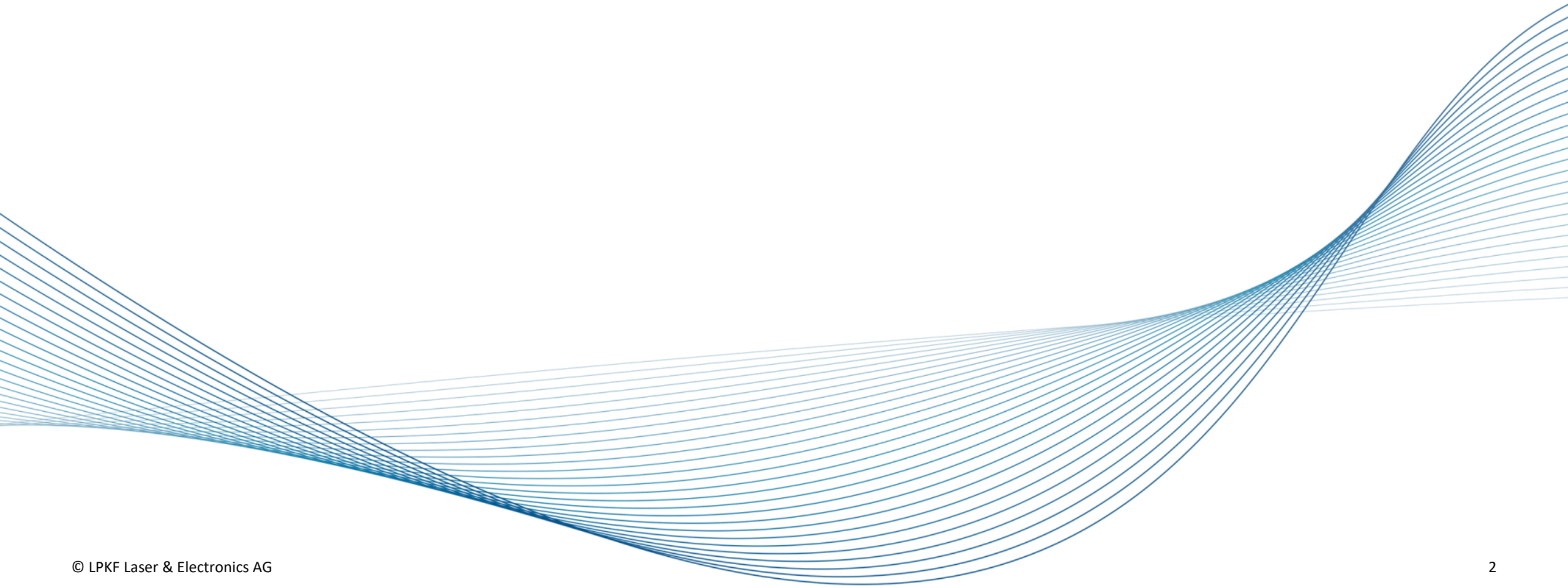
AMP – Active Mold Packaging

Value adding solution for advanced IC packages

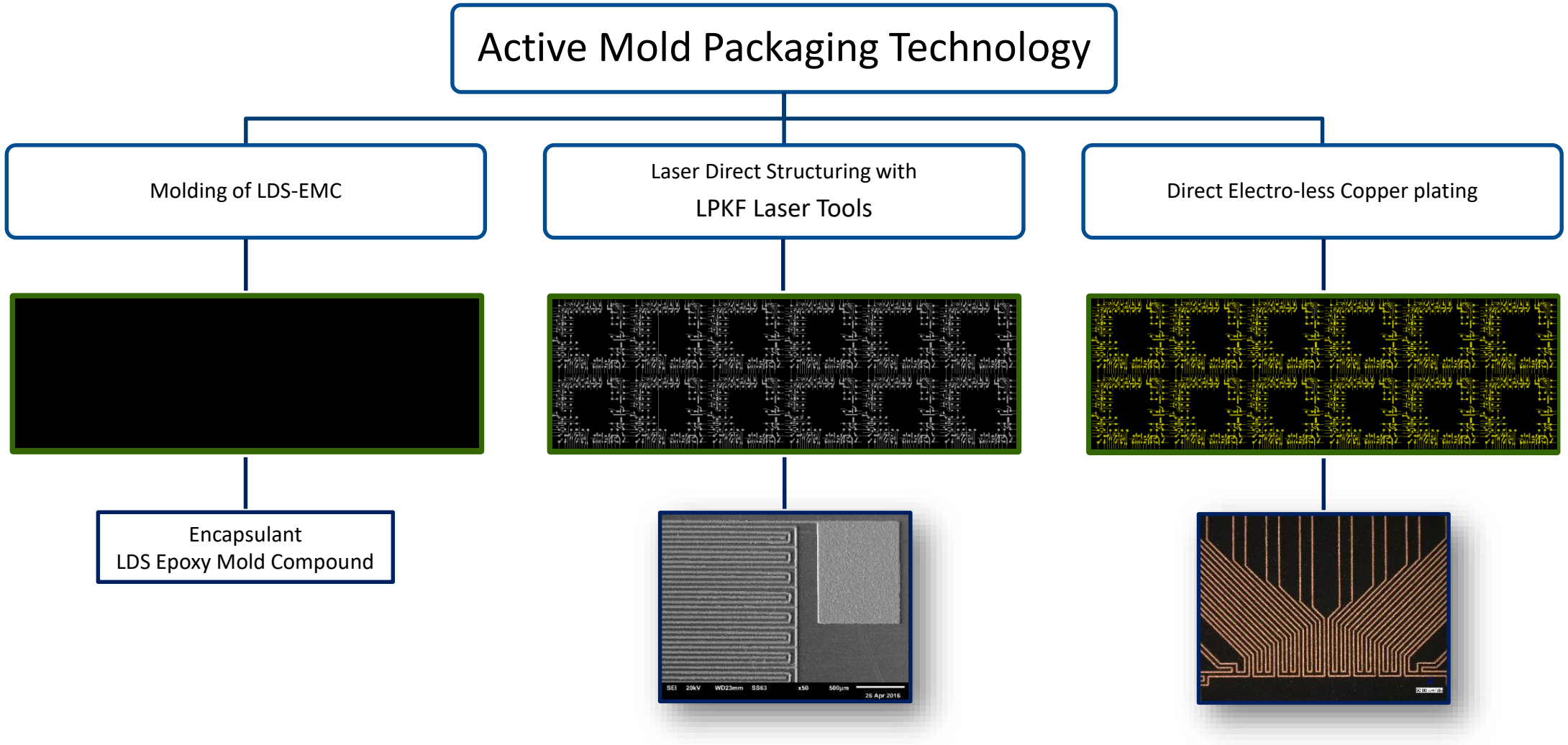
Convert the Epoxy Mold Compound into an active carrier of functionality.

LPKF
Laser & Electronics

Active Mold Packaging Process Flow & Design Rules

