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# Metal-Diamond Composites

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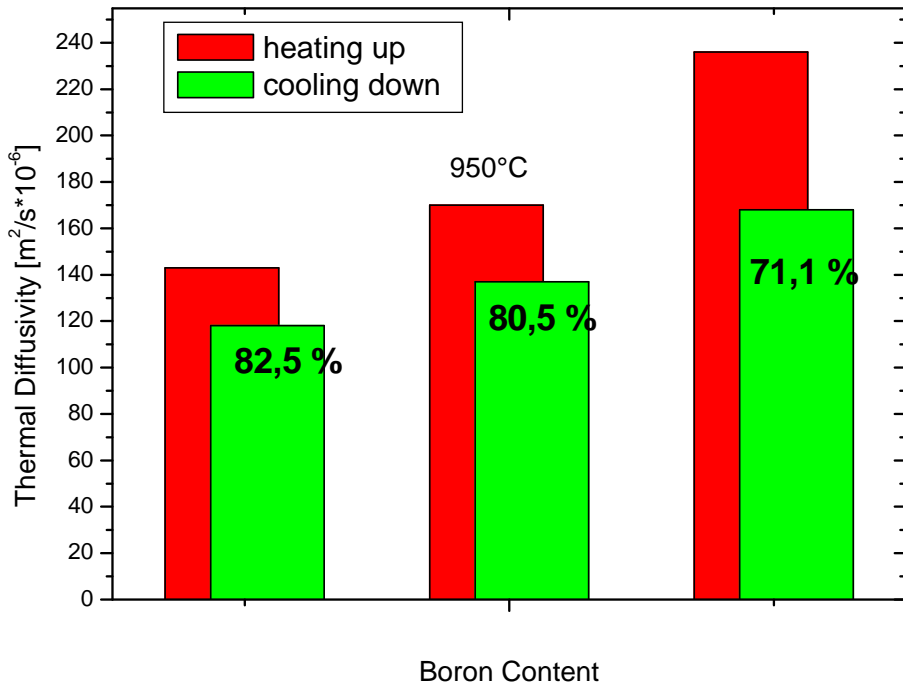
## Task I: Optimisation of Material Composition/Processing

Composition	Thermal Conductivity [W/mK]	CTE [ppm/K]
Al-Dia	400 – 620	8 – 12
Cu-Dia	300 – 680	6 – 12
Ag-Dia	300 – 650	8 – 10

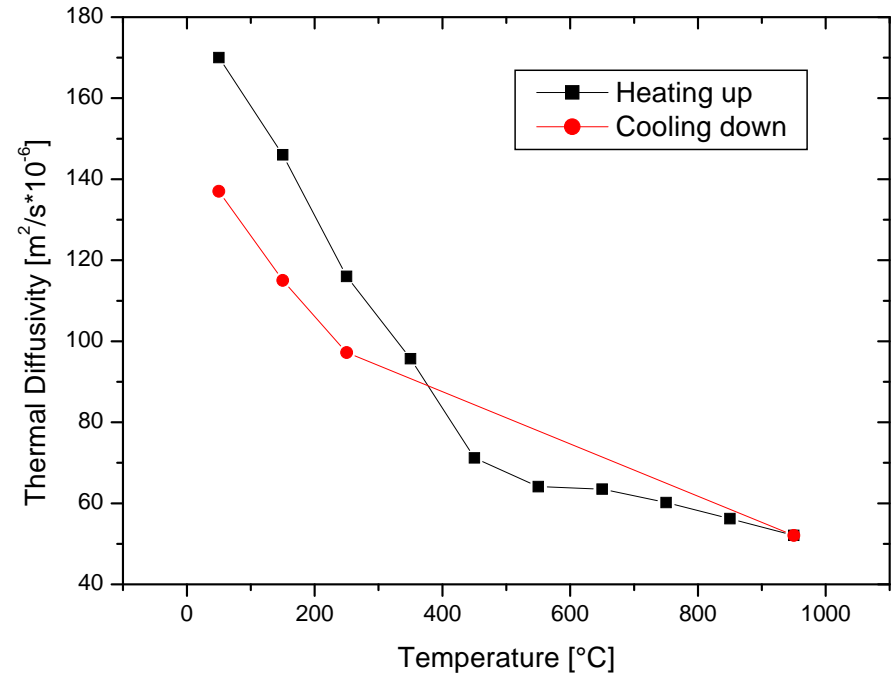
Table 1: Material properties realized in „lab-size“ by PM process

# Task II: Optimisation of Thermal Stability of Metal-Diamond

Cu+B+50vol.%Dia (120/140)



