



## **CHEMICAL TREATMENT PROCESS**

### ***Pickling bathes***

After several years, FIB has now launched a new design of pickling bath that is optimising the aspects of maintenance, tightness control and liquids dragging. The **TORNADO** pickling comes alive!

The general design of the bath is oriented towards the exploitation of contemporary lines where the running speed of the wires is beginning to lead to problems as far as the dragging of liquids as well as lengths are concerned.



### **Why "TORNADO"?**

A unique system of water fountains with high turbulence is allowing an intense cooling of the wires as well as an extremely efficient rinsing of the pickled wires.



### **TORNADO as far as acid is concerned.**

The injection of acid is made through several slits located under the wire field. These slits being distributed all along the length of the acid plate, a turbulent exchange between the wires to be pickled and the acid is ensured. This allows to permanently have a rate of acid renewal during the whole pickling process.

### **TORNADO as far as the control of the liquids dragging is concerned.**

An internal system for the control of the dragging of liquids from bath to bath is ensured by air knives with high flow incorporated inside the pickling bath. As the system is working in closed circuit, there is no emission of air outside the bath.

### **Advantages :**

- ☺ No scrubber
- ☺ High turbulence of the acid
- ☺ New design of sealing (thick water sealing)
- ☺ Very efficient rinsing of the wires in turbulent mode
- ☺ Internal air wiping into the bath in order to control the liquid dragging
- ☺ General improvement of the construction (full PP construction)
- ☺ Lifting up of the water without pumps
- ☺ Acid circuit: no possibility of leakage on the acid pump thanks to the use of vertical pumps
- ☺ Automatic threading improved
- ☺ Possibility to automatically control the acid concentration



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More than 20 years ago FIB was the first equipments manufacturer that introduced the "fumeless" pickling thanks to the use of water curtains (more than 56 FIB pickling baths currently equip lines in more than 20 countries).

Since that time this technology has been copied many times and finally, only a few innovations have been brought to these baths since decades.

FIB believed that it would be useful to revise the general design of the pickling bath that has therefore been improved on several points.

#### **General design:**

The general design of the bath has been revised. The latter is now made in polypropylene, what is giving the possibility to obtain a much more balanced construction as far as the design aspect and the general aspect are concerned.



### Cooling, rinsing and tightness :

The part related to water curtains has been revised. Indeed, the use of classical water curtains is showing the following disadvantages:

- ☞ Presence of pumps for the circulation of water
- ☞ Fineness of the water curtain and therefore, possible instabilities of the water curtains
- ☞ Presence of cascades and, as a consequence, contact of acidulated water with the ambient work atmosphere
- ☞ Openings at the level of the cover with the risk of vapor emissions in the factory if the water curtain is not tight

An original technology (patent pending) is allowing the obtaining of water curtains having a height and thickness that can reach up to 30 cm height and 15 cm width approximately (1 ft). Thanks to this technique, the use of water pumps can be eliminated and **the cover** of the cooling part of the pickling bath **can be completely closed**.



◀ Tightness curtains without cover



### Acid circuit:

The circulation of acid has been revised with the particular improvement of :

- ☞ The **acid turbulence** on the acid plate
- ☞ The piping aspects with the use of vertical pump systems (**no acid leaks are possible**)

The acid is fed by **a series of slits that are transversal compared to the movement of the wires and which are situated under the wire field**. These slits are disposed at a regular distance **on the whole length of the acid bath**. This system is therefore allowing to have a significant turbulence all along the pickling process, what is favorable for chemical reactions. Moreover, the regular injection of fresh acid in several points is also a favorable element.





**Control of the liquid dragging from bath to bath:**

Thanks to a technology of internal **air knives** in closed circulation, the dragging of fluid from bath to bath can be avoided.

This technology is giving the possibility to use this type of installation in the case of high speeds of the wires as well as in the case of big diameters.

**Threading up:**

The threading up system has been revised in order to allow an optimizing of the threading-up operations as well as the protection of the mobile elements against the aggressions of acid.



**Continuous control of the acid concentration:**

As an option, the bath could be automatically monitored in order to keep the acid concentration at a constant value.

This allows to minimize the controls in laboratory and is offering an easier way of handling your eventual neutralization plant.

