



# PICKLING AND PASSIVATION OF STAINLESS STEEL

## CONTAINERS

[www.ancoracorp.com](http://www.ancoracorp.com)





CORPORATION LTD. SP. Z O.O.



ANCORA Ltd., founded by MSc in Eng Tomasz Kurczewski in 1994, quickly became a modern enterprise, leading in technological solutions, developing and implementing new, high standards. In 2020 the company was restructured into **Ancora Corporation Ltd.**, increasing reach and expanding the range of services.

The company carries out pickling and passivation of stainless steel structures, titanium alloys and aluminum alloys, as well as perfect cleaning of oxygen devices. Ancora Corporation Ltd. produces also integrated container tanks equipped with special measurement systems. The containers were designed and built for sea rescue services, transporting hazardous substances, transporting and storage of water in accordance with standards of modern armies (NATO). Production program includes containers for liquefied gas, transport and storage of drinking water and water treatment plants equipped with membrane filtration systems (microfilters, nanofilters and reverse osmosis modules).

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## PICKLING AND PASSIVATING OF STAINLESS STEEL



ANCORA Co. represents the greatest industrial unit in Central / Eastern Europe in the field of pickling and passivating of stainless steels (SS) structures. Pickling and passivating technologies are consistent with:

ASTM A-380, ASTM A-967, PN-EN 2516:2000.

Spray passivating of chemical ship holds  
Panama City, Rousse (St. Petersburg, Las Palmas)

Passivation of SS products effects their high durability, resistance against pitting and crevice corrosion, retards development of microorganisms. The SS surfaces lose strange dark colours coming from cutting, welding or improper heat treatment and become smooth after formation of an uniform oxide film.



Ancora Corporation Ltd. professional technicians have passed years of experiences in bath pickling / passivating of SS elements in the company premises in Gdansk and in passivating of outdoor tanks, cargo tanks on ships carrying aggressive chemicals, pipelines and different SS industry equipment.

Passivating of hundreds of SS tanks and pipelines on ships belonging to world known ship owners has been carried out in shipyards in Poland, Panama, Russia, Bulgaria, Canary Islands on new build or repaired ships.

Passivating of chemical ship  
Stocznia Szczecińska Nowa Yard

Passivating of tanks  
Bergen (Norway)



Specialistic equipment in pharmaceutical industry has been passivated in Poland and Lithuania with traditional chemicals or with application of citric acid and peroxidised water. Ancora Corporation Ltd. is authorised by the Swedish producer Avesta Finishing Chemicals to use its chemicals for SS cleaning, pickling and passivating.

Passivating Plant in Gdansk is well equipped to carry out pickling / passivating processes by bath immersion or spraying. The surface contaminants are removed by shot blasting with glass beads if required.

Bath passivating of containers  
and heat exchangers



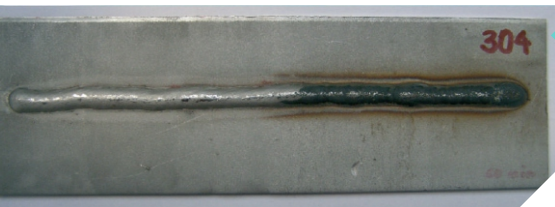


# PICKLING AND PASSIVATING OF STAINLESS STEEL THEORY AND EXAMPLES

Stainless steels are resistant against corrosion due to their readiness to passivation, that means to formation at their surfaces very durable chemical compounds, among them especially chromium, but also nickel and molybdenum compounds are most important. Corrosion resistance of stainless steels depends on the very thin superficial film having thickness of thousand parts of micrometers and built of metal oxides.



Control of the passive film quality with the potential meter



Sample of 304 stainless steel with an overweld  
Test for heat tint and oxide scale removing

A passive film created in natural conditions suffer local damages and is contaminated during the stages of construction works like welding, grinding, or thermaltreatment. At the points of damages or contaminant inclusions the metal oxide film loses compactness and/or its ability for selfregeneration.

