Stencils manufacturer for over 30 years

DB Products in figures:

15 employees
1200m² production unit based North of Lyon (France)

Stencils Department - 3 fiber lasers – 1 marking laser
Tooling Department - HSC computer-controlled machine tool

An ERP dedicated to production and commercial management
A secure, customized online order website www.dbproducts.fr

2018
A consolidated turnover of 2,600,000€
Over 11,000 screens and 8,900 tools manufactured and shipped

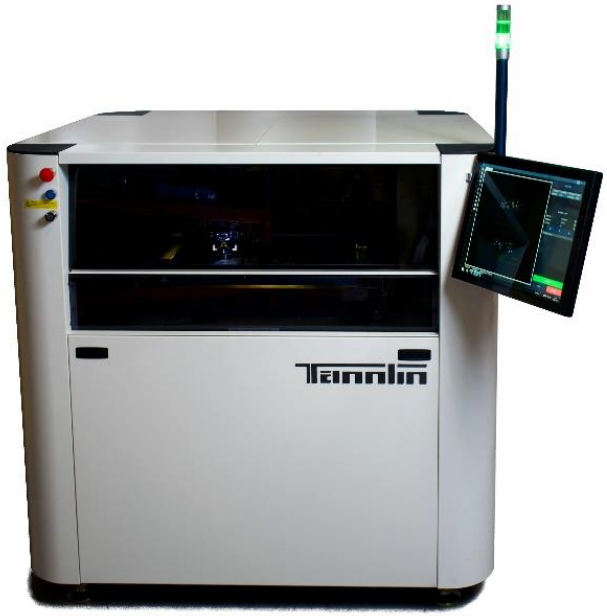
257 existing customers

ASM, Osram, Philips, Vestel, Flextronics, Thales Alenia Space, Continental, Robert Bosch, Airbus Group, Schneider Electric, Safran, Autoliv, Actia, Tronico Alcen, Magneti Marelli, AsteelFlash, Zodiac, Eolane, Thales Group…..

Our largest customer accounts for 4% of our annual turnover

1,000,000€ invested since 2015 (building, software, production and control resources)
5% of the annual turnover allocated to R&D

Stencils Department:



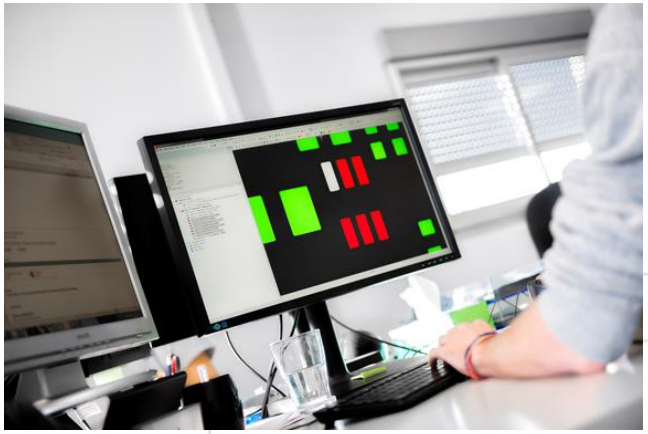
Three last-generation fiber lasers (TANNLIN) and one marking laser (Technifor)

Automatic control programme integrated to our lasers

Quality Control: Scan and measure Software ScanCad and Vision Engineering

Multi-level stencils manufactured in-house within 24-48h!

Tolerance and accuracy



- Dimensional apertures +/- 5 µm
- X and Y positioning +/- 1 µm
- Cutting repeatability à +/- 1 µm

