



CHRISTIAN KOENEN GMBH
HIGHTECH STENCILS

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Christian Koenen GmbH

company presentation

© 2008 **Christian Koenen GmbH –HighTech Stencils–** • Otto-Hahn-Straße 24 • 85521 Ottobrunn-Riemerling
Tel.: +49 (0)89 665618-0 • Fax: +49 (0)89 665618-30
Internet: www.christian-koenen.de • E-Mail: info@christian-koenen.de



CHRISTIAN KOENEN GMBH
HIGHTECH STENCILS

Federal Republic of Germany

- area: 357 092 km²
- habitants: 82,365 Mio.
- capital: Berlin
- gross domestic product (GDP)
 - 2006: 2.307,20 bn. €; +2,7 %
- fractions in:
 - service sector 69,2 %,
 - industry and building sector 29,9 %,
 - agriculture 1,0 %
- export / import 2006 bn.€:
 - 896,05 / 731,48
 - export hits:
automobiles, automobiles components,
machines, chemical goods
- highest mountain: Zugspitze 2.962 m
- biggest rivers:
 - Rhine (Rhein) 865 km,
 - Elbe 700 km,
 - Danube (Donau) 647 km
- biggest lakes:
 - Lake Constance (Bodensee) 572 km²,
 - Lake Müritz 110 km²,
 - Lake Chiemsee 80 km²
- tourism:
 - countryside and German traditions,
 - castles,
 - Oktoberfest



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Company Data

- time line

- 1968 - Foundation of the Koenen GmbH by Karl-Heinz & Isabella Koenen



- 2003 - Foundation of the Christian Koenen HighTech Stencils



- 2006 - Formation of the KOENEN GROUP:
 - KOENEN HighTech Screens
 - KOENEN Solar
 - KOENEN HighTech Stencils



- KOENEN GROUP

- employees 130
- company area Σ 5500 m²
 - Christian Koenen HighTech Stencils 2400 m²
 - Koenen HighTech Screens & Solar 3100 m²
- Laser systems 7



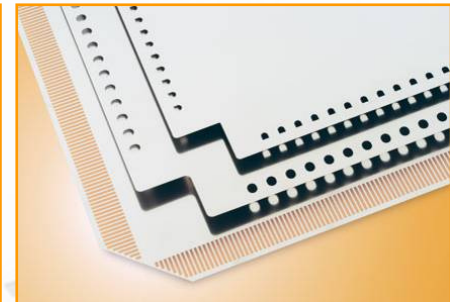
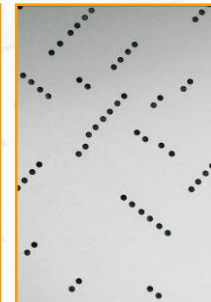
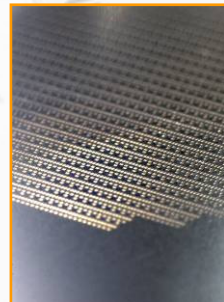
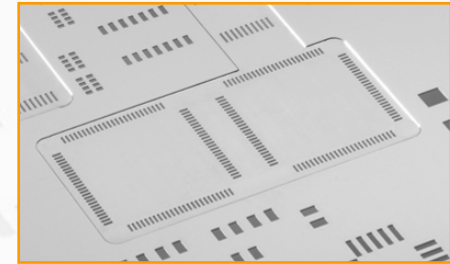
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CHRISTIAN KOENEN GMBH
HIGHTECH STENCILS

Products of the Christian Koenen GmbH

- Metal Stencils
 - for Solder Paste & Glue Printing, Wafer Bumping, LTCC und Fine Line Technology
 - Step Stencils for achieving different paste heights with one print or to compensate height differences of the substrate
 - engraving Bar- & DataMatrix – Codes
 - Design Consultation
 - Express Delivery
- accessories
 - Frames, Screen fabric and Self Tension Systems
 - Stencil Storage Systems
 - Metal Squeegees
 - Solvents



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Worldwide Delivery

- Countries, we already deliver to:

- Egypt
- Bulgaria
- China
- Germany
- England
- France
- Ireland
- Japan
- Lithuania
- Malaysia
- Austria
- Poland
- Portugal
- Rumania
- Russia
- Scotland
- Slovakia
- Spain
- Schwitzerland
- Czech Republic
- Turkey
- Hungary
- USA

