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***Abstract***

*This document gives formatting instructions for authors preparing papers for publication in the International Journal of Advance Industrial Engineering. The authors must follow the instructions given in the document for the papers to be published. You can use this document as both an instruction set and as a template into which you can type your own text.*

***Keywords:*** *The author can include 5-7 words like Thermal Analysis, Pre-conditioner, In-mold, Inoculant’s efficiency.*

**1. Introduction**

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A cooling curve is a plot of temperature as a function of time for a sample of an alloy poured into a standardized mould with a thermocouple usually positioned in the center (Warsinsk, 1975). Depending on the sampling rate of the data, the cooling curve can be represented and the first derivative can be accurately calculated (Backerud, *et al*, 1975). Invention and introduction of thermal analysis in casting production has brought a comprehensive evaluation of melt iron quality. Research has shown that the shape of the cooling curve measured by thermal couple mounted in the thermal analysis sample cup reflects the solidification process of iron melt in the cup (Zhu and Smith, 1995) .Measuring the shape of the cooling curve will give comprehensive information about the melting and treatments quality thereby the properties and microstructure could be predicted (Labrecque and Gagne, 1998), (Chisamera, *et al*, 2009) , (Riposan, *et al* 2003).

Thermal analysis can be used to determine inoculants performance, apart from the traditional usage of thermal analysis to determine the percentage of carbon equivalent liquidus, carbon and silicon levels, it can also be used to monitor metallurgical processes and identify potential problems areas such as low nodule count, under-cooled graphite and carbide/chill propensity (Udroiu, 2002), (Corneli, *et al*, 2004), (Seidu, 2008). It can be used to predict iron shrinkage tendency and help the foundry to control scrap.

**2. Placing the figures**

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**Fig.1** Typical cooling curve and its first derivative

*2.1 Placing the graphs*

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**** (1)

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**Table 1** Experimental procedure parameters

|  |  |  |
| --- | --- | --- |
| S. No | Parameters | Values |
| 1 | Melting Changes | Acid lining coreless induction furnace,100kg, 2400Hz |
| 2 | Charges | 3.6%C, 1.22%Si, 0.02%P, 0.016%S, 0.04%Cr, 0.47%Mn, 0.005%As, 0.001%V, 0.001%Pb, 0.002%Ti. |
| 3 | Base Metal | 3.56%C, 2.78%Si, 0.47%Mn, 0.020%P, 0.008%S, 0.0384%Cr, 0.0384%Cr, 0.042%Mo, 0.023%Ni, |

**Conclusions**

The authors can write the conclusion as a whole in a paragraph or by making points. An example is given as under.

1. Derivatives of the cooling curve can be used to understand the small changes in the undercooling of the liquidus and solidus temperature.
2. Thermal analysis is a good technique to control carbides, shrinkage and micro-shrinkage formation.
3. It is visibly shown that there is significant reduction in undercooling degree on the alloys and the value of inoculation index was increased. Although the addition of Al,Ca,Zr-FeSi pre-conditioners gives no significant influence .
4. The use of relative performance makes a clear distinction of the alloys efficiency and could be concluded that Ca,RE,S,O-FeSi inoculated iron gave the most influence.
5. From the result obtained, it could be deduced comparatively that Ca,RE,S,O-FeSi inoculant give the best efficiency followed by Ca,Zr-FeSi and Ca,Ba-FeSi inoculants respectively.

**References**

The authors are required to follow the following reference style i.e. Authors names (Year of publication), Title of the Article, *Name of the journal in Italics,* Vol. No. Page No. The examples is given as under

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