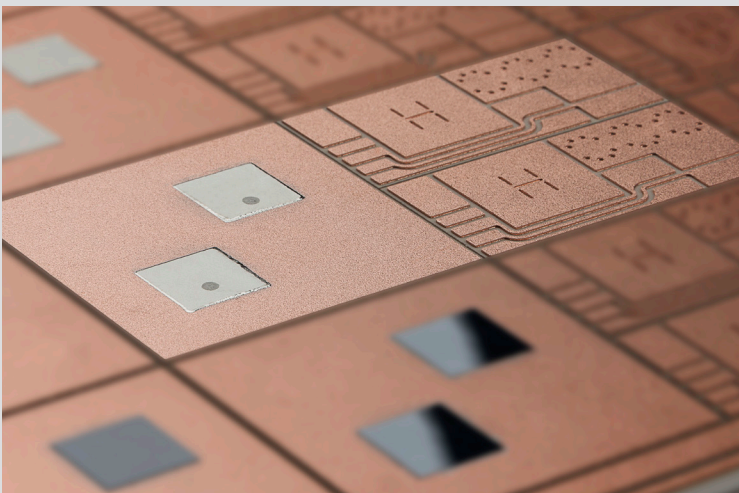


Condura® Metal Ceramic Substrates with Pre-applied Solder DPIS⁽¹⁾



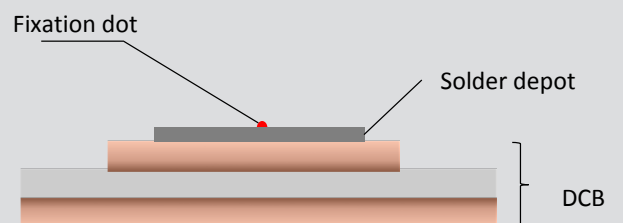
Key Features

- 50 % fewer process steps for die soldering
- No cleaning steps required
- Lower investment
- No solder or flux splatters
- No need of solder stop (e.g. dimples) on DCB
- Improved yield
- Lower production risks
- Production cost savings

Pre-application of flux-free solder pads on Condura® DCB substrates is one of the processing features under Condura®+.

Here solder material of defined thickness and varying sizes can be applied on the substrate and is so customized that the pad location is pre-fixed on the substrate

Fixation dots deposited on the solder pads ensure that the dies do not move once placed. Upon reflow, the fixation material vaporizes without leaving any residues.



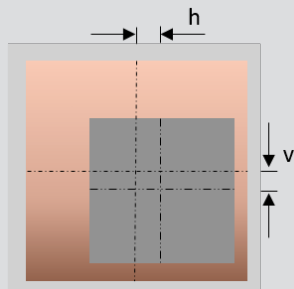
Alumina DCB substrate

- Alumina ceramic Al_2O_3 (96 %)
 - Thicknesses: 0.25 mm/0.32 mm/0.38 mm/0.63 mm
- Direct Copper Bonding Cu-OFE
 - Thicknesses: 0.2 mm/0.25 mm/0.3 mm/0.4 mm
- Single Unit or Master Card size 7" x 5" (usable area)
- Surface finish: bare Cu, Ni-plated (further options as Ag, NiAu by agreement)
- No visible splatter
- Link: https://www.heraeus.com/en/het/products_and_solutions_het/material_systems/dcb_with_pre_applied_solder/dcb_with_pre_applied_solder_page.aspx

Solder pads

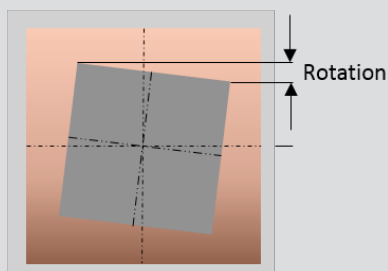
Alloy	SnAg3.5, SnAg3Cu0.5, SnSb10, SnAg20, PbSn5Ag2.5	Other alloys to be agreed
Solder pad dimensions	Possible down to 1mm ² in area; to be agreed on the maximum area	
Solder thickness	Based on customer requirement	Typically $\leq 60 \mu\text{m}$ after die attach

Various solder material thicknesses and areas can be placed on the substrate



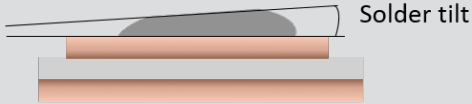
Positioning solder pad with respect to the component

h	$\pm 100 \mu\text{m}$
v	$\pm 100 \mu\text{m}$



Rotation of solder pad

$< 300 \mu\text{m}$, to be agreed



Solder tilt	
	Max. 5°, to be agreed

Fixation dot

The volume of the fixation dot varies with chip or solder pad size. The materials vaporizes without leaving any residue (checked through Auger spectroscopy and bonding wire pull & shear tests)

Die backside metallization

Metallization	Solderable functional surface, e.g. Ag or Au
Size	Based on customer requirement

Die placement

Standard chip placement parameters
No temperature needed for placement

Die soldering

Process	Reflow in active atmosphere, e.g. formic acid, forming gas (N ₂ +H ₂), pure H ₂ ; Vacuum recommended for high quality We can support you in designing process conditions, e.g. reflow profile
Total void rate	≤ 5 % of the wetted area
Max. void size	≤ 0.5% of wetted area
Splatter	No splatter visible
Residue cleaning	Not required

Handling and storage

Shipping	Temperature⁽²⁾: 5 - 40°C Humidity: Keep packaged in a dry place
Storage conditions	Room temperature⁽²⁾: 15 - 25°C Humidity: Store in a dry place in original packaging
Shelf life	Original packaging: 2 months after shipment date ⁽²⁾
Processing	Open the original package only in a clean environment Floor life: Total processing time after opening is max. 2 days Unused parts must be replaced in a moisture barrier bag and be stored in nitrogen atmosphere, max. storage time is 2 weeks

Heraeus Electronics offers:

- Reliable IATF 16949 certified supply of:
 - ✓ Condura®.prime AMB-Si₃N₄ (active metal brazed Si₃N₄)
 - ✓ Condura®.extra DCB-ZTA (zirconia-toughened alumina)
 - ✓ Condura®.classic DCB-Al₂O₃ (direct copper bonded Al₂O₃)
- Condura®+ for example:
 - ✓ Engineering Services (Simulation, Prototype Design & Assembly, Testing and Qualification, Material Analysis)
 - ✓ Pre-applied sinter / solder
- To be your competent **one-stop materials solutions partner!**

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