

MBtech

your cleaning partner

106 chemin de la Gironde - 31470 - Saint-Lys FRANCE

☎: (33)5.61.91.71.85

Fax: (33)5.61.91.33.60

commercial@mb-tech.fr

MBtech NC25 PCB/PCBA Cleaner



COMMERCIAL BROCHURE

PRESENTATION OF THE EQUIPMENT

General Presentation

MBtech NC25 has been developed to clean PCBA from flux as well as solder paste from misprinted PCB. **This equipment has been designed to use water based or semi water based cleaning agent.** To reach a high level of efficiency the equipment uses a **patented filtering system and unique spray under immersion cleaning action.**

General Specifications

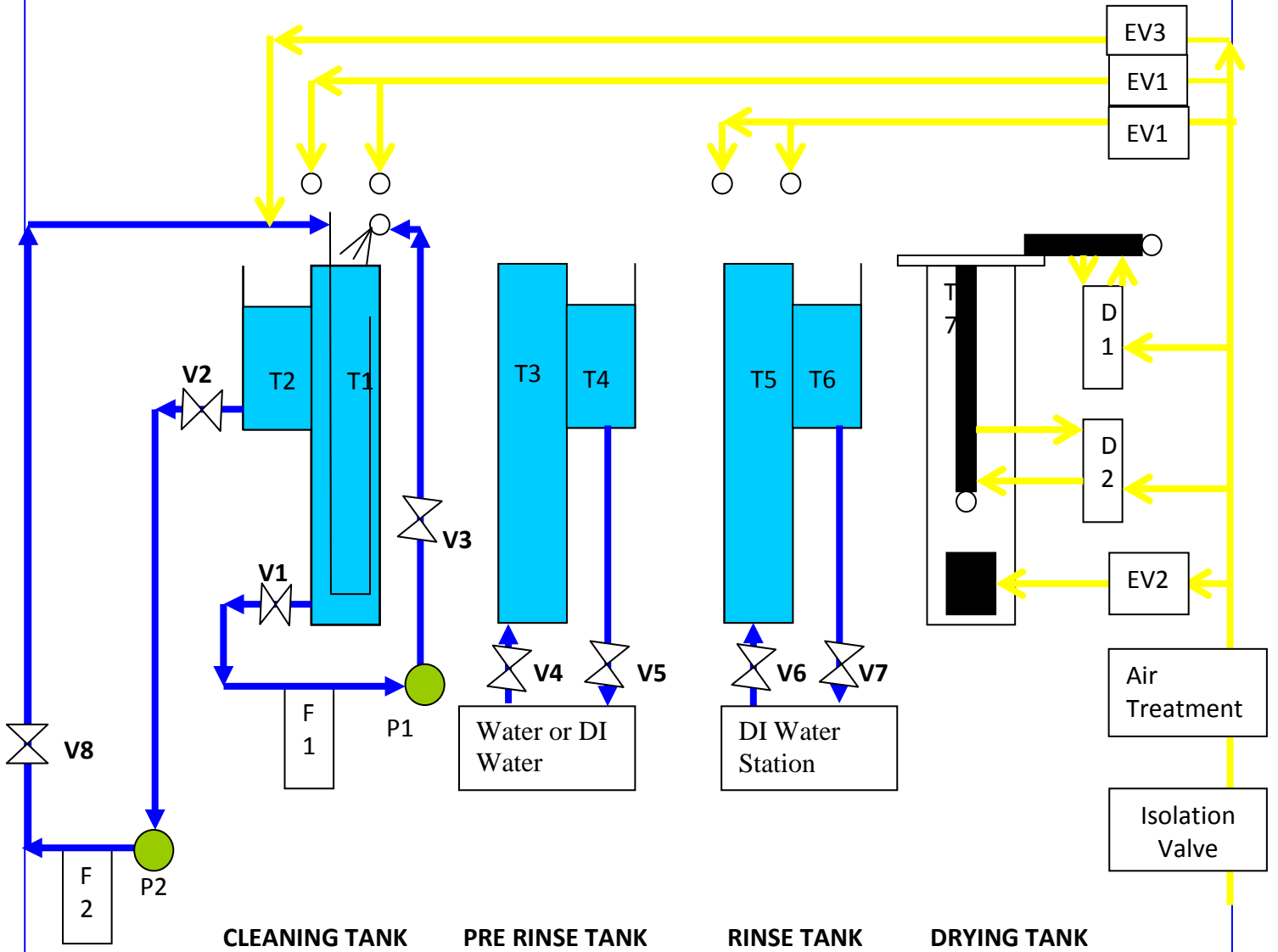
- Dimension: Width: 1,00m; High: 1,90m; Depth: 1,60m.
- Empty weight: around 700 kg.
- Capacity: Wash tank = 80 liters cleaning liquid,
Rinse tank 1 = 60 liters DI water,
Rinse tank 2 = 60 liters DI water.
- Power supply: 380/400 V – 50Hz (60Hz on request) – 3 phases + Neutral + Ground.
- Max. Power: 8500 watts.
- Compressed air supply: 5,5 bars, maximum flow rate: **250L/min, air without oil and water.**
- Sound level: under 75 dB.

