

SIBELCO

NEPHELINE SYENITE

**IMPROVE THE FUNCTIONAL AND AESTHETIC
CHARACTERISTICS OF MATT GLAZES**

THE PERFECT MATT EFFECT

Matt glazes give tiles a wonderfully natural look and open up endless design possibilities. But creating a matt glaze that is also functional (in terms of ease of cleaning and resistance to scratching and chemicals) can be very challenging. In addition, the trend towards large format tiles means that manufacturers need to minimise glaze-related pinhole defects in order to reduce costly volumes of fired waste.

Drawn from Sibelco's unique deposits in Norway, nepheline syenite enhances the aesthetic and functional characteristics of matt glazes in a number of ways, as well as helping to reduce production costs.



INCREASE SILKINESS AND WHITENESS



IMPROVE INK COLOUR DEVELOPMENT



INCREASE SCRATCH RESISTANCE



REDUCE DEFAULTS



LOWER THE MELTING TEMPERATURE



IMPROVED SCRATCH RESISTANCE AND LOWER COSTS

In comparison to other nepheline products, the higher alumina content improves scratch resistance. It also means that the glaze formula needs less amounts of expensive calcined alumina, and less clay and kaolin, too much of which can adversely affect glaze slip rheology and aesthetic surface appearance.

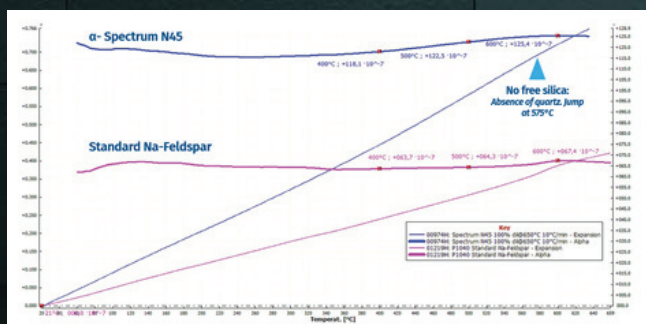
When used in place of feldspar, nepheline syenite reduces the melting temperature of the glaze (thanks to high levels of sodium and potassium) thereby helping to reduce overall energy consumption. It also has a higher coefficient of thermal expansion (CoE) than a standard sodium feldspar, making the glaze CoE more compatible with the CoE of the tile body to improve the body-engage-glaze fit. In terms of firing temperatures, it is extremely stable up to 1070°C whilst sintering and softening points are close to the firing temperature for glazed vitrified tiles (GVT).

ACHIEVING A GOOD BALANCE BETWEEN INK COLOUR DEVELOPMENT, MATT LEVEL AND WHITENESS

Free of magnesia and with a barium oxide content of 0.4, our laboratory tests show that nepheline syenite enhances digital ink colour development whilst delivering a good level of matt glaze surface. It therefore outperformed other nepheline products in the tests, which either delivered good colour development but a lower matt, or a higher matt but lower colour development. Our tests also showed that GVT tiles with a glaze made with the product were easier to clean than those made with other nepheline products.

When whiteness matters, our product again outperforms alternative nepheline products, thanks to low levels of iron oxide and titanium dioxide (0.21%). And because of the purity of our deposit in Norway, it has a higher nepheline content than alternative products and contains no free quartz.

	CoE 50-400°C	CoE 50-500°C	CoE 50-600°C
Cl - NEPHELINE SYENITE	118.1	122.5	125.4
Std. Na-Feldspar	63.7	64.4	67.4