Cutting of apertures down to 20 µm

Exclusive range DB Products

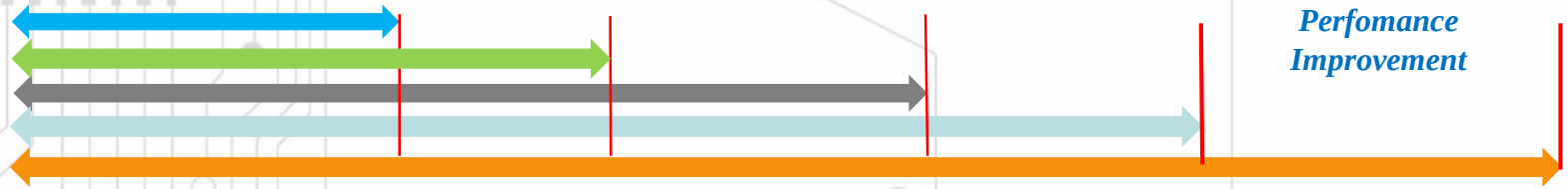
stainless steel

Laser Fine Grain

Electroformed

Nickel Laser

ExaKut



Perfomance Improvement

Pitch 0.5 mm
1206-0603

BGA
Resistance level
0402

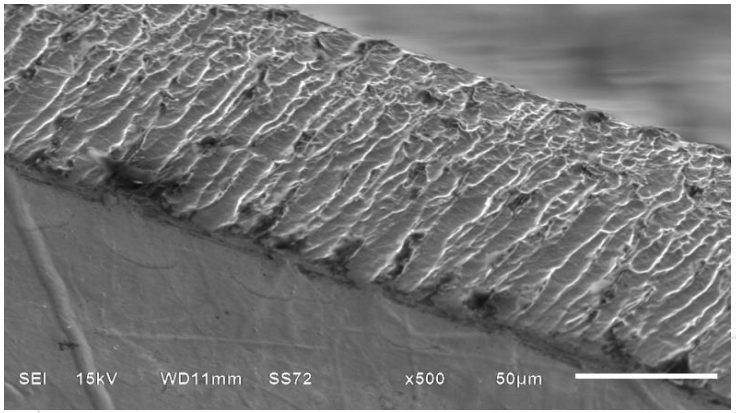
µBGA, QFN, QFP, 01005
fine pitch 0.4– 0.3– 0.250

Objectives:

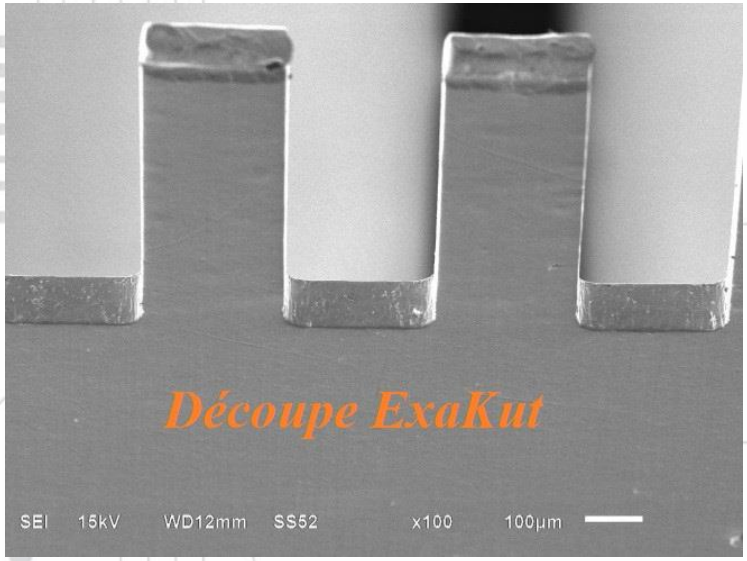
- Supporting our customers in increasingly complex markets due to the miniaturization, high density and mix of components.
- Offer French manufactured production tools with high technical capacity, with a reasonable lead-time and at affordable cost

The ExaKut process was developed during a 24-month R&D programme:

it significantly reduces scories due to laser cutting



Stencil with scories in standard cut-out



Stencil with ExaKut process without scories

Scories are removed without altering the geometry of the openings

A surface treatment is applied to limit the clogging of the screen, facilitate cleaning, thus enhancing productivity.

Experimental printing comparison

EMS – Medical- Aeronautics – Defence & Space

Challenge = Improvement of the solder paste printing process

Process Parameters

Screen printing of 10 PCB reference CT V1.1 with each stencil with the following printing parameters:

- Pressure of the blades: 65 Newton
- Print speed: 45mm/s
- Paste release length: 2mm
- Paste release speed: 4mm/s
- Gap stencil - PCB: 0
- Stainless steel blade
- Lateral clamping
- **No stencil cleaning for 10 pass**

Solder paste characteristics

Inventec ECOREL FREE 305-6D33 T4
Alloy SAC305 SN96,5AG3CU0,5
Grain size Type 4 (20-38µ)