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delivery times

- normal production
- express delivery
 - business days
8:00 a.m. - 5:00 p.m.
 - late service on business days
5:00 p.m. - 8:00 p.m. (Monday – Friday)
 - weekend and holiday service
10:00 a.m. - 6:00 p.m. (weekend & holiday)
- Production and Shipping
 - fast, reliable and in proven Quality
 - afterwards Shipping by UPS or courier)

2 ... 3 business days

24h or 6h Service

6h Service

6h Service

For Orders by
late, weekend- or holiday service:
+49 - 173 83 95 00 1





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HIGHTECH STENCILS

The Stencil Production

- 7x LPKF- Laser
 - inclusive TurboCut, motorised Beam expander & Camera System
 - engraving of DataMatrix- & Bar-Code
 - optional use of Gases for Cutting
 - Laser Beam Reduction down to 20 μm
 - daily, weekly and monthly Maintenance (1/2-yearly by LPKF)
 - 1/2-yearly external Check of the Stencil Quality
- 2x ScanCheck
 - fully automated & 100% Stencil Check for Absence, Size and Position of the Openings
- Climate control
 - constant Temperature of 21 °C in the Production Area
 - optimal Function of the Measuring Systems
 - redundant Systems on-hand
- automatic Brushing Machine
- Ultrasonic Cleaning System
- WaterJet System for the Cleaning of used Stencil Frames



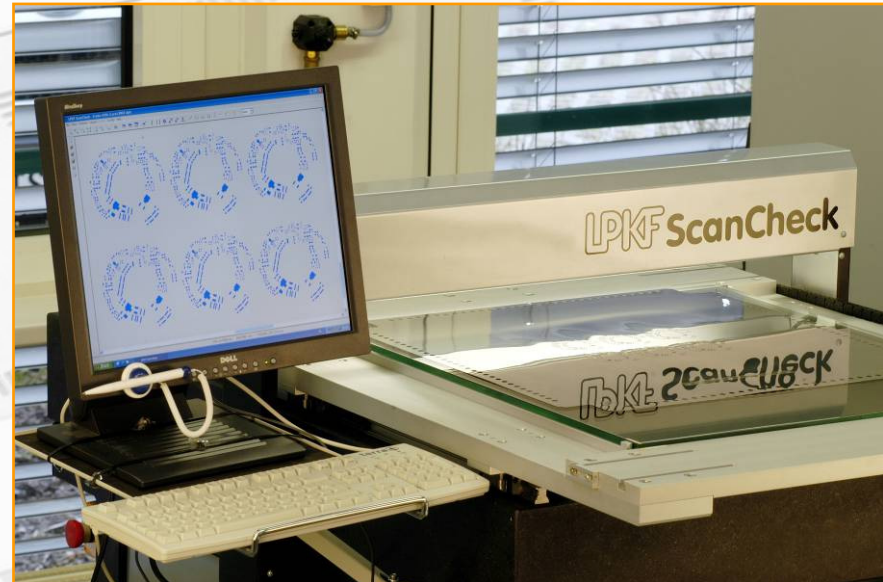
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Traceability

- Each Production Step is carefully checked, measured and documented.
- The Materials Batches and Tools will also be documented.
- Scancheck for each Stencil
 - Fully automated & 100% Stencil Check for Absence, Size and Position of the Openings in the Stencil.
- Measuring Reference Pads
 - Pad Dimensions are checked on Top and Bottom Side of the Stencil to control the Taper Angle of the opening.



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Quality Management

- Thickness Measurement
 - each Position of the Stencil can be checked for its Thickness at a accuracy of $\pm 1 \mu\text{m}$
 - three times guided Measuring Sensor from Heidenhain
 - perfectly flat Granite Table
- 3D Measuring Machine
 - Working Area $700 \times 700 \text{ mm}^2$
 - fully automated Measurement over the whole Working Area
 - Accuracy $\pm 1 \mu\text{m}$



