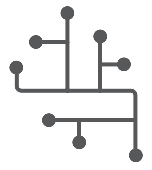
Circuitization, imaging and bonding



Leading production solutions for PCB and package substrates

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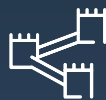
Circuitization, imaging and bonding at a glance

Leading-edge chemistry, equipment, and process solutions for PCB and package substrate applications

- Bonding enhancement
- Advanced surface preparation
- Photoresist stripping
- Metal resist stripper



Presence in more than 40 countries
Serving more than 1,000 customers

33%

Market share
Our BondFilm® process makes us the global market leader

Dedicated TechCenter
in Guangzhou, China

Highly trained experts
in the area of surface treatment in all key markets

More than 204
registered patents

Sustainable approach
Products and processes designed to measurably lower chemistry and water usage

Market leading solutions for surface treatment

Metal complex free solution, e.g. CupraEtch® SR8000

MKS' Atotech surface treatment technology solutions offer superior bonding enhancement, advanced surface preparation, photoresist stripping, and metal stripping options.

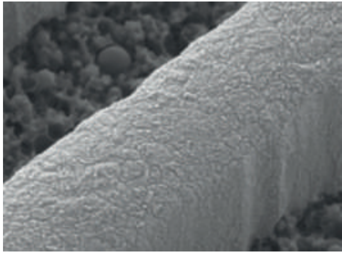
One such particular focus area is advanced surface preparation. The CupraEtch® product series is a range of microetch products that guarantee our customers reliable adhesion for photoresists and soldermasks. The products are technology leaders providing significant benefits such as low etch depths while being cost effective options.

Furthermore, the CupraEtch® series is fully compatible with MKS' Atotech ST-Line® equipment, which is specifically designed for advanced surface preparation.

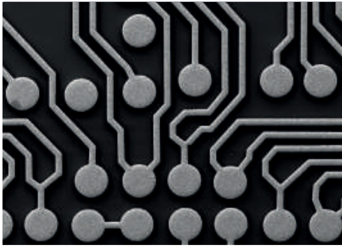
We understand the goals of our customers

High-frequency applications need a bonding enhancement process that gives excellent thermal reliability and additionally provides superior performance in terms of reduced signal loss. BondFilm® EX is an advanced replacement for conventional bonding enhancement solutions, offering enhanced performance with minimal copper removal and therefore a smooth copper interface desired for high-frequency applications.

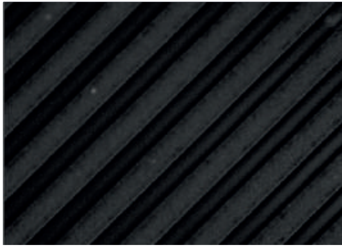
Our broad solutions portfolio



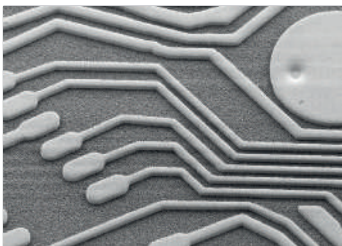
Bonding enhancement



Advanced surface preparation



Photoresist stripper



Metal resist stripper

Production step	Technology application	Atotech solution
Innerlayer bonding	Advanced HDI / package substrates	BondFilm® EX, Novabond® Series
Package substrate	PCB / MLB / HDI	BondFilm® Series, BondFilm®, MS Series MultiBond®
Differential etching / flash etching	Advanced HDI / package substrates	EcoFlash® S 200, EcoFlash® M 100, HyperFlash® M 100
Dryfilm pretreatment	PCB / MLB / HDI	CupraEtch® Series, CupraEtch® SR8000
Soldermask pretreatment	Advanced HDI / package substrates	CupraEtch® FH, CupraEtch® SR8000
Photoresist stripping	Advanced HDI / package substrates	ResistStrip® IC Series
Photoresist stripping	PCB / MLB / HDI	ResistStrip® Series
Metalresist stripping	Advanced HDI / package substrates	PallaStrip® IC
Photoresist stripping	PCB / MLB / HDI	TinSolv® Series

Systems

Horizon® BondFilm

Leading horizontal production equipment for bonding enhancement and surface treatment technologies

Polygon® ST-Line

New horizontal equipment for advanced surface preparation: inner layer, out layer, and soldermask pretreatment

