

Thermal conductivity of the green-sand mould poured with copper

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Abstract

The paper presents results of measuring thermal conductivity of green-sand mould material and time of pure-copper plate castings solidification evaluated from the casting cooling curve and from the sand mould temperature field. During the experiments pure Cu (99,8 %) plate was cast into the green-sand moulds. Basing on the measurements it was stated that thermal conductivity of the moulding sand has complex temperature variability, especially during the water vaporization and the obtained dependence should be used in the numerical calculations to improve their accuracy.

Keywords: castings, green-sand mould, thermal conductivity, solidification

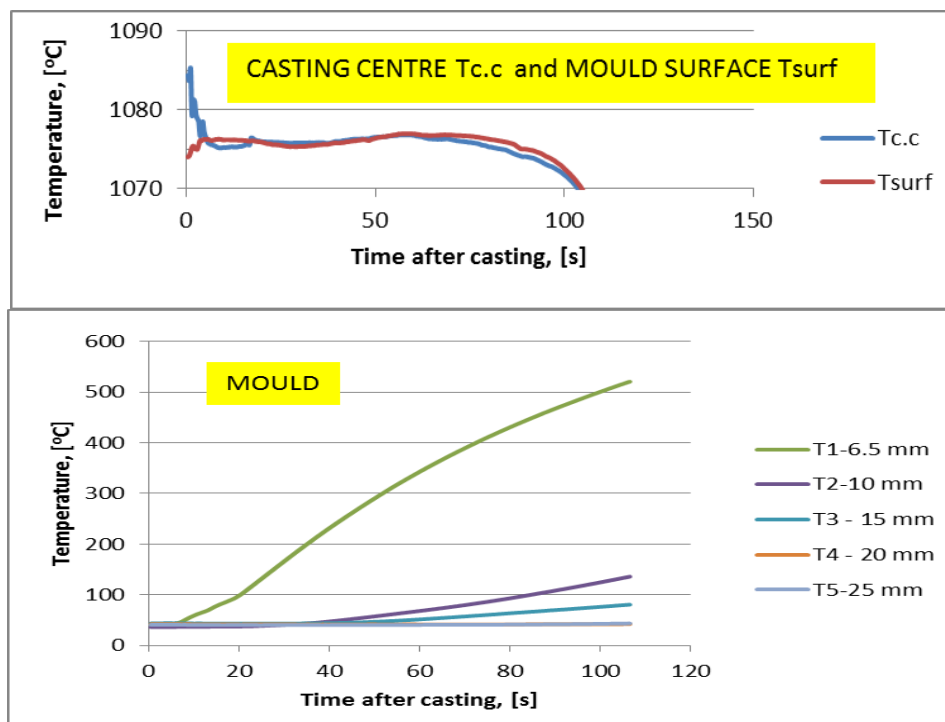


Fig. 1. Temperature field of the examined system. Tc.c. is temperature measured in the centre of the plate-casting; Tsurf is temperature of the mould inner surface; T1 to T6 are temperatures measured inside the mould body on different distances from the inner surface

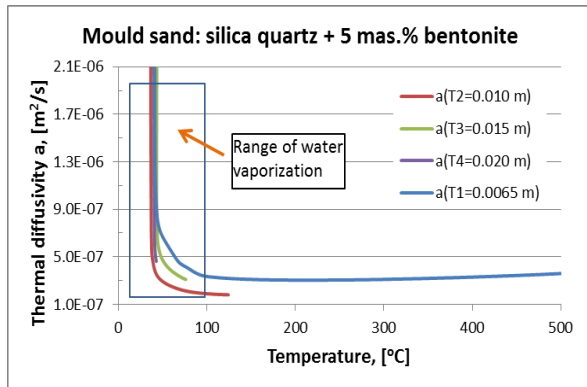


Fig. 2. The thermal diffusivity coefficient calculated from the registered temperature field shown in Fig. 1

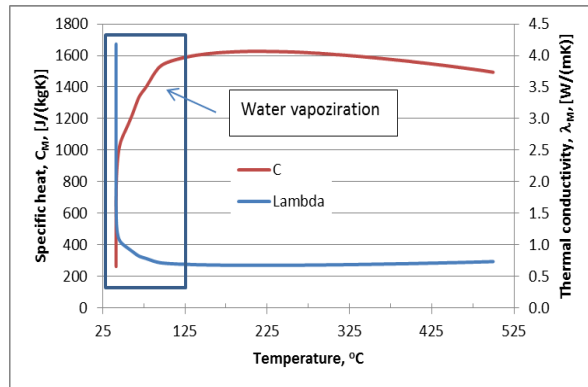


Fig. 3. The Relationships: thermal conductivity vs. temperature obtained in the *Casting Method* experiment for the examined green-sand [5-7]

Acknowledgements

The authors acknowledge The Polish Ministry of Higher Education for financial support under grant 11.11.170.318 – Task No. 9.

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