

Pharmaceutical equipment

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Brilliant products



Following the highest standards



We design and manufacture process equipment for pharmaceutical and biotechnological use in accordance with the highest standards, as well as quality and safety demands.

We are well-versed in various modern technologies that allow us to design and manufacture high-quality products. One of our advantages is that the entire commission process - request overview, construction engineering, production, control procedures, documentation preparation, shipping - is carried out in one location and in a controlled environment.

We ensure complete control over the production process with a wide range of in-house finishing capacities including automatic grinding, polishing, passivation, and electropolishing.



Process tanks for pharmaceutical and biotechnological use

Our pharmaceutical and biotechnological industry customers expect the best, which is par for the course given the nature and demands of their work. Pharmaceutical and biotechnological process tanks are designed and manufactured in accordance with the highest sanitary, safety, and quality standards.

An internal quality control is carried out during every production phase of a project: planning, preparation, manufacturing, and final control. We also guarantee supervision by independent notified bodies (TÜV, SIQ, The Welding Institute, Lloyd's).

Main product groups:

- WFI (Water for Injection) tanks for sterile water preparation
- PW (Purified Water) tanks for pure water preparation
- tanks for sterile and non-sterile solution treatment
- CIP tanks (Clean in Place)
- SIP tanks (Sterilization in Place)
- atmospheric storage tanks
- pressure tanks for product storage and preparation
- mobile tanks
- mixing tanks
- fermenters
- bioreactors
- reactors
- dosing tanks



TFV Vertical tanks

Vertical cylindrical tanks used for product storage and preparation.

The design depends on technological and customer demands. We manufacture atmospheric and pressure tanks (pressure range -1 to 10 bar). The tanks can be partially or completely insulated.

Main TFV tank groups based on purpose of use:

- WFI (Water for Injection) tanks for sterile water preparation
- PW (Purified Water) tanks for pure water preparation
- tanks for sterile and non-sterile solution treatment
- CIP tanks
- SIP tanks



TFV tank 1000 L



TFP Temperature control tanks

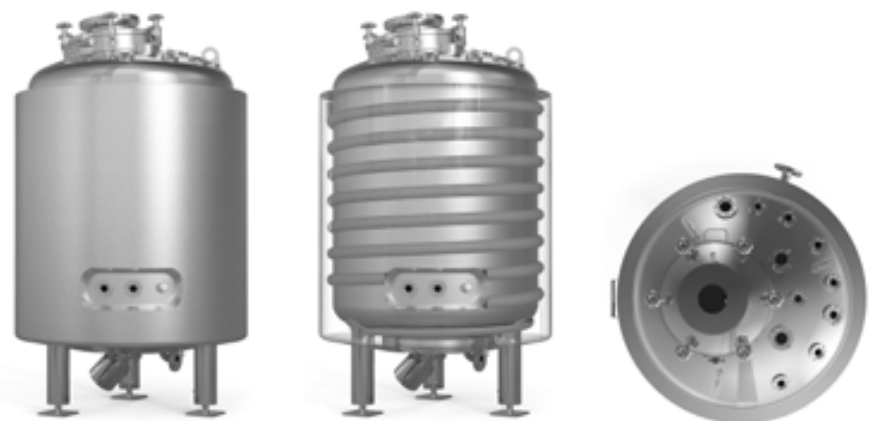
Tanks with a double jacket (duplicators), used for product storage and preparation. We manufacture atmospheric and pressure tanks (pressure range -1 to 10 bar).

The tanks are equipped with a cooling/heating system (heat transfer surface): conventional double jacket with directing coil, half-pipe coil, pillow plate jacket (dimple).

They are insulated and covered with an outer insulation jacket. If requested, we can also install agitators, electric heating, and other additional equipment.

Main TFP tank groups based on purpose of use:

- fermenters
- reactors
- bioreactors
- mixing tanks
- preparation tanks



TFP tank 1500 L



TFM Mobile tanks

Vertical cylindrical tanks designed as mobile units. The design depends on technological and customer demands. We manufacture atmospheric and pressure tanks (pressure range -1 to 10 bar).

The tanks can be equipped with a cooling/heating system and an outer insulation jacket. If requested, we can also install agitators and other additional equipment.

Main TFM tank groups based on purpose of use:

- fermenters
- reactors/bioreactors
- mixing tanks (we design and manufacture all mixing tanks used in the mixing, inertization, dispensing, and emptying process)
- preparation tanks
- transport tanks



TFM tank 500 L



TFH Horizontal tanks

Horizontal cylindrical tanks, used for product storage and preparation.

We manufacture atmospheric and pressure tanks (pressure range -1 to 10 bar).

