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E-coat / KTL surface treatment plants

AABO IDEAL

E-coat/KTL expert center

The AABO-IDEAL Group e-coat/KTL expert and service center is situated in Czech Republic. At this facility our highly skilled staff has more than 30 years of experience in designing, manufacturing and installing turnkey e-coat/KTL lines.

We can guide and advise you in the process of making the right choice of system for your business.

INDEX

The advantages of e-coat/KTL....4

The process.....6

Material transport 8

The anolyte circuit..... 10

The reverse osmosis 12

The control system..... 14

TURNKEY SOLUTIONS

Energy efficient and environmentally friendly solutions

AABO-IDEAL Group has more than three decades of experience in manufacturing industrial e-coat/KTL solutions for surface treatment, and over the years we have supplied many lines.

Regardless of whether you require a more basic line or a bigger and highly advanced solution, we always make sure it will be very efficient and that it fits your operation.

Another important aspect is to provide counselling, and to advise you on choosing the very best fit for your business.

It is a well-known fact that the e-coat/KTL process is the most energy efficient and environmentally friendly coating system available. Consumption and waste are kept to a minimum, and at the same time it creates a perfectly uniform coating with low running costs.

However, a perfect result depends on a perfect pretreatment, and AABO-IDEAL Group is your one stop shop when it comes to surface treatment plants.

We provide a full-circle procedure from initial contact across training of your operators to the handover of your plant, and last but not least the service and after sales.

If you have any questions, do not hesitate to contact us.

we know how

The advantages of e-coat/KTL

The properties of this process and the coating results are unattainable for almost all other surface painting solutions, and it makes e-coat/KTL the most efficient technology with a competitive and marketable edge.

Below we have listed some of the main advantages:

First of all

To have full advantage of the e-coat/KTL, a very well-designed pretreatment is necessary. Please contact us about the best solution for your line.

Environmentally friendly

E-coat/KTL has a minimal impact on the environment and represents a limited burden due to very low solvent content, a minimum of emissions, solid waste and wastewater.

Low running costs

Due to the close-circuit design of the e-coat/KTL line, a minimum of paint loss will occur during operation, and close to 100% consumption of the paint can be registered.

Furthermore, the workload and the need for operators is low on the line.

Best protection

Even at a relatively thin layering, e-coat/KTL creates the best corrosion protection (tested in salt chamber for more than 1000 hours).

Perfectly uniform

E-coat/KTL creates a perfectly uniform coating thickness over the entire surface of the products/items. This includes hard-to-reach areas, on edges, in corners, and on complex parts.

High adhesion

The coating has a high adhesion and is therefore very resistant to mechanical impact.

Flawless surface

The process ensures that no droplets or "sagging" occur on the surface.

Multiple possibilities

This coating is mainly used for protection, either as primer or as a final single-layer surface treatment.