Gel passivated part | Part that was not passivated

Stainless steels with damaged superficial films represent weaker corrosion resistance. Brown colours within the heat affected zone after welding, cutting or other thermal operations are connected with increased content of chromium oxides in the superficial film. Such discolouration in stainless teels that can be seen very often along the welds means that the metal has diminished content of chromium under the film. Because of this the metal will corrode with a higher rate especially when conditions for crevice, pitting or intercrystalline corrosion exist.

The brown layer consisting of metal oxides is porous, has lower corrosion resistance and must be removed by pickling. A correct metal oxide film should be restored later by passivating carried out at the surface having a proper alloy composition. The best corrosion resistance of a stainless steel can be obtained in this way.

Sample of 2101 duplex steel with an overweld  
Test for heat tint and oxide scale removing



Gel passivated part | Part that was not passivated



Part that was not passivated

Gel passivated part

Sample of 2205 duplex steel with an overweld  
Test for heat tint and oxide scale removing

Mechanical surface cleaning is often difficult or impractical, because embedded abrasive particles effect corrosion of a metal (with the exception of the glass beads). Chemical treatments, these are pickling and passivation of stainless steels is applied to remove contaminants, or embedded iron after operations with the usage of carbon steel tools or supports and to extract iron oxides having low corrosion resistance. Chemical treatment restores a uniform passive film, improves its compactness, greatly increase content of chromium, and also molybdenum and nickel oxides. The passive film created by the chemical treatment present much better corrosion resistance effecting better stainless steels durability.





**WE ARE AUTHORISED BY THE SWEDISH  
CHEMICALS PRODUCER - AVESTA**



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USD: IBAN SE32 9500 0099 6026 0868 1546

Malmö, Dec 2<sup>d</sup> 2020

To whom this may concern,  
We hereby confirm our long time collaboration with the company Ancora in Gdansk Poland. They have successfully been using our Finishing Chemicals, for the cleaning, pickling and passivation of stainless steel applications. See here a list of the standard product range:

- Avesta RedOne 240
- Avesta Duplex Spray 250
- Avesta Pickling Bath 302
- Avesta BlueOne 130
- Avesta RedOne 140
- Avesta Passivator 601

More information about the Finishing Chemicals can be found on our web site by following this link:  
<http://www.vabw-service.com/voestalpine/?changeLang=en>

