

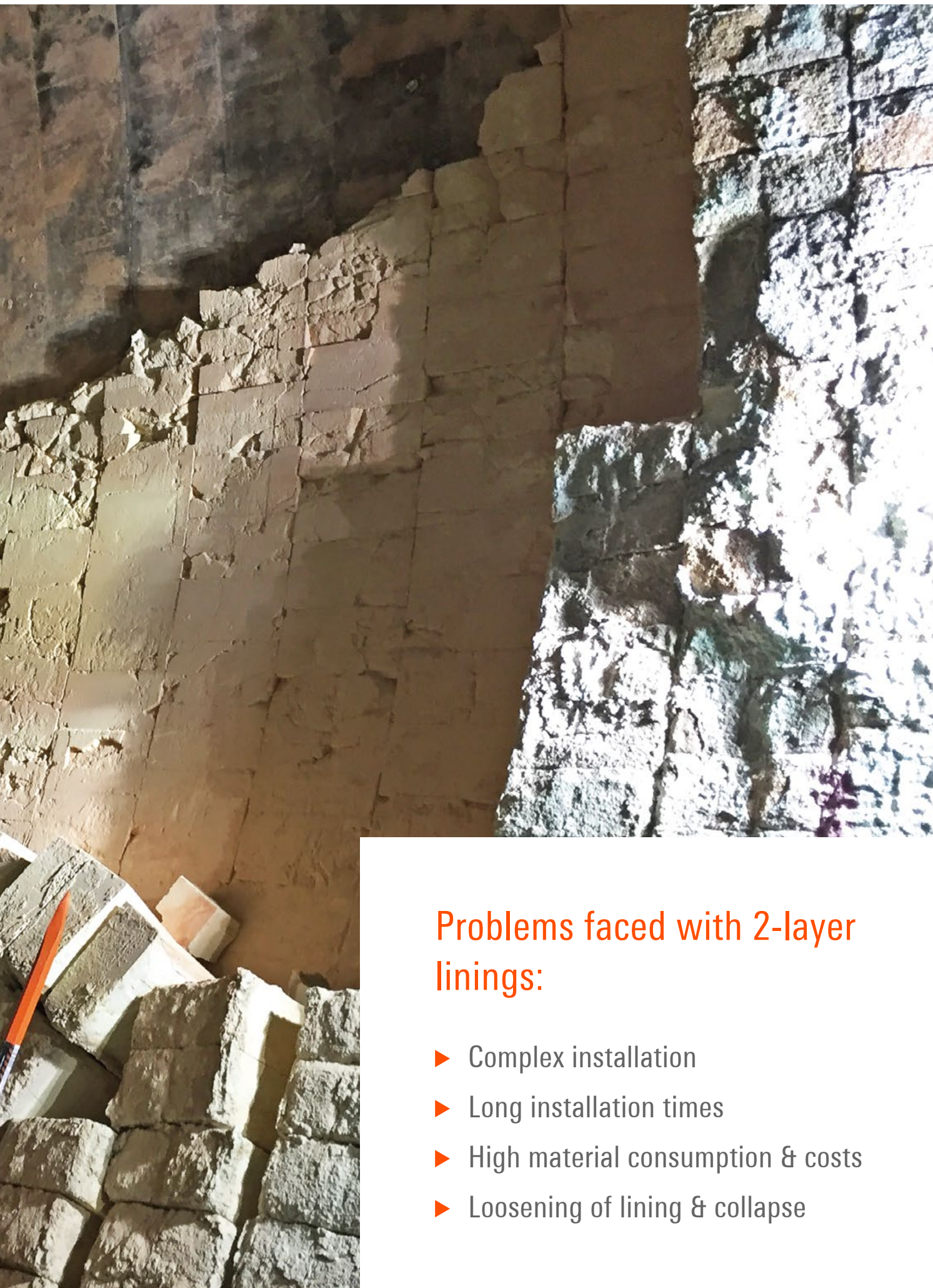
Expect the best. **REFRATECHNIK**



The 1 and only.
REFRALUSIT® ES

TWO IS NOT
ALWAYS BETTER

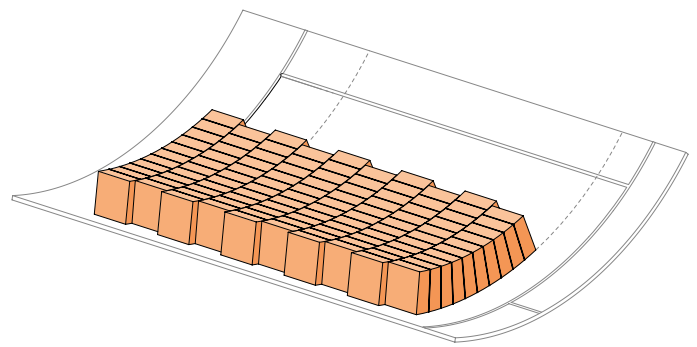




Problems faced with 2-layer linings:

- ▶ Complex installation
- ▶ Long installation times
- ▶ High material consumption & costs
- ▶ Loosening of lining & collapse

THE SOLUTION: 1-LAYER LINING



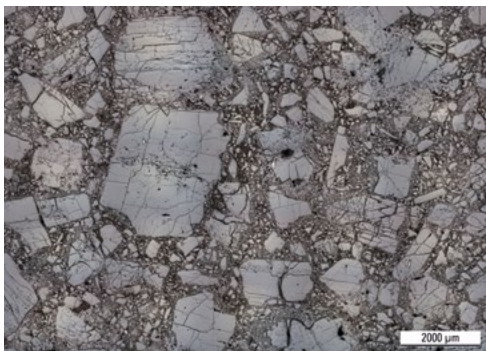
For protecting the kiln shell and keeping heat losses as low as possible, lime kilns are traditionally fitted with a 2-layer refractory lining. This means that a layer of insulating bricks with lower thermal conductivity but also lower cold crushing strength is installed