

UNIVERSITY OF MORATUWA

Department of Material Engineering
Faculty of Engineering

The production of alloyed white cast iron
for the use in the crushing and grinding
operations in Sri Lanka

By



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P R E F A C E

This dissertation is an account of the work carried out in the department of Materials Engineering, University of Moratuwa and the Ceylon Steel Corporation from January 1980 to December 1981.

A section of the dissertation has been sent for publication in an international journal. A summary of this work described in this thesis will also be discussed at the annual session of the S.L.A.S.S. to be held in mid December.

The results described in this dissertation are to the best of my knowledge, original except where reference is made to the work of others. No part of this dissertation has been submitted for a degree at any other University.



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S Y N O P S I S

This thesis describes the work that have been carried out to produce different types of cast iron grinding media and liner plates of good wear resistant quality for the local industry. The types produced were low chromium, nickel chromium, martensitic and high chromium white cast irons. The castings were carried out at the Ceylon Steel Corporation while the micro structural examination and mechanical testings were conducted at the University of Moratuwa.

At present low alloyed cast steel grinding balls and Hadfield steel liner plates are produced at the Ceylon Steel Corporation for local use and they are found to contain defects ranging from shrinkage cavities, sand fusions, blowholes, quench cracks to misruns. It is possible to eliminate most of these defects with certain types of alloyed white cast iron. The grinding balls and liner plates so produced showed greater resistance to wear and the casting yield was higher when compared with the castings of balls and liners.

Although the price of alloyed white cast iron is marginally higher than the cast steel balls and Hadfield liners, the longer life of the former more than compensates the replacement of cast steel balls, Hadfield liners with the white cast iron balls and liners.