Machine Description

NC25 is composed of:

- A stainless steel chassis build on a vessel and equipped with 2 doors:
 1. A first one on the top of the front face giving access to the loading area (Post 1),
 2. Another one on the top of the rear face giving access to the unloading area (Post 2).
- A Control panel with colour display and soft keyboard on the right side of the machine (Post 3).
- A transfer system with synchronized chains with three phases motor and frequency converter allowing the transfer of frames holder to each operation of the cleaning process.
- A gravity conveyor system for loading and unloading.
- A double stainless steel cleaning tank (T1 and T2) with isolation valves (V1 and V2) and a draining valve (V3). Liquid comes back on top of the tank through SL1
- A double stainless steel pre-rinsing tank (T3 and T4) with isolation valves (V4 and V5). Conductivity meter (Cond1) check water quality when coming back. This tank can be in open or close loop.
- A double stainless steel rinsing tank (T5 and T6) with isolation valve (V6 and V7). Conductivity meter (Cond2) check water quality when coming back. This tank can be in open or close loop.
- An aluminium drying tank (T7) with forced convection system and vacuum pump (VP).
- A filtering system combined to the cleaning tank (F1 and F2) with two pumps (P1 magnetic driven and P2 centrifugal) and isolation valve V8 used when operating filter F2 changing.
- In option, a DI water production and regeneration system connected to the 2 rinse tanks.
- A system of spray arms to create an air knife (SL2, SL3, SL4 and SL5).
- A pneumatic system with air treatment, electrovalves (EV1, EV2, EV3 and EV3) and distributors (D1 and D2).

The different tanks and systems linked to these tanks are represented on the diagram on the next page.



Working Principle

Posts Identification

This equipment is composed of three distinct posts and only needs one operator to work.

Post 1: Loading

The loading area is behind the top door of the front face. Boards to clean are loaded in the machine from this post.



Front face

Post 2: Unloading

The unloading area is behind the top door of the rear face. Cleaned and dried boards are unloaded from the machine at the end of the cycle from this post.

Post 3: Control Panel

It centralizes information about the different failures that could occur while the machine is running:

- Wash tank level alarm,
- Pre rinse tank level alarm,
- Final DI water rinse tank level alarm,
- DI Water conductivity alarm rinse 1 and 2,
- Air pressure and vacuum alarm,
- Pump P2 pressure alarm,
- Frame position alarm,
- Door open or cycle not launch,
- Sprayer wrong positioning,
- Unloading conveyor full alarm,
- Conveying system positioning alarm,
- Vacuum tank cover alarm,
- Conveying sensors alarm.
- ...