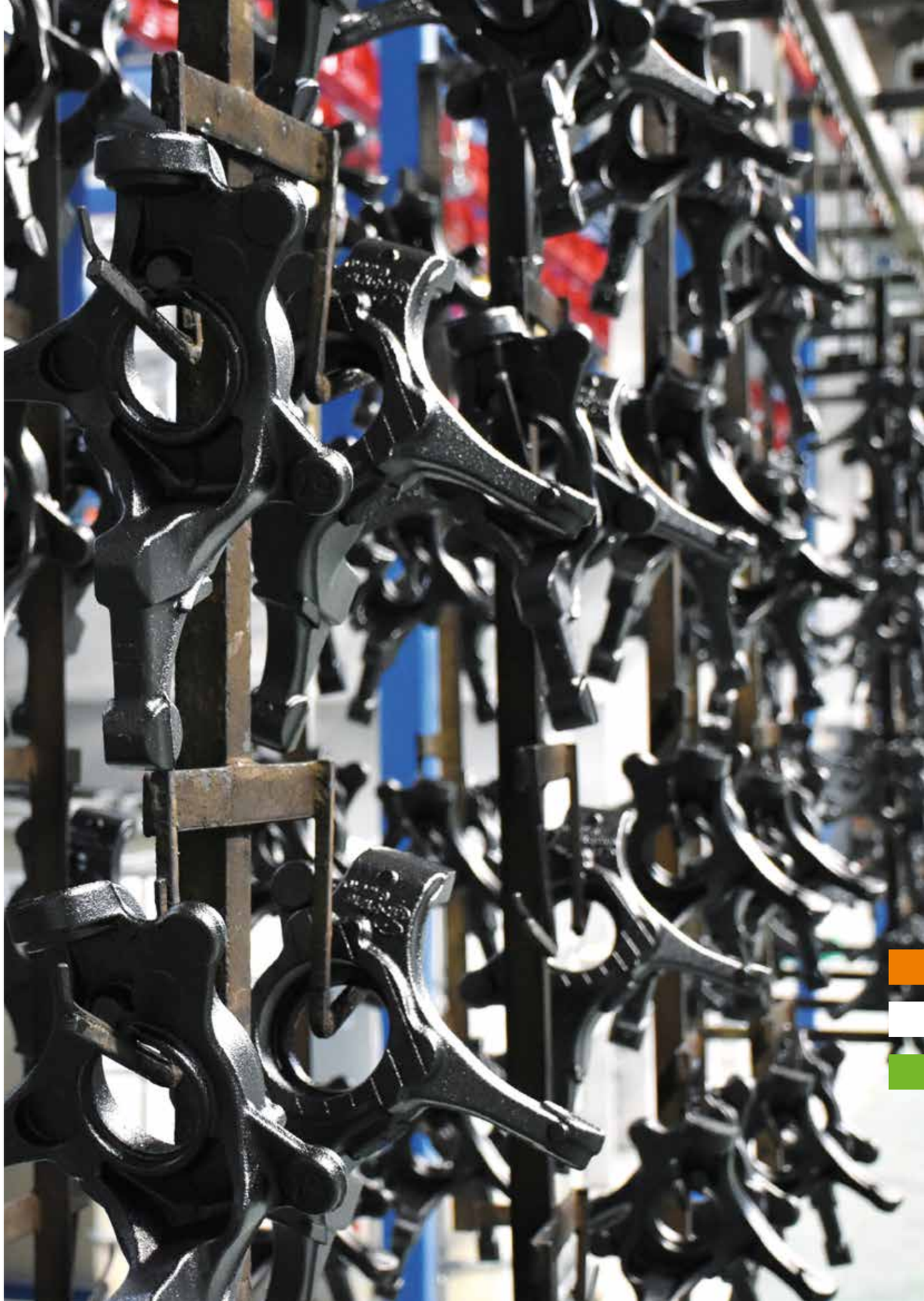
When used as a primer, a powder or liquid paint topcoat can be applied.

Easy to operate and control

The e-coat/KTL line is easily automated, and very easily operated and process controlled.

A safe line

The e-coat/KTL line requires no fire, explosion or special safety measures.



The process

The cataphoretic painting system uses cationic water-based paint, based on epoxy or acrylic resins, pigments and low content of organic solvents (below 1%).

The painting

During the coating, the product/item is immersed into a painting bath and connected as a cathode.

By applying a DC voltage between the product/item and the counter electrode (anode), an electric field is created. Polycations travel to the cathode, whereby reaction with hydroxyl ions formed by decomposition of water causes them to lose solubility and precipitate on the surface on the product/item.

As the thickness of the coating increases, the resistance of the layer increases causing the deposition rate to decrease. When the desired thickness is reached over the entire surface, further precipitation stops. The coating thickness is regulated by increasing or decreasing the voltage level.

The electrically deposited layer adheres firmly to the substrate, and the excess paint is rinsed off. For the coating to acquire the final properties, the product/item must undergo a heating treatment at temperatures of approx. 160 to 180^{0}C in a curing oven.