between shell and wear lining. Under increased mechanical load, the physical strength of the insulating bricks can be exceeded.

With REFRALUSIT® ES, it is possible now to benefit from an option with the lowest thermal heat losses combined with the mechanical resistance of a 1-layer lining.

A unique product concept:

- ▶ Simple installation
- ▶ Up to 40 % faster installation
- ▶ Reduced material consumption

And all this with a comparable shell temperature



Conventional matrix
 Apparent porosity: 11–14%



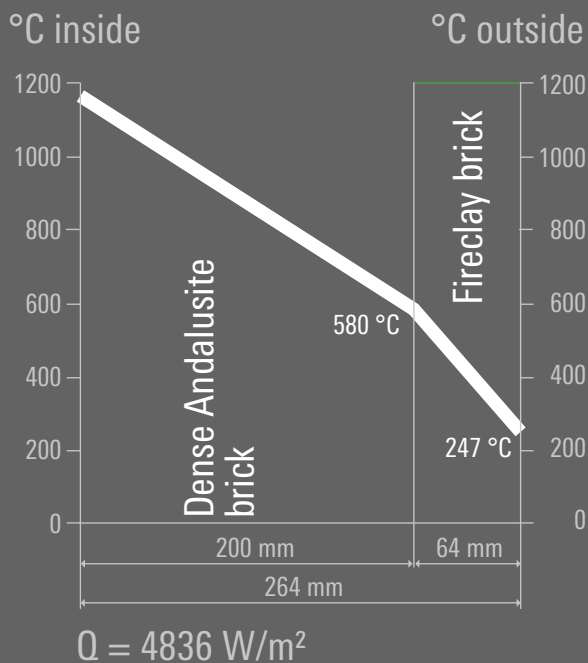
REFRALUSIT® ES matrix
 Apparent porosity: 18–21%

► Our lightest Andalusite brick, completely transformed by the ES® technology.