Etching and non-etching adhesion promoter

> 400

BondFilm® installed worldwide

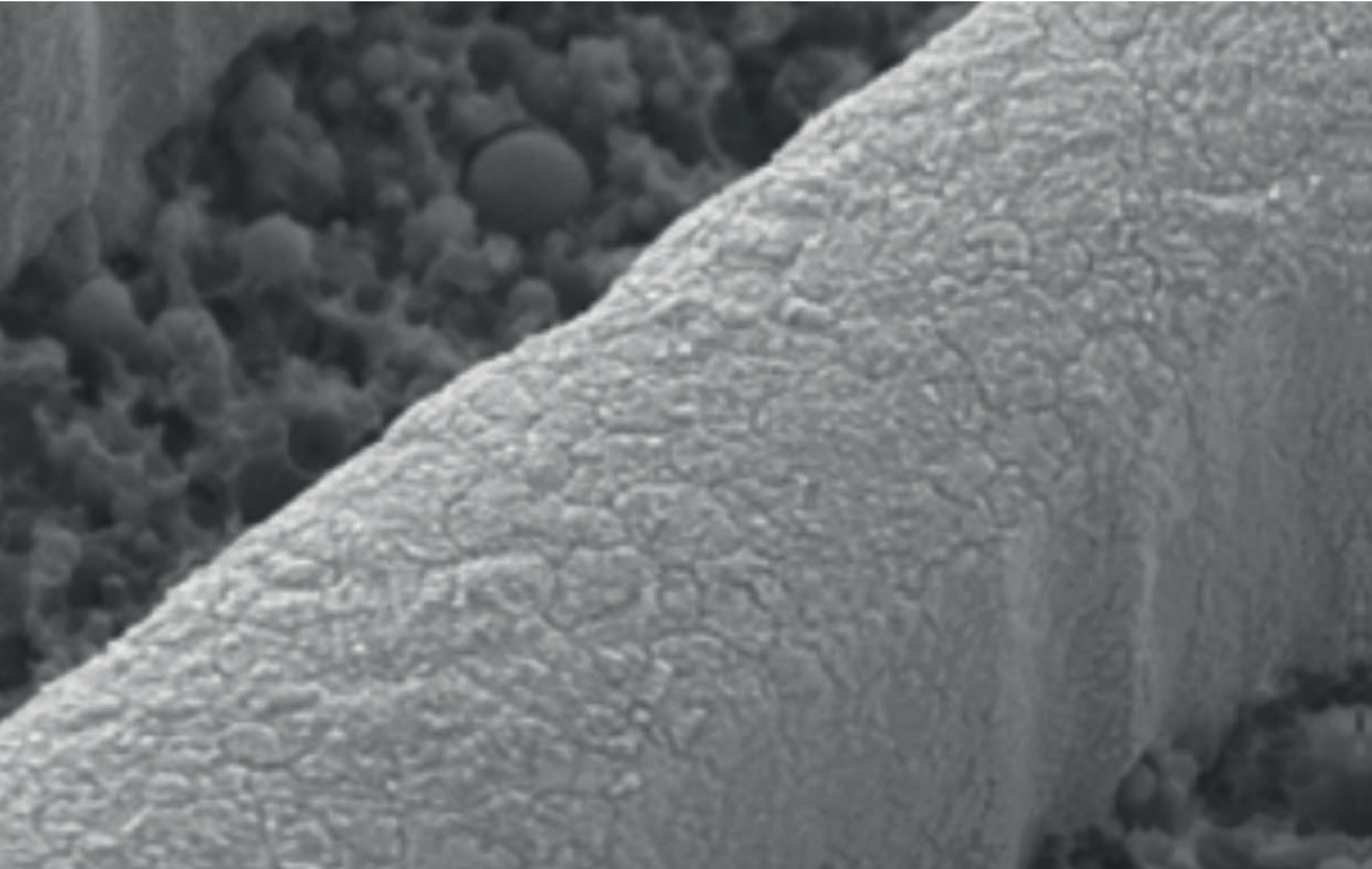
MKS' Atotech is a globally leading brand for processes employed for permant I/L bonding. The portfolio contains traditional etching solutions as well as advanced and innovative non-etching adhesion promoters.

BondFilm®

Since introduction in 1999 Atotech markets the world's most successful, reliable and omni-present oxide replacement processes for inner layer bonding under the BondFilm® brand. BondFilm® remains one of the most innovative, simple and economic oxide alternative processes for improved inner layer bonding.

NovaBond®: Advanced adhesion promotion for package substrates

MKS' Atotech new NovaBond® process is developed to meet all of the challenges of mobile electronic device manufacturing for high frequency functions. This surface treatment process provides enhanced peel strength and thermal reliability for standard ABF build up films using a combination of chemical bonding with minimal copper removal.