The function

A circulation pump keeps the paint in motion. It brings the paint from the bottom of the tank and back to the surface. An overflow ensures a constant level and is led to a reservoir tank to which the new paint is added.

The paint is kept clean and fresh by a very advanced control of the paint flow through the filters and the anolyte system. Adding new pigment and binder is essential as well.

The control of the current can either be automated, ensuring adjustment to the load of m2 in the tank, or it can be simpler if the production is consistent.

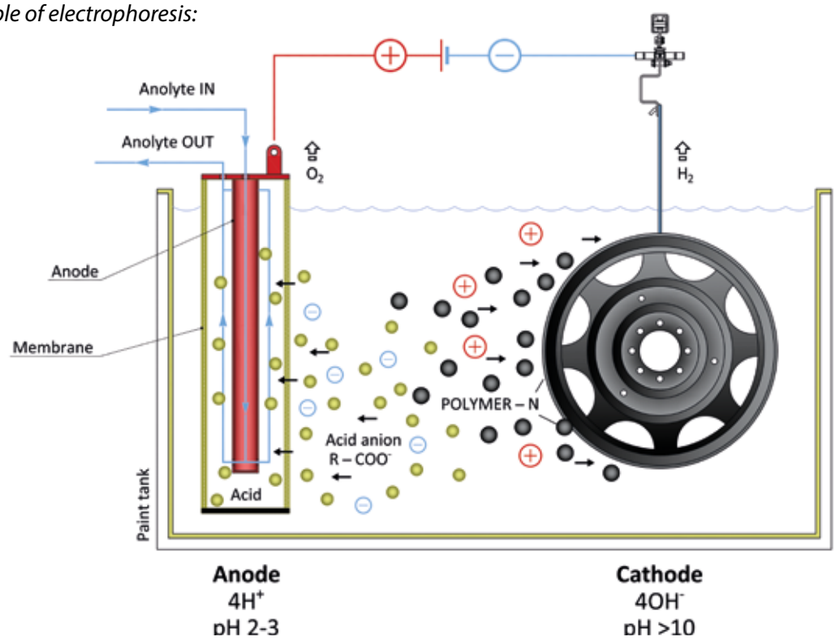
The construction

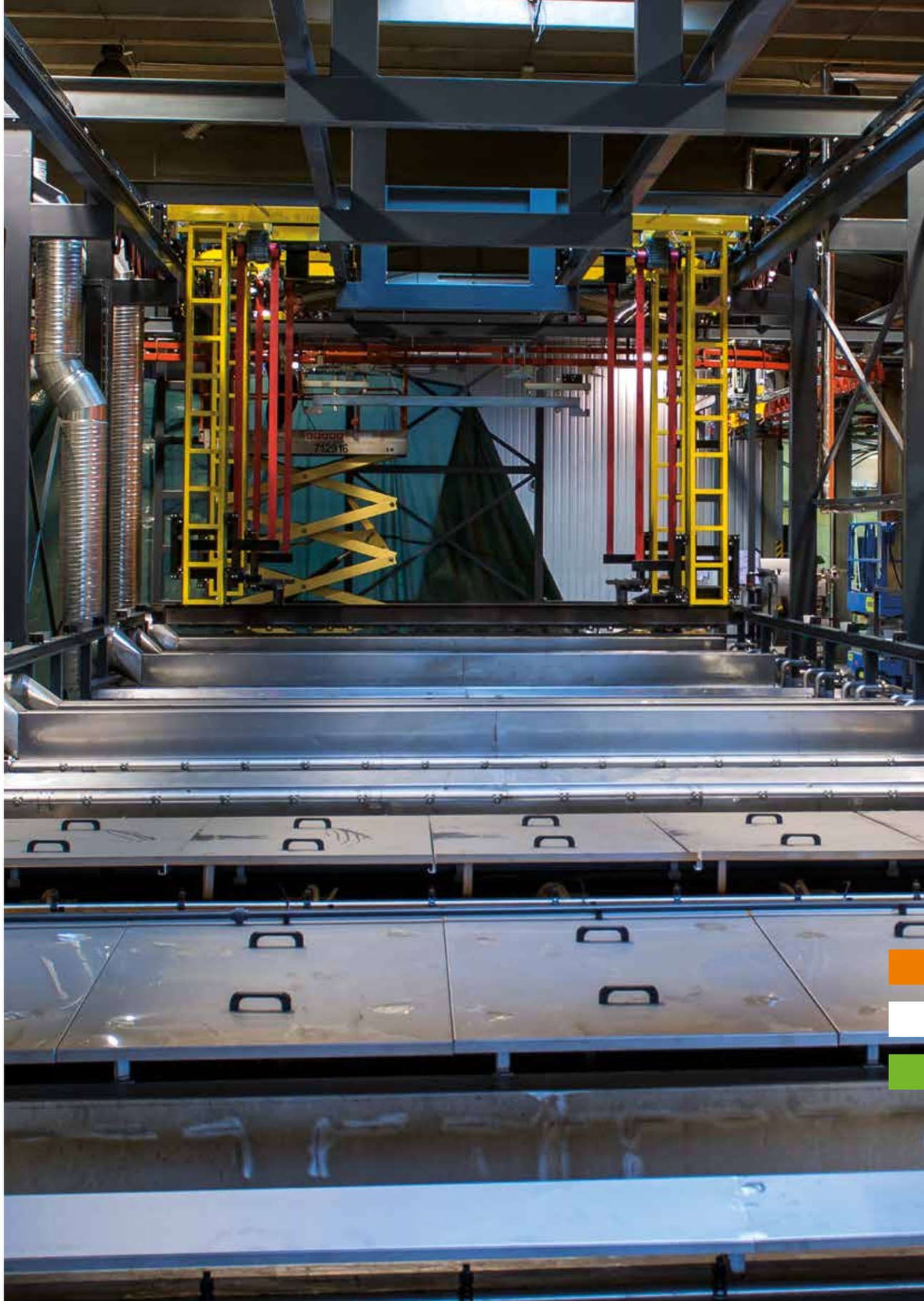
The paint tank consists of a stable welded construction with a shape adapted to the products/items and the conveyor guiding. The tank is reinforced with a strong steel construction.

The outlet is provided with a filter for protection of the pump. The pump is chosen individually and depends on the paint type used.

Temperature control is always part of our delivery with no exceptions: Precise temperature control is essential to maintain paint application process quality and consistency. The paint circuit is equipped with a plate heat exchanger, chiller, and hot water boiler achieving temperature accuracy within 1 °C.

The principle of electrophoresis:





Material transport

E-coat/KTL lines can be divided into two basic types according to material transport:

- **Tact line** – with a transport system in which the products/items are transported in a certain cycle.
- **Continuous line** – with a chain conveyor making the products/items pass continuously.

The choice of type depends on a number of factors, the most important being:

Conveyor type and overall system layout is defined by many factors and their combination, mainly by

- coated products dimensions
- rack weight
- production volumes
- chemical pretreatment process requirements
- following top coating options

The tact line

Tact lines are well suited for smaller production volumes and batches such as long or bulky items/parts, or a wide and often changing range of items/parts of various shapes, sizes and materials.

Tact lines are characterized by high flexibility due to the ability to assign each batch to a different painting parameter or using various chemical treatment processes.

The continuous line

Continuous lines are very suitable for large outputs and large series of the same or mutually similar items/parts.

