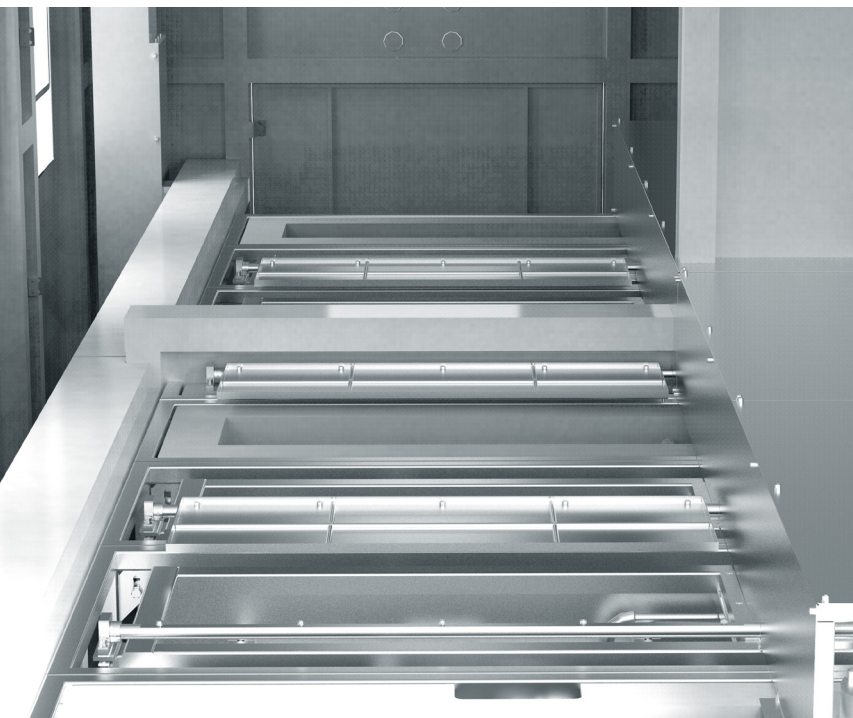


# Advanced production solutions of IC Substrates and Through Glass Via

Comprehensive wet chemistry equipment solutions

# Through Glass Via — Igniting new production momentum in advanced IC substrates

With nearly 40 years of experience in glass processing, circuit patterning, and metallization, Manz is a trusted partner in the through glass via (TGV) process. We work closely with customers to develop innovative equipment for TGV production.



With years of experience in glass handling and wet chemistry, Manz is a trusted partner dedicated to developing equipment.

- High uniformity performance to achieve fine line
- Special gear configuration to prevent chipping
- Automated configurations for loading and unloading

## Continuously enhance redistribution layer technology for through-glass via and metallization processes

To meet the demands of emerging AI chips, Manz focuses on glass-based architectures. Our goal is to enable chips with higher bandwidth, greater density, and enhanced thermal management. This involves advancing metallization of internal interconnects and through glass via (TGV) processes using various types and thicknesses of glass. By controlling different temperatures and chemical compositions, we aim to achieve high aspect ratio through-holes.

Manufacturing high-quality through glass via (TGV) requires precise equipment to ensure the reliability of the vias, which supports efficient signal transmission.

## Solid technical experience to accelerate customer success

Manz provides highly selective TGV and RDL construction process equipment, ensuring the maintenance of high-quality processes. Our adjustable solutions are tailored to meet customers' specific requirements. Our equipment lineup includes: glass substrate cleaners, laser treatment, glass etching, via cleaners, through-hole plating (PTH), inkjet printing, and double-sided plating.

Diverse technologies lead to success with customer oriented production solution

Manz offers wet chemistry solutions for pre-treatment, developing, etching, stripping, brown oxide, DSM/PTH, imaging, various surface treatment and automation. With maximized efficiency and stability of equipment, Manz has gained customer trust and confidence.

The strength of Manz advanced IC substrate production solutions:

- ✓ High process stability and high manufacturing yield

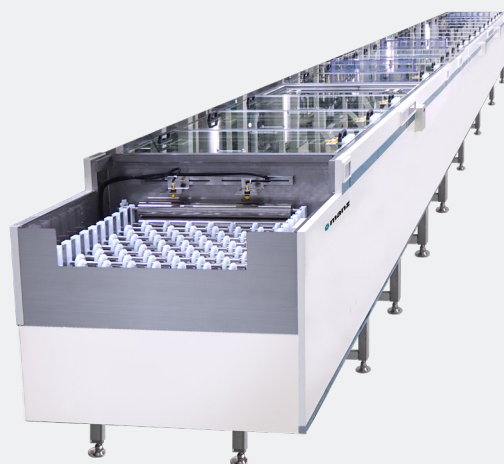
Use solid components to fit requirements of high reliability and safety standards. Collaborate with customers to do production optimization and increase yields

- ✓ High integration of hardware and software for rapid production

Manz provides solutions with integrated hardware and software to link with CIM for process optimization and smart database creation

- ✓ Automation enables production cost reduction

By providing high efficiency substrate handling systems and robotics plus the expertise in IC substrate sector, Manz offers a complete range of automation, production lines and Total Fab Solution



## Developing, Etching, Stripping

- Etch factor  $\geq 3.5$ , great uniformity and patterning
- High conveying stability, squeegee roller residue  $\leq 10 \text{ cc/m}^2$
- Small-volume tank design for the rinsing process to increase the tank turnover rate by 50 %

## Developing Process

- Excellent cleaning ability, no roller mark, water mark and SCUM residual
- High conveying stability, squeegee roller residue  $\leq 10 \text{ cc/m}^2$

## Integrated total production solutions

With technologies and customer services, we see ourselves as a development partner who works out solutions together with our customers. We therefore support you in numerous stages of development and design from delivery to after sales services.

## Horizontal DSM &amp; PTH

- Excellent  $Mn^{2+}$  activation:  $Mn^{2+}$  content < 25 g/l
- Excellent chemical copper deposition speed and thickness with at least Grade 9 backlight
- Equipped with width control device
- Small-volume tank design to increase the tank turnover rate by 50 % and drag out  $\leq 10$  cc/m<sup>2</sup>

## Horizontal Brown Oxide

- Minimum 5 times of thermal shock test
- Uniformed color and oxidization layer bounding force  $\geq 3.0 \text{ lb} / \text{in}^2$
- High conveying stability, squeegee roller residue  $\leq 10 \text{ cc/m}^2$

## Inline Concentration Analyzer

## ICA 300 dose-type

- Analysis precision > 97 %
- Process window temperature 10 - 80 °C
- Up to 6 simultaneous measurements
- Analysis frequency : 60 seconds
- Integration of IoT technology, providing real-time product information

## ICA 500 clip-type

- Analysis precision > 97 %
- Process window temperature 10 - 160 °C
- Up to 4 simultaneous measurements
- Analysis frequency : 60 seconds
- Integration of IoT technology, providing real-time product information and Cloud-based monitoring platform

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