

# Specialised welding consumables for the sugar industry

UTP Maintenance, the voestalpine repair welding specialist, is a reliable supplier of welding consumables used for the repair and arcing of cane crushing rollers used in the sugar industry. Kenneth Labuschagne of voestalpine Böhler Welding presents the company's purpose designed offering for the better protection of these rollers and production optimisation in the industry.

Extracting the juice from sugar cane to make sugar involves squeezing shredded cane between large rotating rollers. Grooves in the cast iron roller surfaces and subsequently deposited globules of hard and highly durable metal improve juice extraction and prevent slippage of the shredded cane during crushing.

Sugar cane is acidic with a pH of around 5 and carries up to 5% soil which is harvested with the cane. As a result, the mill rolls are exposed to a combination of abrasive and corrosive wear and require periodic hardfacing to repair them. The hardfacing alloy must provide good wear characteristics and add to the good grip on the sugar cane and bagasse (the fibrous by-product) provided by the roller profile.

A full sugar crushing roller overhaul involves a four-step rebuilding procedure, for which UTP Maintenance has developed a set of three dedicated hard surfacing cored wires and procedures for mechanised welding.

In Step 1, the laterals, are deposited to strengthen and protect the sides of the teeth against abrasion. This is done using 1.2 mm diameter UTP AF DUR 600-MP wire, which is a cored wire that provides a hard impact resistant weld overlay. The same wire in 1.6 mm diameter is used in Step 2 to seal the top of the teeth and provide a firm base for the next step.

In Step 3, the hook, which is also referred to as 'picote' is deposited with 1.6 mm diameter UTP AF 715 Hook flux-cored wire, which gives a weld metal with resistance to very high abrasion. These hooks on the teeth catch the sugar cane and bagasse and largely determine the output of a sugar mill in terms of tonnage of sugar cane juice and bagasse produced.

Step 4 involves 'arcing' with a 2.8 mm UTP AF Vanadium 500 wire. This special, large diameter cored wire operates in the spray arc mode at relatively low currents depositing high amounts of weld metal droplets of a uniform size.


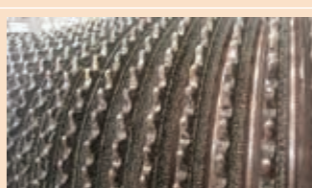


It is used with a relatively long stick-out length and produces a very powerful arc, which also enables the welding of the rolls in the presence of large quantities of juice and bagasse, while in operation during the harvesting season.

"The use of UTP cored wires makes the whole repair procedure much more efficient, helping the mill to get a good extraction index. Deposition rates and duty cycles are much higher than procedures using stick electrode welding. When compared to mechanised welding with solid wires, repair times can also be significantly shorter," notes Labuschagne.

## SBR and UTP: A successful partnership

S. B. Reshellers Pvt. Ltd. (SBR), located in Kolhapur in the Indian state of Maharashtra, is a specialist in the manufacture, reshelling and hardfacing of rollers used in the sugar industry. The company,

	Function	Photo	Consumable and typical welding parameters
Step 1	<b>Lateral</b> Strengthen and protect the sides of the teeth. Provide a wider platform for Step 2, the base weld.		<b>UTP AF DUR 600-MP: 1.2 mm</b> Position: Vertical-down Current: 150-170 A Voltage: 25-28 V Stickout length: 18 V Travel speed: 36 cm/min Weaving width: 12-20 mm Number of torches: 1 or 2
Step 2	<b>Base</b> Sealing top of the teeth. Preparing a platform for the hook weld.		<b>UTP AF DUR 600-MP: 1.6 mm</b> Position: Downhand Current: 160-220 A Voltage: 25-28 V Stickout length: 20 mm Travel speed: 64 cm/min Weaving width: 0 Number of torches: 1 or 2
Step 3	<b>Hook</b> Protection of top of teeth. Providing a firm grip on the bagasse. Higher crushing efficiency.		<b>UTP AF 715 Hook: 1.6 mm</b> Position: Downhand Current: 180-230 A Voltage: 27-29 V Stickout length: 20 mm Travel speed: 54 cm/min Weaving width: 0 mm Number of torches: 1
Step 4	<b>Arcing</b> Further improving grip on the bagasse. Protection of teeth profiles. Enabling repair while crushing.		<b>UTP AF VANADIUM 500: 2.8 mm</b> Position: Vertical down Current: 250-350 A Voltage: 28-36 V Stickout length: 40-60 mm Travel speed: 4-6 rpm Weaving width: 0 mm Number of torches: 1 or 2