Main TFH tank groups based on purpose of use:

- WFI (Water for Injection) tanks for sterile water preparation
- PW (Purified Water) tanks for pure water preparation
- tanks for sterile and non-sterile solution treatment





Technical features:

- vertical or horizontal orientation, for fixed installation or mobile applications
- single, double, or triple-wall design
- cone-shaped, flat, or torispherical tank bottom design
- stainless steel material: EN 1.4301, 1.4307, 1.4401, 1.4404, 1.4571, 1.4435, 1.4539 and others, depending on order specifications
- basic material surface: 2B (IIIc), 2R (III d, BA), 1D (IIa)
- surface finish: ground inside and outside, scotch brite, mechanically polished, passivated, electropolished
- surface roughness : up to $Ra < 0.4 \mu m$
- delta ferrite content: $< 1 \%$ material, $< 3 \%$ welds (depending on order specifications)

Temperature control:

- laser welded cooling/heating jacket and bottom
- double jacket with directing coil
- half-pipe coil

Insulation:

- partial or over complete tank surface
- insulation material is mineral wool
- insulation is covered with welded outer insulation jacket



Operating pressure:

- tanks for use under atmospheric pressure
- pressure tanks (from -1 to 10 bar) manufactured in accordance with the PED Directive 2014/68/EU, AD Merkblatt standard, or EN 13445



Fittings and accessories:

- different designs and sizes of service, revision and filling openings (DN100 up to DN600)
- spray balls and turbines, CIP/SIP system connectors
- block flanges in accordance with DIN 32676 (DIN 11850), ISO 2852 (ISO 1127), BS 4825 (ASTM A270), connections in accordance with DIN11864/2, Ingold, BioControl fittings, Varivent, NovAseptic connections
- sight glass (DIN28120), MetaGlass, light fittings
- tank outlet, tank valves with manual, pneumatic, or other drive
- top- or bottom-mounted agitator
- level and temperature probes, pressure gauges
- rupture discs, safety valves
- filters

... and other, depending on order specifications.



We offer technical advice and assistance in choosing the right material, and also guarantee material and technological production process traceability.

Materials used in the production process:

- EN1.4301, AISI 304
- EN1.4307, AISI 304L
- EN1.4401 AISI 316
- EN1.4404 AISI 316L
- EN1.4571, AISI 316Ti
- EN1.4435, AISI 316L
- EN1.4539, AISI 904L
- ... and other, depending on order specifications.



Basic surface finishes:

2B (IIIc)	cold-rolled metal with 2B (IIIc) surface in accordance with EN 10088-2 (smooth, matte surface) surface irregularities that appear as a consequence of different manufacturing procedures are tolerated metal roughness (before tank manufacturing): $0.1 \mu\text{m} < \text{Ra} < 0.5 \mu\text{m}$ product roughness is not inspected
2R (IIIId, BA)	cold-rolled metal with 2R (IIIId) surface in accordance with EN10088-2, bright annealed (smooth, "mirror" surface) surface irregularities that appear as a consequence of different manufacturing procedures are tolerated metal roughness (before tank manufacturing): $0.03 \mu\text{m} < \text{Ra} < 0.1 \mu\text{m}$ product roughness is not inspected
1D (IIa)	hot-rolled metal with 1D (IIa) surface in accordance with EN 10088-2 surface irregularities that appear as a consequence of different manufacturing procedures are tolerated metal roughness (before tank manufacturing): $2 \mu\text{m} < \text{Ra} < 6 \mu\text{m}$ product roughness is not inspected

Special surface finishes:

scotch brite (SB)	surface is brushed with scotch brite material based on 2B or 2R metal surface basic material surface irregularities and surface irregularities that appear as a consequence of different manufacturing procedures are tolerated product roughness is not inspected
sandblasted (CrNi beads)	surface is sandblasted with CrNi steel beads based on 2B, 2R, or 1D metal surface product roughness is not inspected
ground K60 (Ra<2.0μm) K80 (Ra<1.6μm) K120 (Ra<1.2μm) K180 (Ra<0.8μm) K220 (Ra<0.6μm)	surface is ground with abrasive belts of different grit sizes surface roughness: Ra < 2.0 μm to Ra < 0.6 μm product roughness is inspected and certified
mechanically polished Ra < 1.2 μm Ra < 0.8 μm Ra < 0.6 μm Ra < 0.4 μm	surface is mechanically polished to a high-gloss surface finish different polishing grades surface roughness from Ra < 1.2 μm to Ra < 0.4 μm product roughness is inspected and certified
electropolished Ra < 1.2 μm Ra < 0.8 μm Ra < 0.6 μm Ra < 0.4 μm	surface is electropolished different polishing grades, surface roughness from Ra < 1.2 μm to Ra < 0.4 μm product roughness is inspected and certified

Weld finishes:

passivated weld (CZZ)	weld surface is chemically passivated and cleaned, no additional treatment visible weld structure
striped weld (BP)	weld zone is ground with abrasive belt (K80) partially visible weld structure weld zone partially evened out with sheet metal surface weld surface roughness is not inspected
polished weld (C)	weld surface is chemically passivated, cleaned, and polished visible weld structure weld surface roughness is not inspected
ground weld K120 K220 K320	weld zone is ground with abrasive belt (K120, K220, or K320) weld structure not visible weld zone evened out with sheet metal surface weld surface roughness is inspected and certified
ground and polished weld Ra<1.2 μm Ra<1.0 μm Ra<0.8 μm Ra<0.6 μm Ra<0.4 μm	weld zone is ground and polished with polishing paste for a high-gloss surface finish weld surface roughness: Ra < 0.4 μm to Ra < 1.2 μm weld structure not visible weld zone evened out with sheet metal surface weld surface roughness is inspected and certified



Pharmaceutical and biotechnological industry tank equipment is designed and manufactured in accordance with the highest standards, as well as quality and safety demands:

- internal quality control in all production phases of each project: planning, preparation, manufacturing, and final control;
- supervision by independent notified bodies, such as TÜV, SIQ, The Welding Institute, Lloyd's;
- we ensure material and product traceability, as well as technological process control during the entire production process;
- management, planning, and manufacturing are regulated in accordance with the ISO 9001 and ISO14001 standards.