Equipments

Screen print Machine EKRA serio 4000
SPI VI primo L

Stencils

VectorGuard Electroformed 125µm

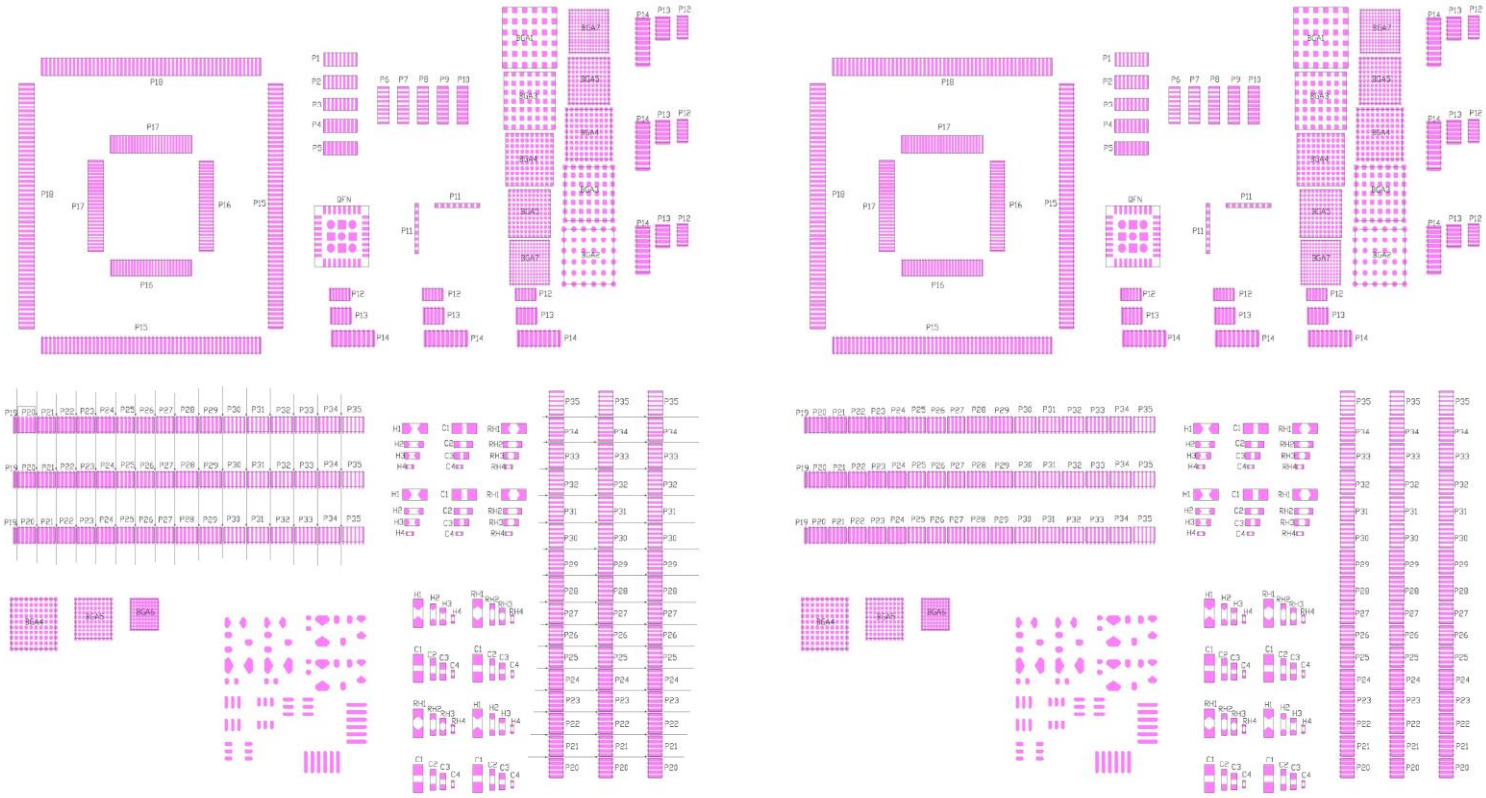
VectorGuard Nickel 125µm

VectorGuard ExaKut 125µm

PCB

Pcb CT V1.1

PCB test DB Products - component layout design



CT V1.1

Short-circuit / PCB results

Electroformed Stencils

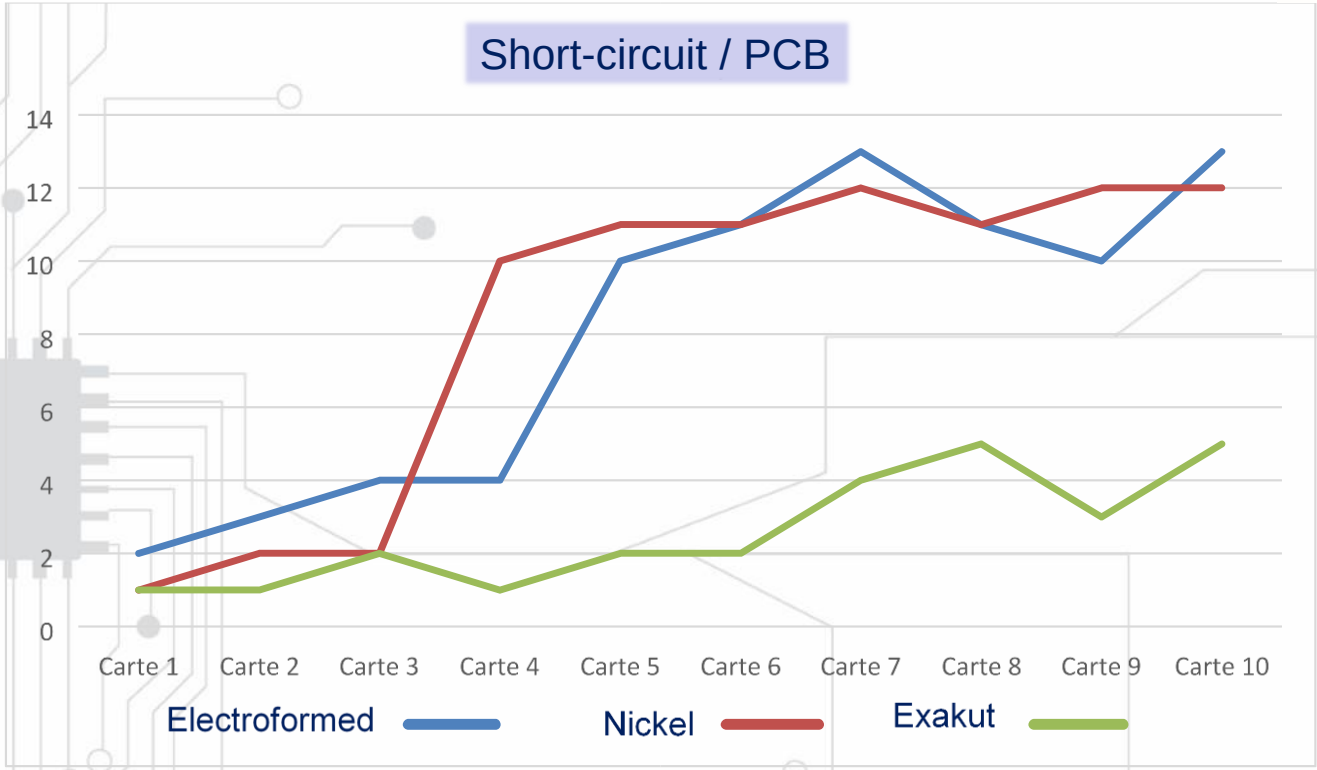
PCB	Number of prints with no short-circuit	Part Name
1	2	P33 – P17
2	3	BGA5-P16-P17
3	4	P16-P17-P19-P35
4	4	P12-P13-P16-P17
5	10	BGA5-P12-P14-P16-P17-P19-P20-P21 -P22-P34
6	11	P12-P13-P14-P16-P17-P19-P20-P21-P22-P23-P34
7	13	BGA5-P12-P13-P14-P16-P17-P19-P20-P21-P22-P23-P24P25
8	11	P12-P13-P14-P16-P17-P19-P20-P21-P22-P23-P33
9	10	BGA5-P12-P13-P14-P16-P17-P19-P20-P21-P23
10	13	P12-P13-P14-P16-P17-P19-P20-P21-P22-P23-P33-P34-P5

