ISASMELT™

How to get the best copper blocks for your smelter

GLENCORE TECHNOLOGY

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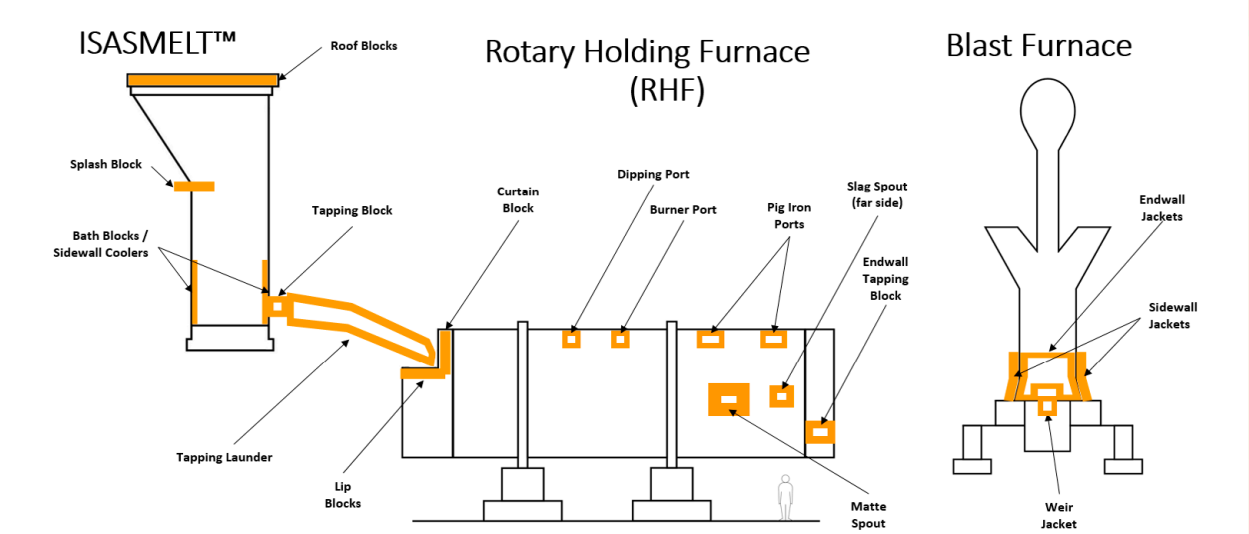
The ISASMELT™ team behind the world's best performing TSL smelter have also created Copper Blocks for use in smelters, so now you can source the best performing tapping blocks, launders and more.

Using the right copper blocks is a critical factor in making your smelter operation safer, easier and more productive, and because we have to use them ourselves, the ISASMELT™ team have developed superior copper blocks. You can purchase tapping blocks, launders, spouts, roof blocks, and bath blocks that have been developed, supplied, and installed specifically for your smelter. And you can take advantage of them even if you don't have an ISASMELT™.

Typical range of copper blocks available:



Benefits of ISASMELT™ copper blocks

- Longer life – one campaign, or greater
- Low maintenance
- Reliable performance
- Good control of freeze linings
- Improvements driven by users and field experience
- Superior leak resistance
- Variety of cooling fluids
- Robust design practices, real-world data tested in operation
- Cast copper for high cooling capacity
- Variety of cooling channel materials
- Advanced inspection & testing
- Shipping aids for safer arrival
- Installation and handling aids
- Commissioning support programmes
- Operational support programmes.

Mitigate risk and improve performance

A common, but riskier, approach to purchasing copper blocks is to have them designed and fabricated by conventional engineering or foundry entities without hands-on experience in smelting.

A far less risky option – with full accountability based on extensive real-world experience – is to use our ISASMELT™ team to design them to suit your operation's specific operational needs.

Our three-stage approach

1 Our team's designs are based on sound theoretical analysis and practical experience. This includes advanced computer modelling and we reference it against real world, in-plant operating performance.

That design process considers practical considerations including manufacturing practices, installation, replacement, copper block life and the potential for refurbishment. And it considers compatibility with support systems such as cooling water-supply and -quality.

Therefore, right from the design stage, what we deliver is designed to perform.

Our design factors

- People and furnace activities in the surrounding area
- Direct human/element interactions
- Nearby mechanical equipment
- Equipment inspection and monitoring availability
- Existing cooling water systems
- Existing copper elements
- Cooling flow monitoring and control
- Leak detection and management
- Component change-out logistics
- Component isolation from system
- Back-up water flow
- Stagnation and steam build-ups
- Management of cooling water chemistry
- Scale removal
- Cooling system capacity
- Minimised change-out time
- Operating risks and mitigation strategies.