Operational documents:

- Assembly drawing incl. nozzle list and identification plate
- Spare parts list
- Instructions for use and maintenance
- Technical data sheets/accessory manuals

Manufacturers and authorities documents:

- EC Declaration of Conformity
- Construction and pressure test certificate
- Design testing reports
- Stress analysis / static proofs
- Certificates by the authorized inspection bodies on safety systems
- Hazard analysis

Production and control procedure documents:

- Signature list
- Manufacturing test plan
- Delta ferrite content inspection report
- Surface roughness test report
- Radiographic testing report (welding joints)
- Dye penetrant testing (PT) report
- Visual inspection (of welds) report
- Pressure test report (product side / primary side)
- Pressure test report (double jacket / secondary side)
- Electropolishing protocol
- Tank cleaning efficiency report (spray pattern test with fluorescent chemicals, riboflavin)
- Weld log
- Welder and welding inspector certificates
- Certificate of welding company's qualifications (in accordance with national standards)
- List of welding machines
- Final test report (check of completion and final cleaning before delivery)
- Calibration certificates of the measuring instrument used

Material certificates:

- List of materials (material, heat number, etc.)
- Material certificates 2.1 (acc. EN 10204) for all product contact parts
- Inspection certificates 3.1 (EN 10204) for metallic product contact parts
- Certificate of conformity to USP, Class VI, BSE/TSE for product contact seals
- Certificate of conformity for insulation material (AS quality, chloride content)
- Type I testing for all product contact sight glasses
- List of additional welding material

Technical Documentation



Process tanks

For Lek d.d. Ljubljana, a Slovene pharmaceutical company, we designed and manufactured stainless steel pressure tanks for pharmaceutical product preparation and storage.

	Tank type, volume in liters	Operating pressure	Operating temperature
1	PW tank for pure water preparation 5200 L	-1 / +1.5 bar	+5 / +120 °C
2	Preparation tank with agitator 400 L	-1 / +4 bar	+5 / +150 °C
3	Collection tank for wetting agent 50 L	-1 / +4 bar	+5 / +120 °C

Materials:

Product contact parts: EN1.4404, AISI 316L

Non-product contact parts: EN1.4301, AISI 304

Insulation: mineral wool

Surface and weld treatment:

	external	internal
Surface	ground / polished	ground and electropolished, Ra < 0.6 µm
Welds	ground and passivated	ground and electropolished, Ra < 0.6 µm

Documentation and control procedures:

- Construction drawing
- Component conformity inspection
- Pressure tank calculation (AD 2000 Merkblatt)
- Material conformity inspection
- Pressure tank evidence list
- Surface roughness test report
- Cleaning and passivation report
- Electropolishing protocol
- EC Declaration of Conformity (PED 2014/68/EU)
- Factory Acceptance Test (FAT)
- Instructions for use and maintenance



PW tank 5200 L



Preparation tank 400 L



Collection tank 50 L

UCB, Belgium

Buffer preparation tank 2500 L

Vertical cylindrical tank with torispherical ends. The tank is equipped with a half-pipe coil. The cooling surface is insulated (mineral wool) and covered with an outer insulation jacket. The tank is designed in accordance with the Pressure Equipment Directive PED 2014/68/EU and AD 2000 Merkblatt. It is used for buffer preparation.

WFI and the chosen ingredient are mixed with a magnetic agitator to form a solution, which is later transferred into single-use bags.

Technical features:

Volume	liter	2500
Inside diameter	mm	1400
Outside diameter	mm	1550
Tank wall height	mm	1450
Approx. tank weight (empty)	kg	940
Operating pressure (tank)	barg	-1 / +2
Design pressure (tank)	barg	-1 / +3
Working temperature (tank)	°C	+2 / +135

Surface and weld treatment:

	external	internal
Surface	ground and passivated Ra < 1.5 µm lid mechanically polished	electropolished Ra < 0.6 µm
Welds	ground and passivated	ground and electropolished Ra < 0.6 µm





Buffer hold tanks 4000 and 5000 L

Vertical pressure vessels with torispherical ends.

		tank	jacket
Design pressure	barg	-1 / +6	-1 / +10
Operating pressure	barg	-1 / +2.1	+6
Test pressure	barg	+8.92	+14.77
Design temperature	°C	-10 / +150	-10 / +150
Operating temperature	°C	0 / + 135	0 / + 135

Materials:

Product contact parts: EN1.4539

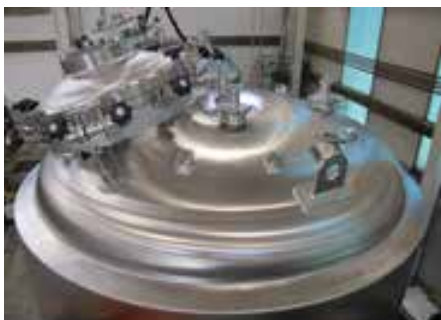
Non-product contact parts: EN1.4571

Insulation: mineral wool

δ-ferrite content (product contact surface): for all parts and welding seams ≤ 3 %

Surface and weld treatment:

	external	internal
Surface	scotch brite, Ra < 1.2 µm	ground, certified roughness Ra < 0.6 µm
Welds	cleaned, polished and passivated, weld structure is visible, Ra < 1.2 µm	butt welds ground (K220), certified roughness Ra < 0.6 µm corner welds ground (K220), certified roughness Ra < 0.6 µm



Baxter Neuchatel, Switzerland



CIP tank 4000 L

Vertical cylindrical tank with dished bottom. The tank wall and bottom are insulated. The outer insulation jacket is welded diffusion resistant on the tank.

Technical features:

Volume	liter	4000
Inside diameter	mm	1650
Outside diameter	mm	1750
Tank jacket height	mm	1600
Approx. tank weight (empty)	kg	1170
Operating pressure	barg	-0.17 / +1.03
Test pressure	barg	-1 / +4
Operating temperature (tank)	°C	+20 / +80

Materials:

Product contact parts: EN1.4435, AISI 316L

Non-product contact parts: EN1.4301, AISI 304

Insulation: mineral wool

Surface and weld treatment:

	external	internal
Surface	scotch brite Ra < 0.9 µm	ground Ra < 0.8 µm
Welds	flush-ground	ground Ra < 0.8 µm





Project description

Planning, manufacturing, and partial installation of tank equipment for PORT1.

PORT1, a pharmaceutical plant in Mengeš (Slovenia) is a biopharmaceutical development center. This biopharmaceutical plant is an important technical, technological, and engineering achievement and is completely based on domestic, Slovenian knowledge.

Their state-of-the-art technology is designed to be environmentally friendly.

	Tank type
1	Buffer preparation tank V541, 1350 mm,
2	Buffer preparation tank V558, 1100 mm
3	Buffer preparation tank V555, 900 mm
4	Buffer preparation tank V550, 1800 mm
5	Buffer preparation tank V557, 1200 mm
6	V080 tank, 1400 mm
7	Buffer preparation tank V549, 1800 mm
8	Buffer preparation tank V544, 500 mm
9	Buffer preparation tank V556, 620 mm
10	Buffer preparation tank V546, 500 mm
11	Buffer preparation tank V560, 500 mm
12	Buffer preparation tank V553, 1100 mm
13	Buffer preparation tank V552, 1800 mm
14	Buffer preparation tank V545, 500 mm
15	Buffer preparation tank V075, 1700 mm
16	V083 tank, 1400 mm
17	Buffer preparation tank V542, 1450 mm
18	Buffer preparation tank V543, 1800 mm
18	Buffer preparation tank V561, 500 mm
20	Buffer preparation tank V548, 620 mm
21	Buffer preparation tank V551, 1350 mm
22	Buffer preparation tank V547, 620 mm
23	Buffer preparation tank V554, 900 mm

References



Preparation tank TFXV 2.5 L and TFXV 5 L

Technical features:

Operating pressure	barg	-1 / +6
Max. operating temperature	°C	0 / +150

Product contact parts: EN1.4404
 Non-product contact parts: EN1.4301
 Insulation: mineral wool

Surface and weld treatment:

	external	internal
Surface	polished (high-shine)	ground (K320) Ra < 0.8 µm
Welds	ground (K320) Ra < 0.8 µm	ground and polished



Preparation tank TFMX 150 L

Vertical cylindrical pressure tank. The tank is insulated and covered with an outer insulation jacket. The vessel was manufactured in accordance with the PED Directive 2014/68/EU.

Technical features:

Volume	liter	150
Inside diameter	mm	600
Diameter (incl. insulation)	mm	660
Tank wall height	mm	700
Operating pressure	barg	-1/+6
Max. operating temperature	°C	0/+150

Materials:

Product contact parts: 2B(IIIc), EN1.4404
 Non-product contact parts: 2B(IIIc), EN1.4301
 Insulation: mineral wool

Preparation tank TFMX 50 L

Vertical cylindrical pressure tank without insulation. The tank was manufactured in accordance with the PED Directive 2014/68/EU.