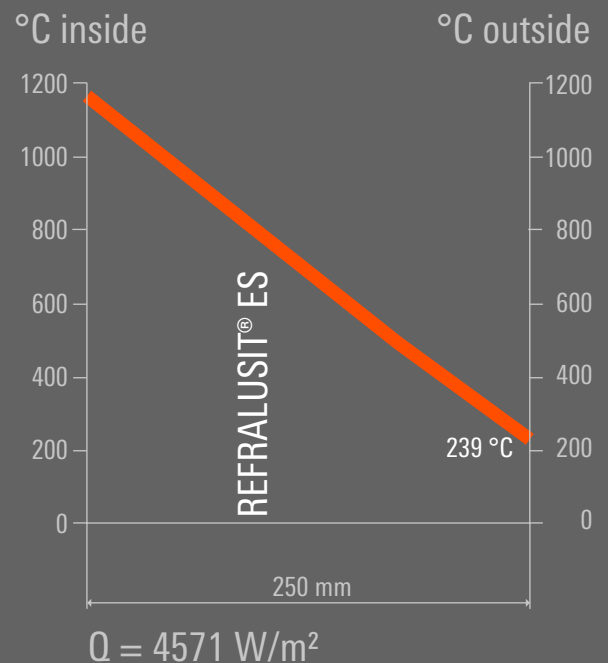
Reinforced sinter bonding + finer structure
 = higher strengths + up to 25% lower heat flow

Comparison of 1-layer and 2-layer linings

2-layer (standard)



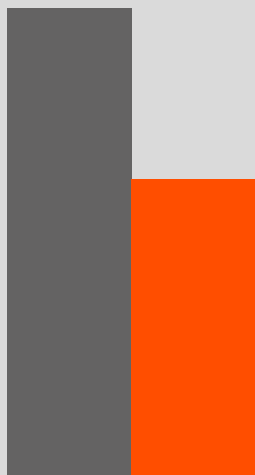
1-layer (energy saving)



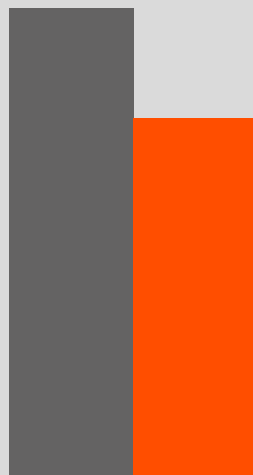
REFRALUSIT® ES offers the unique possibility of installing a 1-layer Andalusite lining in the burning and calcining zone, because conventional Andalusite bricks would lead to a roughly 30% higher shell temperature, which previously prohibited their use.

Comparison of a dense Andalusite brick vs. REFRALUSIT® ES

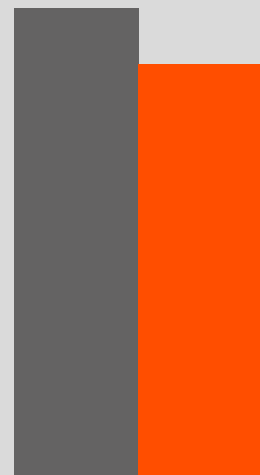
(Ti = 1200 °C, Ta = 20 °C, 4.4 m kiln diameter, 250 mm lining thickness)



