

Ultrasonic cleaning systems for Display production

- Pre cleaning after LC Filling
- Final cleaning after visual inspection



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Display production



Display from filling process

Displays contaminated with rest of LC, glass particles from cutting process, dust and finger prints

Pre cleaning

During the filling of liquid crystal the surplus LC material at the charging hole has to be cleaned together with glass particles and glass dust. It is difficult to remove completely all liquid crystal, as ultrasonic and chemical agent have to enter the narrow gap between the glass plates. Consequently the following process steps in the rinsing procedure are very important to avoid a carrying off of the chemical agent.



Visual inspection

Displays contaminated with dust and finger prints

Final cleaning

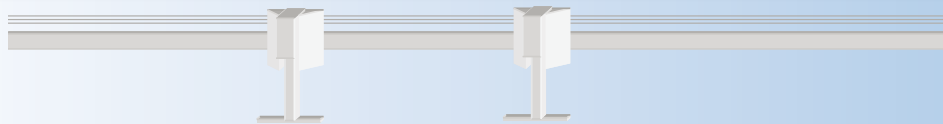
Before Finishing the displays a final cleaning is carried out to remove finger-prints and dust particles. Ultrasonic power is also used to intensify the cleaning and rinsing process. The correct frequency, performance and length of sonification is very important in order not to damage the LC structure with the spacers and the ITO coating. The correct positioning and space between the Displays in the Carriers is also of great significant.



Polar gluing

Standard process for pre - and final cleaning

Pre-Cleaning LCD cell cleaning process Removing of LC material and glass particle after filling and cutting



- Cleaning with Ultrasonic
- Cleaning with Ultrasoni
- Rinsing with Ultrasonic
- Rinsing with Ultrasonic
- Rinsing with Ultrasonic
- Rinsing
- Rinsing with Lift-Out
- Drying

Cycle time 3 – 4,5 min

Final cleaning LCD cell cleaning process Cell cleaning before polar gluing



- Cleaning with Ultrasonic
- Cleaning with Ultrasoni
- Rinsing
- Rinsing with Ultrasonic
- Rinsing with Ultrasonic
- Rinsing
- Rinsing with Lift-Out
- Drying

Cycle time 3 – 4,5 min

Fully automatic standard ultrasonic cleaning machine based on modular components for the pre – and final cleaning of displays



Advantages:

- Modular arrangement according to product requirements
- Ultrasonic equipment with multi frequency technology for the different sensitive products
- Flexible integration into the production process (In Line solution)
- Process related flexibility of cleaning line and application
- Well proven components
- Graphically designed control system
- Lower investment costs through standardization
- Adjustment of investment costs to the shortened product lifecycles



STC 370/880/250/7–WLT- LRS 2



- Type Robot machine for **pre - cleaning** of mobile TFT displays after filling process
- Cleaning product: TFT-displays
- Pollution: rest of LC material, glass particles from cutting process
- Process: water based with hot air drying
- Prophetical system: bath care
- Throughput: 9600 Displays/h
- Machine speciality:
- Multifrequency 35/130 kHz for cleaning – and rinsing support
 - Machine control for process and transport with industrial PC including process visualization



STC 370/880/250/7–WLT- LRS 2



- Type Robot machine for **final cleaning** of mobile TFT displays before polar gluing
- Cleaning product: TFT-displays
- Pollution: glass particle, finger prints, dust
- Process: water based with hot air drying
- Prophetical system: bath care
- Throughput: 9600 Displays/h
- Machine speciality:
- Multifrequency 35/130 kHz for cleaning – and rinsing support
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Products for display pre – and final cleaning

Flex 1 und 2

X-tra 250 / 550 / 800 / 1200 / 1600



Ultrasonic – and rinsing units for display cleaning with water based chemicals and rinsing process
Ultrasonic available in two multifrequency versions 25/45 kHz
35/130 kHz
Options: Agitation, Pump – Filter unit for bath care



X-tra Line

250 / 550 / 800 / 1200 / 1600



Modular system with standard units. Can be individually combined according to the process requirements for the pre – and final cleaning of displays.

Advantages:

- Industrial units in different sizes and options
- From manual units to fully automatic versions with transport robot
- Elma x-tra line can be extended step by step according to your needs and available budget
- Modular cleaning system for different cleaning requirements
- Extensive range of options and peripheral devices
- Short delivery time
- Plug & Clean
- Choice of different cleaning programs in connection with transport system
- Interchangeable units and options for later modification and upgrade of cleaning requirements possible



Accessories

Beside cleaning units and machines, Elma offers also a big range of peripheral systems.

Water treatment systems for softening rinsing water, reosmose water and di – water for point of use or closed loop application from 100 – 2400 l/h.



Laminar flow units to cover rinsing and drying process steps inside the cleaning machine by clean room air.



Pump filter units for continuous bath care of cleaning and rinsing tanks.