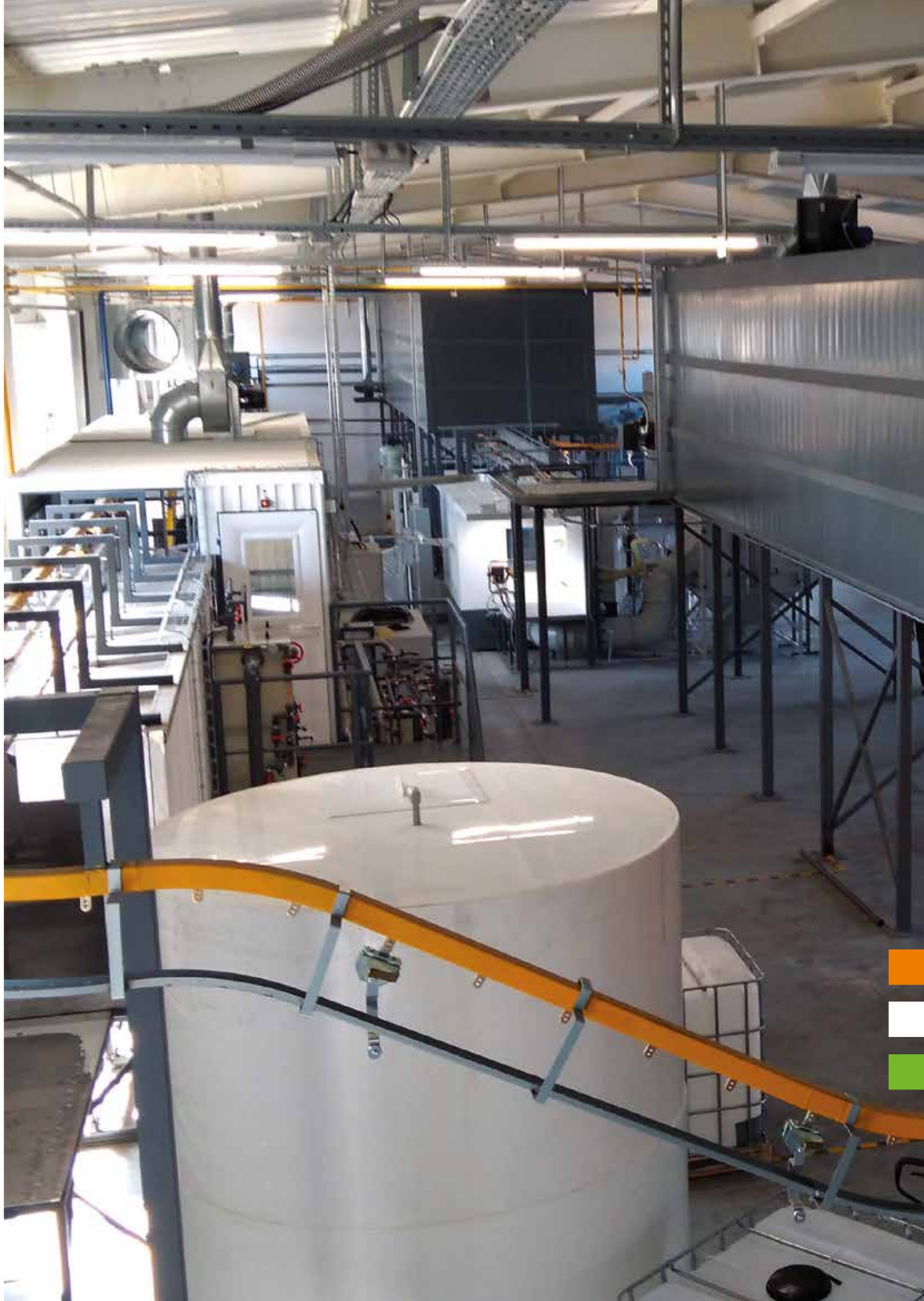
This type of line is, however, not suited for very large items/parts.

Continuous lines are characterized by very high productivity and lower management costs.