Nickel Stencils

PCB	Number of prints with no short-circuit	Part Name
1	1	BGA6
2	2	BGA7-P16
3	2	BGA6-P20
4	10	BGA6-P12-P13-P14-P16-P17-P19-P20-P21-P22
5	11	BGA6-P12-P13-P14-P16-P17-P19-P20-P21-P22-P24
6	11	BGA6-BGA7- P12-P13-P14-P16- P17-P19-P20-P21-P22
7	12	BGA6-BGA7-P12-P13-P14-P16-P17-P19-P20-P21-P22P23
8	11	BGA6-BGA7-P12-P13-P14-P16-P17-P19-P20-P21-P22
9	12	BGA6-P12-P13-P14-P16-P17-P19-P20-P21-P22-P23 -P24
10	12	BGA6-BGA7-P12-P13-P14-P16-P17-P19-P20-P21-P22P23

ExaKut Stencils

PCB	Number of prints with no short-circuit	Part Name
1	1	BGA6
2	1	BGA7
3	2	BGA6-P20
4	1	BGA7
5	2	BGA6-P20
6	2	BGA6-BGA7
7	4	BGA6-P17-P20-P21
8	5	BGA6-BGA7-P14-P20-P21
9	3	BGA6-P20-P22
10	5	BGA6-BGA7-P14-P16-P20



Conclusions: *We find three times less short circuit after SPI analysis, after ten impressions without cleaning*.