Polygon® ST-Line – for inner layer, outer layer and soldermask pretreatment

Considerably reduced wastewater

ST-Line® is a state-of-the-art equipment designed for the requirements of soldermask and dry film pretreatment processes in the manufacturing of PCB. The new line is fully compatible with MKS' Atotech existing offering of CupraEtch® pretreatment chemistry and is expected to boost yields to control production costs. With the accelerated move to finer lines and spaces across PCB applications, ST-Line® is well-suited to meet the industry's current requirements.

Customers can deploy the equipment for inner and outer layer photoresist pretreatment as well as soldermask pretreatment (compatible with all final finishes, including ENIG and IMT) processes across MLB, HDI and package substrate applications. Superior in quality and design, the line also meets rigorous safety standards.

Measurable benefits

- High quality equipment for best process performance
- Significantly lowers the cost of production
- Equipment and chemistry from a single source
- Industry leading customer service

End markets and industries we serve

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Smartphone

Automotive electronics

Computing

Big data infrastructure

Consumer electronics

Communication infrastructure

CupraEtch® SR 8000

Advanced surface preparation

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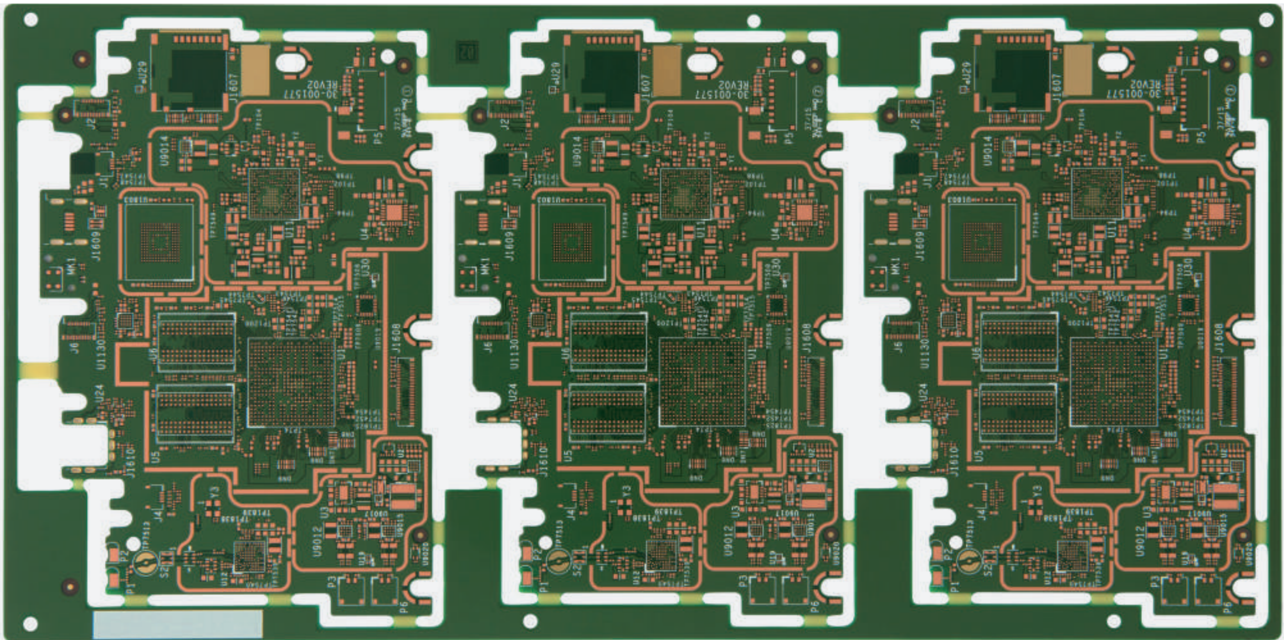
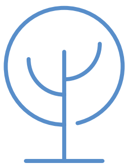


Advanced pretreatment for dryfilm and soldermask adhesion



Metal complex free solution

Excellent dryfilm and soldermask adhesion

CupraEtch® SR 8000 is a cupric chloride based microetching system with unique additives. The simple three step process creates uniform roughening of surface at low temperatures. MKS' Atotech cost-effective pretreatment easily drops into existing lines and reliably improves the adhesion of all copper types to industry standard dryfilm and soldermask types. The metal complex-free solution leads to cost-effective waste water treatment.

