

## How to Reduce the Carbon Footprint through Thermal Insulation in the Industry Furnaces.

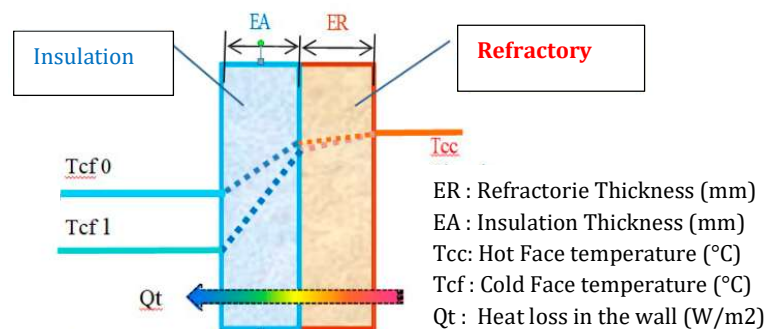
In industry, melting furnaces, processing plants, and laboratories require large amounts of energy to process minerals. Reducing their energy consumption not only reduces costs but also greenhouse gas emissions, contributing to a reduction in the carbon footprint.



### Where is energy lost in furnaces?

The energy consumption of a furnace can be divided into three parts: 1) the energy required for the melting process, 2) flue gas losses (furnace design), and 3) **thermal losses in the walls**. It is in this last aspect where thermal insulation can make a difference.

### Optimization of insulating materials



A furnace lining combines a refractory layer (which withstands high temperatures) and an insulating layer (which minimizes heat transfer to the exterior). Improving the quality or thickness of the insulation reduces the furnace's external temperature and, consequently, the associated heat loss and emissions.

### Estimated Savings in kg of Carbon Dioxide

**For a 1°C drop in the oven wall temperature, over a year, we can have an average of 2 kg of carbon dioxide, per M2 of the oven's external wall.**

## Example of estimated savings



If a 2°C reduction in wall temperature is achieved in a 10 m<sup>2</sup> furnace, the estimated annual savings would be approximately 40 kg of CO<sub>2</sub>. Although this value depends on the fuel, furnace efficiency, and operating hours, it serves as a benchmark for comparing insulation alternatives.

## Practical recommendations

To reduce the carbon footprint in mining furnaces, it is recommended to:

- Periodically review current insulation materials.
- Consult with refractory and insulation specialists.
- Use thermal simulation software to compare alternatives.
- Select materials with lower conductivity and adequate resistance.

## Conclusions

**Improving thermal insulation in industrial furnaces is an effective strategy for reducing energy consumption and carbon footprint. Its impact, although variable depending on the conditions, can be adequately measured and compared.**

**Soluciones Refractarias SRL** offers technical advice, materials, installation services, and software to optimize insulation and reduce emissions.

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**Note:** The results presented are indicative and depend on multiple factors such as furnace type, fuel, efficiency, and local conditions. They should be considered as a comparison between different insulation alternatives, not as absolute.