The display also allows to parameter the machine. Are also present all the buttons to drive the machine:

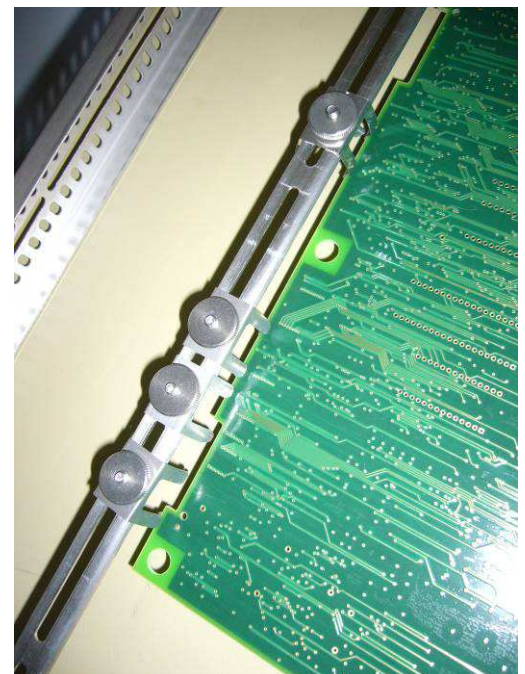
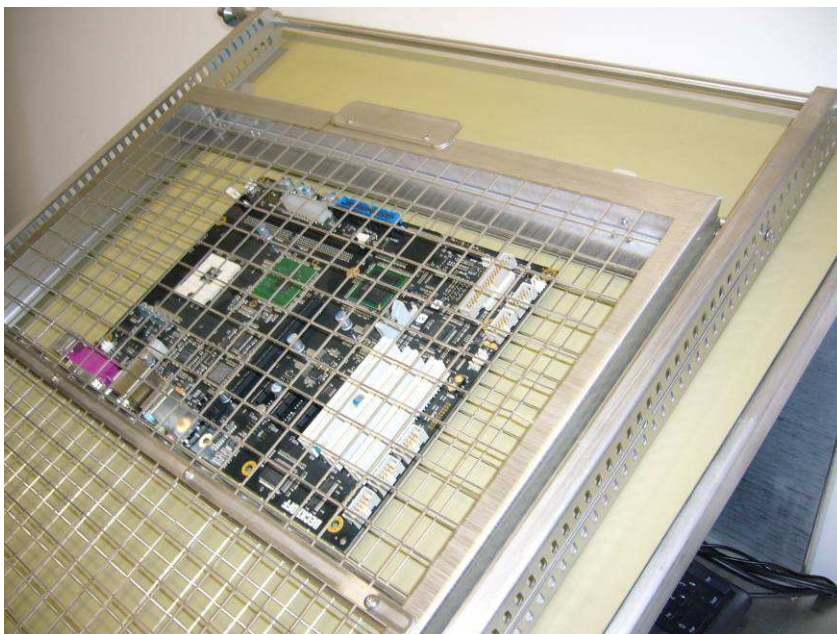
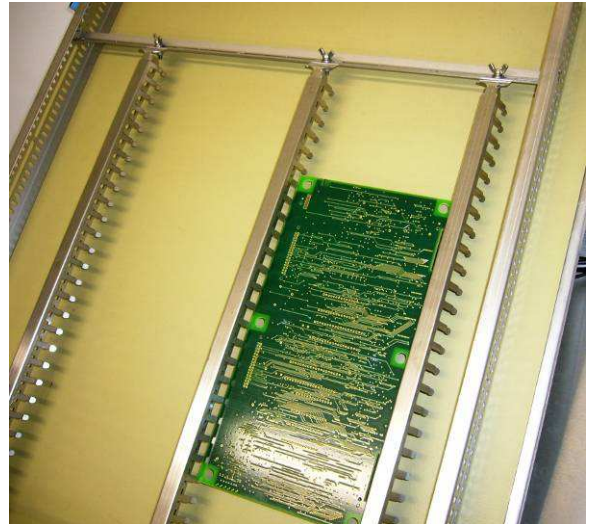
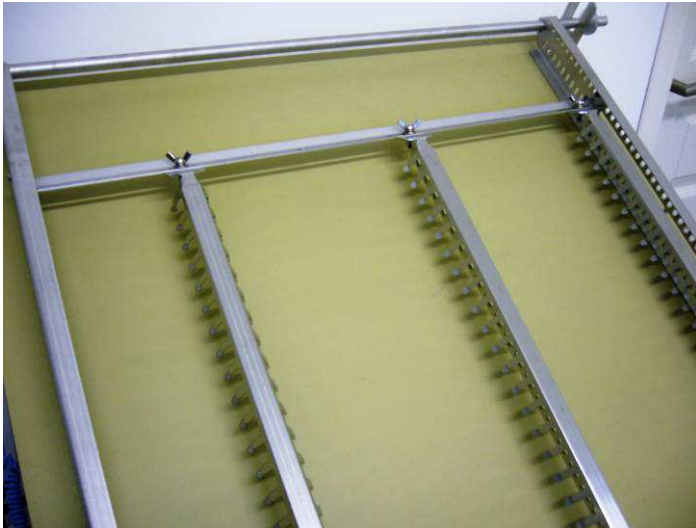
- ON / OFF button to switch on or off the machine,
- START button to start a cycle or clear an alarm,
- Emergency Stop mushroom button.