0201 *Avionic and Defence & Space Customers*

Challenge: improvement of paste deposit on 0201 by using Exakut vs Electroform stencil

Equipments

Printing DEK Machine

Stencils

VectorGuard Electroformed 125µm

VectorGuard ExaKut 125µm

	Electroformed Stencil							
PCB	1	2	3	4	5	6	7	TOTAL
Aera %	84.37	89.78	82.81	83.52	87.36	78.71	79.05	**84.25%**
height um	113	109.2	113	107.1	111.8	113.9	120.5	**113.29**
Volume %	81.69	85.51	80.23	78.27	83.55	77.71	80.77	**81.10%**
SMT defects								**4**

		ExaKut Stencil						
PCB	1	2	3	4	5	6	7	TOTAL
Aera %	97.29	96.42	93.85	96.59	93.54	99.76	106.1	**97.65%**
height um	107.5	103.7	107.7	104.7	109	104.7	107.4	**106.39**
Volume %	90.77	87.48	87.56	88.08	88.21	90.77	99.28	**91.31%**
SMT defects								**2**

Conclusions:

improvement of the aera and volume of solder paste deposit of more than 10% by using Exakut technology.

µBGA *Automtive customers*

Challenge: improvement of paste deposit on µBGA in mass production by using Exakut vs Electroform stencil

Equipments

Printing DEK Machine

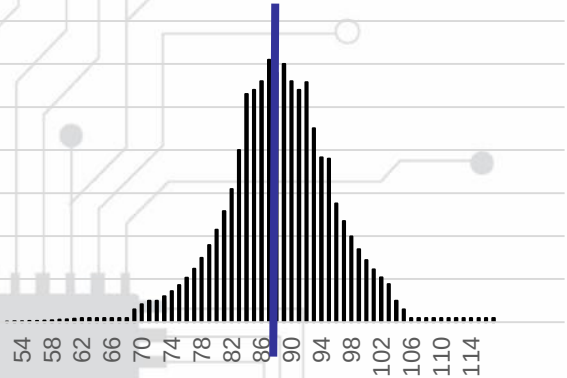
Stencils

Mesh Mount 29’x29’ Electroformed 125µm

Mesh Mount 29’x29’ ExaKut 125µm

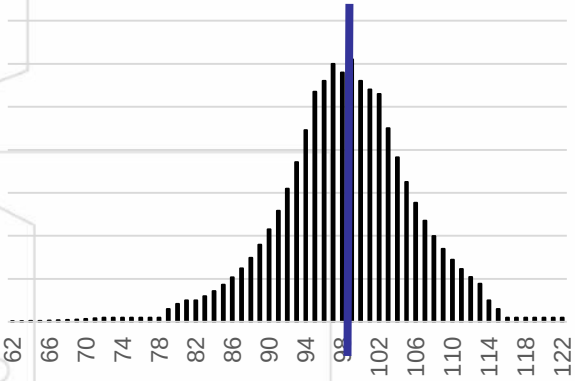
***µBGA** SPI data*

Electroformed Stencil



The curve centered on 87% with an Electroformed

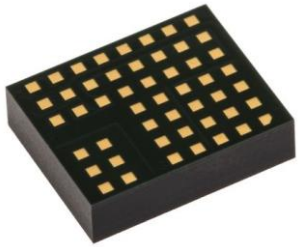
ExaKut Stencil



Stencil **raises to 98% with the ExaKut stencil**

Conclusions:

improvement of the aera and volume of solder paste deposit of more than 11% by using Exakut technology vs Eletroform.

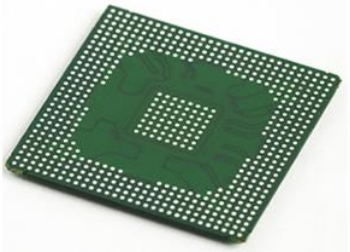


The ExaKut technology, available in 48 hours at an attractive cost, is the most powerful laser cut stencil on the market.

The area ratios obtained of 0.40 (0.66 stainless steel / 0.55 Nickel / 0.43 ElectroFormed) make it possible to assemble:

Examples:

LGA fine pitch 025 with 125 x 125 µm reception ranges and BGA fine pitch 03



Thank you for your attention

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www.dbproducts.fr