A full sugar crushing roller overhaul involves a four-step rebuilding procedure, for which UTP Maintenance has developed a set of three dedicated hard surfacing cored wires. See sugar consumable table at: [www.voestalpine.com/welding/Industries/Sugar-Ethanol#!industry-tables#!industry-table-section-id-6983=paging:number=50|paging-6983-1:currentPage=0](http://www.voestalpine.com/welding/Industries/Sugar-Ethanol#!industry-tables#!industry-table-section-id-6983=paging:number=50|paging-6983-1:currentPage=0) table.

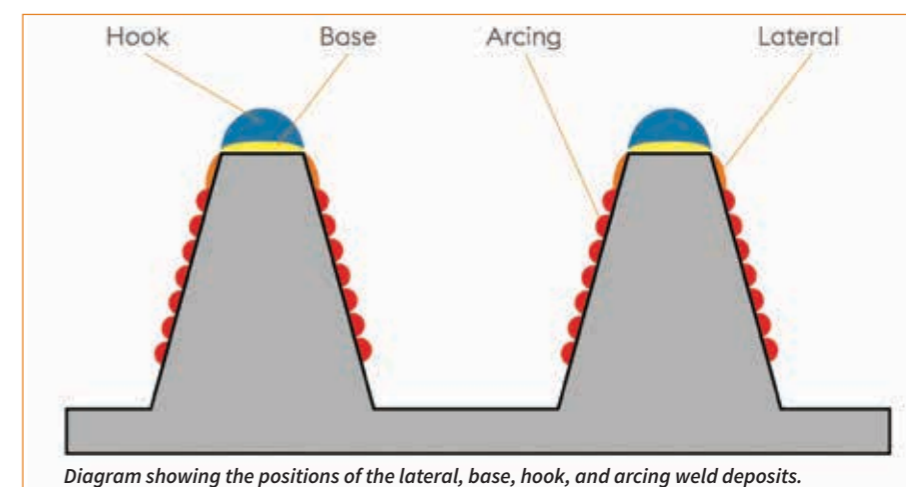
which is the largest of its type in India, caters to all major sugar factories and original equipment manufacturers of sugar mills in both the domestic and international markets.

Hardfacing of roller shells, otherwise known as roller arcing, is carried out using hardfacing welding rods that are used to build up the tips and flanks of the roller grooves. Special flux- and metal-cored wire is used to generate extremely hard metal beads along the teeth profile. UTP Maintenance has been the preferred supplier of the specialised welding material used for arcing at SBR since December 2010.

In cooperation with Fronius India, a new automatic welding system was introduced at SBR's Kolhapur workshop for the arcing of sugar mill rollers. In a series of trials conducted using UTP Vanadium 500 and UTP Vanadium SG welding wire from voestalpine Böhler Welding, the results showed that this material was highly suited for the new welding system and fully met the requirements for achieving excellent arcing results at accelerated deposition rates.

## Tailor-Made-Protectivity

UTP Maintenance ensures an optimum combination of protection and produc-



tivity with innovative and tailor-made solutions. Everything revolves around the customer and its individual requirements. That is expressed in the central performance promise: Tailor-Made Protectivity™.

"Our range of flux- and metal-cored wires for the rebuilding of worn sugar cane crusher rolls continues this tradition. Developed in close co-operation with specialised repair companies and mill maintenance departments, they feature welding characteristics that are fully dedicated to the rebuilding and protection of crusher rolls," adds Labuschagne.

UTP Maintenance has been present in the sugar and ethanol industry since the 70s through the development of products that have met increasing technical demands and productivity of plants. Over the years, UTP Maintenance has acquired considerable knowledge in the production and supply of welding consumables tailor-made to industry needs. "We provide best in class products for maintenance and repair, cladding and metallisation; including alloys of complex carbides and with specific hardness that fulfil the requirements of most different types of wear in this industry segment," Labuschagne concludes. ■



For the sugar industry, UTP Maintenance ensures an optimum combination of protection and productivity with innovative and tailor-made welding consumables and solutions.