

## Parameter recommendation for routing of IMS made of aluminium and copper

GCT end mill type: **1322 / 1328 / 5422** for aluminium  
**1312 / 1318 / 5422** for copper

Cutting speed:  $v = 210$  m/min for aluminium (180 m/min for copper)

D1	n	fxy	Fxy	Fz		H	Depth
Router diameter	Spindle speed	Chip load	Feed rate	Infeed with pre drilling	Infeed with 1328 / 1312 / 1318	Routing depth	into the back up
[mm]	[rpm]	[ $\mu\text{m}/1$ ]	[m/min]	[m/min]	[m/min]	[mm]	[mm]
0.8	83000	3	0.25	0.8	-	0.8	0.3
1.0	66000	5	0.3	0.8	-	1.0	0.4
1.2	55000	9	0.5	0.8	-	1.2	0.4
1.5	44000	14	0.6	1.0	0.3	1.5	0.4
1.6	42000	17	0.7	1.0	0.3	1.6	0.4
1.8	37000	21	0.8	1.0	0.4	1.8	0.4
2.0	33000	30	1.0	1.2	0.5	2.0	0.5
2.4	28000	36	1.0	1.2	0.5	2.4	0.5
3.0	22000	45	1.0	1.2	0.5	3.0	0.5

### General recommendations:

- ⇒ With 1328, 1312 and 1318 no pre drilling required, for 1322 pre drilling of the entry position
- ⇒ With ceramic dielectric or copper, reduce feed rate by approx. 25% and spindle speed by approx. 15%.
- ⇒ For depth routing, reduce feed rate by approx. 25%.
- ⇒ Use 5422 for depth routing by electrical contact, reduce feed rate to approx. 50%.
- ⇒ Use entry material, e.g. phenolic paper  $\geq 0.80$  mm thickness.
- ⇒ Pressure foot with max pressure.
- ⇒ Use minimal quantity lubrication (ethanol or oil emulsion).
- ⇒ Routing in 2 passes with diameter compensation improves quality and dimension.
- ⇒ Follow the GCT checklist for machining of PCB's.

### Router specifications:

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Overall length: 38.2 -0.3mm  
 Flute length: L  $\pm 0.2$  mm  
 Working length: L -2.0 mm  
 Nominal diameter: D1  $\pm 0.015$  mm  
 Shank diameter: D = 3.175 -0.001 / -0.007 mm

