

FLOWING WITHOUT IMPEDIMENTS

THE MAXIMUM PRODUCTIVITY OF THE LARGEST IRON ORE MINER IN EUROPE HINGES UPON A SMOOTH – AND EXTRATERRITORIAL – FLOW OF ORE PRODUCTS. **AUSTRALIAN MINING** EXPLAINS.

Europe's biggest iron ore producer Luossavaara-Kiirunavaara Aktiebolag (LKAB) yields millions of tonnes of iron ore every year.

In fact, ore mined from its two underground mines in Sweden is equivalent to around six Eiffel towers every day (in terms of steel amount). Still, the miner aspires to increase production by an additional 5 per cent year by year up until 2021.

Before being shipped to clients – a majority of whom are European steel mills – LKAB processes its ore into fines, pellets and other products. These are then transported by rail to shipping harbours.

In order to accommodate the demands of this distribution, LKAB built a 17,000 metric ton capacity storage hopper to facilitate a mass flow of iron ore fines. LKAB had to ensure it was void of flow problems previously experienced by other storage hoppers.

Continuous flow of ore products

When arching and bridging iron ore fines and pressed pellets, LKAB's storage hoppers encountered hang-up issues that seriously impeded the company's operation. What's more, its ore fines were also found frozen on the surface of the unlined equipment during the cold weather.

To manage these issues, LKAB put two production lines in an alternate rather than synchronous operation so an adequate and consistent material flow could be maintained – one production line at a time.

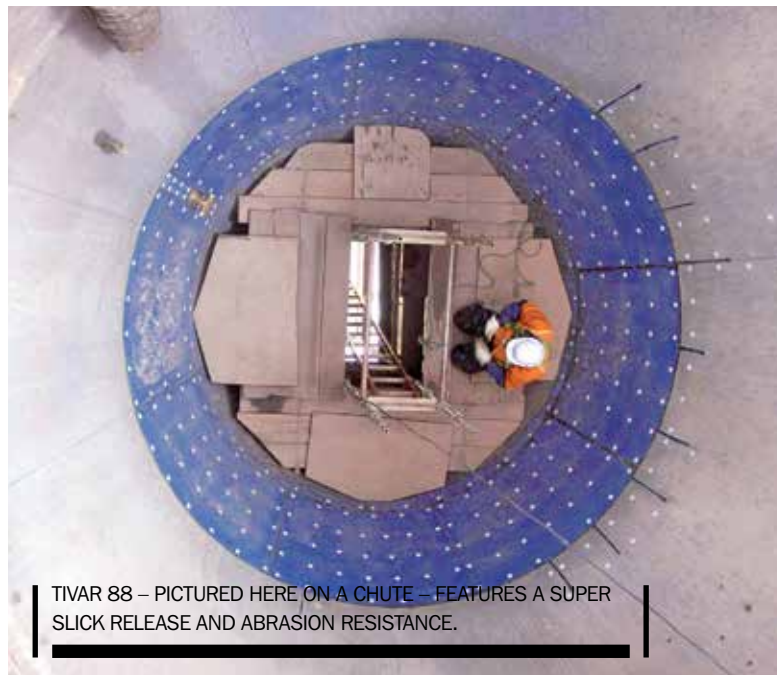
The entire manufacturing process was also regularly shut down to reactivate material flow in chutes, hoppers, silos and railcars. These interruptions ultimately cost a considerable amount of human labour, time and money.

LKAB contacted German engineering consultant Schluz & Schwedes to assess the issues. The company decided to modify LKAB's hopper design, while also lining the new hoppers with an exceptionally slick and abrasion-resistant material.

For a short while, A2-grade stainless steel was considered as a possible lining material. But this alternative was quickly dismissed due to possible corrosion of stainless steel when in contact with the chemical properties of the iron ore, resulting in a short wear life.

Instead, Polymeric material Tough Inert Very Abrasion Resistant (Tivar) 88 was chosen as the preferred lining – it is immune to corrosion, water repellent and even eliminates arching challenges. Further, it has been designed and manufactured for a quick installation on-site.