Technical features:

Volume	liter	50
Diameter	mm	400
Tank wall height	mm	700
Operating pressure	barg	-1/+6
Max. operating temperature	°C	0/+150

Materials:

Product contact parts: 2B(IIIc), EN1.4404
 Non-product contact parts: 2B(IIIc), EN1.4301

Surface and weld treatment:

	external	internal
Surface	legs, bottom, tank jacket and lid mechanically polished to a high-shine, certified roughness Ra < 0.8 µm	ground, certified roughness Ra < 0.8 µm
Welds	vertical and horizontal butt welds on tank jacket: ground (K120) Ra < 3.2 µm; corner welds cleaned and passivated without grinding (CZZ)	butt welds: ground (K180) Ra < 0.8 µm; corner welds cleaned and passivated without grinding (CZZ)



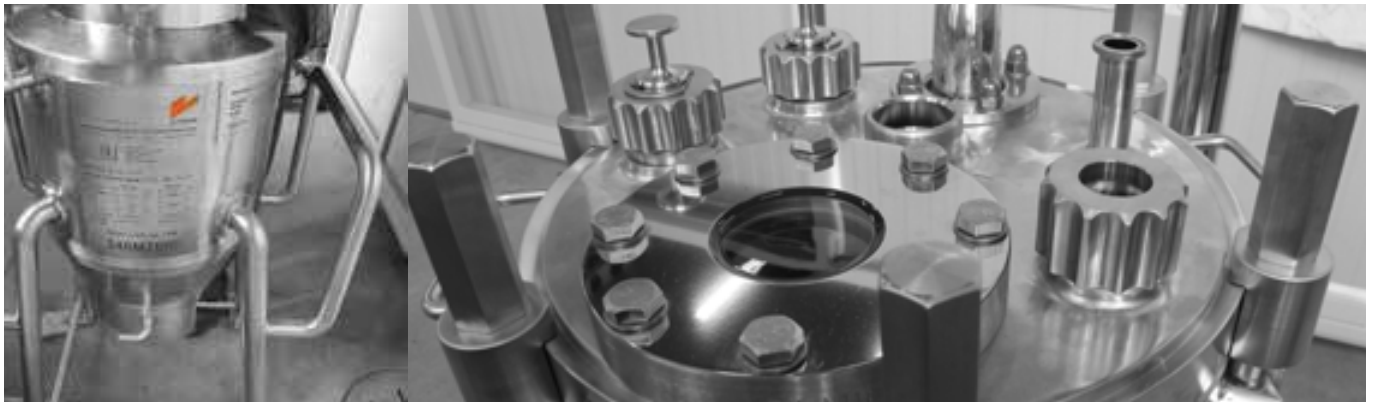
Tank fittings and accessories:

- tube with spray ball
- revision opening
- pressure gauge, air filter, and safety valve connections
- level probe connection
- sample port
- Ph-measurement nozzle
- identification plate (PED 2014/68/EU)
- agitator flange
- bottom outlet with breaker
- handles



Documentation and control procedures:

- Construction drawing
- Surface roughness test
- Component conformity inspection
- Factory Acceptance Test (FAT)
- Material conformity inspection 3.1b
- FDA certificate
- EC Declaration of Conformity (PED 2014/68/EU)
- Passivation report
- Dye penetrant testing (PT) report
- Riboflavin test
- Welder certificates
- Pressure tank evidence list
- Cleaning report
- Instructions for use and maintenance



Mobile process tanks

- cylindrical, installed vertically,
- in sanitary design with magn. coupled bottom drive agitator,
- secondary side sump section designed as a duplicate,
- double jacket on bottom and cylinder,
- insulated tank jacket and bottom, insulation thickness: 50 mm
- fully drainable via bottom discharge valve.

Technical features:

Tank design temperature (min/max)	1 to 145 °C
Tank design pressure	FV 400 kPa G (-1 to +4 barg)
Number of load cycles	5000
δ-ferrite content (product contact surface)	for all parts and welding seams ≤ 3 %

Materials:

Primary (wall): 1.4435

Secondary (jacket): 1.4404 (AISI 316L)

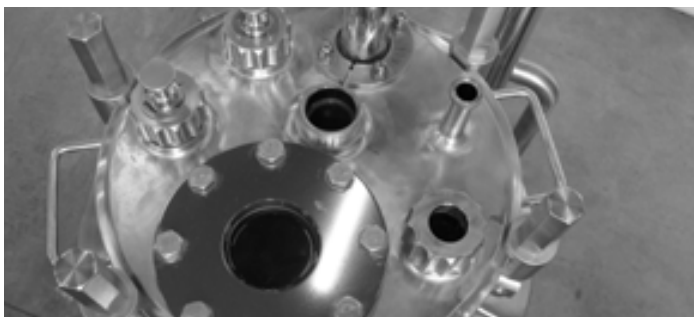
Gaskets (product contact): EPDM; acc. USP <87> or <88>, Class VI

Insulation: mineral wool, AS-quality

Screws/nuts: A4-70/A2

Surface and weld treatment:

	external (non-product contact)	internal (product contact)
Surface	legs, bottom, and tank wall scotch brite, Ra < 1.2 µm	ground and electropolished, Ra < 0.6 µm
Welds	vertical and horizontal butt welds on tank wall: ground, Ra approx. 1.2 µm; corner welds of the connections: ground, Ra < 1.2 µm	butt welds: ground (K220), roughness Ra < 0.6 µm, corner welds: ground (K220), roughness Ra < 0.6 µm



Documentation and control procedures:



- Construction drawing
- Instructions for use and maintenance
- Pressure tank calculation (Lloyd's)
- Pressure test report (reports from authorized inspection body/examination in accordance with the guidelines of Singapore's Ministry of Manpower)
- Manufacturing test plan
- Delta ferrite content inspection
- Surface roughness test report
- Radiographic testing report
- Pressure test (primary and secondary side)
- Welder certificates, WPS
- Electropolishing protocol; ref. ASTM A-967 Norm
- Riboflavin test report
- Dye penetrant testing (PT) report
- Final test report
- Calibration certificates of measuring instruments
- Cleaning before delivery report
- List of materials, certificates 3.1(EN10204) and 2.1(EN10204)
- Registration according to the guidelines of Singapore's Ministry of Manpower (MOM)

Storage tank 28750 L

Vertical cylindrical tank with torispherical ends, intended for outside placement. The tank wall and bottom are insulated and covered with an outer aluminum insulation jacket. The tank is equipped with electrical heat tracing in the lower part of the internal wall.