The basics

A complete electrophoretic line consists of the following technological units:

- chemical pretreatment
- paint application tank
- paint layer polymerization
- cooling down
- air cleaning
- transport system
- raw water pretreatment
- wastewater treatment
- process control



The anolyte circuit

The anolyte circuit automatically controls the paint tank pH.

The anolyte tank is equipped with conductivity meter used for automatic dosage of DI water to keep the conductivity in the range recommended by the paint supplier.

Standard anodes

As standard, our lines are provided with anode tubes with extruded ion-exchanging membranes and stainless steel/titan electrodes.

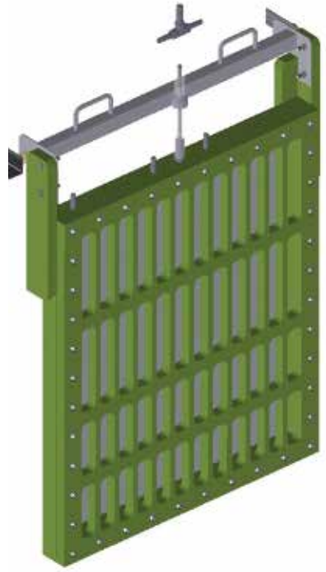
The anode tubes have high efficiency and a low energy consumption. The membrane lifetime is 10-12 years, and the operation with cathode/anode ratio ranging from 4:1 to 7:1.

The tubes are installed along both sides of the paint tank. Additional electrodes might be installed on the bottom in case of painting large surface area.

Optional anodes

Alternatively, planar anode boxes with ion exchanging membranes can be installed. The boxes are optional and not standard and depend among other things on the shape and form of the products/items.

The planar anode boxes are installed along both sides of the paint tank.



The reverse osmosis

The reverse osmosis (RO) is, in its essence, a water treatment process that removes contaminants from water.

The process

A reverse osmosis system removes sediment and e.g. chlorine from water with a prefilter. Hereafter, water molecules are forced by pressure through a semi-permeable membrane.

The membrane has small pores blocking contaminants but allowing water molecules to flow through and thereby removing up to 98% of total dissolved solids.

After the water exits the RO membrane, it passes through a postfilter filtering out the contaminants, which are flushed away and leaves clear water. The clear water then enters a dedicated tank.

The reverse osmosis system comes in various sizes and capacities.

The reverse osmosis unit

The RO unit consists of the following main parts:

- osmosis membrane
- membrane tubes
- centrifugal pump
- prefilter
- postfilter
- conductivity sensor
- flow meters
- quality flash valve
- level sensor for automatic operation
- 2,000 L tank(s)
- PLC control system

The RO unit is constructed as a modular standard design. It is mounted on a frame which makes it very easy to maintain and to upgrade and/or expand when necessary.

The control system

The AABO-IDEAL PLC based control system is designed with an intuitive and easy access interface, using mainly icons and as little text as possible.

All operator panels are HMI colour touch screens showing a very straight forward screen selection, main menu, and submenu.

To offer the very best solution for any requirement, we have created a basic system to start from, and a range of additional options to choose from depending on your operation.

Should you extend your line over time with more functions or processes, our control system is future-proof for upgrades and extension.

Please contact us for more details about the content of our control systems.

The support

At AABO-IDEAL Group we fully understand that a breakdown or any other kind of operational disturbance requires a very quick response and immediate support.

