

Increased performance - Guaranteed!

Makuri Mn1A Manganese Steel: The new benchmark in general crushing applications

The newly developed Makuri Mn1A alloy exhibits exceptional performance due to new refining processes that reduce Phosphorus and Silicon levels to 1/2 and 1/3 of the current industry standard. This higher purity allows more extreme heat treatment profiles to be used in both the quenching and tempering cycles to produce a fully thru hardened, very durable, highly crack resistant long life crusher liner that is extremely cost effective when used in the most typical crushing applications¹

We are so confident in its performance it comes with both our Level 1 and Level 2 guarantees, guaranteeing to make it the lowest cost per tonne, or per hour, crusher liner you can get



Level 1 5F Guarantee

This is a 'best in class' 5F industrial standard covering all Products and guarantees the Fit, Form, Function of such items and that they are also free of defects in Faulty Workmanship & Faulty Materials. Products that fail to meet this guarantee are fully replaced or fully credited.



Level 2 LC Guarantee

Products that fail or wear out in service that do not meet the mutually agreed Lowest Cost / tonne or Lowest Cost / operating hour targets, after a minimum of 3 design iterations, will be credited on a pro-rata basis.

The benefits of using Makuri Mn1A liners are;

- Lowest cost to use, highly crack resistant and long life
- Very predicable wear life so changes can be planned with confidence
- Can be optimized using our proprietary cavity profiling software

Note 1: Some applications, like pebble crushing and extremely abrasive ores, require the additional alloying elements to withstand the higher point loading from tramp metal passage and higher abrasion to impact ratios. The full range of the Makuri Manganese products can be seen on our website and Process Improvement Handbook or contact us to discuss your application and issues

Makuri Mn1A Manganese Steel

Material and Composition

Makuri Mn1A is based on ASTM A128 standards, with individual compositions adjusted depending on casting thickness, complexity and performance requirements.

Typical composition is as follows:

Element	Composition
Carbon	1.05-1.35%
Manganese	12-14%
Silicon	0.35% max ¹
Phosphorous	0.04% max ¹

¹Levels specified for these materials in the ASTM standard (as used by most other manufacturers) are 1% and 0.07% respectively.

Pouring temperatures are carefully controlled to ensure proper solidification and heat treatment is conducted in microprocessor-controlled furnaces. Quenching is then performed in chilled, temperature-controlled quenching baths.

Welding

Welding must be performed by suitably qualified personnel and finished welds should be subject to appropriate proof load tests compliant with local and site safety requirements before being used for lifting purposes. Lifting lugs used should comply with the relevant local standards, and all welds used for lifting should be full penetration.

Welding consumables compliant with AS1553.3 / AWS A5.4 can be used for this purpose. CIGWeld Satincrome 308L-16 is a typical product that complies with this specification.

It is important that preheat and postweld heat treatment of welds on manganese steel is avoided as it can damage the structure of the steel.

Testimonials

"MnA1 is the best general purpose Mn I have tried and is extremely cost effective"
Large contract crushing and quarry owner, Queensland.

"The effort Makuri put into continually improving designs and materials to suit our application was unmatched by any others and we continue to increase our throughput as a result"
Gold Mine Operations Manager, Indonesia.

"These guys continue to amaze me and do what the OEMS and many others say can't be done, all their stuff is good and worth the extra"
Mining Executive, Jakarta.