Cu+B+50vol.%Dia (120/140)

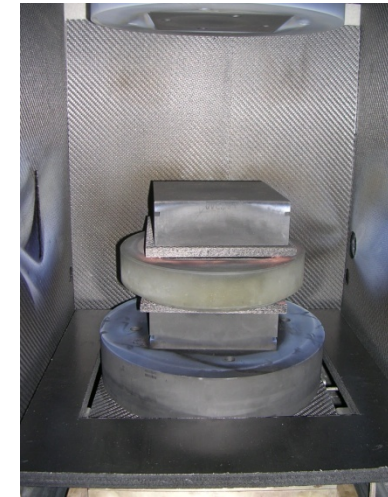


## Task III: Processing of large plates

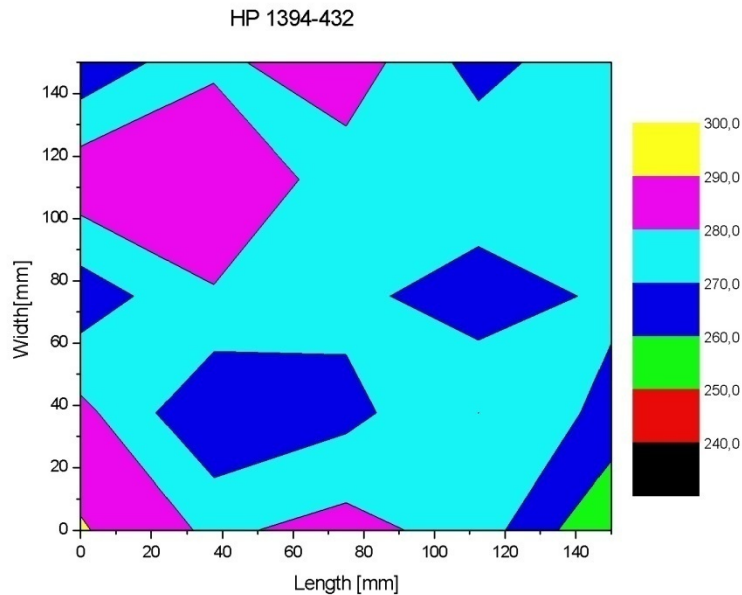


Direct heated hot pressing

- Expected installation of Dr. Fritsch hot press in August/2009
- Heating rate: up to 400 K/min
- Max. temperature: 2.400°C
- Size: 200mmx200mm (250mmx250mm)



## Task IV: Uniformity of Material Properties on large plates

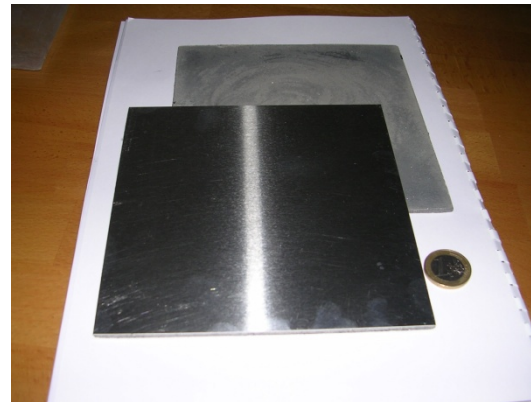


Local Thermal Analyses of Al-diamond composites

Al-Diamond system is very sensitive to T-t in processing

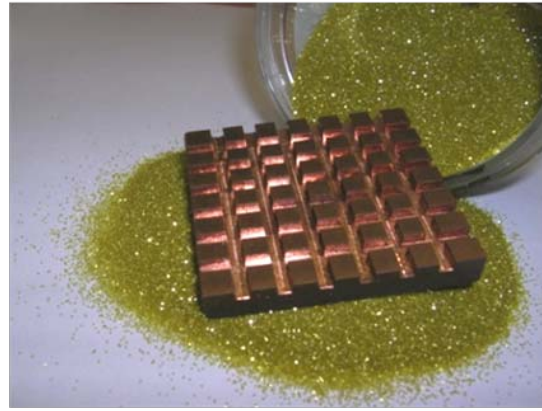
Al-Diamond composite

- $270 \pm 20 \text{ mm}^2/\text{s}$
- $500 - 600 \text{ W/mK}$



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## Task V: Shaping/Surface Finishing



Good surface quality can be realised by:

- preparation of sandwich structures
- or bi-layer structures

“Machining/Cutting” of composites is possible by:

- Water Jet Cutting
- Laser Cutting
- Electro Discharge Machining