Features and benefits

- Fulfills demanding automotive OEM requirements
- Sucessfully passes advanced HDI requirements (< 30 µm L/S) with superior dryfilm adhesion
- Creates sufficient roughness for excellent adhesion on soldermask at low etch depths
- Excellent compatibility to wide range of selective finish processes

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High adhesion performance with minimum etch depth for cost effectiveness

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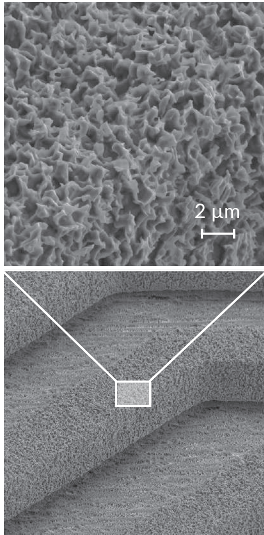

Figure 1: Street view of fine line treated with CupraEtch® SR 8000

Easy process implementation with excellent stability

- Drop-in solution to existing surface preparation line
- Simple analysis methods for easy handling and process control

	Cut board 0 m^2	Cut board 500 m^2	Cut board 1000 m^2	Cut board 1500 m^2	Cut board 2000 m^2	Cut board 2500 m^2
cosmetic						
SEM mag 5k						

Production benefits by using CupraEtch® SR 8000

- Consistent and reliable performance for dryfilm and soldermask adhesion
- Reduced make-up frequency due to high copper loading
- Suitable for a wide range of copper types including CCL, DC and pulse plated panels
- Simplified waste water treatment due to zero complexing agents

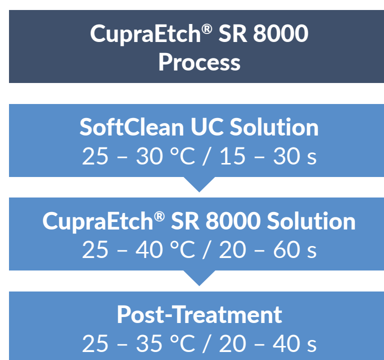

Figure 2: CupraEtch® SR 8000 process sequence

BondFilm® HP

High performance bonding enhancement

Electronics

Surface treatment technology

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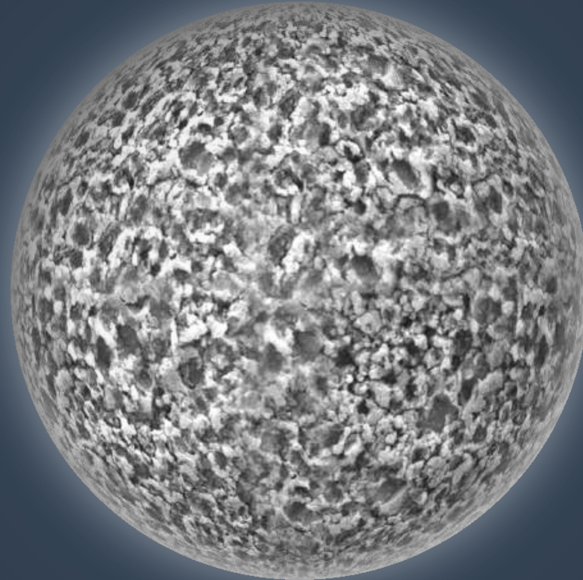

Unmachted performance for the most demanding bonding applications

Up to

98%

reduction of sludge

38g/l

high copper loading capability

BondFilm® HP – The epitome of modern-day oxide replacements

We can confidently say that BondFilm® HP is the best oxide replacement process on the market. The benefits of this process are manifold, but its sludge and particle reduction feature particularly stand out. Since our process is ultra clean, it ensures that the need for maintenance is minimized, thus costs are reduced, but quality and yield remain at the highest level possible.

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A worthy successor of the leading oxide replacement

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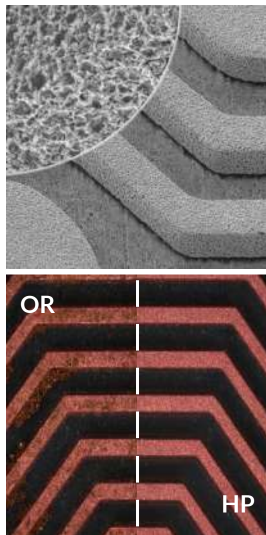

Figure 1-2:
Surface morphology and cleanliness

Performance

Ever finer lines and spaces as well as applications that require extreme high voltages demand not only the very good adhesion performance BondFilm® is known for, but also a tremendous decrease in particle formation, to prevent high resistance shorts. BondFilm® HP is not only able to serve this demand, but also allows for a decrease in etch depth and remains very stable in its performance from the first make-up until its steady state.

Environmental impact

One of our core values at MKS' Atotech is to minimize our ecological footprint. Through considerable efforts, we have succeeded in reducing the amount of wastewater in our process, saving hundreds of filters per line every year and not making any compromises in terms of performance.

