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OCTOBER 2008

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Investment in excellence

The case for carbide

Nickel alloy stockist, Hytemp Engineering, changed from conventional bimetal bandsawing to tungsten carbide tipped (TCT) blades following the installation of its third automatic bandsaw, a KastoTec AC4 from Kasto based in Southampton. The company claims that within eight months, TCT blades were performing half of the sawing at the Sheffield works, routinely cutting at speeds up to two and a half times those attainable with bimetal blades. *Solutions* reports.

Offsetting the speed advantage of carbide cutting on the KastoTec AC4 bandsaw is the higher cost of a TCT blade, which is typically three times more expensive than bimetal. Nevertheless, there is still an overall reduction in the cost of the consumable as carbide blades can cut four to five times more material.

Taking these factors into account as well as labour savings resulting from the higher productivity, Hytemp says it has typically halved its cost per cut, even after allowing for the greater investment in carbide specific machinery.

This latest technology bandsaw, built by Kasto in Germany, is a programmable, 430mm diameter capacity machine that is purpose built for carbide sawing, having a one piece

construction, polymer concrete in the saw head to dampen vibrations, twin column guides and linear slides on the ways. Rest piece in automatic mode is 35mm.

To avoid damage to the carbide tips during blade return, there is the patented facility to retract the bar slightly and displace the blade so that it travels back without touching the stock on either side. This has the additional advantage of protecting the surface finish on the sawn faces. The larger of the other Kasto bandsaws onsite, which has a capacity of 520mm, and one other machine are also sufficiently rigid to be capable of efficient operation using TCT blades.

Scope of supply

Hytemp's stock falls within the diameter range 10mm to 400mm and up to 4m long. 60% of output is in the form of nickel billets and ingots for forging, heat treating and machining by local companies with the remainder going out to subcontract machine shops mainly as round bar but also as ring and flat bar and including superalloys and other non-ferrous metals. A majority of the finished products are used within the petrochemical industry, particularly offshore, owing to the corrosion resistance of the materials. Over 70% of the 500 tonnes annual output is exported, mainly to Singapore and the USA.

Hytemp's operations manager, John Cotterill says: "Over the past five or six years, customers have become more cost conscious, ordering shorter bar lengths to their exact requirements, rather than over ordering and risking being left with unusable stock. You cannot blame them, with nickel costing up to £8,000 per tonne. At the same time, during this period our turnover has increased by 260% to £5.5 million.

"As a result, we carry out a lot more sawing now, particularly of the more expensive, large diameter stock. Materials like Inconel 718 and the slightly less tough 625 grade are very testing on saw blades. One of our bimetal blades will typically cut 1,000in² before it dulls, whereas a band with carbide tips can manage four or five times that area."

up to 30m/minute band speed and 4-5mm/minute infeed rate. With bimetal blades, typical cutting parameters are 12m/minute speed and 2mm/minute feed and it is not possible to increase these by much without stripping the teeth on the first cut.

Not so using TCT blades, according to Kasto which can even be turned up to 50m/minute and 10mm/minute if there is a rush order, although blade life will be reduced by about half. Conversely if the parameters are backed off by 5 or 10% of normal speed and feed, the ensuing higher reliability of operation is ideal for unattended running. Mr Cotterill also finds TCT blades more consistent in quality whereas he says that it is not unusual in a batch of bimetal blades to have one or more defective items.

Monitoring of blade deviation and coolant flow built in to the KastoTec AC4 gives added security for unmanned operation and ensures a good quality cut, even if hot spots are encountered in the material. In such cases, a TCT blade will normally cope without deflecting or seizing. A bimetal blade, on the other hand, sometimes fails to get through at all, so is less suited to unmanned operation. There is also a chance of a blunt bimetal blade welding itself in the material, wasting both expensive alloy and the time needed to remove the blade, which can be one or even two days.



Performance testing

Test carried out by Hytemp on 718 alloy using the KastoTec AC4 achieved 4,120 and 4,802in² respectively. Machine operator Ian Cocking advised that TCT blades can run comfortably at

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