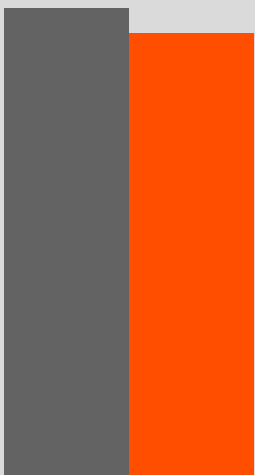
Calculated shell temperature



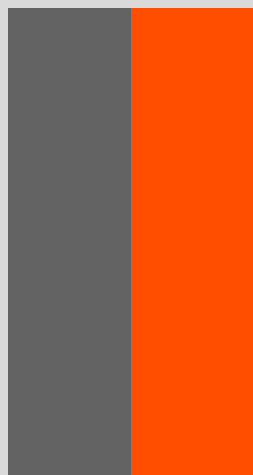
Heat loss



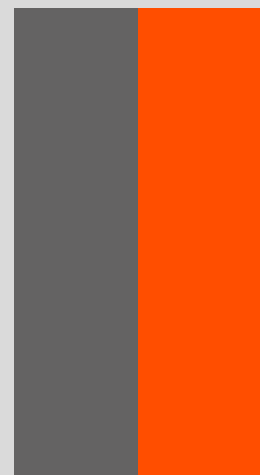
Lining weight



Material costs



Cold crushing strength



Thermal shock resistance

■ Dense Andalusite brick

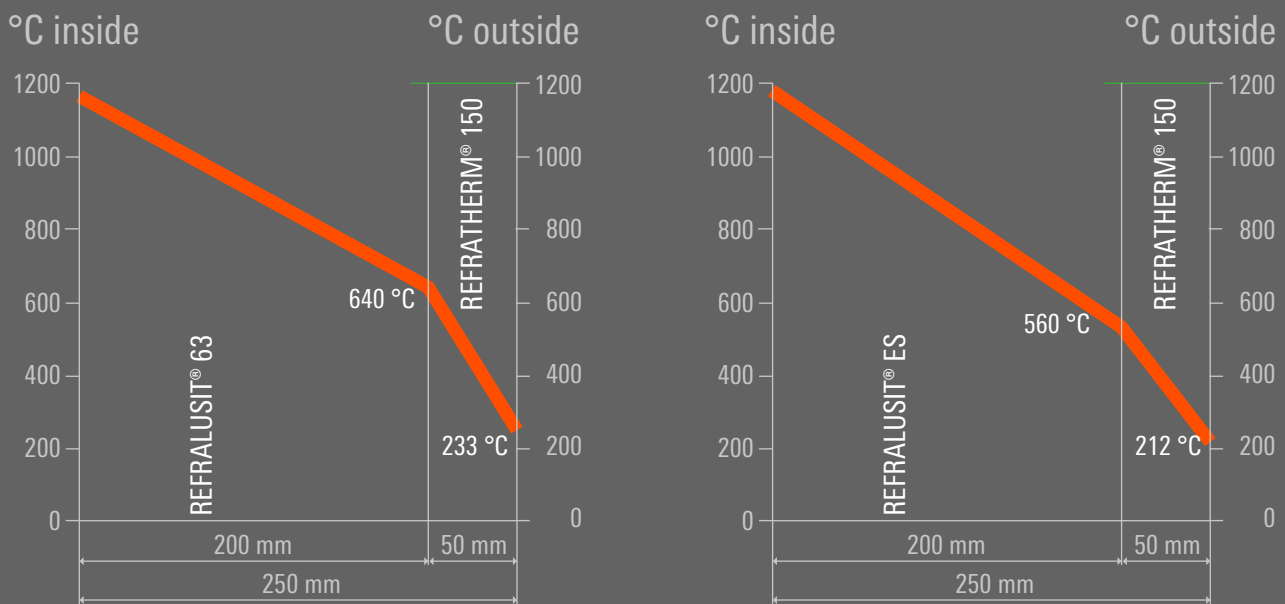
■ REFRALUSIT® ES



AND FINALLY: THE COOLEST PART

If the focus is a reduction of the shell temperature with a 2-layer lining, REFRALUSIT® ES is the best choice.

Thanks to the innovative ES® technology – which is used in an alumino-silicate brick for the first time – a combination of REFRATHERM® 150 with the unique properties of REFRALUSIT® ES enables the shell temperature to be reduced by about 10 %.





ALL THE BENEFITS AT A GLANCE

- ▶ REFRALUSIT® ES helps to reduce the carbon footprint
- ▶ The 1-layer lining concept makes installation easier
- ▶ Up to 40% faster lining installation (1-layer lining)
- ▶ Lowest heat losses – both with 1-layer and 2-layer linings
- ▶ Reduced lining weight and therefore kiln load
- ▶ Reduced transport costs and import duties
- ▶ Higher performance achieved by a thicker wear lining
- ▶ Reinforced sinter bonding and a finer structure lead to higher strengths and an up to 25 % lower heat flow

REFRALUSIT® ES – The 1-layer lining concept with the potential to revolutionize refractory linings in the pulp and paper industry.

We are here for you:

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REFRALUSIT® ES is a product of the unique ES®-Series.