Features and benefits

- Direct drop-in to conventional oxide replacements
- Low sludge formation
- High copper loading
- Low COD/m^2
- Significantly reduced downtimes
- Increased process efficiency
- Lower process costs
- Savings in wastewater

InkPromotor T15

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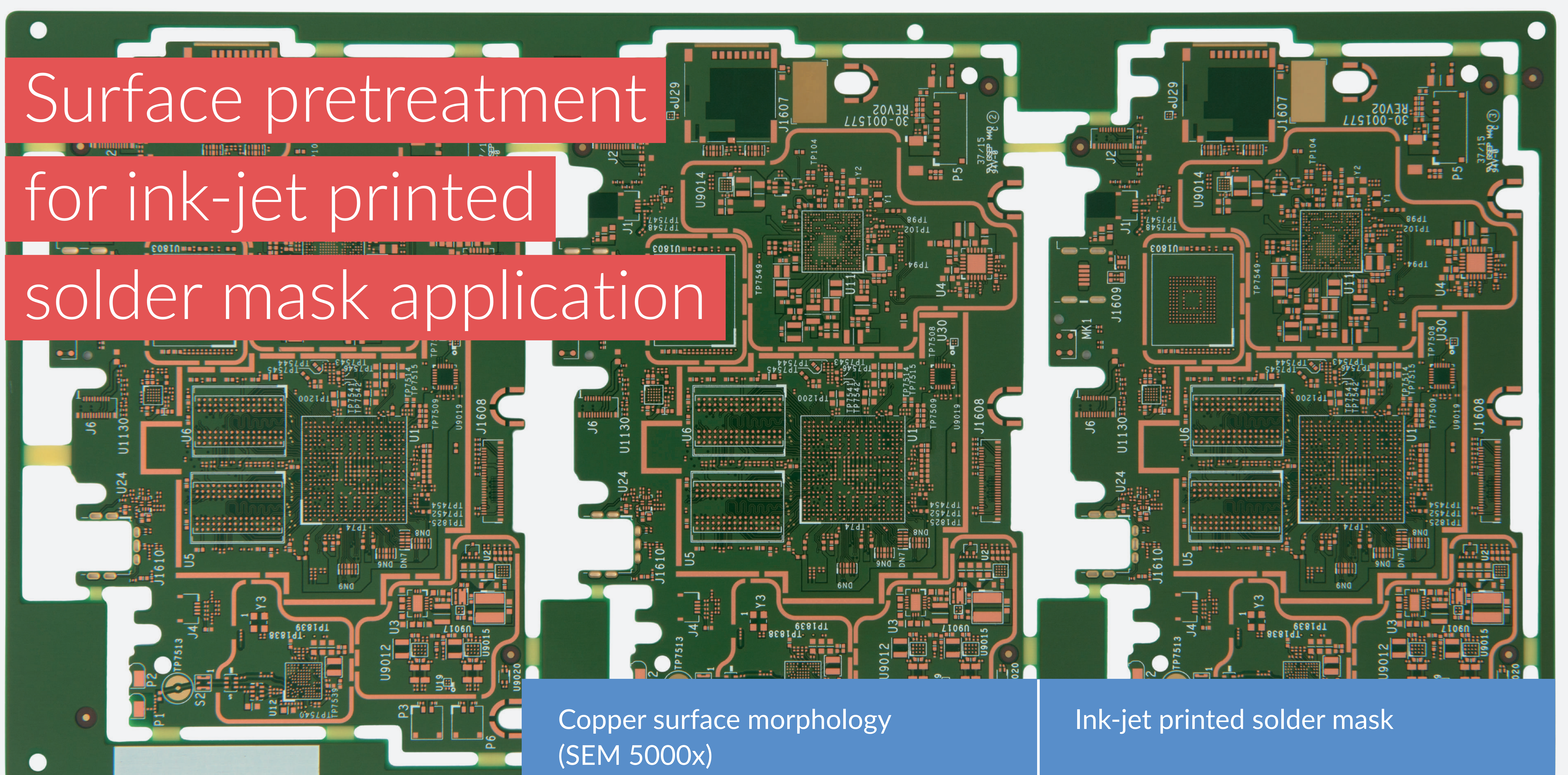
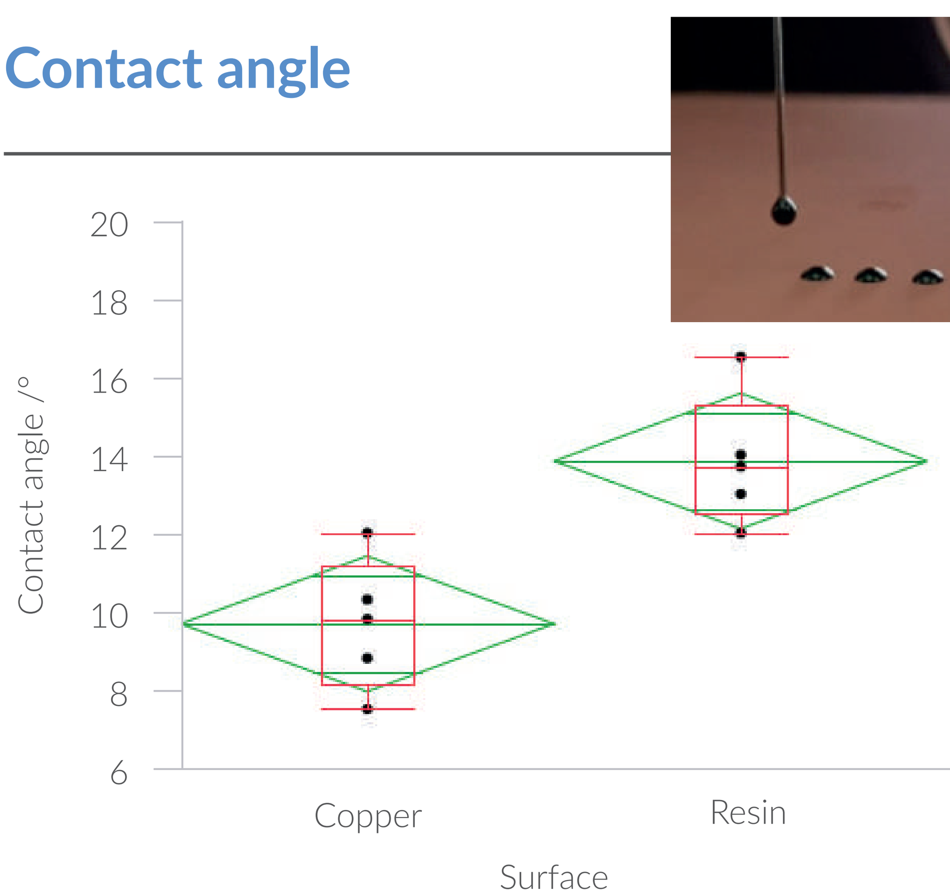


