

★ Manufacturing Location

★ Sales Office/Agency



SHINAGAWA



REFRACTORIES  
FOR THE  
CEMENT INDUSTRY



GLOBAL PROVIDER OF THERMAL SOLUTIONS

Shinagawa is a major supplier of product into the regional cement industry. We have an extensive product range that has proven performance in the preheater tower and cyclones, rotary kiln and also the grate cooler.

### Brick Products

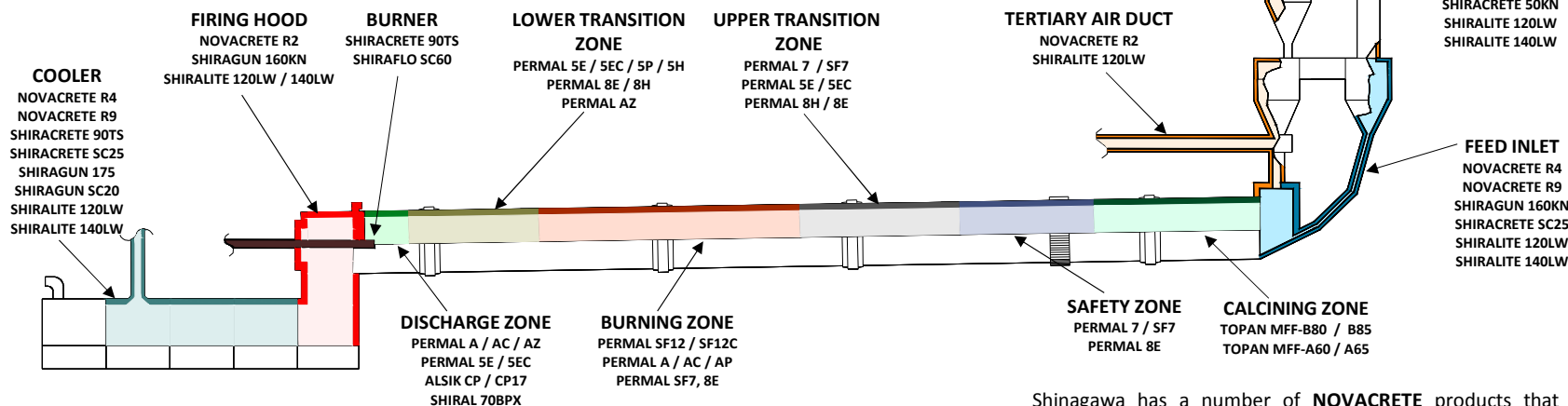


In the rotary kiln Shinagawa supplies a range of **SHIRAL**® brick in the outlet and calcining zones. This includes the **SHIRAL 70BPX** and **SHIRAL 80X** product qualities of brick. Shinagawa has a partnership agreement with Zakłady Magnezytowe "ROPCZYCE" S.A. (**ZMR**) for the supply of mag- spinel brick used in the transition and burning zones. Shinagawa also have a range of lower alumina **SHIRAL** brick products suitable for the preheater cyclones.

### Monolithic Products



Shinagawa low cement technology products are used extensively in the preheater tower and grate cooler. This technology provides the optimum in-service performance and Shinagawa's range of low cement products includes vibration cast, gunned and wet shotcrete products.



### Vibration Cast Technology:

The **SHIRACRETE**® group of products is available in the range of 42% to 90% alumina content, all with good strength and abrasion resistance, for use in the preheater tower and grate cooler. Examples include **SHIRACRETE 50KN** which has been formulated for enhanced resistance to alkali attack. **SHIRACRETE SC25** contains a silicon carbide addition and is recommended for areas in the preheater which have high levels of alkalis. In the grate cooler **SHIRACRETE** products with a higher alumina content provide improved abrasion resistance in this severe operating environment. Shinagawa also manufactures the **SHIRAFLO**® range of products, which have excellent self-flow characteristics.

### Low Cement Gunning:

Shinagawa manufacture the **SHIRAGUN**® range of alumina silica low cement dry gunning products. The advantage of the **SHIRAGUN** range of products is that the excellent low cement properties are retained but with the significant installation benefits of installing via gunning. **SHIRAGUN 160KN** and **SHIRAGUN SC20** have been formulated to provide good strength and resist alkali attack. These products can also be used to undertake veneer repairs during maintenance of the vessels. **SHIRAGUN 175**, based upon premium refractory bauxite, has excellent abrasion resistance and is recommended for application in the grate cooler.

### Wet Shotcrete Technology:

The **NOVACRETE**® range of wet shotcrete products has been developed by Shinagawa to meet the requirements of reducing the length of the refractory shutdown. This allows for increased uptime of the kiln and greater output of cement clinker. The rate of installation is 2-3 times the output of dry gunning. The benefits of the **NOVACRETE** range include:

- Installation rate of 4-5 Mt/hr.
- Minimal formwork required.
- No dust and minimal rebound.
- Water addition is more closely controlled.



Figure 1: NOVACRETE R4 Alkali Testing. Results after repeat soak in reagent at 1100°C for 48 hours.

Shinagawa has a number of **NOVACRETE** products that have been developed to meet the requirements of the cement industry. **NOVACRETE R2** is a general purpose 60% alumina material used in various areas in the cement manufacturing industry. **NOVACRETE R4** contains SiC and Zirconia and has been developed to meet both abrasion and alkali resistance. An exciting new development is **NOVACRETE R9** which also contains both SiC and Zirconia, it however has the advantage of both lower cost raw materials and lower installed bulk density. The latter means that less material is required per volume of product installed. The table below lists the **NOVACRETE** products and associated benefits:

Property	NOVACRETE R2	NOVACRETE R4	NOVACRETE R9
Alkali Resistance	Moderate	Excellent	Excellent
Strength (CCS@1000°C)	70	80	90
Abrasion Resistance (@1000°C)	8.0	8.0	10.0