



360° PROJECTS BY INOVAN

SURFACE TECHNOLOGY



SURFACE TECHNOLOGY

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360° PROJECTS BY INOVAN //--

THINK. THINKING IT THROUGH. THINKING IT THROUGH RIGHT FROM THE START.
THERE REALLY ARE DIFFERENCES //--

During the implementation at the latest. When things take longer, become more expensive or turn out to be much more difficult than expected. So, by all means it is a kind of art: the art of thinking it through right from the start.

It has a lot to do with years of experience, deeper understanding and overall implementation expertise. These are properties expressed in our customised solutions and our role as a leading provider in surface technology.

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THINKING IT THROUGH RIGHT FROM THE START

SURFACE TECHNOLOGY

SURFACE TECHNOLOGY HAS BEEN ONE OF OUR CORE AREAS OF EXPERTISE FOR ALMOST 60 YEARS //--

With state-of-the-art electroplating lines, we offer you the perfect solutions for selective strip and stamped grid coatings that are distinguished by the economic use of precious metal, lowest contact resistance, wear-resistant coating combinations and corrosion-resistant, solderable and bondable surfaces.

QUALITY //--

High precision measurement technologies monitor compliance with our high demands on quality. The coating thicknesses are continually measured on all in-line systems. In our in-house laboratory, we can check nano-coatings from 5 nm and the bondable and solderable capacity alongside the usual quality relevant tests. The process tanks are regularly monitored by our analytical laboratory and replenished accordingly, which guarantees a constant coating quality.

DEVELOPMENT //--

Competent technical advice on new developments and the development and construction of special and individual selective tools are the foundations for our excellent customer relations and ensure that your products are a success. With our own prototype electroplating unit we also offer the opportunity to produce samples and small batches to be able to perfectly evaluate the property of new developments.

WHAT WE CAN COAT FOR YOU:

- » Solid strips, stamped grids and wires
- » All sides or selectively

What makes the difference with our coatings:

- » High selectivity
- » Lowest contact resistance
- » Wear resistant coating combinations
- » Corrosion resistant surfaces
- » Solderable surfaces
- » Adhesive
- » Bondable surfaces:
 - Gold
 - Nickel / phosphor
 - Copper
 - Nano-coatings (Pd, Au)

Possible coatings:

- » Nickel
- » Pure tin
- » Tin / lead
- » Silver
- » Hard gold
- » Ductile (flexible) gold
- » Bondable gold
- » Palladium / nickel
- » Palladium
- » Copper
- » Nickel / phosphor
- » (Copper) tarnish protection

Silver surfaces can be provided with passivation if required. Tin / lead or pure tin coatings can be thermal treated using the reflow method.

YOUR ADVANTAGES:

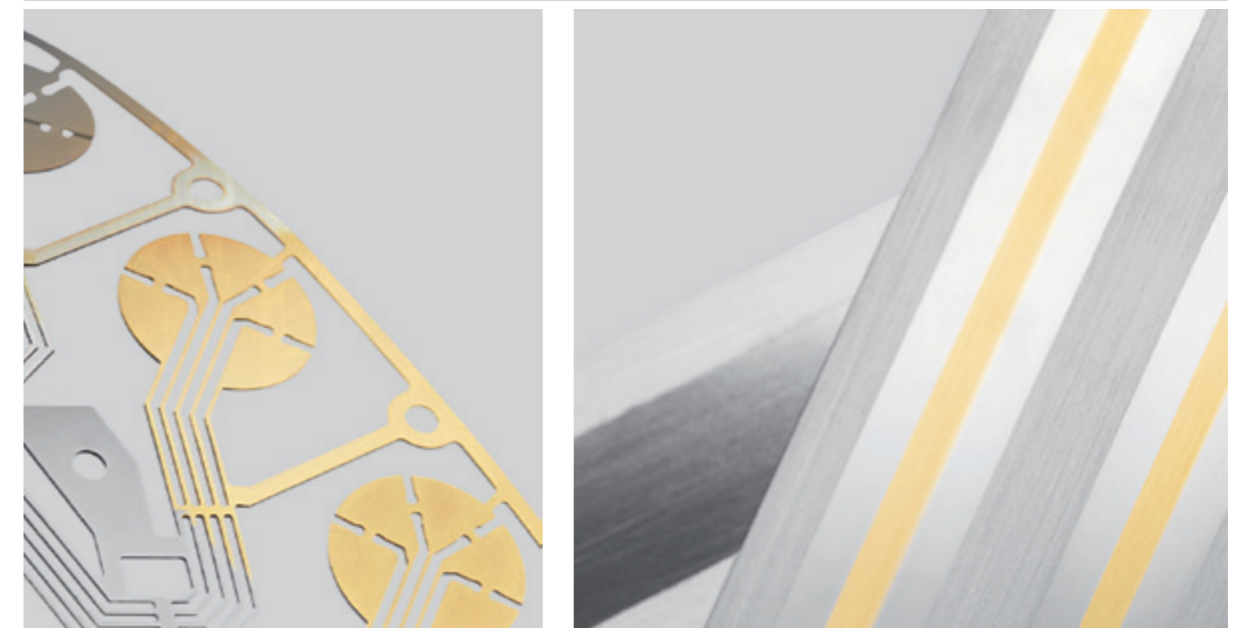
- » Minimum use of precious metals thanks to state-of-the-art coating methods
- » Online measurement of the coating thickness
- » Measurement of nano-coatings on the latest X-ray measurement devices
- » Examination of bonding capacity in our in-house laboratory