Total volume	liter	30560
Inside / outside diameter	mm	2400 / 2600
Total height	mm	7700
Approx. tank weight (empty)	kg	5160
Design pressure	barg	-1 / +4
Operating pressure	barg	0 / +3
Test pressure	barg	+5.72
Design temperature	°C	-20 / +50
Operating temperature	°C	-20 / +40

Materials:

Product contact parts: EN1.4404

Non-product contact parts: EN1.4301

Insulation: mineral wool

Surface and weld treatment:

	external	internal
Surface	outer aluminum jacket	ground, certified roughness Ra < 0.6 µm
Welds	fillet welds cleaned and passivated without grinding	butt welds: ground, corner welds: ground (K220), certified roughness Ra < 0.6 µm



TFPX Process tanks 50 / 200 / 500 / 1000 L

Vertical cylindrical pressure tanks. The tank wall and bottom are insulated. The outer insulation jacket is welded diffusion resistant on the tank.

Technical features:

Design pressure	barg	-1 / +6
Operating pressure	barg	0 / +6
Design temperature	°C	0 / + 145
Operating temperature (tank)	°C	0 / + 145

Materials:

Product contact parts: EN1.4404, AISI 316L

Non-product contact parts: EN1.4301

Insulation: mineral wool

Surface and weld treatment:

	external	internal
Surface	ground (K240), roughness Ra < 1.0 µm	ground, certified roughness Ra < 0.65 µm
Welds	vertical and horizontal butt welds: striped, fillet welds: cleaned and passivated without grinding	butt welds: ground (K220), certified roughness Ra < 0.65 µm





Treatment tank TFPX 600 L

Vertical cylindrical pressure tank with torispherical ends. Secondary side section is designed as a duplicate. The tank is insulated in the bottom and wall sections up to the vessel flange. The external steel plate cover is welded. Legs are welded to the secondary side tank bottom. The tank is manufactured in accordance with the PED Directive 2014/68/EU. Inspection and verification are carried out through Lloyd's Register Group. The tank meets the strict guidelines of Singapore's Ministry of Manpower (MOM).

Technical features:

Volume	liter	600
Inside diameter	mm	800
Outside diameter (incl. insulation)	mm	1000
Tank wall height	mm	1250
Approx tank weight (empty)	kg	920
Tank design pressure	barg	-1 /+4
Operating pressure	barg	0 /+2
Tank design temperature	°C	+1 / +145 °C



Treatment tank TFPX 1600 L

Vertical cylindrical pressure tank with torispherical ends. Secondary side section is designed as a duplicate. The tank is completely insulated (bottom, wall up to vessel flange, lid wherever possible). The external steel plate cover is welded. Legs are welded to the secondary side tank bottom.

The vessel is manufactured in accordance with the PED Directive 2014/68/EU. Inspection and verification are carried out through Lloyd's Register Group. The tank meets the strict guidelines of Singapore's Ministry of Manpower (MOM).

Technical features:

Volume	liter	1600
Inside diameter	mm	1450
Outside diameter (incl. insulation)	mm	1650
Tank wall height	mm	950
Approx. tank weight (empty)	kg	1790
Tank design pressure	barg	-1 /+4
Operating pressure	barg	0 /+2
Tank design temperature	°C	+1 / +145 °C



References

Preparation tank TFPX 800 L

Vertical cylindrical pressure tank with torispherical ends. Legs are welded to the secondary side tank bottom. The external steel plate cover is welded. The pressure tank is manufactured in accordance with the PED Directive 2014/68/EU.

Inspection and verification are carried out through Lloyd's Register Group. The tank meets the strict guidelines of Singapore's Ministry of Manpower (MOM).

Technical features:

Volume	liter	800
Inside diameter	mm	950
Outside diameter (incl. insulation)	mm	1150
Tank wall height	mm	1250
Approx. tank weight (empty)	kg	584
Tank design pressure	barg	-1 / +4
Operating pressure	barg	0 / +2
Tank design temperature	°C	+1 / +145 °C
Operating temperature	°C	+1 / +145 °C



Materials:

Product contact parts: EN1.4435 (δ -ferrite content < 3 %)

