

# Heat Treatment

INDUSTRY

Our customer is a well established European company, with over 100 years experience, providing an extensive range of Heat Treatment services, including foundry, machining and fabrication. They are a global operation, with a turnover in excess of €50M.



## Energy Costs Reduced by 9% Case Study

*The new and innovative Furnace Energy Optimisation technique from Eurotherm, designed for Heat Treatment processes, shortened cycle time and reduced energy costs our customer.*

### Summary of experience

Trials of this new development in furnace control, recently undertaken at our customer's facility, resulted in identified average reductions of 9% in the time required for a range of Heat Treatment process runs. These evaluation runs took into account different load sizes in a variety of furnaces over a typical range of standard temperatures.

### Scope of cost savings

With the customer running processes of durations between 13 hours and 20 hours, operating at temperatures ranging from 580°C and 1080°C, savings of up to 20% in the total cycle time, were identified.

Over the course of a year, this will equate to an actual saving of up to €6700 for each furnace.

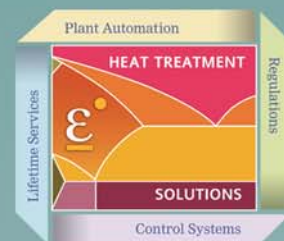
### Results from trial

Old Process Time	Load Temp	New Process Time	Saving
18h30	570°C	16h30	10.8%
19h40	680°C	16h40	19.6%
13h40	1080°C	13h30	3.6%
15h40	1040°C	15h20	2.0%

### How Cost Savings were achieved

These improvements are possible by calculating the moment that a work piece is uniformly at the temperature prescribed by the transformation process that it is undergoing, allowing a reduction in the overall process time while maintaining the metallurgical integrity of the work piece.

Using standard temperature measuring techniques it is impossible to non-intrusively measure the temperature at the core of a work piece. Common industrial practice is to run the process for a pre-determined length of time once the desired furnace temperature has been obtained. This time is known to produce the desired result with a margin for safety.



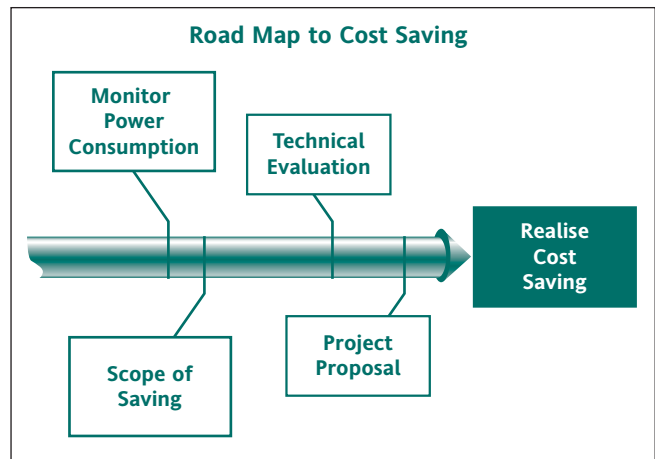
## How furnace energy optimisation functions

To achieve these improvements in timings, the Furnace Energy Optimisation controller monitors the power required to heat the loaded furnace. By performing a number of specific calculations, the controller is able to identify when a steady state has been reached where the work piece is at an homogenous temperature. Depending on the process, this can either flag the end of the process or the start of timed period at temperature.

By knowing the moment that the work piece reaches the required temperature, the overall process time can be optimised, providing increased throughput and not only delivering increased productivity and return on investment (ROI), but also reduced energy costs. These combined savings serve to reduce overheads and increase overall profit before tax (OPBIT).

## The process to allow you to benefit from these control improvements

- Measure the actual power currently consumed by your furnaces (Eurotherm are able to provide the monitoring equipment)
- Use this information to calculate the scope of potential savings
- A technical evaluation of your plant will be undertaken
- Eurotherm will propose the modifications to your plant control to enable you to realise the savings



## How to calculate your cost saving potential

$$\text{Monthly Saving (€)} = [R * (\text{MPO}/100) * \text{Time} * \text{Gain}/100] * \text{Tariff}$$

Where: R = Furnace Rating in kW  
MPO = Mean Power output  
Time = Hours per Month in Production  
Gain = Identified Gain Improvement possible (%)  
Tariff = Unit cost of energy (€/kWh)

## Eurotherm – Committed to saving energy costs

### Eurotherm: International sales and service

For more information: Please contact your local Eurotherm office or use the contacts details below.