**Best Regards**

**Anders Bornmyr**

Sales Development Specialist Finishing Chemicals  
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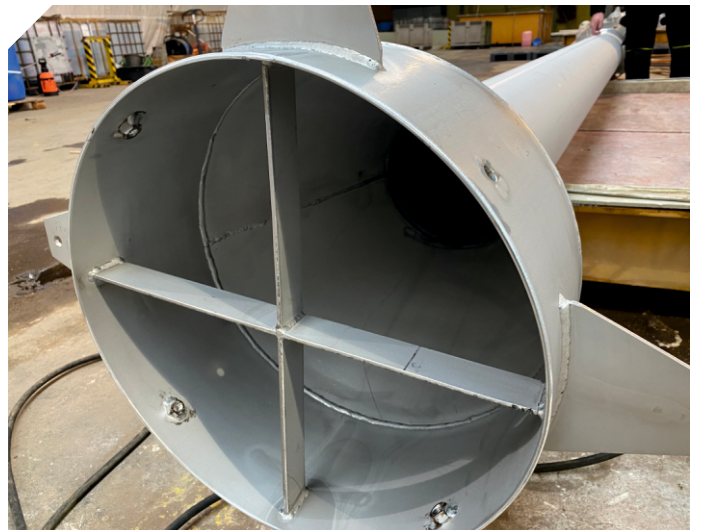
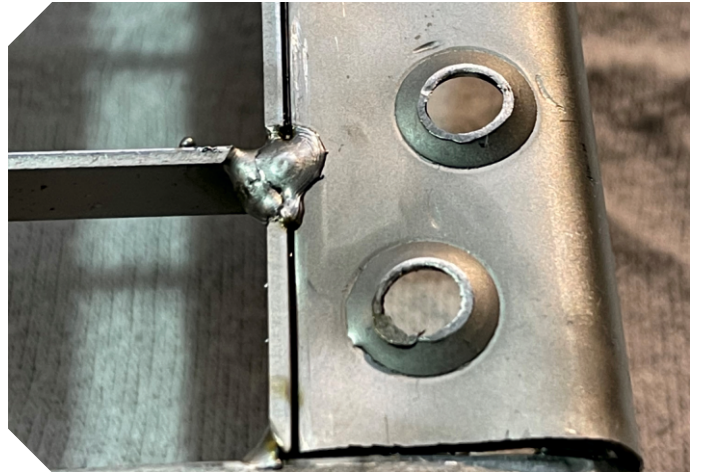
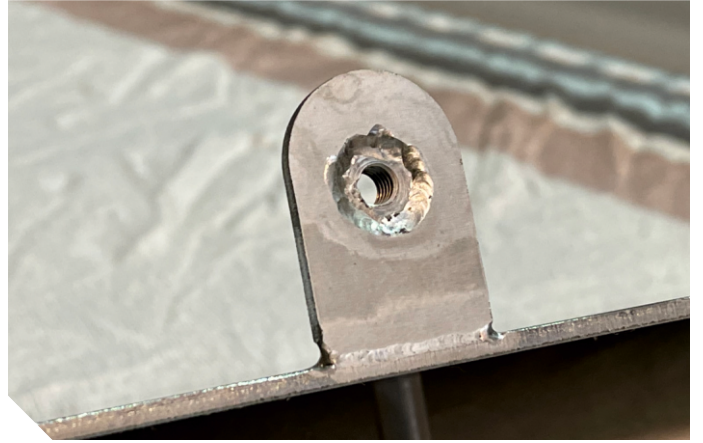
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**voestalpine**  
ONE STEP AHEAD.



**BEFORE  
PASSIVATION**

**AFTER  
PASSIVATION**







# TANK CONTAINERS FOR TRANSPORT AND STORAGE OF AVIATION FUEL



- ✓ tank is mounted in 20' ISO Container's Frame,
- ✓ capacity 12.000 l,
- ✓ mobile storage tank,
- ✓ double skin tank,
- ✓ approved for transport and storage aviation fuel.

## Application

- ✓ transport of dangerous goods according to the requirements of ADR/RID, IMDG,
- ✓ design for transport and storage of aviation fuel product (Un1863)



## Designation

Tank container serves for transport and storage of fuels to supply military units, and humanitarian missions. Design according to The European Agreement concerning the International Carriage of Dangerous Goods by Road ADR, International Maritime Dangerous Goods Code IMDG.

## Equipment:

- ✓ manhole 500 mm or 600 mm with swingbolts,
- ✓ two ladders with non-slip steps,
- ✓ platform or walkway with non-slip surfaces,
- ✓ paint system resistant to the marine and petroleum environment,
- ✓ sampling valve,
- ✓ measuring level,
- ✓ all valve handle's and cover of manhole are equipped with lock devices,
- ✓ automatic grounding reel with clamp.



## Materials

All the components of the tank are made of non-corrosive materials (austenitic steels). Tank is mounted in a 20' ISO Container Frame Type 1 C and is made of high-strength steel.





# TANK CONTAINERS FOR TRANSPORT AND STORAGE OF DANGEROUS GOODS



- ✓ tank is mounted in 20' ISO Container's Frame,
- ✓ capacity range from 15.000 up to 25.000 l.

## Application

- ✓ transport of dangerous goods according to the requirements of ADR and IMDG,
- ✓ storage of dangerous goods.

## Designation

Tank container serves for transport and storage of dangerous goods, including condensed gas according to The European Agreement concerning the International Carriage of Dangerous Goods by Road ADR and International Maritime Dangerous Goods Code IMDG.