Non-product contact parts: EN1.4404

Insulation: mineral wool, AS-quality

Seals: EPDM, acc. USP<87> or <88>, Class VI

Screws, nuts: A4-70/A2

Surface and weld treatment:

	external	internal
Surface	legs, bottom, lid and tank wall scotch brite (SB), certified roughness Ra < 1.2 μ m	ground and electropolished, certified roughness Ra < 0.6 μ m
Welds	vertical and horizontal butt welds on tank wall: ground (K120) Ra < 1.2 μ m; corner welds of the connections: ground and passivated	butt welds: ground (K220) and electropolished, roughness Ra < 0.6 μ m; corner welds: ground (K220) and electropolished, certified roughness Ra < 0.6 μ m

Documentation and control procedures:

- Construction drawing
- Manufacturing test plan
- Instructions for use and maintenance
- Pressure tank calculation
- Pressure test report
- Delta ferrite content inspection
- Surface roughness test report
- Radiographic testing (PT) report
- Welding plan, welder certificates, WPS
- Electropolishing protocol
- Riboflavin test report
- Final test report
- Calibration certificates
- Cleaning before delivery report
- List of materials, certificates 3.1 (EN10204) and 2.1 (EN10204)
- Verification in accordance with the guidelines of Singapore's Ministry of Manpower (MOM)





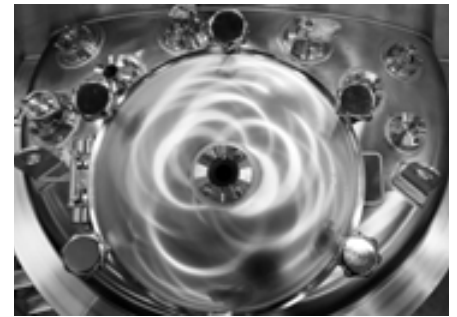
Preparation tank 1000 L

Vertical pressure tank

		wall	jacket
Material		1.4404	1.4301
Design pressure	barg	-1 / +3	-1 / +5
Operating pressure	barg	-1 / +2.9	-1 / +4.5
Test pressure	barg	+6.55	+8.28
Design temperature	°C	0 / +150	0 / +150
Operating temperature	°C	+20 / +130	+20 / +120

Surface and weld treatment:

	external (no product contact)	internal (product contact)
Surface	scotch brite, roughness Ra < 1.2 µm	ground and electropolished, certified roughness Ra < 0.6 µm
Welds	vertical and horizontal butt welds on tank wall: striped; corner welds: cleaned and passivated without grinding	butt welds ground (K220), certified roughness Ra < 0.6 µm; corner welds ground (K220), certified roughness Ra < 0.6 µm



Mobile tank 1500 L

- ▶ cylindrical vessels, duplicator, vertical installed
- ▶ 4 legs, equipped with wheels
- ▶ temperature control: spiral-baffled jacket and bottom
- ▶ the external stainless steel plate cover is welded
- ▶ the pressure vessel is manufactured according to the PED Directive
- ▶ lifting lugs on tank lid
- ▶ handle for easy vessel manipulation on one side of the vessel
- ▶ custom made spray ball (2 pcs)

		tank	jacket
Material		EN 1.4404	EN 1.4301
Design pressure	barg	-1 / +3	-1 / +10 bar
Operating pressure	barg	0 / +2	+4 / +5
Test pressure	barg	+ 5,6	+18,5
Design temperature	°C	-10 / +170	-10 / +170
Operating temperature	°C	+2 / +24	+1 / +30

Surface and weld treatment:

	external (no product contact)	internal (product contact)
Surface	ground (K180), certified roughness Ra < 0.76 µm	ground and electropolished, certified roughness Ra < 0.4 µm
Welds	vertical and horizontal butt welds: ground (K180), Ra < 0.76 µm, corner welds: ground (K180), Ra < 0.76 µm	butt welds: ground (K320), roughness Ra < 0.4 µm, corner welds: ground (K320), roughness Ra < 0.4 µm



References



Mobile preparation vessel TFXV_700 L

nominal volume	700 L
inside / outside diameter	850 / 1070 mm
material primary side (product contact)	EN1.4435 / EN1.4404
material secondary side (non-product contact)	EN1.4301
working pressure (tank)	-0,4 to +2 bar(g)
working pressure (duplicate)	0 to +3 bar(g)
design pressure (tank)	-1 to +4 bar(g)
design pressure (duplicate)	-1 to +6 bar(g)
design temperature (tank)	3 to +135 °C
design temperature (duplicate)	-10 to +160 °C

Documentation and control procedures:

- ▶ Construction drawing
- ▶ Operation and maintenance manual
- ▶ CE Declaration of conformity
- ▶ Pressure tank calculation according to PED 2014/68/EU) and AD Merkblatt
- ▶ Technical datasheet
- ▶ Roughness measurement
- ▶ Welder certificates, WPS
- ▶ Report of cleaning before delivery
- ▶ Electropolishing protocol, Ref. ASTM A-967 NORM
- ▶ Riboflavin testing
- ▶ FDA certificate
- ▶ List of materials for product wetted parts, certificates 3.1



Surface and welds finishing:

	external (no product contact)	internal (product contact)
surface	scotch brite (SB), certified roughness Ra<1.2 µm	ground and electropolished, certified roughness Ra<0,6 µm
welds	vertical and horizontal butt welds on the tank wall ground (K120), roughness Ra<1.2 µm; corner welds of the connections ground (K120), roughness Ra<1.2 µm	butt welds ground (K220), certified roughness Ra<0,6 µm; corner welds ground (K220), certified roughness Ra<0,6 µm



