



SES InfinityLine

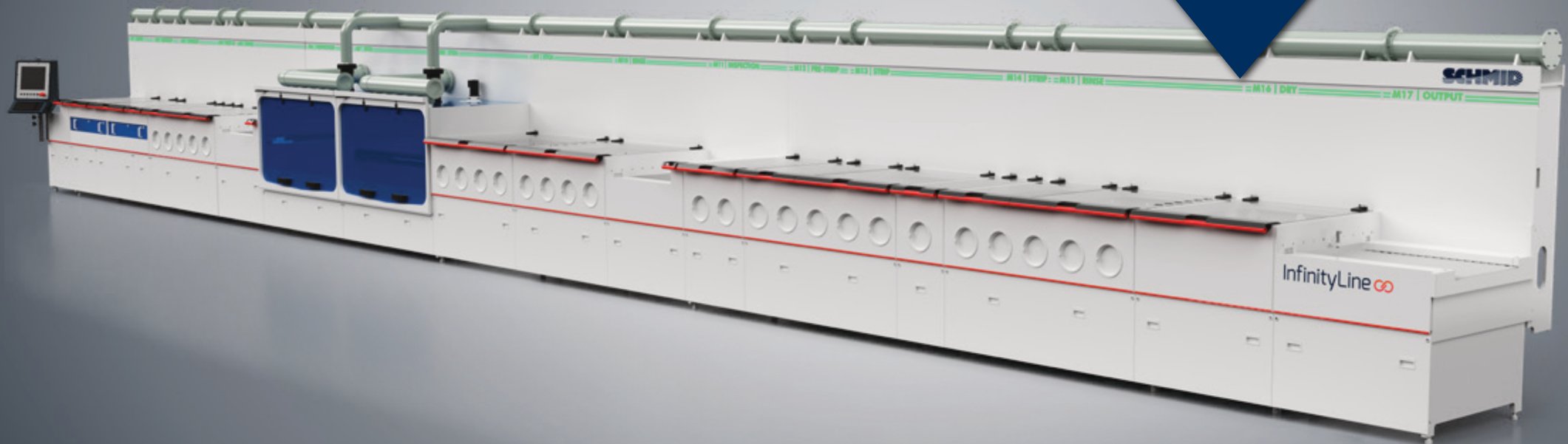
Alkaline Etching with Vacuum Etching System (Option)

In an outer layer line, the photoresist is used to build up an additional deposited metal resist layer. This plating resist is removed in the resist stripper with an alkaline solution. In the etching section, the copper not protected by the metal resist is etched off with an ammoniacal etching solution. In final step, the metal resist layer (Sn or SnPb) is removed in the tin stripper. At the end of a SES line, a highly effective dryer system with dry jets ensures perfect drying of the printed circuit boards.

InfinityLine

Advantages SES Line

- Innovative filter technology for stripping of the plating resist
- Reduced chemical and water drag-out helps to reduce the production costs and to avoid high costs for the water treatment especially after the plating resist stripper
- Magnetic-driven conveyor system in dryer and output sections for particle-free production
- ESD transport to avoid electrostatic shocks to the outer layer with fine structures and panels with embedded components



VACUUM ETCHING

Vacuum etching system for alkaline etching modules

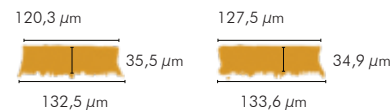
Thanks to the vacuum etching system with suction bars and the powerful suction blower, the well-known puddle effect on the top side of the panel during the etching process has been extremely minimized. In addition, the faster exchange of the etchant on the panel surface increases the standard distribution and the etch factor.