PCB Frame holder

Very easy to use, without any tools, it allows transferring boards stored on the frame through each step of the cleaning process.

These frames offer an up to 580x530mm modular area to store PCB with maximum width of 50mm in standard and 90mm in option.



Loading Conveyor

They allowed storing up to 5 frames at the same time and can be loaded at any time even during a cycle.

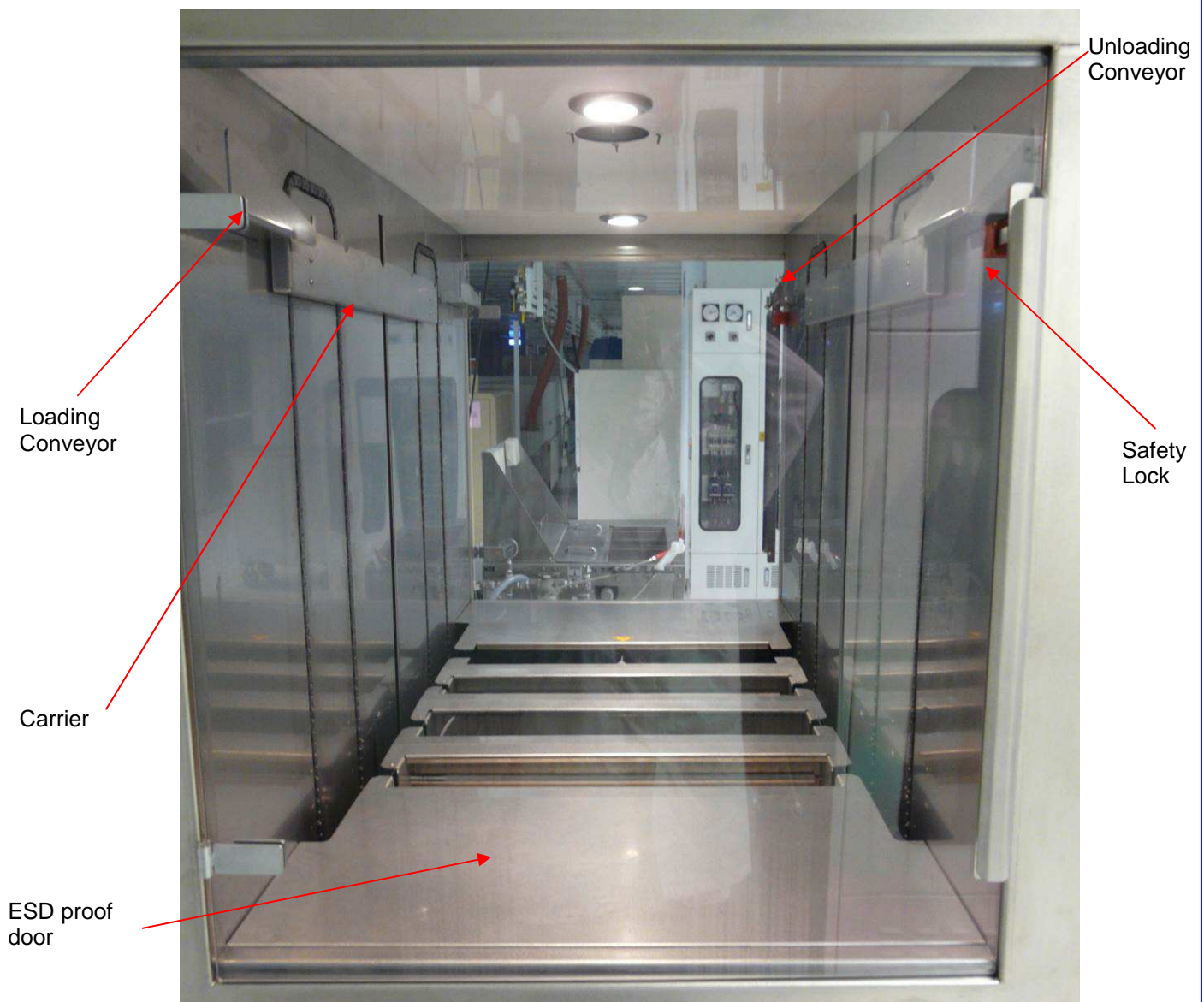
Conveying System

This system is composed of a dual speed motor / a torque limiter / a system of synchronized chains / two carriers. The two carriers take frames on the loading conveyor and transfer them in the cleaning tank. At the end of the cycle, the cleaned frame is transferred to the rinsing tank while the next frame, waiting on the loading conveyor, is taken to go to the cleaning tank. And so on, after the rinsing, the frame is transferred in the drying tank and then on the unloading conveyor.

Carriers are equipped of inductive sensors that allow knowing the position of the frames during the transfer phases and also to identify bad positioning of the frames.

Unloading Conveyor

They received frames from the drying operation. They allowed storing up to 5 frames and for the safety of the machine an alarm stops the cycle when there are 5 frames on it. It is of course possible to unload the conveyor at any time even during a cycle.



Cleaning Tank

Made out of stainless steel, it is divided into two tanks by a partition: a main tank T1 that permanently overflows into the second tank T2 (overflow tank). This system allows separating the residues by getting the floating residues from T1 into T2.

An agitation system gives an up right movement to the frames while a spray arm is moving all along the width of the tank creating a turbulent flow closed from the boards. The combined action of agitation and turbulence help to easily remove the residues. This sprayer, also called “bubble sprayer” is equipped with a flow limiter and flow meter to adjust the compressed air injection within the flow of cleaning fluid.

At the top of the tank, there are two air sprayers lines SL3 and SL4 with calibrated nozzles that create an air knife to keep in the tank most of the cleaning liquid remaining on the boards.

