マイクロ熱電対を用いた金型内の樹脂温度直接測定

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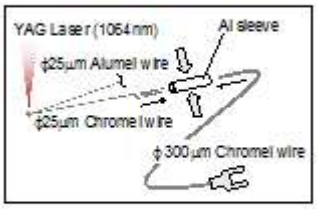
Micro thermocouple

1. Laser welding of ϕ25μm Alumel and Chromel wires
2. Termination by caulking Aluminum sleeve
3. Insulation by cashew paint



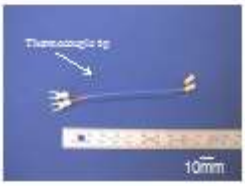


Fig. Micro thermocouple with terminals

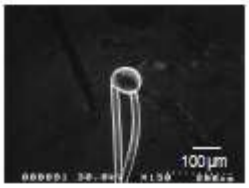


Fig. SEM view of micro thermocouple tip

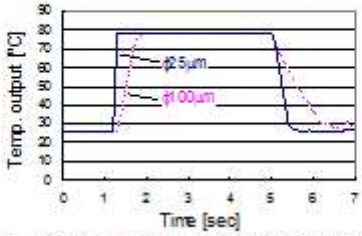
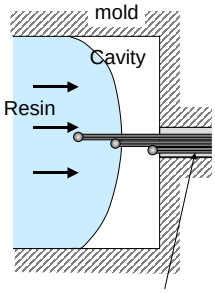


Fig. Response of micro thermocouple

Needle type micro thermocouple array



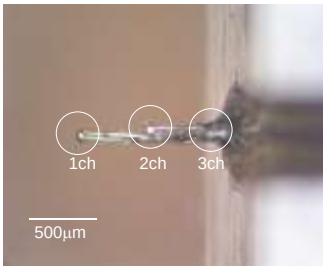


Fig. Micro thermocouple array before injection

Front view

Side view

Fig. Micro thermocouple array after injection

Temperature and heat flux inside an injection mold

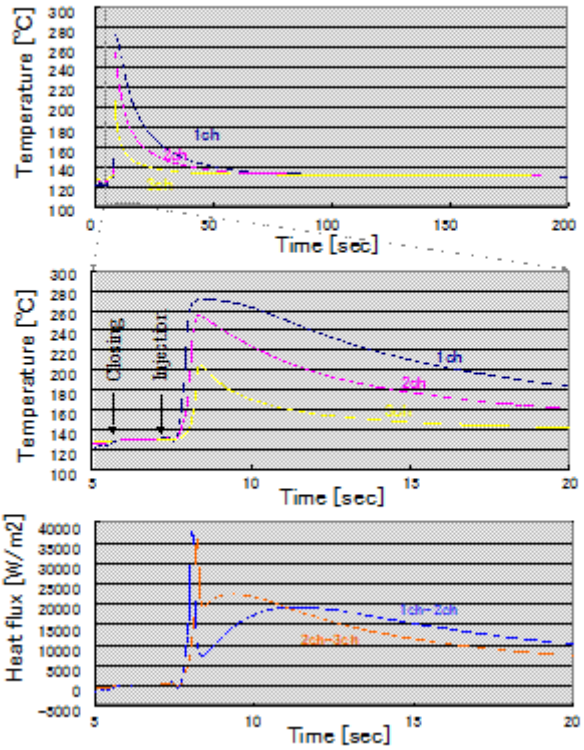
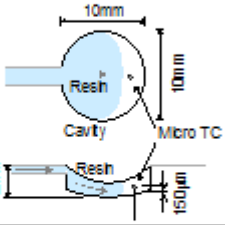


Fig. Resin temperature and heat flux in the cavity measured by the themicro rmocouple array

Measurement of Heat Flux on an Injection Mold Wall by Using micro thermocouple

(1) Laser welding

(2) Machining using femtosecond laser



$$H = Q/(Tw - Tf)$$

H: Heat transfer coeffident
Q: Mold heat flux
Tw: Mold temp.
Tf: Infinity temp.

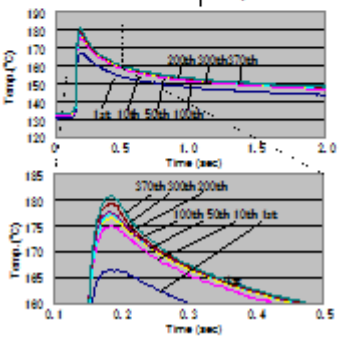


Fig. Temperature of the resin at the mold surface

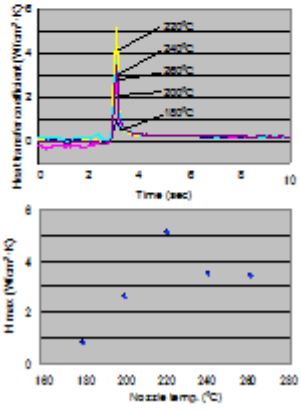


Fig. Heat transfer coefficient on the mold surface