

★ Manufacturing Location

★ Sales Office/Agency



SHINAGAWA



REFRATORIES
FOR THE
NICKEL INDUSTRY



GLOBAL PROVIDER OF THERMAL SOLUTIONS

Shinagawa is a major supplier of product into the regional nickel industry. We have an extensive product range that has proven performance in rotary calciners, multi hearth roasters, smelters and ladles.

Ore Drying

Moisture in the raw ore is reduced by use of coal fired dryers. Shinagawa have a range of brick and castable products suitable for use in these units. Where abrasion resistance and alkali resistance is necessary, **SHIRACRETE® 50KN** should be used. For hot repairs with minimal downtime, **SHIRAPLAS® 170 GUN** can be installed onto hot surfaces (up to 500°C) with minimal rebound and excellent properties.

Rotary Kiln Calcination and Reducers

Rotary kilns are used to calcine the dried ore. The refractory lining on the kilns is required to work under both oxidising and reducing conditions. The **SHIRAL®** range of bricks is particularly well suited to this application. **SHIRAL 50AD** has high abrasion resistance, high hot strength and excellent resistance to reducing conditions. **SHIRACRETE 50** will provide similar benefits in areas where the kiln is lined with monolithic products.

For the extreme wear and thermal shock environment of the kiln nose ring, **SHIRACRETE 80TSR**, with its exceptional strength and wear resistance is the recommended material.

Electric Furnace Smelting

The roasted ore is melted in a high frequency electric arc furnace. Zakłady Magnezytowe ROPCZYCE (ZMR), a supplier of high technology mag chrome brick can provide engineering and product support for this application. Shinagawa manufacture a range of **SHIRAMAG®** monolithic products that are used for patching in the electric furnace.

Shinagawa can provide a number of suitable product options for the metal and slag launders. In the nickel matte launders Shinagawa can supply large precast shapes in either **CASTON 21** or the **SHIRACRETE 50** range. **SHIRAGUN® 80** is used extensively as a patching material for slag launders. Shinagawa has also recently supplied **SHIRAL 85CB BPX** as a hot face lining in a slag launder application.

Pierce Smith Converters - ZMR supply a range of **TOPKROM** magnesia-chrome brick that gives excellent performance in this application.

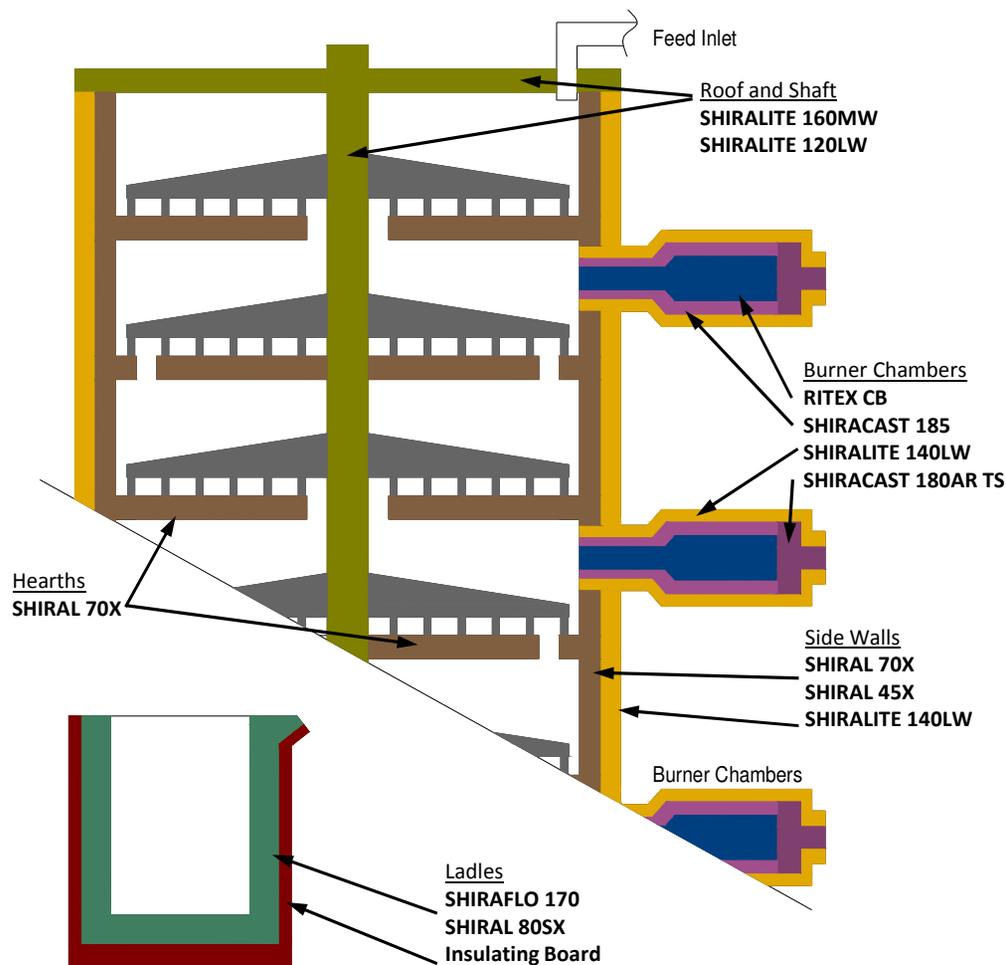
Ladles

Ladles are used to transport the liquid metal and in some operations they are also for chemical processing through the addition of lime (CaO) or soda ash (Na₂O₃). Temperatures in the ladles can exceed 1600°C during Oxygen injection to remove impurities. The ladle linings are required to work in extremely difficult and challenging conditions. Shinagawa can supply either brick or monolithic technology linings. The current trend in lining technology is the use of self-flowing low cement castables - **SHIRAFLO® 170** is an example of this high technology product that is used successfully in this application.

Where the preferred lining is brick then **SHIRAL 80SX**, a high alumina, high temperature brick is recommended. It will provide excellent resistance to the both metal and slag corrosion, as well as, the mechanical strength to withstand ladle cleaning practices. Shinagawa can also supply magnesia-chrome brick for the slag zone.

Multi Hearth Roaster and Reducers

SHIRAL brick are used in the construction of multi hearth roasters, **SHIRAL 45X** or **SHIRAL 70X** are the recommended grades. The burners are lined with **RITEX®** magnesia-chrome brick which has excellent slag resistance. The back-up layer to the **RITEX** is **SHIRACAST 185** together with a suitable insulation **SHIRALITE®** insulation castable.



Flow Control Systems

Shinagawa, through our parent company Shinagawa Refractory Co, Japan (SRC), can provide a complete range of flow control devices for the casting of ingots and pellets. Nozzles, slide gates and casting nozzles can be provided, together with a fully integrated operational system that will provide excellent performance and cost effectiveness. Comprehensive support from SRC engineering staff and technical personnel can also be provided to ensure the system performance is maintained at a very high level. .