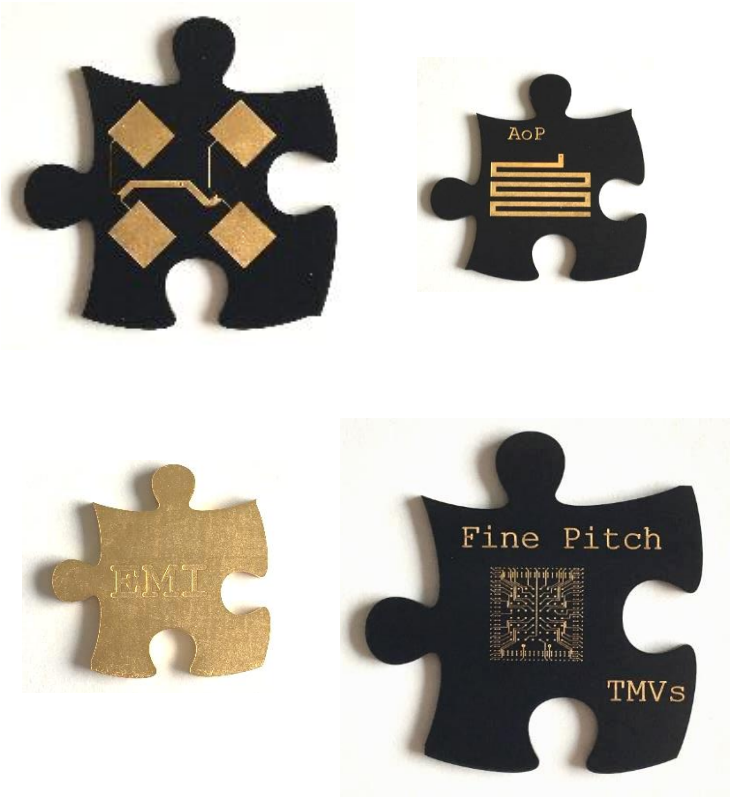


Active Mold Packaging Technology



AMP Process Flow – 1. LDS-Epoxy Mold Compound

Currently available Laser Direct Structuring (LDS) Epoxy Mold Compounds (EMC) are available from a selection of compound suppliers*.