## Basic equipment

- ✓ manhole for inspection with diameter of 500 mm,
- ✓ relief valve,
- ✓ loading valve placed on top of the tank including deep-seated pipe,
- ✓ bottom drainage valve,
- ✓ gas valve,
- ✓ pressure gauge,
- ✓ temperature indicator.

## Materials

All the components of the tank are made of non-corrosive materials (austenitic steels or Duplex steels).

Tank is mounted in a 20' ISO Container Frame Type 1 CC or 1 CX and is made of high quality steel (S355J2G3).







# TANK CONTAINER FOR TRANSPORT AND DISTRIBUTION OF POTABLE WATER FBWC 12000



- ✓ capacity 12 000 liters,
- ✓ insulation and heating system preventing water and construction freezing at the ambient temperature down to  $-32^{\circ}\text{C}$ ,
- ✓ insulation and cooling system preventing temperature of water to rise above  $+15^{\circ}\text{C}$ ,
- ✓ possibility to safe storage of water for 3 months,
- ✓ materials admitted to contact with potable water.

## Application

- ✓ firing ground and training centre,
- ✓ logistic units,
- ✓ national units fulfilling tasks of Peace Missions,
- ✓ Rapid Reaction Force.

## Designation

Tank Container of capacity 12 000 liters is designed for transport, storage and distribution of potable water.

## Basic equipment

- ✓ three-phase generator set,
- ✓ water pump,
- ✓ pipe system and hose reels with hoses and filling guns,
- ✓ water cooling system (temperature of water from  $+13^{\circ}\text{C}$  till  $+15^{\circ}\text{C}$ ,
- ✓ system of water conservation (time of safe storage 3 months).

The installation is also equipped with control and measurement system showing actual parameters of system status, operating the work of generator set and pump together with safeguard system preventing system freezing and its endamage.

The Tank and every pipe installation are equipped with electrical heating system as well as insulation preventing of water and system freezing at the temperature down to  $-32^{\circ}\text{C}$ .

## Materials

Every elements of the Tank are made of materials admitted to the contact with potable water (Duplex LDX 2101).

The Tank is put into the container frame of 20' 1 CX type. Container's frame is equipped with the hook lift system made of high quality steel (S355J2G3).



# TANK CONTAINER FOR TRANSPORT AND DISTRIBUTION OF POTABLE WATER WDR 9000



- ✓ capacity 9000 liters,
- ✓ insulation and heating system preventing water and construction freezing at the ambient temperature down to  $-26^{\circ}\text{C}$ ,
- ✓ insulation and cooling system preventing temperature of water to rise above  $+15^{\circ}\text{C}$ ,
- ✓ possibility to safe storage of water for 3 months,
- ✓ materials admitted to contact with potable water.

## Application

- ✓ firing ground and training centre,
- ✓ logistic units,
- ✓ national units fulfilling tasks of Peace Missions,
- ✓ Rapid Reaction Force.

## Designation

Tank Container of capacity 9000 liters is designed for transport, storage and distribution of potable water.

## Basic equipment

- ✓ three-phase generator set,
- ✓ water pump,
- ✓ pipe and valves system,
- ✓ water cooling system (temperature of water from  $+13^{\circ}\text{C}$  till  $+15^{\circ}\text{C}$ ,
- ✓ system of water conservation (time of safe storage 3 months).

The installation is also equipped with:

- ✓ control and measurement system showing actual parameters of system status, operating the work of generator set and pump,
- ✓ safeguard system preventing system freezing and its endamage.

The Tank and every pipe installation are equipped with electrical heating system as well as insulation preventing of water and system freezing at the temperature down to  $-26^{\circ}\text{C}$ .

## Materials

Every element of the Tank are made of materials admitted to the contact with potable water (AISI 304L).

The Tank is put into the container frame of 20' 1 CX type. Container's frame is equipped with the hook lift system made of high quality steel (S355J2G3).