Surface pretreatment for ink-jet printed solder mask application

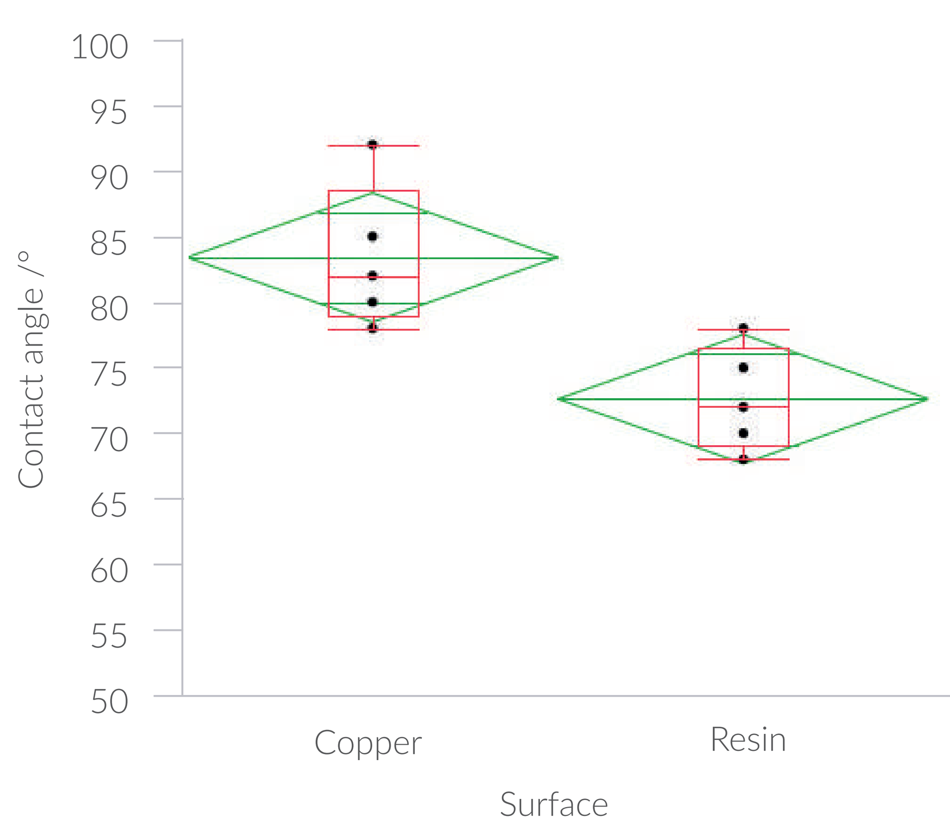
Copper surface morphology (SEM 5000x)