SUMITOMO BAKELITE CO., LTD.

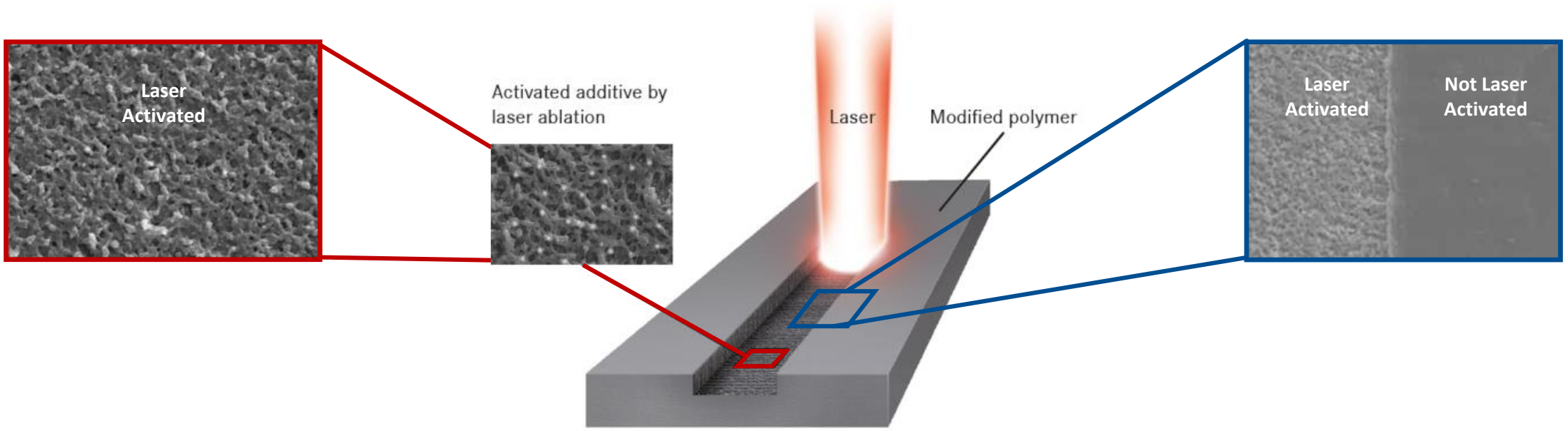
ShinEtsu

Check out the list of Epoxy Mold Compounds approved by the compound suppliers, LPKF and most important by end-users on our homepage.

* others on request

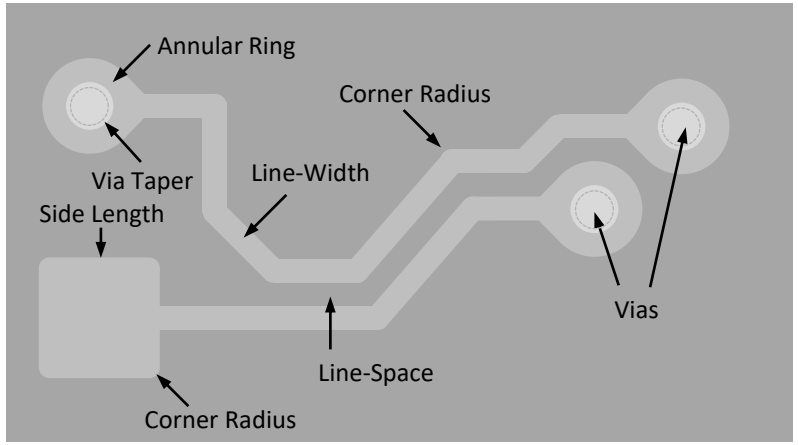
AMP Process Flow – 2. Laser Direct Structuring