OUR SERVICE:

- » Short processing times
- » Professional advice
- » Individual product solutions

Benefit from our experience of our own electroplating systems and selective coating systems development.

STAMPED GRIDS & SOLID STRIPS //--



INOLINES – STATE-OF-THE-ART SYSTEMS FOR TECHNICALLY DEMANDING SELECTIVE SOLUTIONS

On our Inolines, which have been specially built for selective technology, various metal combinations can be cost-effectively illustrated in a single run.

SOLID STRIPS AND STAMPED GRIDS COATED BY INOVAN ARE CHARACTERISED BY:

- » High coating precision in function areas
- » Several spots or stripes possible in different coating thicknesses in a single process run
- » Customised solutions

| | SOLID STRIP | STAMPED GRID |
|--------------------------|---|--|
| Minimum quantities | 300 m | 100 m |
| Max. weight / dimensions | Coil ~ 1,5 t Max. outer diameter 1450 mm | W ~250 kg Max. outer diameter 1000 mm |
| Base material | Copper and copper alloys, steel, stainless steel and nickel alloys | |
| Material thickness | From 0.05 mm to 1.5 mm (more available on request) | |
| Coating techniques | <ul style="list-style-type: none"> » All sides in the controlled depth method » Controlled immersion depth (selective dipping) » Stripe coatings using the masking technique <ul style="list-style-type: none"> - Wheel module - Film masking - Adhesive band (tape) technique Several strips in various widths and coating thicknesses possible » Brush technique » Spot-plating <ul style="list-style-type: none"> - For stamped grids and coded solid strips » Customised special coatings possible | |

WIRE COATING // --



WE ALWAYS GO "DOWN TO THE WIRE"

Alongside coating stamped grids and solid strips, Inovan also offers full or selective coatings on wire or contact profiles.

WIRE COATING

| | | |
|--------------------|---|-------------------------|
| Base material | Copper and nickel alloys, steel, stainless steels and alloys containing precious metals | |
| Dimensions | 0.1 × 0.5 mm to 1.5 × 3 mm as well as round wires (more available on request) | |
| Minimum quantities | Minimum length: 200 m | |
| Max. coil weight | ~50 kg on coils K355 (other coils on request) | |
| Coatings | » Nickel | » Solid gold |
| | » Fine gold | » Palladium |
| Coating types | » All sides | » Selective single side |



360° PROJECTS



BY INOVAN

THOUGHT THROUGH FROM BEGINNING TO END

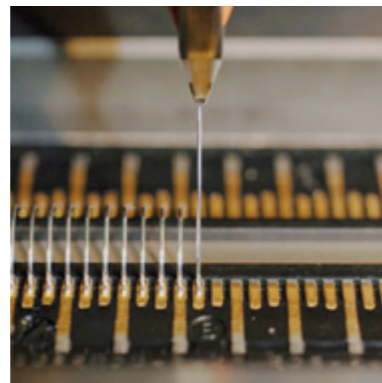
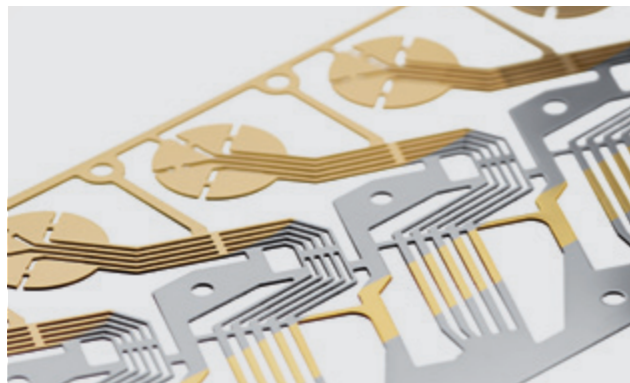