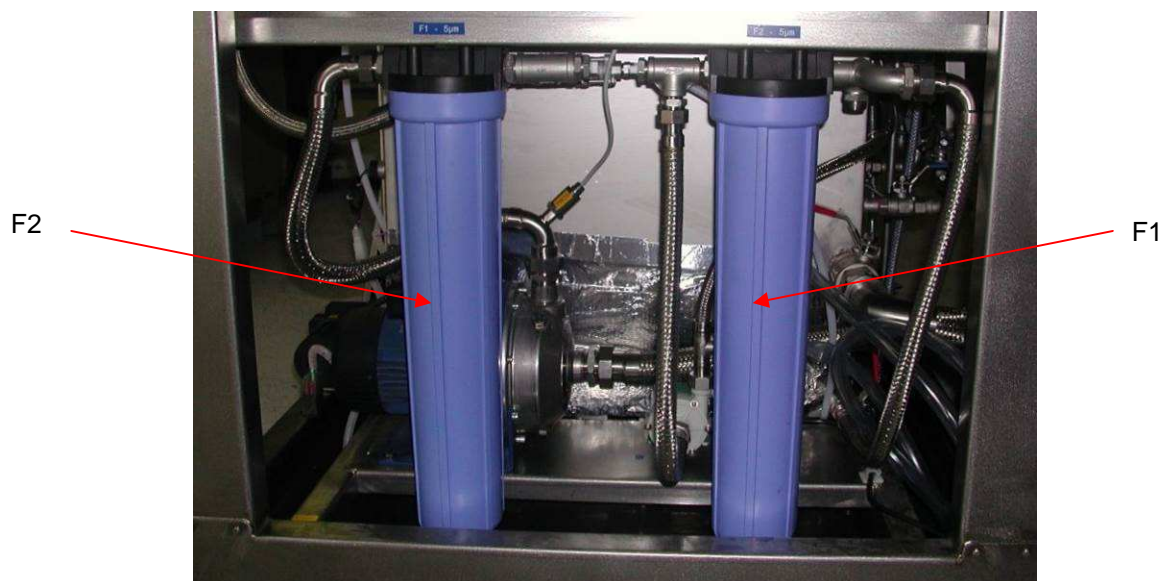
On the sides of the tank, there are heating resistors driven by a precise regulator (+/- 1°C precision) in order to meet the temperature wished. A safety thermostat adjusted to 67°C avoids the liquid overheating because of PLC failure.

Cleaning Tank Filtering System

Behind the bottom door of the front face is the filtering system composed of two independent elements:

1. The fluid sucked into the lower part of T1 may contain particles of glue or heavy residues such as solder paste alloys. The alloy particles and the former are trapped in the 5µm F1 filter cartridge.
2. Likewise in the lower part of T2, the liquid charged with the floating particles that have overflowed from T1 (fluxes of solder paste) is filtered by 5µm F2 filter.

Each of these loops includes a magnetic driven pump to avoid any leaks and a centrifugal pump. Valves at the outlet of T1 and T2 make it possible to change the filters. A pressure sensor makes the use of pump P2 safer. The filters consist in a bowl and an interchangeable filter with porosity of about 5µm.



Pre rinse Tank

This stainless steel tank can be configured into a pre rinsing tank with tap or DI water, in open or close loop. Whatever the configuration is, the goal of this tank is to eliminate the cleaning agent and remaining residues thus to increase the life time of the second rinsing bath.

This tank is equipped with spray arm on the top of the tank to rinse both sides of the boards when getting in and out of the tank during transfer phases.

Rinse Tank

Identical to the cleaning tank, it is linked to the DI water station. It ensures the rinsing of boards by immersion. In this tank, boards are also shacked with the same agitation system as in the cleaning tank.

When the boards rise, they go through the air knife of SL5 and SL6 to eliminate most of the water before drying.

Final rinse tank can be in open or close loop.

Drying Tank

This strengthen aluminium tank is heated up to 145°C maximum. Boards will rise to a temperature around 80°C. The temperature can be adjusted through the display.

