroad shall to meet these requirements) :

- Rozporządzenie Ministra Gospodarki z dnia 18 września 2001 r. w sprawie warunków technicznych dozoru technicznego, jakim powinny odpowiadać zbiorniki bezciśnieniowe i niskociśnieniowe przeznaczone do magazynowania materiałów ciekłych zapalnych - Dz.U. 2001 nr 113 poz.1211, z późniejszymi zmianami (Regulation of Minister of Economy of 18 September 2001 on technical requirements for atmospheric and low pressure tanks designated for storage liquid flammable materials, as amended, Journal of Laws 2001 No. 113 item 1211)
- Rozporządzenie Ministra Gospodarki z dnia 16 kwietnia 2002 r. w sprawie warunków technicznych dozoru technicznego, jakim powinny odpowiadać zbiorniki bezciśnieniowe i niskociśnieniowe przeznaczone do magazynowania materiałów trujących lub żrących - Dz.U. 2002 nr 63 poz. 572 (Regulation of Minister of Economy of 16 April 2002 on technical requirements for atmospheric and low pressure tanks designated for storage toxic, poisonous, and caustic materials Journal of Laws 2002 No. 63 item 572)

4 Inspection of UDT

Types of low-pressure and atmospheric storage tanks that are subject to UDT/ZDT inspection shall be according to paragraph 5 of Grupa LOTOS S.A. specification no. 8100.

Manufacturers of tanks subject to UDT inspection shall have UDT authorization for fabrication.

Storage tanks subject to UDT inspection shall respectively meet requirements of Regulations of Minister of Economy referenced under paragraph 3 of this specification.

4.1 Technical documentation

Technical documentation of tanks subject to UDT inspection shall be verified and agreed (approved) by UDT prior to fabrication commencement

All cost associated with verification and agreement of technical documentation shall be covered by Manufacturer.

The technical documentation submitted for UDT acceptance shall include as minimum:

- Tank assembly drawing,

- Calculations according to design code being applied.
  Calculations for bolted flanged connections are not required provided that such flange connections are in accordance with requirements of relevant PN-EN standards. However tank technical documentation shall include data on materials of flanges, bolting, gaskets, as well as tightening bolts torques.
- Accessories' data; in case when tank is to be equipped with auxiliary systems – diagrams and parameters of such systems,
- Erection procedure for tanks being site-erected.
- Necessary descriptions and explanations to accessories' drawings and diagrams.

Assembly drawing of tank shall contain:

- Dimensions necessary for verification of design calculations
- Accessories data and, if tank is to be furnished with auxiliary systems, diagrams of such systems and data regarding their selection.
- Name and basic properties of working medium (including vapour pressure).
- Working and design parameters.
- Grades of materials used for tank construction including respective material specifications
- Type and data regarding anti-corrosion protection of internal and external surfaces, requirements for execution of tests and inspections, as well as foreseen operating period (lifetime) of tank.
- Strength factors of welded joints and scope of non-destructive examination (NDE)
- Weld map
- Post welded heat treatment, if applicable
- Special requirements regarding fabrication, erection and testing, including leak proof test data
- Location of nameplate
- Data on allowable settlement of foundation and frequency of such settlement measurement.

Documentation delivered with tank shall contain number of copies as specified in purchase order, including 1 copy of original documents being signed by UDT, and shall contain at least:

- Technical description of tank
- Design documentation (drawings and calculations), agreed with UDT
- Report of documentation agreement by UDT
- Records of hydrostatic test, confirmed by UDT.
- Manufacturer declaration of conformity.
- Material certificates
- Reports of non-destructive examination
- Heat Treatment Certificate with heat treatment plan and temperature vs. time chart, if required
- Certificate of performed anticorrosion protection in accordance with EN ISO 12944-8
- Report of dimensional inspection and settlement measurements

- Documentation of breathing devices (selection, certificates, declaration of conformity)
- Data regarding accessories – only those supplied together with equipment
- Instruments for measuring, controlling, signalling and instrument blocks – only if delivered together with equipment
- Feeding equipment – only if delivered along with equipment
- Operating Manual of tank
- Catalogue sheets and certificates of tank fittings
- Assembly drawings in „as-built" version

Documentation that should be prepared for structure acceptance:

- Design of tank structure,
- Design of tank process equipment,
- Instruction of assembly organizing,
- Instruction of welding technology,
- Design of electric and fire safety systems
- Other projects connected with specified structure,
- Metallurgical certificates,
- Certificates and attests of quality for completed semi-finished products, issued by Quality Control services of manufacturing plant,
- Records regarding tank location positioning and setting out of its axes and axis of bottom, as well as initial point of tank shell assembling,
- Records of tank foundation acceptance,
- Records of current inspection of erection and welding works as well as partial acceptances,
- Construction register
- Welding register,
- Register of documents (correspondences) containing additional technical arrangements.