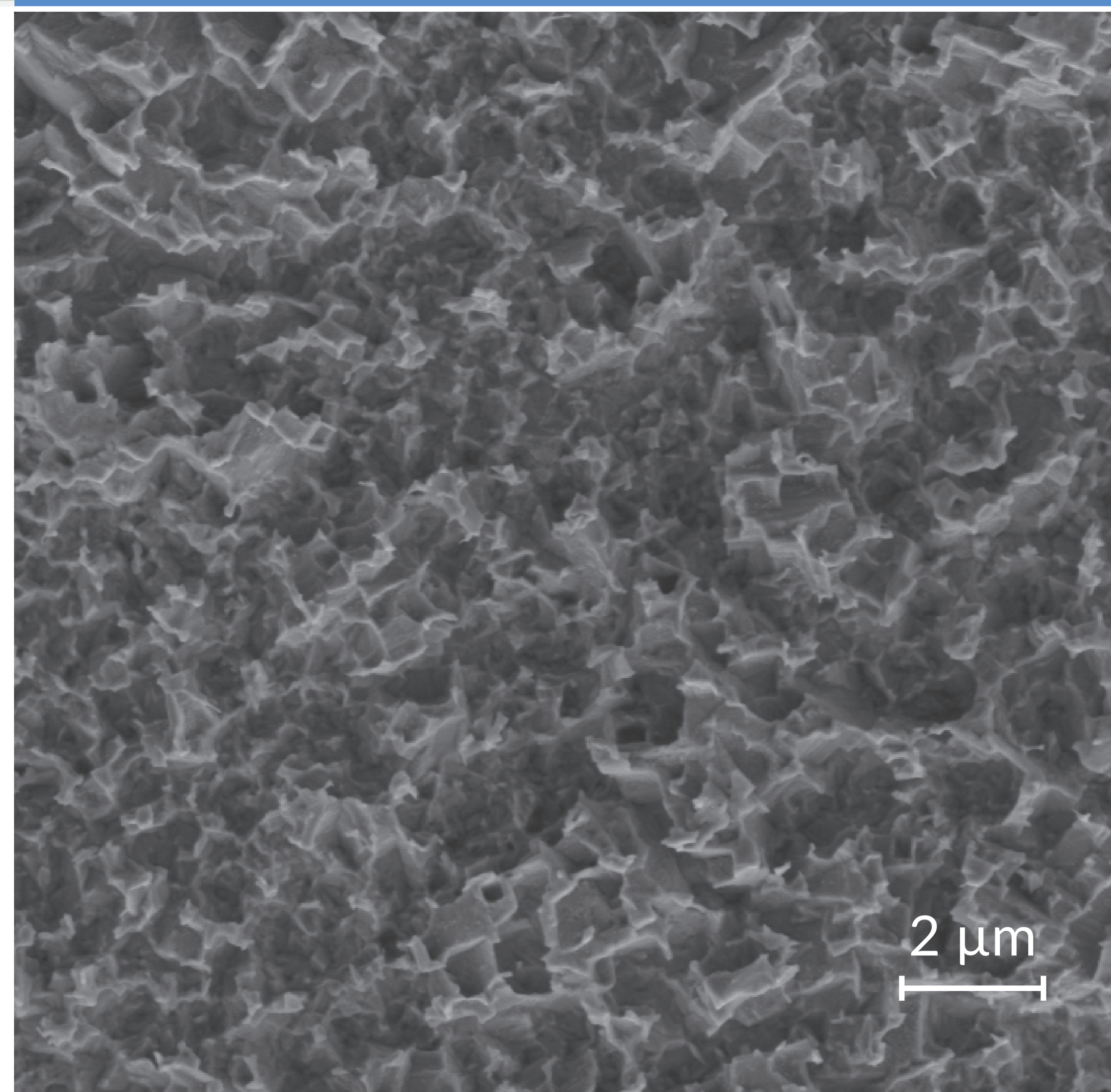
Ink-jet printed solder mask

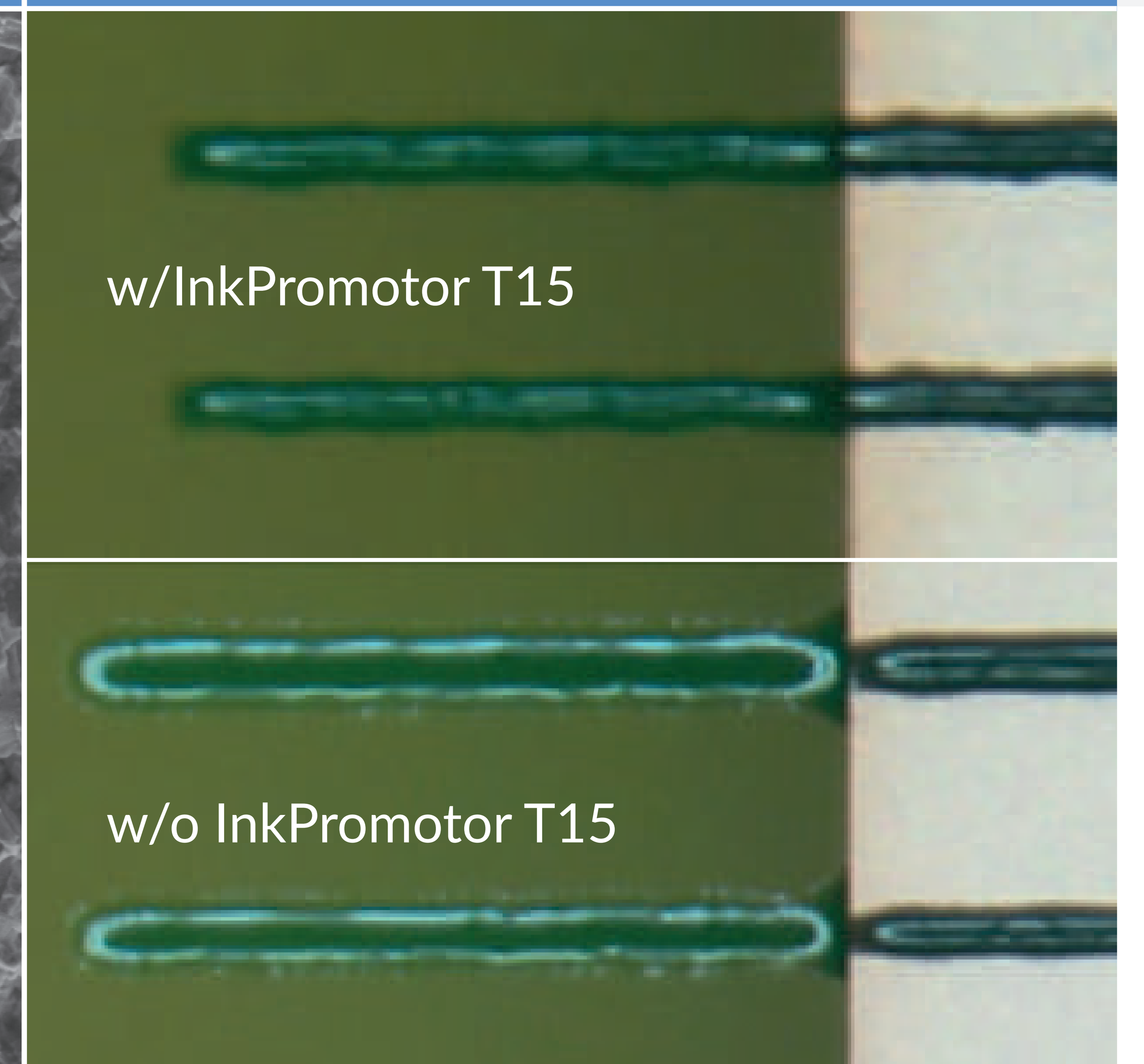
Contact angle



InkPromotor T15







Improved resolution of ink-jet printed solder mask

InkPromotor T15 is an anti-bleeding agent for use in combination with a highly controllable cupric chloride-based micro etching system, CupraEtch® SR 8000. InkPromotor T15 is a simple one-step process that prevents the capillary action and therewith the excessive ink flow over the roughened surface referred to as a BLEED of the ink across the copper surface. It makes the ink-jet printing solder mask process with high line resolution possible. InkPromoter T15 is the new and innovative way to produce PCBs in an environmentally friendly way at low costs.

Features and benefits

- Best in class anti-bleeding agent
- Fine and uniform structures of printed solder mask on Cu and resin
- No detrimental effect on adhesion
- Simple analysis methods for easy handling and process control
- Worldwide availability upon request