**AUSTRALIA** Sydney  
T (+61 2) 9838 0099  
E [info.au@eurotherm.com](mailto:info.au@eurotherm.com)

**AUSTRIA** Vienna  
T (+43 1) 7987601  
E [info.at@eurotherm.com](mailto:info.at@eurotherm.com)

**BELGIUM & LUXEMBURG** Moha  
T (+32) 85 274080  
E [info.be@eurotherm.com](mailto:info.be@eurotherm.com)

**BRAZIL** Campinas-SP  
T (+5519) 3707 5333  
E [info.br@eurotherm.com](mailto:info.br@eurotherm.com)

**DENMARK** Copenhagen  
T (+45 70) 234670  
E [info.dk@eurotherm.com](mailto:info.dk@eurotherm.com)

**FINLAND** Abo  
T (+358) 22506030  
E [info.fi@eurotherm.com](mailto:info.fi@eurotherm.com)

**FRANCE** Lyon  
T (+33 478) 664500  
E [info.fr@eurotherm.com](mailto:info.fr@eurotherm.com)

**GERMANY** Limburg  
T (+49 6431) 2980  
E [info.de@eurotherm.com](mailto:info.de@eurotherm.com)

**HONG KONG & CHINA**  
Guangzhou Office  
T (+86 20) 8755 5099  
E [info.cn@eurotherm.com](mailto:info.cn@eurotherm.com)

**INDIA** Chennai  
T (+91 44) 24961129  
E [info.in@eurotherm.com](mailto:info.in@eurotherm.com)

**Beijing Office**  
T (+86 10) 6567 8506  
E [info.cn@eurotherm.com](mailto:info.cn@eurotherm.com)

**Shanghai Office**  
T (+86 21) 6145 1188  
E [info.cn@eurotherm.com](mailto:info.cn@eurotherm.com)

**IRELAND** Dublin  
T (+353 1) 4691800  
E [info.ie@eurotherm.com](mailto:info.ie@eurotherm.com)

**ITALY** Como  
T (+39 31) 975111  
E [info.it@eurotherm.com](mailto:info.it@eurotherm.com)

**KOREA** Seoul  
T (+82 31) 2738507  
E [info.kr@eurotherm.com](mailto:info.kr@eurotherm.com)

**NETHERLANDS** Alphen a/d Rijn  
T (+31 172) 411752  
E [info.nl@eurotherm.com](mailto:info.nl@eurotherm.com)

**NORWAY** Oslo  
T (+47 67) 592170  
E [info.no@eurotherm.com](mailto:info.no@eurotherm.com)

**POLAND** Katowice  
T (+48 32) 2185100  
E [info.pl@eurotherm.com](mailto:info.pl@eurotherm.com)

**SPAIN** Madrid  
T (+34 91) 6616001  
E [info.es@eurotherm.com](mailto:info.es@eurotherm.com)

**SWEDEN** Malmo  
T (+46 40) 384500  
E [info.se@eurotherm.com](mailto:info.se@eurotherm.com)

**SWITZERLAND** Wollerau  
T (+41 44) 7871040  
E [info.ch@eurotherm.com](mailto:info.ch@eurotherm.com)

**UNITED KINGDOM** Worthing  
T (+44 1903) 268500  
E [info.uk@eurotherm.com](mailto:info.uk@eurotherm.com)  
[www.eurotherm.co.uk](http://www.eurotherm.co.uk)

**U.S.A.** Leesburg VA  
T (+1 703) 443 0000  
E [info.us@eurotherm.com](mailto:info.us@eurotherm.com)  
[www.eurotherm.com](http://www.eurotherm.com)

ED52

The example given in this document is for guidance and illustration purposes only. It does not imply or constitute any representation, warranty or guarantee from Eurotherm Limited

© Copyright Eurotherm Limited 2006

Invensys, Eurotherm, the Eurotherm logo, Chessell, EurothermSuite, Mini8, Eycan and Wonderware are trademarks of Invensys plc, its subsidiaries and affiliates. All other brands may be trademarks of their respective owners. All rights are strictly reserved. No part of this document may be reproduced, modified, or transmitted in any form by any means, nor may it be stored in a retrieval system other than for the purpose to act as an aid in operating the equipment to which the document relates, without the prior written permission of Eurotherm limited.

Eurotherm Limited pursues a policy of continuous development and product improvement. The specifications in this document may therefore be changed without notice. The information in this document is given in good faith, but is intended for guidance only. Eurotherm Limited will accept no responsibility for any losses arising from errors in this document.