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Home-Grown, World Class Mine Winder Manufacture

So well regarded is Parnis Manufacturing's reputation in manufacturing and refurbishing mine winders, that the company recently delivered a 23 tonne, 3 metre single drum winder to a gold mining company in Canada.

The unit will be used as a man winder and service hoist, and will be used to reach a depth of 2,000 metres. Manufacturing the winder using material that is safety critical, Parnis Manufacturing's contribution was to profile and roll, fabricate and weld, inspect, machine and paint – among other specialist services.

Its quality systems, depth of expertise and range of heavy machinery are among the factors that have ensured its success in this field, according to Brian Berry, works manager at Parnis Manufacturing.

"We work from drawings supplied by our customers, first inspecting the material to ensure that it complies with the specifications, and then preparing it for welding. This is essential to ensure an optimum quality result," says Berry. "A critical element in the fabrication of the winder drum is our specialised welding and boilermaking skills."

Boilermakers fabricated the drum using S355J2+N steel, a raw material that can be sourced either from a local supplier or imported – depending on availability and the demands of the project's timeframe.

"Winder manufacture is certainly a complex engineering task, with the final product comprising a drum, two brake carriers and two brake discs, as well as a shaft, gear box, couplings, bearings and bearing bases," he says.

After the welding process is completed, the drum goes through full non-destructive testing (NDT) and dimensional inspection to ensure that it conforms to the drawing specifications, and that the requirements of the customer are met. This large component is then sent for stress relieving, after

which the gussets and stiffeners are removed and another full NDT and dimensional inspection conducted.

“All this testing is done to ensure the integrity of the material has not been compromised at any stage during the manufacturing process,” says Berry. “The large fabrication is then marked up to ensure machining allowances are within specification, and joint faces are pre-machined on the horizontal boring machines, making use of temporary holes.”

Parnis Manufacturing’s facility is equipped with horizontal borers which have capacities of up to 5,5 metres longitudinal travel and a height of 2,5 metres. The drum is then assembled with temporary fasteners and is inspected once again. Following this process, it is set up for further pre-machining on the drum, leaving material for the final machining phase.

“The drum is then dismantled and final machining of the joint faces – with joint holes – is conducted,” he says. “Final assembly is done followed by final machining using the vertical boring machine.”

Vertical boring capacity at Parnis Manufacturing extends to a table size of 4,5 metres, a turning diameter of 5,3 metres and a turning height of 3,2 metres, with a maximum load of up to 50 tonnes. Other equipment at the company’s facility includes milling machines with 4,5 metre longitudinal travel and a height of 1,8 metres, as well as overhead crane lifting capacity of 50 tonnes (tandem).

“We mark off hole positions for the brake disc carriers, as well as for the positions of the shaft, and then drill and ream for brake and shaft carriers,” he says. “A simultaneous process is carried out for the two brake carriers, after which shot blasting and painting can be done. The components are trial assembled before being packed for shipment.”

Berry highlights the depth of expertise in mine winder fabrication and refurbishment which continues to reside in South Africa, and emphasises the value of close communication with the customers during construction, to ensure that the final quality product is perfectly to specification.

Parnis Manufacturing tackles not only new winders, but also has an established track record for the repair and complete refurbishment of mine winders. Outlining the refurbishment process, he says the work includes stripping down, cleaning and building up of worn areas, as well as extensive machining.

“This is all done on the strength of comprehensive dimensional reports and in close consultation with customer,” he adds. “The machining of the main winder shaft, for instance, requires the customisation of all the related components in line with new size requirements.”

Items like white metal bearings and seals have to be procured in accordance with the exacting tolerances of the reconditioned shaft. The facility even has capacity to refurbish double drum winders, which comprise clutching equipment, drum bushes, stub shafts and various other components.

“It is important to remember that customers expect the refurbished equipment to function as new, so our artisans and technicians must be at the top of their game to get the most out of our reconditioning facility,” says Berry. “Where possible, we also work closely with original equipment manufacturers to ensure that the right quality procedures are followed to achieve the best quality result.”

Parnis Manufacturing’s engineering capability covers the design, fabrication, machining and manufacture of medium to heavy equipment, which includes crushing equipment, mining skids, e-houses, mills and mill heads.

PARNIS PIC 01 : Parnis Manufacturing has a solid reputation for manufacturing and refurbishing mine winders.

PARNIS PIC 02 : Trunion machining underway at Parnis Manufacturing's facility in Johannesburg.

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