Alkaline etching results with vacuum system:

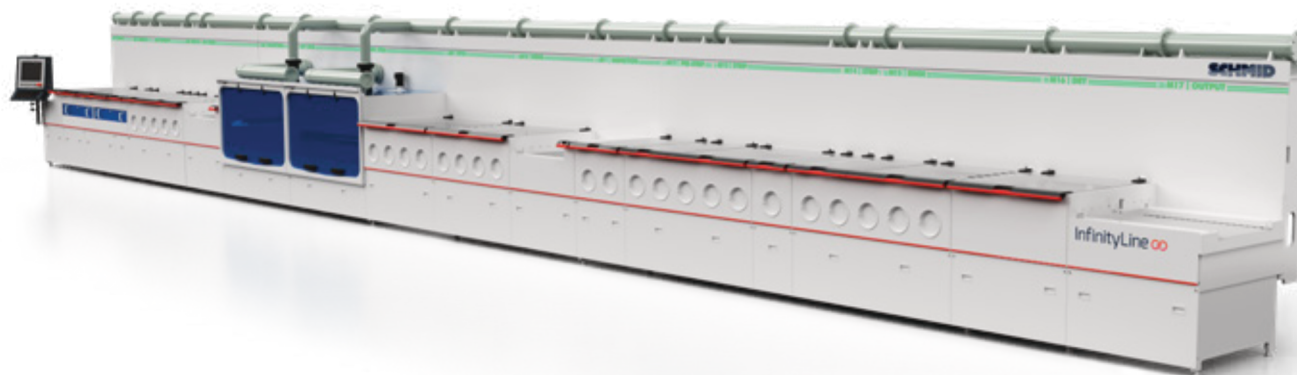
- For alkaline etching with a high etching rate and a good etching factor > 5
- For thick copper etching applications to obtain steep conduct edges
- For Cu reduction to reduce the standard distribution $< 1\mu\text{m}$
- Significant reduction of the etching undercut with a high process capability

Alkaline etching results with vacuum system:



Advantages Etching Module

- Advanced vacuum etching system for higher etching performance
- Spray manifold with excellent spray pressure distribution in the etching modules for a perfect etching of structured printed circuit boards
- Large sliding door with an inflatable sealing for an advanced sealing of the etching module and for a better accessibility to the module during cleaning and maintenance



Why is the SCHMID vacuum system better than others based on a vacuum injector?

The key benefit of the SCHMID vacuum system over competitors is the powerful vacuum blower system that works constantly even if more air is sucked in by the suction lances instead of etchant due to small plate formats or holes in the panels. Competitors work with a vacuum injector system, whose vacuum becomes unstable and can collapse if too much air is sucked in.

PROVEN AND LATEST TECHNOLOGIES

Intermittent Etching with selective spray pipe control

The intermittent etching is based on a spraying system that removes the effects of the puddle effect on the top side of the board. This application is particularly interesting for etching systems that work without the vacuum. In conjunction with the vacuum system, the intermittent etching will also correct the difference due to the panel plating process. The spray pipes of the spray manifold are equipped with a varying number of spray nozzles (see picture). Each single nozzle pipe of the triangularly arranged nozzles can be controlled directly via the PC. Spraying of the panel works individually with an optimal adjustment to the panel size. The result: An absolutely uniform etching pattern.

Advanced filter system for resist stripping

The entire stripping solution is cleaned by passing it through the filter before returning to the pump tank. Depending on the resist type, a cyclone or a cyclone-drum filter can be used.

Transport system for all PCB formats and applications

Based on disc roller shafts and rollers the system allows flexible adjustment to various PCB formats. It suits rigid boards, inner layers, flexible as well as ultra-flexible circuits ($< 50 \mu\text{m}$).



ELOFAST RECYCLING SYSTEM

Etching in a closed loop system in advanced design:

By consistently optimizing the regeneration processes, the space required for the regeneration system could be reduced to a minimum, while the system has the same effectiveness as before. This results a cost reduction for the equipment and savings for the production plant.

Process Description

First, the etchant is buffered with 80gCu/l in an intermediate tank 1 (80gCu/l). In the subsequent low working tank, on which the easily accessible electrolysis cells for copper harvesting are located, the copper content of the etchant is reduced from 80 gCu/l to 30gCu/l. In the buffer tank, the etchant agent is stored until further use in the etching module. For one electrolysis cell, 3 kg Cu/h can be recovered.