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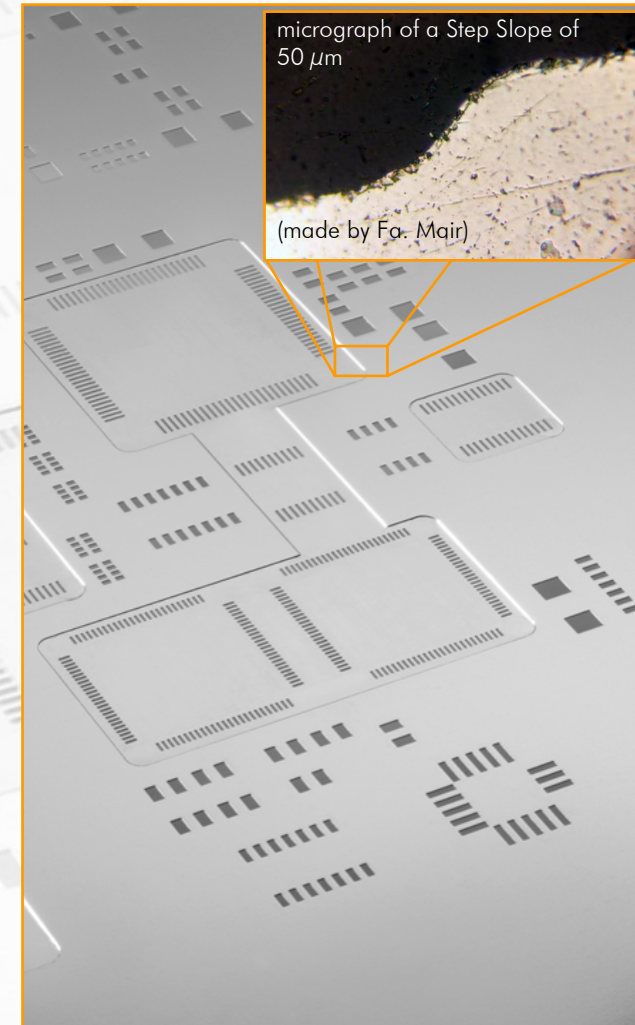
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Step Stencil

- CK-Special Technology Step Stencil
(Patent pending)

The Stainless Steel Blank is precisely thinned in well defined areas. Afterwards it will be aligned in the Laser System to cut the Openings precisely according to the Steps in the Stencil

- +exact defined Material Thickness
- +exact Pad Geometry and Position
- +positive & negative Steps on each Side of the Stencil are possible
- +soft Slope between different Thicknesses (refer micrograph)
- +expands the Process Window
- +no Production Step for a Mask needed
- +cost-effective
- +fast Delivery (2 ... 4 business days)





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Stencil Welding

- patented CK Special Technology
- high mechanical strength up to 100 N/cm²
- capable for all kind of solvents
- capable for ultrasonic cleaning
- double weld seam for better performance and to avoid loose ends of wires
- increase of the printing area about 30 mm (the weld seam is a lot smaller than a gluing area)

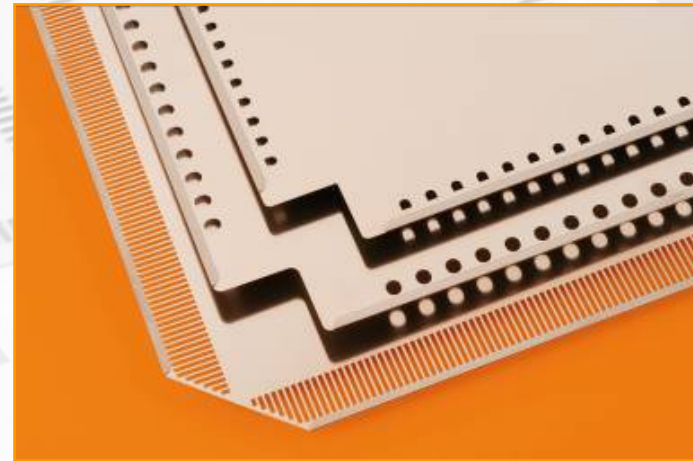


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Edge Protection

- utility patent CK Special Technology
 - minimised injury risk
 - more ridged – reduces damage due to flexing stencils during set-up or transport
 - available for all foil tensioning systems as Alpha Tetra, Stencilman (identical with Quattroflex), LPKF (Zellflex), Metz, Thieme etc..
 - the edges are bend by 180°





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Customer Support

- Order Processing
 - customer related administrators
 - complete order processing – by one contact for commercial, technical, CAD and date issues
 - check customer data by design rules for Aspect and Area Ratio
 - consult the customer for the best choice of stencil options for his process requirements
 - set up customer specific libraries
 - reengineer and setup layouts (e. g. for step stencils, glue printing, Anti-Tombstone-Layout etc.)
 - are constantly trained to provide best technology support for our customers



