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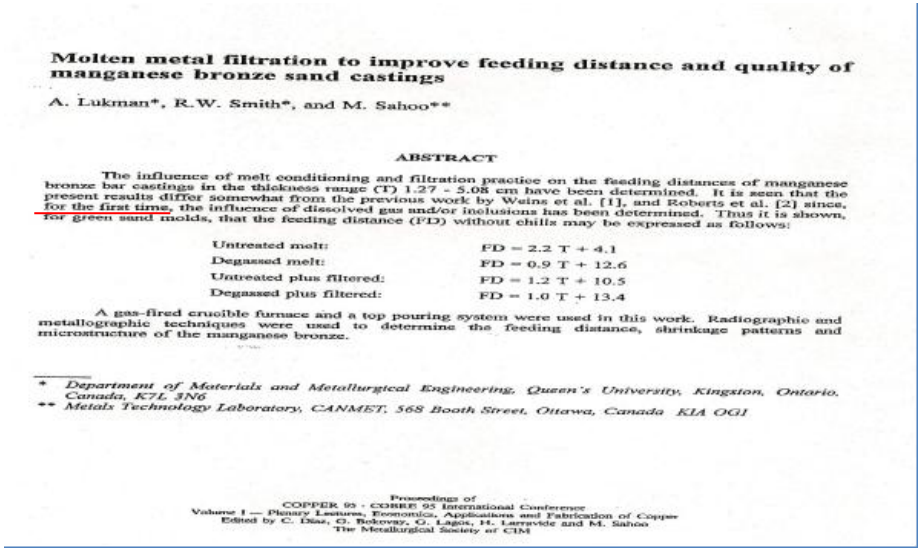

Molten metal filtration to improve feeding distance and quality of manganese bronze sand castings

A. Lukman*, R.W. Smith*, and M. Sahoo**

ABSTRACT

The influence of melt conditioning and filtration practice on the feeding distances of manganese bronze bar castings in the thickness range (T) 1.27 – 5.08 cm have been determined. It is seen that the present results differ somewhat from the previous work by Weins et al. [1], and Roberts et al. [2] since, for the first time, the influence of dissolved gas and/or inclusions has been determined. Thus it is shown, for green sand molds, that the feeding distance (FD) without chills may be expressed as follows:

Untreated melt:	FD = 2.2 T + 4.1
Degassed melt:	FD = 0.9 T + 12.6
Untreated plus filtered:	FD = 1.2 T + 10.5
Degassed plus filtered:	FD = 1.0 T + 13.4

A gas-fired crucible furnace and a top pouring system were used in this work. Radiographic and metallographic techniques were used to determine the feeding distance, shrinkage patterns and microstructure of the manganese bronze.

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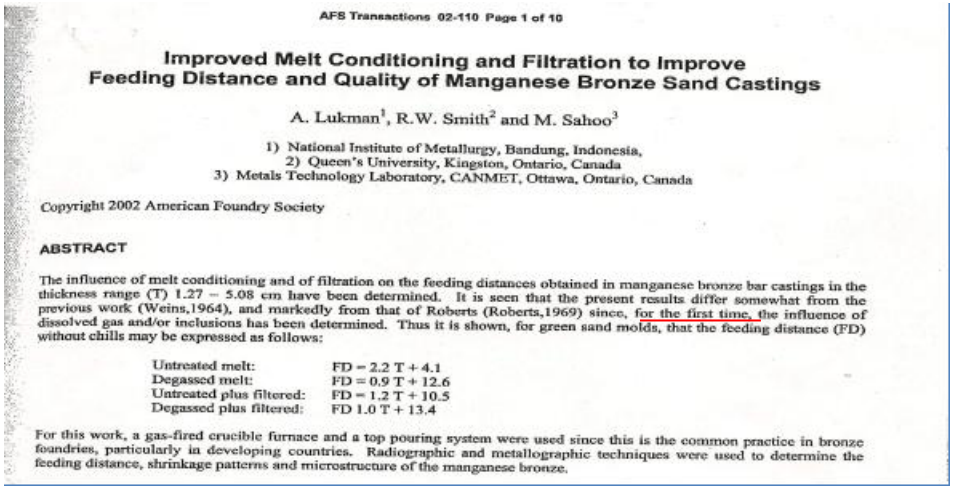

Improved Melt Conditioning and Filtration to Improve Feeding Distance and Quality of Manganese Bronze Sand Castings

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ABSTRACT

The influence of melt conditioning and of filtration on the feeding distances obtained in manganese bronze bar castings in the thickness range (T) 1.27 – 5.08 cm have been determined. It is seen that the present results differ somewhat from the previous work (Weins,1964), and markedly from that of Roberts (Roberts,1969) since, for the first time, the influence of dissolved gas and/or inclusions has been determined. Thus it is shown, for green sand molds, that the feeding distance (FD) without chills may be expressed as follows:

Untreated melt:	FD = 2.2 T + 4.1
Degassed melt:	FD = 0.9 T + 12.6
Untreated plus filtered:	FD = 1.2 T + 10.5
Degassed plus filtered:	FD 1.0 T + 13.4

For this work, a gas-fired crucible furnace and a top pouring system were used since this is the common practice in bronze foundries, particularly in developing countries. Radiographic and metallographic techniques were used to determine the feeding distance, shrinkage patterns and microstructure of the manganese bronze.