

GREENLINE | Green Electrified Ultrafast In-Line Heat Treatment for Net-Zero Forging and Casting

About GREENLINE

GREENLINE is an EU-funded project accelerating the decarbonisation of Europe's forging and casting industries through innovative, energy-efficient, electrified in-line heat treatment technologies that reduce energy consumption, CO_2 emissions and production costs.

THE CHALLENGE

Heat treatment is essential for achieving the required mechanical properties of forged and cast metal components, but it can account for up to 40% of energy consumption in forging and casting plants.

Conventional processes often require components to cool down, be stored and then reheated in separate furnaces. This wastes valuable thermal energy, increases production costs and extends processing times.

OUR APPROACH

We are developing an electrified in-line heat treatment process that makes use of the residual heat already contained in newly forged and cast components.

Instead of cooling and reheating components in separate production stages, the process combines controlled rapid cooling with compact electric furnaces directly integrated into manufacturing lines.

Expected Outcomes

- up to **40%** energy savings
- up to **95%** shorter lead times
- reduced **CO_2** emissions
- validated **material** quality

Technologies to be developped

Ultra-fast cooling system

Enables precise control of cooling rates to achieve the desired material properties while reducing processing time.

Thermal navigation charts and metallurgical models

Predict material behaviour and determine optimal temperature profiles and cooling conditions for different metals.

Modular electric furnace

Provides flexible, energy-efficient heat treatment designed for integration into existing industrial production lines.

GREENLINE EU Project

www.greenline-project.eu

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