2 Once it's designed properly, we arrange manufacturing in accordance with strict specifications. We also inspect the blocks in detail throughout the entire manufacturing stage.

Our manufacturer criteria:

- Only hand-picked strategic partners
- Specialised expertise and equipment
- Stringent specifications
- Rigorous inspection & testing
- Actively involved in inspection process
- Results reviewed to ensure that components are fit for purpose.

3 Once the block is ready for you, we can supervise the installation and offer commissioning services and performance monitoring assistance.

The result is that your copper block experiences less downtime, better availability, it's safer and it lasts longer.

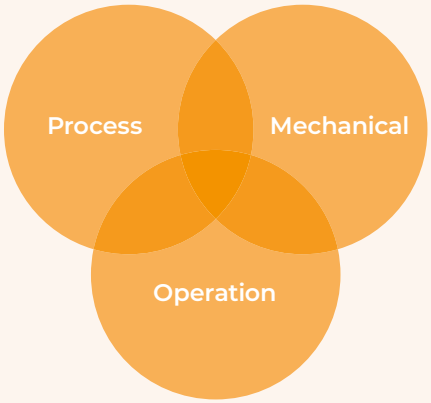
Our commissioning includes:

- Check off design and operating requirements
- Adjust all flows and settings
- Check system performance
- Monitor expansions and movements
- Benchmark settings
- Review performance in-service
- Address deviations.

Why do we use copper and not something cheaper?

Our cast-in copper is not the cheapest for you or the easiest for us. But in specific critical locations, it is the best performing block in terms of reliability and service life. It delivers to your operation the best value outcomes possible.

TECHNOLOGY	PROS	CONS
Refractory materials	Low Cost	Limited service life, easily damaged, difficult to repair
Water cooled steel jackets	Moderate Cooling capacity	Thermal Cycle Cracking, risk of water leaks, moderate life
Uncooled copper	Robust, simple, strong	Moderate life, low cooling capacity, limited strength
Drilled and plugged copper	Very high cooling capacity	Risk of water leaks at connections, risk of water leaks due to cracking
Cast-in copper	High cooling capacity, robust, low risk of water leakage	Specialist casting skills required, specialist inspection skills required



The ISASMELT™ success zone

The success of your operation needs three ingredients – process expertise, mechanical expertise and operational expertise. We have and deploy all three to ensure that what we design, build, install and commission for you will be safe, reliable and easy to manage. So the ISASMELT™ team working on your copper blocks includes designers and engineers who have spent years working at operating sites. To make sure your Copper Blocks are the best they can be, make contact with the ISASMELT™ team today.

For more:

isasmelt@glencore.com.au · Tel +61 7 3833 8500

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Glencore Technology

Glencore Technology develops innovative products that help mining operations extract more from their flowsheet. ISASMELT™, IsaKidd™, IsaMill™, Jameson Cell and Albion Process™ have been developed in the real world and proven in more than 500 operations across every continent.

Many of our technologies have been developed and proven at our own sites, like ISASMELT™ and IsaMill™, which were pioneered by Mount Isa Mines and helped revolutionise mining and smelting processes all over the world.

Our approach is premised on a technology partnership to provide a full product and service offering, including process flow design, engineering, equipment supply, commissioning and operational expertise, and ongoing process and maintenance support.

Glencore

Glencore is one of the world's largest global diversified natural resource companies and a major producer and marketer of more than 90 commodities. The Group's operations comprise around 150 mining and metallurgical sites, oil production assets and agricultural facilities. With a strong footprint in both established and emerging regions for natural resources, Glencore's industrial and marketing activities are supported by a global network of more than 90 offices located in over 50 countries.

Glencore's customers are industrial consumers, such as those in the automotive, steel, power generation, oil and food processing sectors. We also provide financing, logistics and other services to producers and consumers of commodities. Glencore's companies employ around 146,000 people, including contractors.

Glencore is proud to be a member of the Voluntary Principles on Security and Human Rights and the International Council on Mining and Metals. We are an active participant in the Extractive Industries Transparency Initiative.

CONTACT

Glencore Technology Pty Limited
ABN 65 118 727 870

Level 29, 180 Ann Street
Brisbane QLD 4000
Australia

T. +61 7 3833 8500
E.isasmelt@glencore.com.au

Chile · T. +56 2 2342 9078
Vancouver · T. +1 604 601 2070
South Africa · T. +27 11 772 0555

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