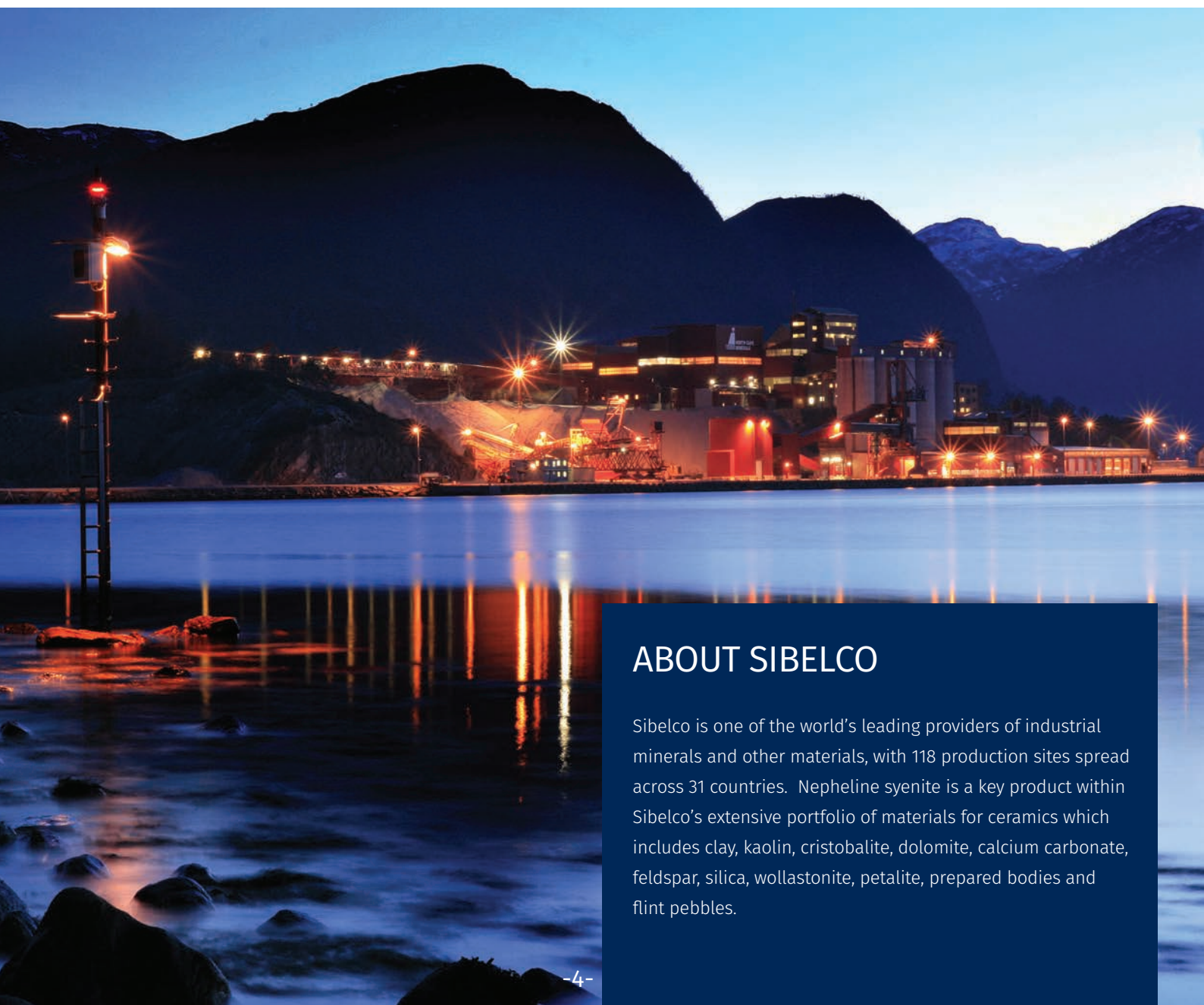
	NEPHELINE SYENITE	Average Std. Dev.
Al ₂ O ₃	24.5	0.5
BaO	0.4	0.0
CaO	1.1	0.1
K ₂ O	8.8	0.1
Na ₂ O	8.2	0.2
MgO	0.0	0.0
SiO ₂	55.7	0.6
Fe ₂ O ₃	0.11	0.01
TiO ₂	0.1	0.0

	NEPHELINE SYENITE
Phase Name	Wt% Rietveld
Nepheline	39.8
Albite	11
Microcline	48.5
Analcime	0.6

HIGHEST CONSISTENCY TO INCREASE YIELD AND REDUCE SCRAP WASTE

Thanks to the outstanding dimensions of the Nepheline Syenite deposit, and to the well consolidated know how on processing, our product presents the greatest characteristics of consistency and quality. It helps to significantly reduce problems with pinholes, thereby reducing scrap waste after firing. This is even more important when glazing slabs, as a defect on a 1.5m x 3m piece means a lot more wastage than a defective 60cm x 60cm wall tile.

Sibelco's nepheline syenite deposit sits in a challenging location in the north of Norway, close to the Alta Fjord in the Arctic Circle. Sibelco has a long reserve of over 80 years and today our product is exported to customers around the world for use in a wide range of applications including ceramics, coatings and plastics.



ABOUT SIBELCO

Sibelco is one of the world's leading providers of industrial minerals and other materials, with 118 production sites spread across 31 countries. Nepheline syenite is a key product within Sibelco's extensive portfolio of materials for ceramics which includes clay, kaolin, cristobalite, dolomite, calcium carbonate, feldspar, silica, wollastonite, petalite, prepared bodies and flint pebbles.

CONCLUSION

Nepheline syenite plays an important role in matt glaze production. Using high-quality materials can help to significantly improve the functional and aesthetic properties of the matt glaze and finished tile, as well as reducing overall production costs.

For further information please email: ceramics@sibelco.com or visit www.sibelco.com



Material solutions advancing life