THINKING IT THROUGH RIGHT FROM THE START

BONDABLE SURFACES

INTRODUCTION

WE HAVE BEEN THINKING SURFACES THROUGH RIGHT FROM THE START FOR MORE THAN 30 YEARS //--



OUR SERVICES //--

Stamped parts with bondable function surfaces allow electronic components to make contact with their carrier materials or contact elements.

Inovan offers you complete solutions:

- » Solid strip finishing
- » Complex stamped parts – endless on coils or individual in customer packaging
- » Specimen injection moulded parts
- » Complex assemblies in metal-plastic components

The application area for our products extends from sensors and control units for applications in the automobile industry through to IGBT power modules for energy supply. Inovan manufactures the whole range of current bondable coating systems:

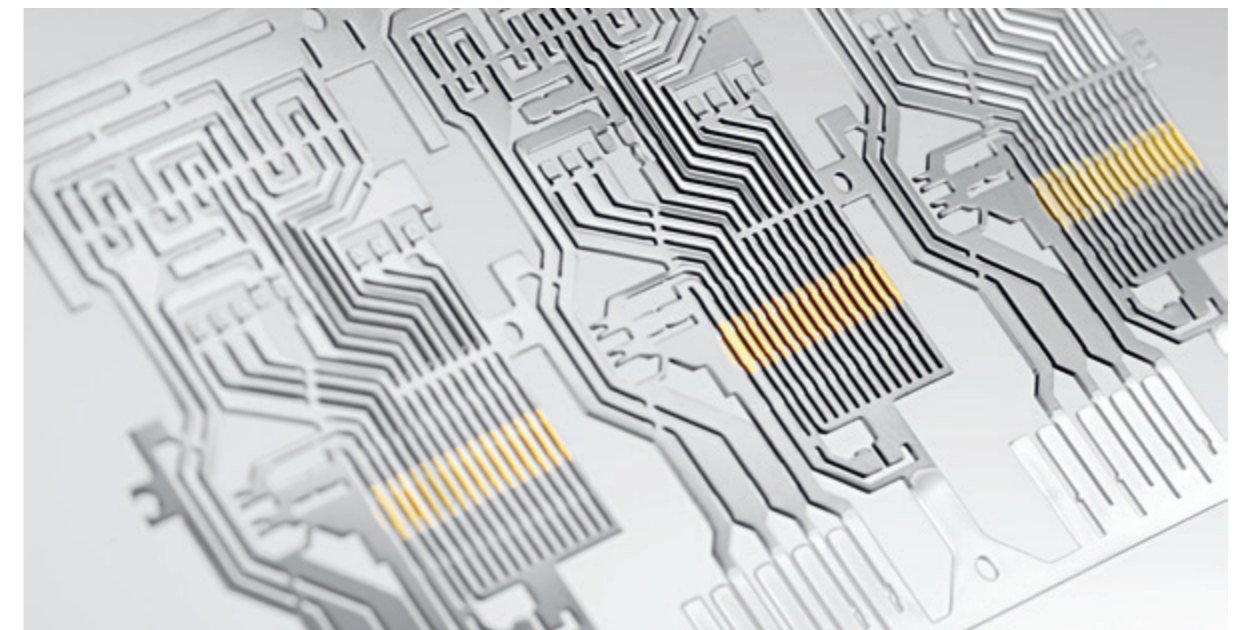
- » Ni-Au (bond gold)
- » Ni-NiP
- » Roll clad AlSi
- » Silver
- » Nano-system (Pd, Au)
- » Copper

YOUR ADVANTAGE //--

We supply all of the expertise from one source:

- » Development, consultancy and engineering
- » Bond coating systems in connection with other electroplated function coatings
- » Stamped parts at every stage of development
- » Metal-plastic compound components
- » Process techniques and technology