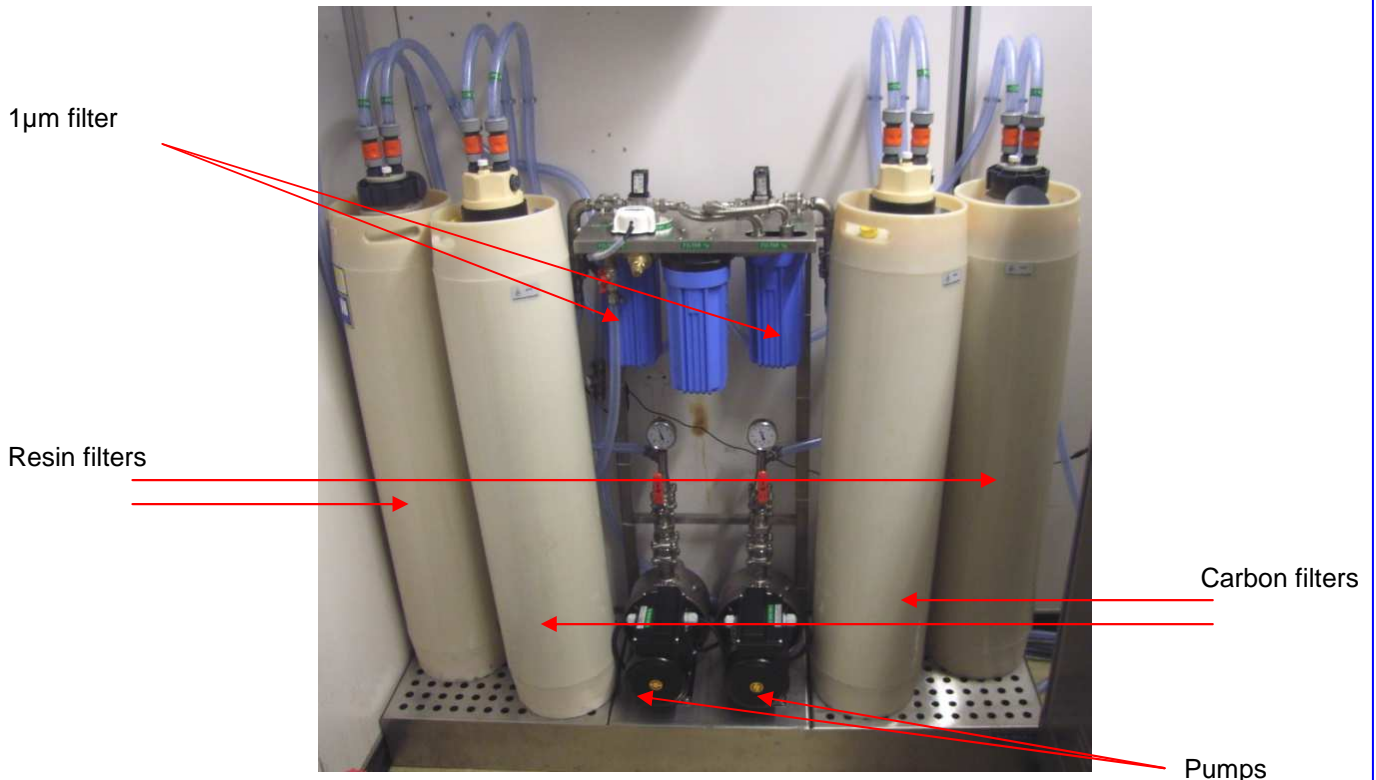
There is a cover on the top of the tank with an airtightness gasket that is moving with pneumatic cylinder system. A fan inside the tank makes forced convection as soon as the cover is closed.

The drying process consists in an alternated cycle of vacuum made with a vacuum pump. This system allows a very efficient drying without overheating the boards. Moisture is removed from connectors, low stand off components and even PCB substrates.

DI Water Station (close loop process)

This DI water production unit is composed of:

- A body with pumps, manometers, filters and isolation valves,
- Active Carbon Cartridges,
- Mix Bed Resin Cartridges,



Conductivity for both rinse tanks are continuously monitored and displayed. An alarm indicates when the threshold, set at 5µS/cm, is reached on 1st rinsing and 1µS/cm, is reached on 2nd rinsing.

Filling System

Stainless steel filling pipes are located on the side of the machine next to the control panel. It allows to fill manually the cleaning tank or the rinsing tanks from the outside during the installation or to add cleaning liquid while the machine is running. These pipes are labeled to identify the fluid to use.

As an option, the refilling of the cleaning, first and second rinsing tanks can be automated.

Automatic refilling options

CLEANING tank: this option will offer an automatic dilution of the cleaning chemistry with the DI water from rinse tank 2. The mixture will be added into the cleaning tank whenever the level is too low.

RINSING tanks: This option makes possible to automatically adjust the level inside the 2 rinsing tanks with a set of electropneumatic valves. It requests to connect the machine to the water network.