

The state of the local foundry sector

Written by RL Paul

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The ten papers appearing in the Journal this month were presented during the Ferrous and Base Metals Development Network Conference 2012 held in Johannesburg over the period 15–17 October 2012. With the exception of the paper on the coordination chemistry of zirconium, they cover a spread of research activities associated with the physical and metallurgical properties of alloys.

After being requested by the Journal Editor to comment on these learned papers in the field of physical metallurgy, I found myself in the same awkward position as early cartographers who, when faced with a lack of knowledge, were forced to avoid the issue completely by inserting 'There be Dragons' into the relevant empty spaces on their maps. I shall do the same! But I don't feel embarrassed, as I know that I am not alone in my inadequacy. Just look at the authors and their company affiliations and you will note that physical metallurgy is the domain of a select few in South Africa. Their research is directed, in the main, towards improving the operation of our local foundries.

Although simple iron objects such as beads, rings, and crude blades have been excavated and dated as early as 4000 years before present, it took another 500 years for the techniques of forging to be developed (i.e. the manufacture of iron objects by heating to temperatures about 200–300 °C below the melting point and hammering into the desired shape). The Chinese were the first to develop a furnace that could reach temperatures high enough to melt and cast iron (attributed to 2500 years before present), beating the western world by more than 1000 years. It is reported that they had already pioneered the structural use of cast iron in the supporting pillars of pagodas by the time that the West had, at last, developed the ability to melt iron on a scale that could be used for casting purposes (www.historyworld.net). Foundry technology can take the credit for kick-starting the Industrial Age, and we owe much to those early pioneers.

The operation of ferrous and non-ferrous foundries is critical to the functioning of modern society, and without this essential skill we would not have engine blocks, mill balls, and railways (amongst countless other cast products that we take for granted). So, how healthy is our local foundry sector? Suffering poorly, is the simple answer. According to recent reports, the sector is beset by rapidly rising input costs, a crippling skills shortage, and intense competition from imports.

In a research report entitled Industrial Structures and Skills in the Metals Beneficiation Sector of South Africa commissioned by the Department of Labour and dated March 2008, it is stated that 'there has been significant restructuring and consolidation in the South African foundry industry over the past 10 to 15 years. The number of firms shrunk from 450 in the early to mid-1980s to just over 200 in 2003. The industry is very small compared to its global competitors. For instance, in 2003 China had 12 000 foundries and India had 4 500.'

More recently, the National Foundry Technology Network (more on this entity later) reports that there was a 13 per cent decline in the number of foundries in South Africa between 2007 and 2011, and that employment in the sector fell by 30 per cent over the same period.

Most of these foundries utilize electrically operated furnaces and are reeling with the recent doubling in the Eskom tariffs (even higher when buying power from some municipalities), with

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further increases to come. It is reported in Engineering News (August 2012) that some foundries are converting to gas fired furnaces where casting temperatures permit. Ferrous foundries rely upon scrap steel, but dealers are exporting our local scrap due to the high dollar prices coupled with a weak rand.

The final blow to the local foundry sector is in the area of skilled labour. In the 2008 Department of Labour report cited above we find: 'However, these industries also require skilled labour and face severe skills shortages at artisan, technical and engineering levels. The shortage of skilled artisans exists across the manufacturing industry as a whole. In 1982 there were 13 000 artisan apprentices registered, but this figure had dwindled to only 2 000 in 2003, a completely inadequate number.'

Without any real insight into recent developments, I am sure that the sector is considering every technical, financial, and skills-related possibility to remain competitive (the conversion to gas fired furnaces is but one tangible example). What else can be done to support the foundry sector?

The cost of electrical power is negatively impacting upon society at large and the mining industry in particular. The Chamber of Mines has made representation at the NERSA hearing and criticized the fact that two thirds of the proposed increase in electricity prices requested by Eskom was attributable to return on capital and depreciation charges.

Minister Ebrahim Patel of the Department of Economic Development has just published a draft (please note – draft) policy directive that provides for foundries, mills, and smelters of scrap to be given first option to purchase scrap at a predetermined price preference level. An export permit will be approved only if local users have not taken up the offer to purchase the scrap after 30 working days. The Department of Science and Technology (DST) established the National Foundry Technology Network (NFTN) in 2008, which has six key objectives, of which three are relevant to this discussion:

- Providing relevant practical and theoretical training in order to increase the skills of foundry personnel and to ensure a constant flow of skilled trainees entering the industry
- Ensuring the availability of technical foundry support that would solve day-to-day foundry problems and enhance productivity
- Conducting relevant R&D and transfer state-of-the-art technologies to industry.

The DST also launched the R26 million Technology Assistance Packages (TAP) in 2009/10 to assist 28 specially selected foundries in improving their technological capabilities to enable them to leverage procurement opportunities from state-owned entities such as Eskom and Transnet.

These are all sound interventions, and we can only hope that they will be successful in sustaining the sector. As a nation we cannot sit by passively as jobs are shed, essential skills are lost, valuable steel scrap is exported, and we become increasingly dependent on imported finished products.