BOND GOLD / NANO-COATING TECHNOLOGY //--



STAMPED GRIDS AND STAMPED PARTS WITH BONDABLE ELECTROPLATED SURFACE – BOND GOLD //--

- » Inexpensive preparation material as all standard copper alloys are possible in principle
- » Bond gold coatings can be combined with our electroplated coatings such as Ni, Sn, SnPb, Ag, AuCo
- » Application of all necessary coatings in a single system run
- » Minimum use of precious metal with the minimised gold coating thickness and state-of-the-art selective technology in gold depositing (stripe technique and spot-plating)
- » Plated stamp edges
- » Stamped parts curved and insert moulded with plastic upon customer request
- » Examination of the bond quality in our own bonding laboratory
- » Approved process by numerous suppliers to the automobile industry
- » Many years of experience
- » Stamped grid material thickness: 0.1 mm to 1.0 mm
- » Strip width: up to 130 mm can be electroplated

Application:

- » Parts with average to high copper weight
- » Parts with small bonding surfaces

NANO-COATING TECHNOLOGY //--

Due to the increasing demands on bond technology, Inovan has dedicated itself to developing a Ni / Pd / Au nano-coating system as a wire-bond surface and has reached the market launch stage. The thinnest precious metal coatings in the ranges of ~70 nm palladium and ~10 nm gold are used in this system and allow huge potential for savings.

A prerequisite for the development of this technology was the detailed examination of the limits and parameters of this Ni / Pd / Au system to be able to understand and influence its properties. After all, series processes with such bond surfaces are viewed as extremely sensitive due to their frequent use in the automotive sector.

Inovan's 15 years of experience in the area of conventional bond surfaces therefore played an elementary role.

Application:

- » Cost-effective surface due to minimal use of precious metal
- » Very universal: can also be used as an adhesive or solder surface

THINKING IT THROUGH RIGHT FROM THE START

BONDABLE SURFACES

NICKEL / NICKEL-PHOSPHOR //--



SOLID STRIPS AND STAMPED GRIDS WITH BONDABLE ELECTROPLATING SURFACE – NICKEL / NICKEL-PHOSPHOR //--

- » Copper alloys can be used as an inexpensive preparation material
- » Non-precious metal as a functional layer (expensive precious metal not necessary)
- » The bond layer can be combined with other electroplating coatings such as Ni, Sn, SnPb, Ag, and AuCo
- » Plated stamp edges
- » Application of all necessary coatings in a single system run
- » Solid strips and stamped grids possible upon customer request
- » Examination of the bond quality in our own bonding laboratory before delivery to the customer
- » Material thickness: 0.1 mm–1.2 mm
- » Strip width: up to 160 mm

Application:

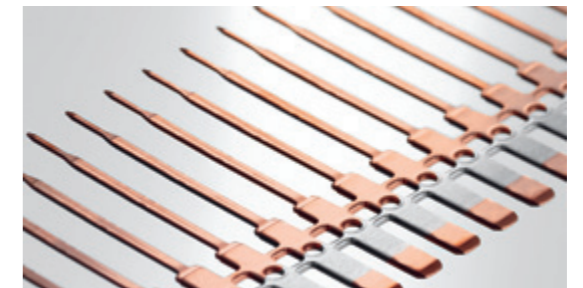
- » Inexpensive electroplated bond surface free of precious metals for partial areas of the wire and die-bonding application

ALUMINIUM-SILICON //--



SOLID STRIPS AND STAMPED GRIDS WITH PLATED ALUMINIUM-SILICON SURFACE //--

- » Low costs due to functional bi-metal without precious metal
- » Bi-metal can be combined with other electroplated coats such as Ni, Sn, SnPb, Ag, and AuCo
- » Plated stamp edges possible
- » Stamped parts flat or curved according to customer request and insert moulded with plastic
- » Examination of the bond quality in our own bonding laboratory
- » Material thickness: 0.4 mm–2.3 mm
- » Strip width: up to 150 mm



Application:

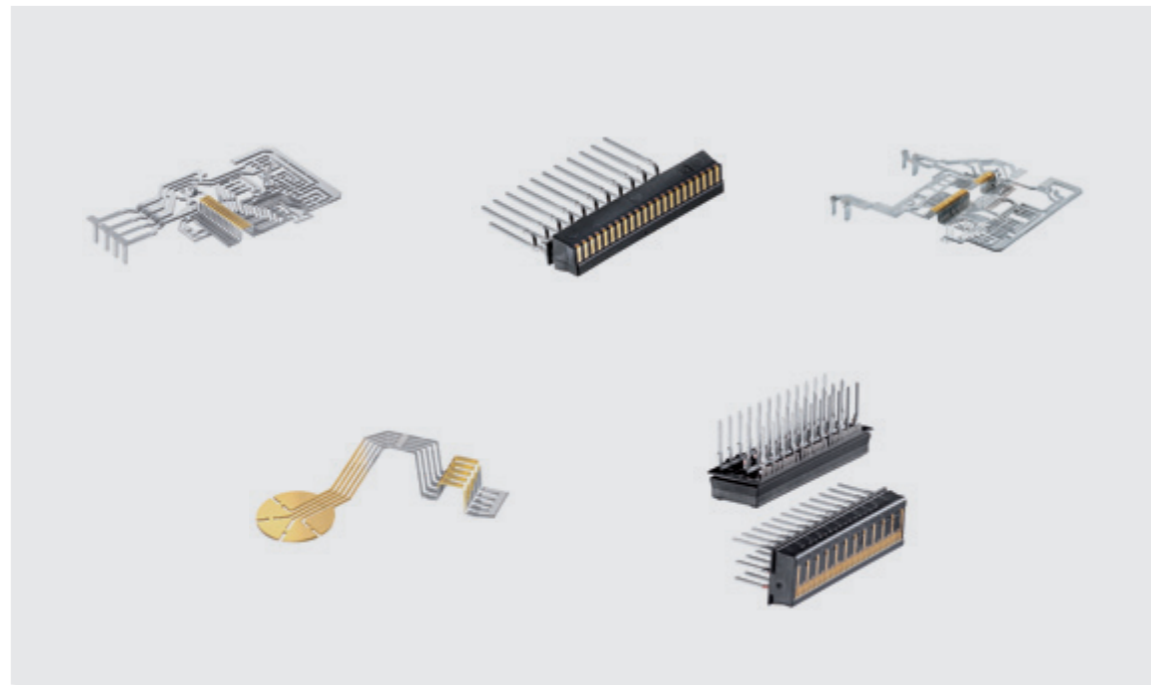
- » Widespread and long-standing technology with versatile applications

THINKING IT THROUGH RIGHT FROM THE START

BONDABLE SURFACES

APPLICATIONS

INOVAN COMPONENTS IN EVERY CAR WITH ABS / ESP



PROOF OF BONDABILITY //--



Pull and shear tester Dage 4000

STATE-OF-THE-ART BOND AND TESTING TECHNOLOGY IN OUR OWN LABORATORY //--

- » Pull and shear tester from Dage Series 4000
- » Semi-automatic bonder, Delvotec 5650
 - Al thick wire 125–500 µm
 - Au thin wire 18–75 µm



Selection from our laboratory:
Semi-automatic bonder from Delvotec

THINKING IT THROUGH RIGHT FROM THE START

QUALITY AND ENVIRONMENT

THOSE WHO MAKE CUTS IN QUALITY AND ENVIRONMENTAL COMPATIBILITY ONLY THINK IN THE SHORT-TERM //--

After all, what sense does a quick profit make if it affects long-term customer relations? And where are real benefits of a good balance sheet if it is at the cost of the environment and the quality of life for generations to come?

Our uncompromising quality and environmental management is one way in which Inovan shows that they think things through from start to finish.

QUALITY MANAGEMENT //--

For Inovan, quality is the best possible fulfilment of the demands and expectations of our customers. This links in with the open way we handle our errors. We ask for a high level of quality awareness and personal responsibility from our employees and oblige each and everyone to continual improvement of processes.

Only consequential planning and optimisation of our processes leads to systematic achievement of the demands and expectations of our customers. This means that our quality is not a one-off thing but is continual and reproducible. Our systems are regularly reviewed by an independent certification body to prove our quality capacity. Our quality management systems are currently certified in accordance with the requirements of ISO / TS 16949:2009.

ENVIRONMENTAL MANAGEMENT //--

Protecting and maintaining the environment, acting in socially compatible way and economising responsibly: this is sustainability. We dedicate ourselves to making this possible every day. Environmental protection is an issue that involves everyone. Practising environmental protection is therefore a matter of course to us. Acting with environmental awareness is aggressively pushed forward in all of our processes and procedures with permanent improvements. Careful use of water, energy and raw materials as well as noise protection, and keeping air and soil clean are important obligations to us; in all of our factories and in all processes.

We have been fulfilling all legal and authoritative regulations on environmental protection for many years. We have used this basis to implement environmental management systems in accordance with the requirements of DIN EN 14001 at the Birkenfeld and Stolberg sites and have successfully certified them.



LET US THINK YOUR PROJECT THROUGH FROM BEGINNING TO END. GET IN TOUCH WITH US.

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