

Thermbond solutions, Refractech

Refractech offers the complete line of Thermbond refractory products for the cement and lime plants throughout Australia and New Zealand. The range consists of over 65 products available for use in cement and lime kilns. The 'key' benefit to Thermbond refractory is its ability to save time and money during and after the installation, through rapid curing and drying, lowering subsequent downtime costs. A Thermbond refractory installation provides:

- rapid mixing
- rapid curing
- rapid heat up after the installation
- ability to withstand repeated thermal shock without spalling
- tenacious bonding to all fired, cleaned, solid, refractory without de-laminating
- alkali resistance means providing a superior non-wet surface this means less alkali buildup and less downtime with kiln installations.

Thermbond refractory placement is via casting, gunniting, trowelling, packing and ramming. The gunned and castable products have been highly successful in the "Rock" Products industry in North America. Thermbond gunnite and castable linings would bond tenaciously to all fired, cleaned, solid refractory, reducing tear-out, lowering costs, providing rapid curing and dry out in less than four hours. Thermbond can be heated up linearly depending on lining thickness and configuration at 250°C per hour with no holds. The other unique benefit of Thermbond is non-wetting that resists penetration from aggressive alkalis found in cement and lime clinker during processing in kilns, coolers and other high temperature equipment used in the cement and lime industry.

Thermbond Refractory Case Study 1: cement kiln

A major cement producer chose Thermbond Formula 6-A castable to make repairs on cooler curbs and it was chosen because of the materials ability to bond to existing fired, cleaned refractory and then be fired-in very rapidly.

This feature minimised refractory tear out of existing refractory materials and was a benefit to the customer because this area does not see controlled heat up during a kiln start-up. The refractory contractor had to prepare the area by chipping away all loose curb refractory and any areas with heavy alkali penetration. Also the contractor had to ensure before casting, there was a solid surface to cast Thermbond onto with a rough textured, dust free surface available.

Refractory formwork was placed on both sides of the curbs, approximately 6m in length. Thermbond Formula 6-A castable was mixed three units at a time and internally vibrated into place using a 50mm diameter, high frequency vibrator. The kiln curb block repair ranged from 25mm to 150mm thickness and took roughly two hours to complete each curb section.

Thermbond refractory sets rapidly and the forms were stripped

off the first curb when the second curb was completed.

This cement plant customer reported, two years later, that the Thermbond castable repairs were still in tact and looked as good as the day it was installed.

Thermbond Case Study 2 Cement plant precalciner

A North American cement plant chose Thermbond Formula 6-P trowel grade castable to repair the outlet area of #4 cyclone, in their four-stage precalciner. The problem they had was that the brick lining constructed in 1981 had become worn and uneven. This porous and uneven brick surface provided a surface for a hard sintered material to build up, 100mm or so thick. The layered build up would eventually fall into the cone and cause a vessel plug to occur. This build up on the brick was difficult to remove and access was a problem.

The customer required a solution and he did not want to remove the bricks from the precalciner cyclone. It was decided that Thermbond Formula 6-P trowel grade castable, a dense fine-grained alumina, mullite based material was best with its superior alkali resistance, thermal cycling and high performance in a reducing atmosphere.

The preparation is most critical when installing Thermbond into cement and lime kiln applications and this was to sand blast the brick surface to remove any build up of lime, alkalis etc. Then apply a light coat by brush of Thermbond Liquid Activator to remove any fine dust that may be left on the brick surface. The entire area was allowed to air dry for 30 minutes before placing Thermbond Formula 6-P castable onto the fired, solid, cleaned refractory bricks.

When the cement plant came down everyone had an opportunity to inspect #4 cyclone outlet and commented how Thermbond Formula 6-P castable performed. The results were excellent the customer was extremely pleased; he commented the Thermbond repair was still in place and does provide a non-sticking surface, as there was no build up on the Thermbond but plenty of build up on all other surfaces.

In conclusion, Thermbond Formula 6 series refractory materials have repaired the following cement kiln applications with a high degree of success:

1. burner pipes
2. kiln hot spots in brick and castable linings
3. preheater repairs
4. burning zone repairs to dolomite brick
5. firing hood repairs
6. nose ring repairs
7. drop box repairs
8. hearth curb repairs
9. kiln brick repairs
10. back up to SiC brick in cyclones
11. kiln brick repairs
12. cooler curb repairs.

