

## SUSTAINABILITY CASE STUDY

# CELSA Group Green Steel: Every Degree Counts

A STUDY INTO THE IMPLEMENTATION OF CASTEMP SUPERHEAT A CUTTING-EDGE TECHNOLOGY TO IMPROVE CASTING EFFICIENCY AND REDUCE CO<sub>2</sub>.

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Steelmakers are constantly looking for ways to reduce carbon emissions due to steelmaking contributing 7% to global CO<sub>2</sub> output. The quickest, most cost-effective way of reducing environmental impact is through a reduction in the temperature steel is cast at, continuous temperature "CasTemp" can help.

## INTRODUCTION

It is critical in the current climate that steelmaking is as efficient as possible, current practises must be challenged to ensure they are sustainable long term. We looked for answers to the following questions:

Are you in control of casting Superheat? How accurate is your Superheat?  
How much Superheat do you cast with on average?  
Superheat must be benched marked to be challenged.

How much energy can you save by reducing casting Superheat?  
How do you define your secondary steel send temperatures and how often do you hit this target? Is this target dynamic?

Once Superheat is reduced, how does this product quality improve?  
What process benefits are seen? What is the value of this energy?

## SUMMARY

Celsa UK adopted CasTemp in 2014 and the steelmaking process was benchmarked to fully understand the thermal profile of the casting process with continuous temperature, this also included analysis of secondary steel making's ability to successfully hit send temperatures, this investigation allowed for small calculated incremental reduction of casting Superheat. The Superheat adjustments were then analysed, allowing for changes in casting speed and secondary cooling to optimise the process. This process was repeated multiple times with each repeat analysed for process impact.

## RESULTS

7°C

Celsa UK has demonstrated a reduction in casting temperature of 7°C by consistently using CasTemp as a means of controlling casting speed.

<CO<sub>2</sub>

This energy saving equates to a reduction of 1515 tonnes CO<sub>2</sub>, with a financial gain in 2022 of circa. £1M through energy saving and carbon credits.

85%  
REDUCTION

Superheat reduction doubled the tonnes cast between strand breakouts, as well as reducing product scrap due to defects by ~85%.

## CONCLUSION

Steel makers using spot measurement for temperature control on continuous casting machines are casting with too much Superheat. Adopting CasTemp Superheat have been proven to reduced casting temperature, and therefore save energy and significantly reduce costs.