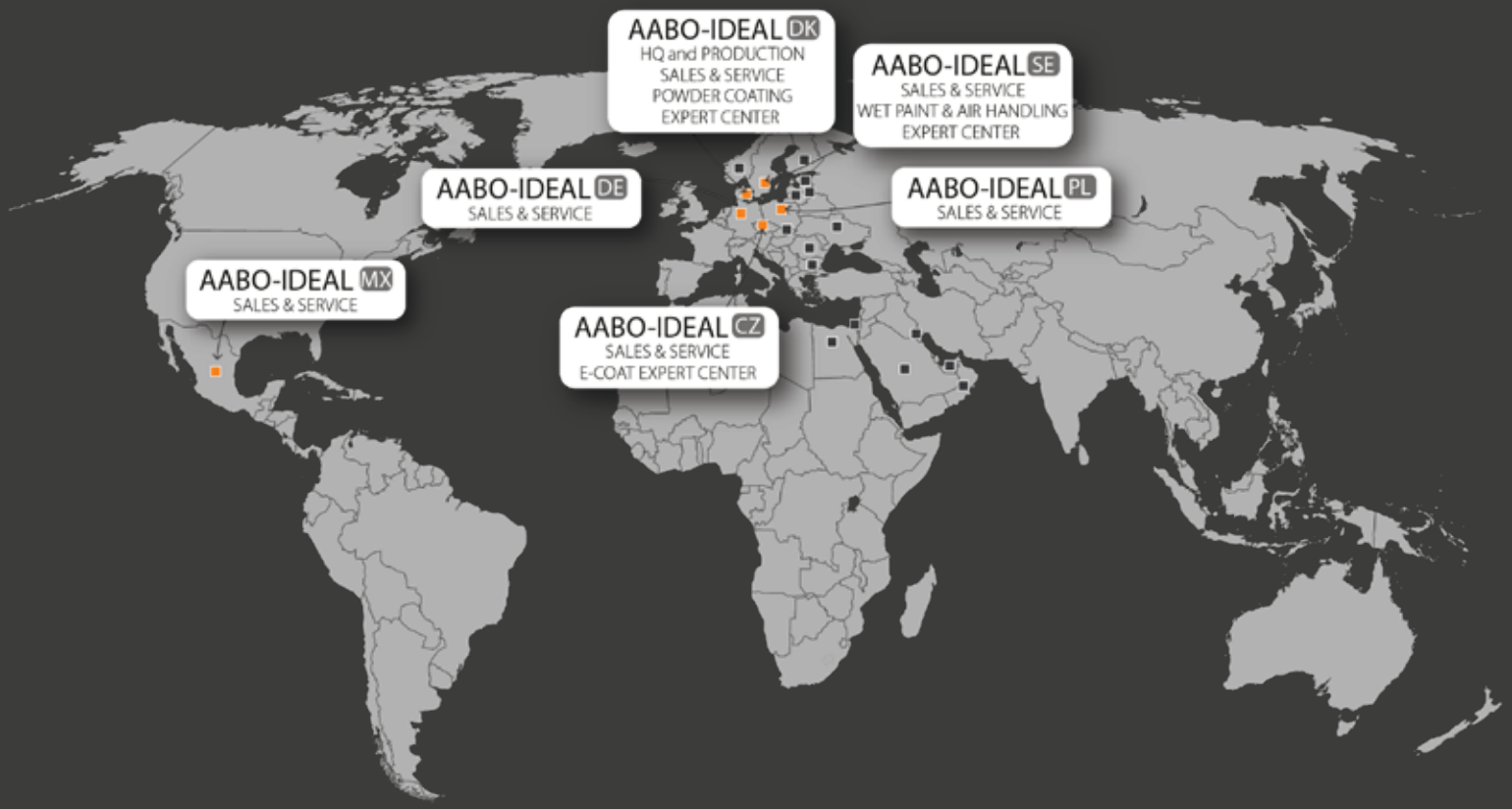
Most of our control systems installed are prepared for online service, which – if chosen – enables remote access for our service team to perform programming, upgrades, trouble shooting and system monitoring.

Please contact us for more information about the online service.

More information

For more information about IT support, please contact our Service & After Sales Department on: +45 6361 8149, or service@aabo-ideal.com.

You can also find more information on our website: aabo-ideal.com.



■ AABO-IDEAL headquarters and subsidiaries

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AABO-IDEAL E-COAT/KTL SURFACE TREATMENT LINES 2025