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THE PLACE OF THE IMPERIAL SMELTING PROCESS IN NON-FERROUS METALLURGY (*)

S.W.K. Morgan,
Managing Director,
Imperial Smelting Processes Ltd.,
London.

The Imperial Smelting Process is a blast furnace process for the simultaneous recovery of zinc and lead. It was developed at Avonmouth, England, by the Imperial Smelting Corporation. Although the first commercial furnace was built only in 1959, there are now eight others operating under licence in various countries. Two more come into operation during 1968 and two more are under construction. It is estimated that in 1968 the furnaces in operation will produce together some 430,000 tons of zinc and 220,000 tons of lead. It can therefore be claimed that the process has already made a considerable impact in non-ferrous metallurgy.

The process has already proved itself as a commercial process and has shown many of the advantages of blast furnace operation - large units can be built at competitive capital and operating costs. If the ores are available, considerable quantities of lead can be smelted with the zinc at practically no additional cost. This makes the furnace, in many cases, a more economical producer of lead than a standard lead blast furnace. When the full potential of this is realised, the process will obviously affect lead smelting practice in the future. The ability of the process to produce lead enables silver, gold, copper, antimony and bismuth to be recovered, and thus almost all the values in an ore can be recovered in one operation.

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A further advantage of this ability to smelt zinc and lead together is beginning to affect mining and milling to an increasing degree. It is now no longer necessary to use differential flotation to separate zinc and lead into individual concentrates. At a number of mines they are now recovered together in a single bulk concentrate for treatment in an I.S.F., thus improving recovery and reducing treatment costs.

Perhaps, however, the most important single attribute of the process is its ability to smelt high-iron, low-grade concentrates. All its competitors are restricted in the main to high-grade materials. The annual consumption of zinc in the Free World is of the order of 3,500,000 tons. Over the last ten years, it has been growing at an average rate of over 120,000 tons per year. There is little reason to doubt that this rate will continue, if not increase, in the future. The recent remarkable growth of continuous sheet galvanising, and the widening use generally of zinc for the protection of structural steelwork alone, will ensure this. Growth of this order over the next twenty years is certain to pose problems for the exploration and mining companies. High grade concentrates will surely be at a premium and the zinc smelting industry will be driven to increasing use of lower-grade materials. Recovery of all values at both mine and smelter will become increasingly important. In this context the blast furnace process would appear to have no rival.

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