Advantages of Elofast

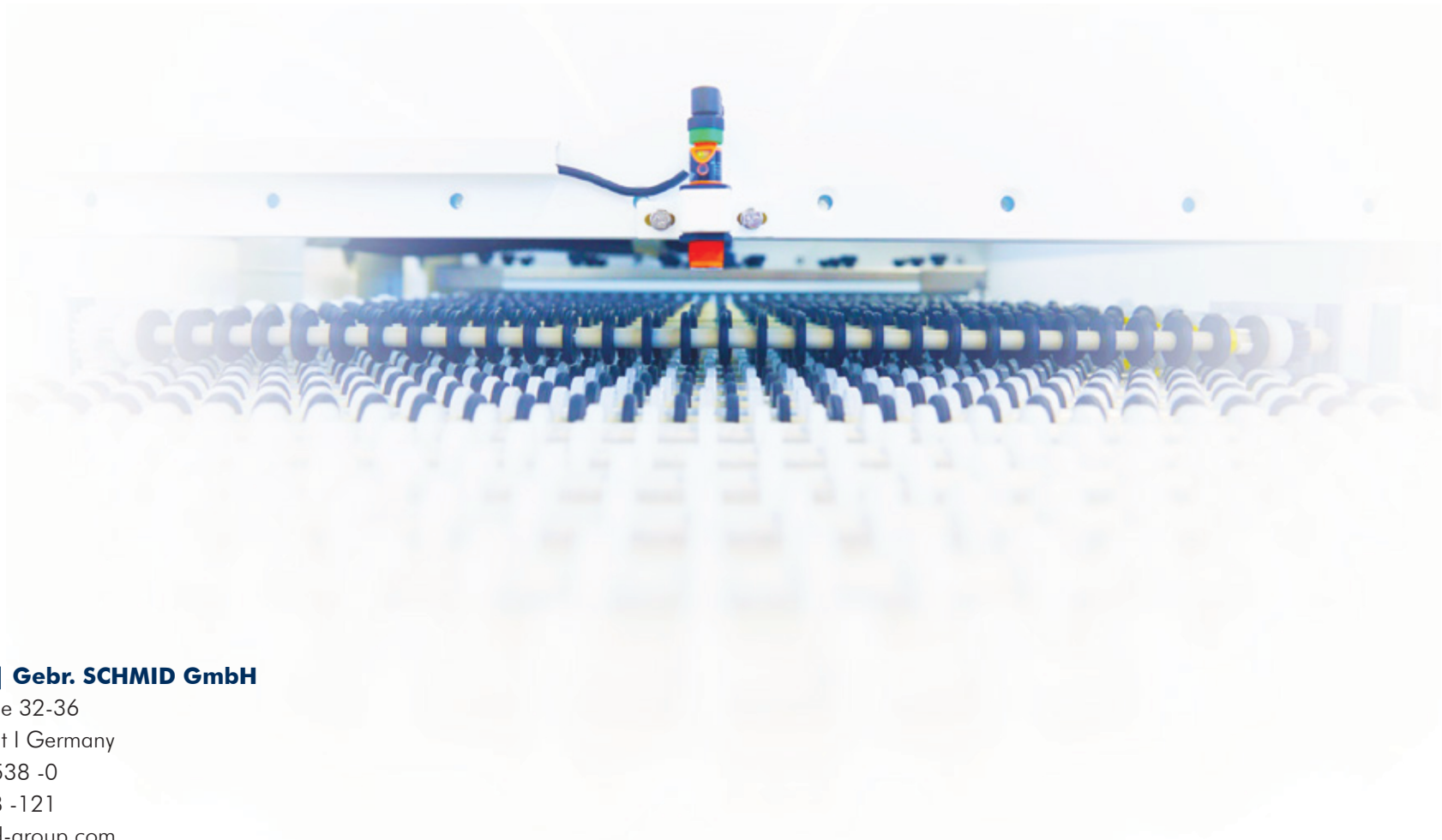
- Reduction of process costs
- More stable etching chemistry and thus more consistent etching results
- Better etching results at an etching rate of 40-45 $\mu\text{m}/\text{min}$



Reduction of process costs:

In a closed loop, alkaline etching the accelerator additive EloFast 60 is used instead of a conventional replenisher solution. The Process costs per kg/Cu for EloFast 60 are approx. 95% lower than the costs for the standard replenisher. Due to the additional repurchase value of the copper, the investment is amortized within a short period of time.

In a closed-loop etching system using the accelerator additive, consumption costs can be reduced to a minimum by regenerating the chemistry.

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