Tivar 88 is simply fitted with



TIVAR 88 – PICTURED HERE ON A CHUTE – FEATURES A SUPER SLICK RELEASE AND ABRASION RESISTANCE.

THE INSTALLATION PROCESS PRODUCES A SEAMLESS LINING SURFACE THAT WOULD NOT INHIBIT MASS FLOW.

countersinking screws, which are covered by TIVAR 88 plugs and advanced butt welding at joints. The installation process produces a seamless lining surface that would not inhibit mass flow.

Being a superior, modified grade of the base industry-standard of UHMW-PE (ultra-high molecular weight polyethylene) that increases flow of product, the material was used by LKAB personnel to line other areas of the iron ore handling system.

In Australia, the Tivar range is imported from Germany by E-Plas Engineering and Specialty plastics. Company national operations manager Sean Kelly says, "If a client or a production supervisor is having problems with a hopper on the mine site, we are able to assist with a variety of solutions, which will enhance production and profitability.

"Depending on the numerous applications on-site, other products within the Tivar range can be used for bulk material handling."

With the low coefficient of friction of Tivar 88, it is exemplary

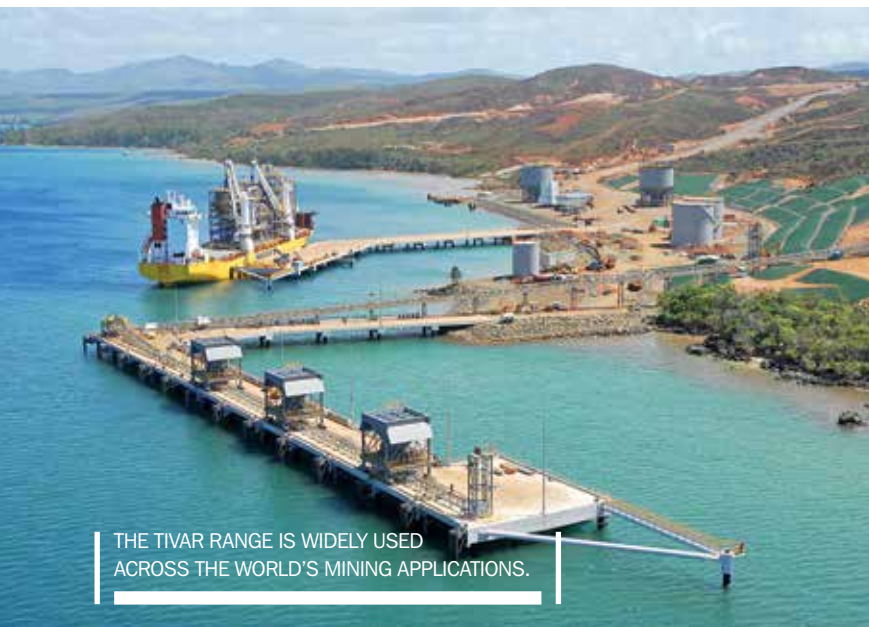
in facilitating bulk solids flow of cohesive or non-free flowing materials such as minerals, metals, steel, cement and chemical. These properties are effective even in the extreme temperatures of -269°C to over 80°C.

Additionally, among the Tivar range are a multitude of modified products, such as the distinctively avocado-coloured Tivar Ceram P for demanding applications with higher mechanical loads.

It is capable of sustaining operating speeds of up to 700 metres per minute while providing a lining of low maintenance and long lifespan.

"Further, there's a new addition to the Tivar 88 family. It's called Tivar 88-2, which adds UV resistance while bearing weldable property.

"All things considered, the longevity, the number of uses in the marketplace and the successful history of the Tivar88 family prove that there are so many happy clients who continue to purchase the product after many generations," Kelly concludes. **AM**



THE TIVAR RANGE IS WIDELY USED ACROSS THE WORLD'S MINING APPLICATIONS.