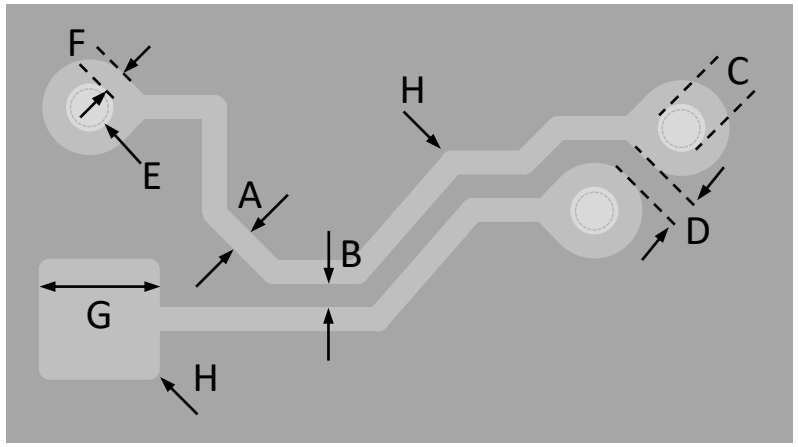
Laser Direct Structuring (LDS) and Laser Activation by laser tools from LPKF Laser & Electronics Laser Technology.



AMP Process Flow – 2. Laser Direct Structuring – Design Rules

Design rules/ specification for Laser Direct Structuring (LDS) laser process.



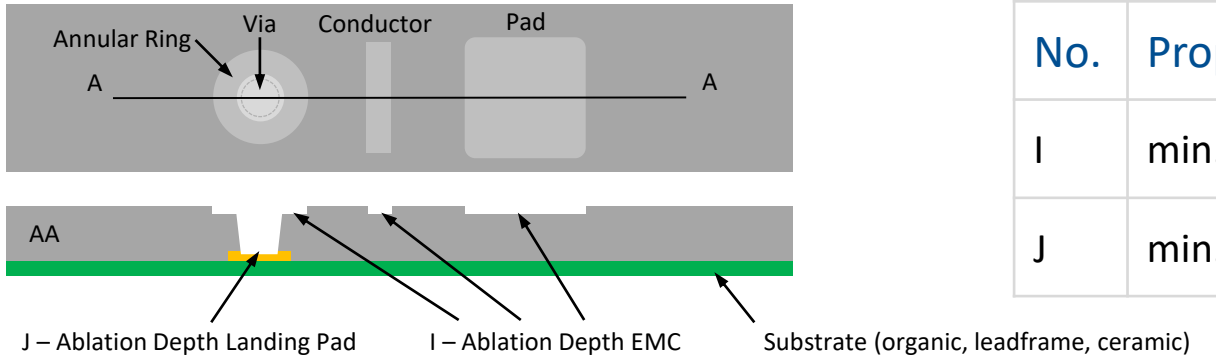


No.	Property	LDS-EMC*
A	min. Linewidth in um	25
B	min. Space in um	25
C	min. Via Diameter in um	40
D	min. Via Space in um	25
E	typical Via Conicity / Taper Angle in degree	5
F	min. Annular Ring in um**	25
G	min. Pad Side Length in um	50
H	min. Corner Radius in um	12.5

* above value are typical values and may vary ** min. via pad diameter = C+2F

AMP Process Flow: 2. Laser Direct Structuring – Design Rules

Design rules/ specification for Laser Direct Structuring (LDS) laser process.



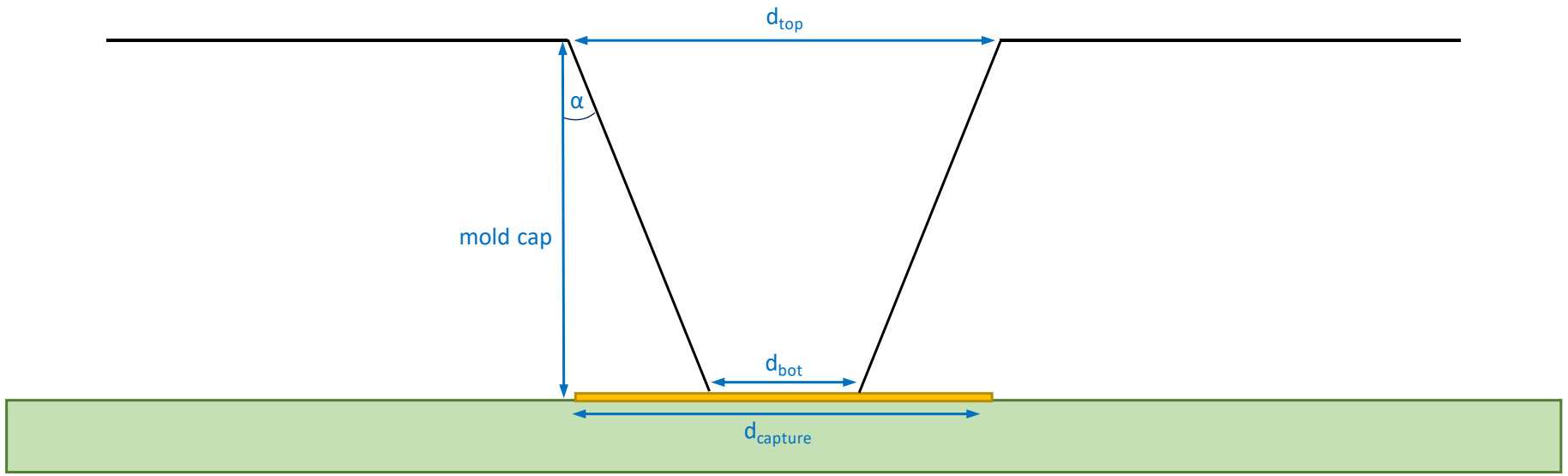
No.	Property	LDS-EMC*
I	min. Ablation Depth EMC in um	5
J	min. Ablation Depth landing pad substrate/ die in um	2

