

How India can increase Ductile Iron production

Data published in 44th Census of World Casting Report as published in the MODERN CASTING - DEC. 2010 issue shows India has just overtaken USA by 30,000 tonnes and is now ranked second in the world compared with fourth last year. Part of the reason is the reduction of output in some of the markets but it is still an excellent result for the Indian Foundry Industry.

Looking at the figures in more detail, particularly the top 10 producers, show an anomaly in the Indian figures. USA and France produced more ductile than grey iron castings. All the other countries produced well over 50% ductile iron whereas India's ductile production was only 16% of its grey iron output – why?

Ductile iron is a well established material and there are many methods available for making it. When it was first produced conventional coke cupolas were the starting point followed by desulphurisation. Reheating was usually required due to temperature loss and there were not many simple castings so a fairly high pouring temperature was required. Also the magnesium treatment takes some time so metal temperature falls. Generally electric furnaces were required for superheating as well as making sure the composition was correct as the specifications for ductile iron are quite rigid.

As electric furnaces improved in efficiency and melting capacity increased it became the melting unit of choice for the production of ductile iron. This is where the problem lies for Indian Foundries. In many areas there is a shortage of electricity. As the country has developed the electric requirements have increased rapidly particularly for domestic use and industry has often had to take second place in the queue for its requirements. This shortage of electricity has frequently restricted the size of electric furnace a company can operate. Even where the required size has been bought there are often reductions in power available as well as shut downs. These problems have greatly restricted the increase in ductile production. There is an obvious requirement for ductile castings shown by the production in most countries so how can India meet this demand?

Indian Foundrymen have the skills and the technology but the shortage of electricity restricts the growth. If the available electricity could be used to better effect then the output could be raised. The cokeless cupola can help Indian Foundrymen achieve this expansion. It can be used on its own to produce ductile iron castings as it makes an ideal melting unit. There is no sulphur pick up during melting and the high carbon content generally required for ductile iron can be achieved with the injection system. However a duplex operation is more economic with the cupola used as a prime melter and an electric furnace for superheating and recarburising. In many cases the ductile iron specification makes an electric furnace essential for checking analysis before magnesium treatment and pouring the castings.

In duplexing only 60 –80 Kw/tonne are required compared with a minimum of 600 Kw/tonne for electric melting. This immediately gives the foundry with electric melting the possibility of expanding their production. For foundries who would like to make ductile but can only obtain a small increase in power from their electric supplier they

can now purchase a furnace suitable for duplexing and commence ductile iron production using the cokeless cupola as the prime melter.

Natural gas is already available in many areas and this is the fuel of choice on economic grounds. However propane or LPG can easily be used and when natural gas is available the conversion is very straight forward. The burners are the same and only minor changes are necessary to the control system.

The growth potential for ductile iron in India is huge. The technology to achieve this is now available with the introduction of the cokeless cupola in India. It is up to Indian Foundries to use this technology and achieve the same production levels that the Modern Castings Data indicate is the norm and not be left behind on the world stage.