Costs of UDT participation in inspection activities shall be covered by / Manufacturer.

5 Inspection of ZDT

5.1 Tanks subject to ZDT inspection

Storage tanks of capacity exceeding 10 m^3, excluded from UDT inspection scope, as well as tanks in process train designed for temporary storage of hazardous materials, which are not storage tanks, and therefore are not subject to UDT inspection, shall be subject to ZDT inspection.

5.2 Technical requirements

Tanks subject to ZDT inspection shall meet the same technical requirements, as tanks subject to UDT inspection.

Manufacturers of tanks subject to ZDT inspection shall have UDT authorization for fabrication. Any deviations from this rule require ZDT approval in writing.

5.3 Technical documentation

Scope of required design documentation shall be the same as for tanks subject to UDT inspection (refer to paragraph. 4.1 for details).

Technical documentation shall be verified and agreed by ZDT prior to tank construction commencing.

The scope of technical documentation delivered with tank (As-built documentation) shall be the same as for tanks subject to UDT inspection.

Costs of ZDT participation in inspection activities shall be covered by / Manufacturer.

6 Relevant documents

Any "Technical Specification" issued by Grupa LOTOS S.A. listed in Contract Files.

7 Codes, standards and regulations

Codes and standards listed below form part of this specification. Each publication shall be the latest revision and addendum in effect at the Contract award, unless otherwise specified:

- API Std 650 Welded Steel Tanks for Oil Storage
- PN-EN 14015 Specification for the design and manufacture of site built, vertical, cylindrical , flat-bottomed, above ground, welded, steel tanks for the storage of liquids at ambient temperature and above
- PN-EN 1993-4-2 (Eurokod 3) Design of steel structure - Tanks
- ASME B 96.1 Welded Aluminum-Alloy Storage Tanks
- API Std 620 Design and Construction of Large, Welded, Low-pressure Storage Tanks
- API Std 2000 Venting Atmospheric and Low-pressure Storage Tanks
- API Std 973 Evaluation of the Design Criteria for Storage Tanks with Frangible Roofs
- API RP 651 Cathodic Protection of Aboveground Storage Tanks
- API RP 652 Lining of Aboveground Petroleum Storage Tank Bottoms
- API Std 850 API Standards 620, 650, and 653 Interpretations - Tank Construction and In-Service Inspection
- PN-EN 1990 (Eurokod) Basis of structural design
- PN-EN 1991-1-3 (Eurokod 1) Actions on structures. General – Snow loading
- PN-EN 1991-1-4 (Eurokod 1) Actions on structures. General – Wind actions

- PN-EN 10204 Metallic products - Types of inspection documents
- Rozporządzenie Ministra Gospodarki z dnia 18 września 2001 r. w sprawie warunków technicznych dozoru technicznego, jakim powinny odpowiadać zbiorniki bezciśnieniowe i niskociśnieniowe przeznaczone do magazynowania materiałów ciekłych zapalnych - Dz.U. 2001 nr 113 poz.1211, z późniejszymi zmianami (Journal of Laws 2001 No. 113 item 1211)
- Rozporządzenie Ministra Gospodarki z dnia 21 listopada 2005 r. w sprawie warunków technicznych, jakim powinny odpowiadać bazy i stacje paliw płynnych, rurociągi przesyłowe dalekosiężne służące do transportu ropy naftowej i produktów naftowych i ich usytuowanie - Dz.U. 2005 nr 243 poz. 2063, z późniejszymi zmianami (Journal of Laws 2005 No. 243 item 2063)
- Rozporządzenie Ministra Gospodarki z dnia 16 kwietnia 2002 r. w sprawie warunków technicznych dozoru technicznego, jakim powinny odpowiadać zbiorniki bezciśnieniowe i niskociśnieniowe przeznaczone do magazynowania materiałów trujących lub żrących - Dz.U. 2002 nr 63 poz. 572 (Journal of Laws 2002 No. 63 item 572)

8 Record of changes

No.	Date	Description	Introduced by
0		This specification entirely replaces the former LOTOS Group S.A. standard No. PR 07 830 with the same title.	W. Zaborowski
1	30-11-2013	Review, update, standardize and changes to the Standard within scope of order No. OK/990/2012	Editorial board coordinated by T.Wróbel
-	31-08-2015	Page layout corrections, no contents changes.	T. Wróbel