UF circulation
CIP purification
CIP ultrafiltration
Peak pool dilution
Homogenization

Main design specifications:

- cylindrical vessels, duplicator, installed vertically
- 3 or 4 legs with 2 rings, on 5 wheels
- lifting lugs on tank lid, handle on one side of the tank for easy manipulation
- tank lid with side handles, completely removable for maintenance purposes (hinged screw clamps)
- dished bottom

Technical features:

Tank design temperature (min/max)	1 to 145 °C
Tank design pressure	FV 400 kPa G (-1 to +4 barg)
Number of load cycles	5000
δ-ferrite content (product contact surface)	for all parts and welding seams <= 3 %



duplicator

UF circulation

Materials:

Primary (tank): 1.4435
Secondary (jacket): 1.4301 / 1.4404
Gaskets (product contact): EPDM in accordance with USP <87> or <88>, Class VI
Insulation: mineral wool, AS-quality
Screws/nuts: A2-70

Surface and welds finishing:

	external (non-product contact)	internal (product contact)
Surface	legs, bottom and tank wall scotch brite, certified roughness Ra < 1.0 µm	ground and electropolished, roughness Ra < 0.4 µm
Welds	vertical and horizontal butt welds on tank wall: ground (K120), roughness Ra < 1.0 µm; corner welds of the connections: ground (K120), roughness Ra < 1.0 µm	butt welds: ground (K320), roughness Ra < 0.4 µm; corner welds: ground (K320), roughness Ra < 0.4 µm



double jacket adjustment



cone-shaped bottom of the UF circulation tank

References



removable lid with hinged screw clamps

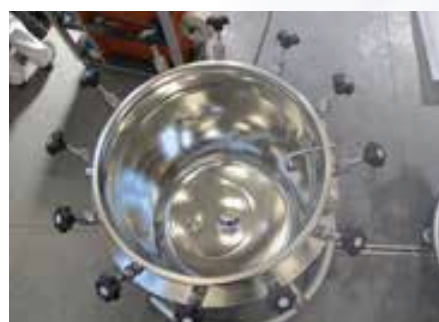


Documentation and control procedures:

- Construction drawing
- Instructions for use and maintenance
- EC Declaration of Conformity (PED 2014/68/2EU)
- Pressure tank calculation
- Pressure test report
- Manufacturing test plan
- Delta ferrite content inspection report
- Surface roughness test report
- Radiographic testing report
- Welder certificates, WPS
- Electropolishing protocol; ref. ASTM A-967 Norm
- Riboflavin test report
- Dye penetrant testing (PT) report
- Final test report
- Calibration certificates
- Cleaning before delivery report
- List of materials, certificates 3.1(EN10204) and 2.1(EN10204)
- Registration in accordance with the guidelines of the Japanese Ministry of Health, Labour and Welfare (MHLW)



CIP lance with rotating spray ball



tank inside ground and electropolished



prepared for delivery



Škrlj d.o.o. is a renowned European company built on rich family tradition and with an established international market.

Škrlj d.o.o. specialize in research, development, production, and sale of stainless steel equipment for different industries:

- winemaking
- beer brewing
- food processing
- pharmaceutical and biopharmaceutical

In order to efficiently adapt to changes in the economic environment and to high market demands, we have to continuously modernize and technologically improve our products, services, and processes. Production and design have to be extremely adaptable, while the entire process and documentation preparation need to be run as efficiently as possible.

A large portion of our financial resources is dedicated to research and material assets that are needed for technological process optimization. We keep an eye out for any emerging new trends and industry demands.

We offer the following services:

- sheet metal disc cutting line
- plain sheet polishing and grinding line
- internal and external grinding (tank and tank bottom)
- bending, shaping sheet metal
- manual, machine (linear and circular), and robotic welding (TIG, MIG/MAG, plasma)
- automatic sandblasting of larger products in a grinding chamber (using CrNi beads)
- passivation of finished products
- treatment with CNC processing machine
- abrasive water jet cutting
- 2D and 3D laser cutting
- laser welding
- electropolishing





Winemaking



- wine storage tanks
- fermenters
- pneumatic presses
- temperature regulation equipment
- labelling machines

Beer brewing



- fermentation tanks
- brite beer tanks
- mono-block brewhouses
- small and medium-sized brewery design, manufacturing, and installation
- labelling machines

Food industry



- storage tanks for milk and yogurt
- process tanks for milk and dairy products
- production and storage tanks for alcoholic drinks
- production and storage tanks for juices and fizzy drinks
- storage tanks for water, oil, and vinegar

Pharma Biotechnology



- CIP / SIP tanks
- Preparation tanks for sterile water WFI and for purified water PW
- Tanks for sterile and non-sterile solution treatment
- Reactors / bioreactors
- Fermenters
- Agitator tanks

Other products



- Tanks for chemical substance processing and storage
- Silos for bulk material storage (grain, flour, etc.)
- Tanks for liquid storage
- Tanks for waste material storage
- Walk-on platforms, staircases, and ladders
- Stainless steel drain channels



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