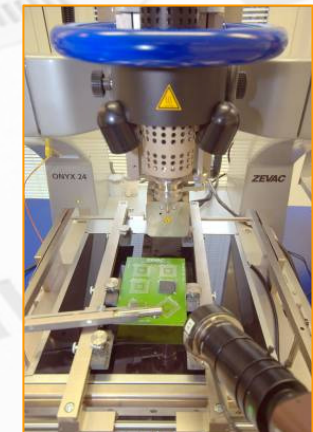
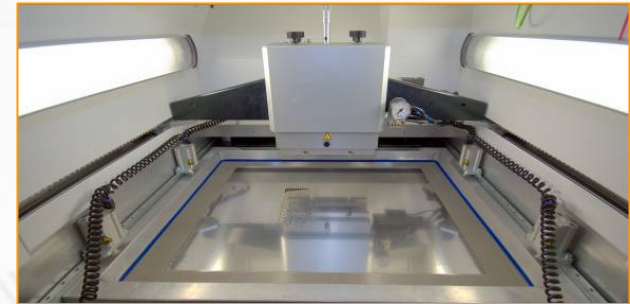
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Process Support

- Installation of an application centre
 - equipped with printing machines and measurement devices
 - established process knowledge
 - fast response times for layout changes
 - thigh cooperation with customers
- Network of partners
 - for the processes:
print, population, reflow, vapour phase,
wave soldering, handling, AOI, X-ray,
substrates, paste & rework
 - detailed knowledge and competence
 - access to already realised solutions



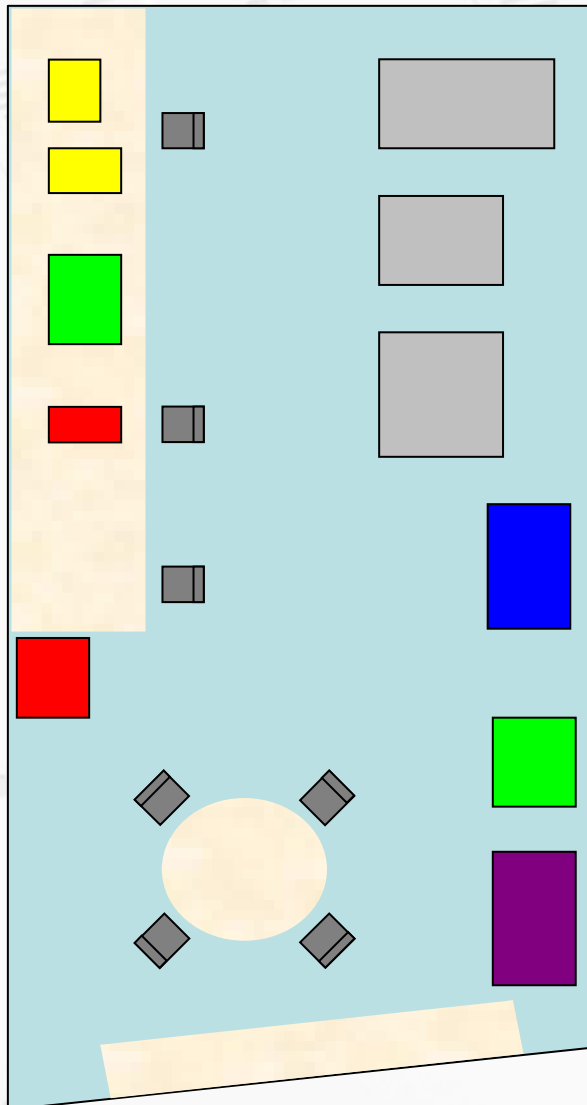
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Ausstattung des KOENEN GROUP Application Centers

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- Print
 - Ekra X5 STS
 - Ersa S1
 - Essemtec SP900
- Place / Solder
 - ZEVAC Onyx 24
- Measure / Document
 - Cyber Technologies CT300
 - Leica M205
- Dry / Fire
- Ball Placement
 - Wagenbrett WB300
- Clean
- general
 - 60 m²
 - temperature control &
 - exhausts for all machines



Actual Projects

- QFN – layout optimisation
 - calculation process for ground & I/O-pads
- detailing THR – layout calculations
- defining areas for steps in stencils
- finding a measuring method for the stencil tension
- stencil optimisation
 - surface structures
 - coatings
- specialising stencils for wafer bumping & balling processes
- setting up a stencil guideline



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Road - Map

- new stencil materials
- even thinner step stencils
- more surface treatment options
 - e. g. Nano coatings
- enhanced laser systems
 - diode pumped systems
 - reduced beam diameters
 - keep track of water jet guided laser systems

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Thank you for your attention

We would be glad to provide further
information