

HASLE low cement castables for cement plants

HASLE low cement castables (LCC) are characterized by having a very dense and strong matrix developed to withstand the challenges of modern cement production, where alternative fuels are customary. Alkali-resistant castables with low porosity and high strength based on selected alumina-silicates make up the back-bone of our product range. We use only new raw materials with high chemical purity in order to ensure uniform products.

In the following we give a short introduction to four of our most widely used LCC's for the cement industry. These materials have been used for the past decades in cement plants all over the world, and through continuously optimization they meet the challenges caused by the growing usage of various alternative fuels in kilns and preheaters.

We have many other materials in our product range, including SiC containing materials. However, these SiC materials are only beneficial in very limited areas of a cement plant, where temperatures and thermal shock are extreme, and hence they are not mentioned in this introduction. Please contact us for further information.

HASLE product	Properties	Typical applications in kilns with high utilization of alternative fuels	Alkali resist.	Build-up resist.	Thermal shock resist.	Abrasion resistance
D39A	Extremely alkali-resistant LCC based on high-burnt Fireclay (Chamotte)	Top of preheater tower, smoke chamber, riser ducts and grate cooler (cooler parts)	++++	+++	+	+
D52A	All-round, strong LCC combining the properties of Fireclay, Mullite and Bauxite	Bottom part of preheater, riser ducts, smoke chamber, kiln inlet, kiln hood, nose ring, burner pipe and cooler	+++	++	++	++
D59A	Strong, shock- and abrasion resistant LCC based on Andalusite, Mullite and Bauxite	Nose ring, burner pipe, bull nose, hot part of the cooler. Can also be beneficial in the inlet areas if the mechanical stress is high	++	++	+++	+++
D66	Strong, fine grained LCC based on high quality calcined Bauxite and Mullite with extraordinary abrasion resistance at all temperatures.	Tertiary air duct, damper and elbows, where abrasion is a problem due to high velocity clinker dust	+	++	+	++++

Datasheets for the four products in question are sent along with this introduction.

WE PROTECT YOUR PROCESS

D39A, D39A-EF and GUN39A

HASLE D39A is a strong and extremely alkali resistant low cement castable based on high-burnt fire clay. The SiO₂-rich material encapsulates alkali-vapors and increases the viscosity of liquid phases, whereby corrosion is slowed down. Supplementary to the alkali-resistant properties of the raw materials, the grain size distribution ensures a low porosity and hence reduces the risk of build-up on the refractory lining. This castable can be supplied as a fine-grained easy-flowing version (D39A-EF) and as low cement dry gunning mix (GUN39A) for fast installation and repairs.



This picture shows the result of a standard alkali-test of D39A-EF with K₂CO₃ at 1100°C according to EN/TS 15418.

At HASLE we make analyses with various salt mixtures relevant for the cement industry (K₂SO₄, KCl etc.) and we offer tests of any raw meal, build-up or slag from fuels that may cause trouble at your plant.

D52A

HASLE D52A is an all-round low cement castable with an intermediate level of alumina. D52A is based on fireclay, mullite and bauxite whereby D52A exhibits a high resistance to alkalis, as well as good resistance to abrasion and thermal stresses.



Carefully preheating to approx. 400°C significantly increases the life-time of any castable.

This picture shows the set-up for a preheating on site of a burner pipe. Heating coils should be covered by ceramic fiber and the heating has to be controlled by a thermostat.

After preheating the life-time of D52A on burner pipes is typically 12 months

D59A, D59A-EF and GUN59A

HASLE D59A is strong and very dense low cement castable, which combines the best refractory properties from several natural high-alumina raw materials, including andalusite and bauxite for shock- and abrasion resistance. Thanks to its low porosity D59A performs well against most chemical vapors and reduces build-up. The chemical composition makes it resistant to mixtures of alkalis, chlorines and sulfates at moderate levels. Therefore D59A is widely used in the outlet areas of cement kilns fired with various alternative fuels.



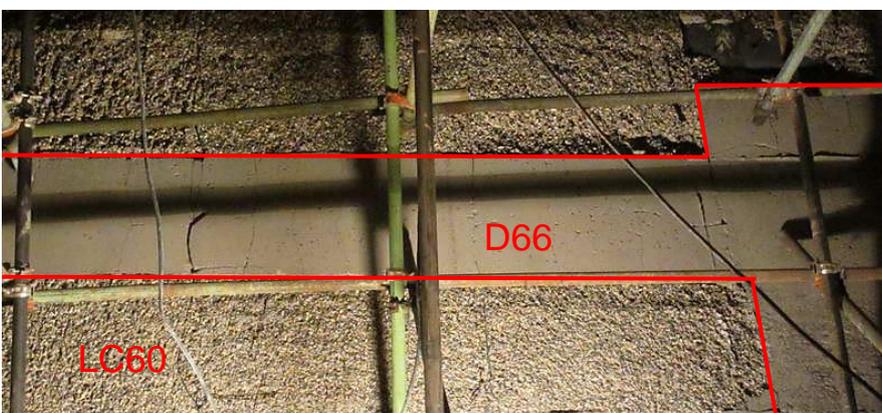
D59A-EF is a fine-grained easy-flowing version of D59A and GUN59A is a low cement dry gunning mix for repairs and fast installation.

The picture shows a precast bull nose of D59A.

HASLE offer a wide range of standard and customized precast solutions that can be pre-fired up to 1350°C

D66

HASLE D66 is a fine grained and strong low cement castable based on high quality calcined bauxite. D66 exhibits an extraordinary abrasion resistance at all temperatures, including temperatures (300-600°C) far below the point of ceramic sintering of the castable. D66 needs vibration during installation, but thanks to its grain size distribution it is highly suitable for thinner linings and curvy sections.



This picture shows the condition of D66 compared with a competitive LCC two years after installation in a cooler take-off-duct in a Polysius kiln with heavy abrasion. The erosion of D66 was far less than the surrounding material.