* above value are typical values and may vary

AMP Process Flow: 2. Laser Direct Structuring – Design Rules

Calculation* of capture pad diameter, taking conicity of the TMV into account.

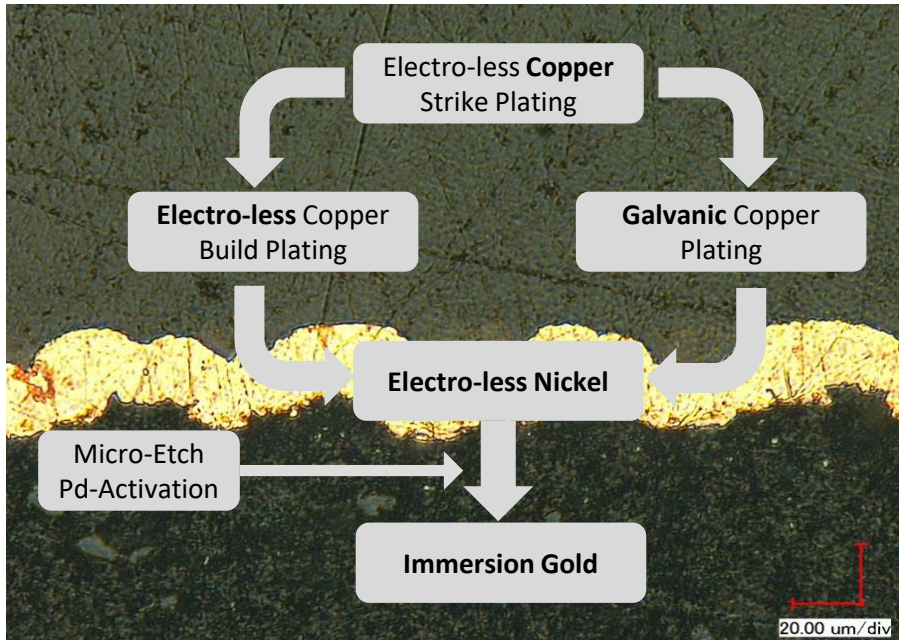
Property	Unit	Value	Remark
Aspect Ratio		1 : 1	EMC mold cap to top via diameter
EMC mold cap	um	300	
taper angle α	deg	5	laser drilling inherent value; larger values support plating better, but limit via pitches
via d_{top}	um	300	
via d_{bot}	um	248	this is the limiting size for e.g. max. current density etc.
$d_{capture} = d_{bot} + 50$	um	298	minimum capture pad diameter



*embedded excel

AMP Process Flow – 3. Plating

Typical Copper Plating with e.g. Electro-less Nickel, Immersion Gold (ENIG-finish) process flow and thicknesses for electro-less and galvanic plating.



No.	Property	Electro-less plating	Electro-less + Galvanic Plating
1	Electro-less Copper **Strike** Plating	1…2um	1…2um
2.1	Electro-less Copper Build	5…10 um	n.a.
2.2	Galvanic Copper Plating	n.a.	10…100 um
3	Electroless Nickel	2…10 um	2…10 um
4	Immersion Gold	0.1…0.5 um	0.1…0.5 um
	Total Thickness	**≈ 8…22 um**	**≈ 13…110 um**

* above value are typical values and may vary

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