Materials Processing Institute

Innovate UK

CASE STUDY

Best Practice and Heat Recovery in Continuous Gas Fired Furnaces

PROJECT

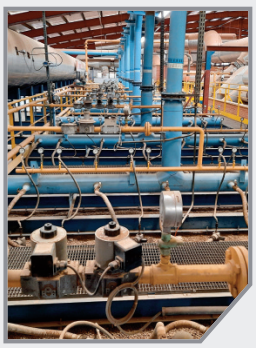
The Materials Processing Institute, British Steel, Wienerberger UK Low Carbon Europe and Heatcatcher Ltd have collaborated in this UK steel and ceramics sectors Industrial Strategy Challenge Fund (ISCF) project to share best practice and investigate waste heat recovery from furnaces.

PROJECT SUMMARY

Furnaces used in both industries are gas fired and operate continuously heating products to temperatures over 1000°C.

Both industries currently use waste process heat to good effect and use exhaust heat to pre-heat product. The brick kiln using further exhaust heat for drying products and the steel furnace recuperating heat into combustion air. The steel furnace also uses its cooling system to generate steam for other uses on the steel plant.

The project compared a reheating furnace operated by British Steel, with brick kilns operated by Wienerberger UK; investigating combustion efficiency and heat flows to assess contrasting practices and heat use in the processes.



OPPORTUNITIES

The project identified opportunities to:

- Use heat from cooling systems to pre-heat combustion air in brick kilns
- Generate electricity from excess heat in the furnace cooling system
- Use remnant heat in the steel furnace exhaust to generate electricity using an organic rankine cycle turbine
- Improve combustion efficiency and control using modern burner technologies

POTENTIAL BENEFITS

Benefits identified included:

- A reduction in gas use
- Burner changes could enable hydrogen to be used in the fuel mix

The findings of this project highlighted how these highly efficient processes might further improve and become less carbon intensive using improved heat recovery and combustion technologies. These improvements will typically be possible on all similar continuous reheating furnaces and brick kilns.

LCE

Wienerberger

Materials Processing Institute

HEATCATCHER Waste Heat & Power

BRITISH STEEL

Address:
Materials Processing Institute
Eston Road
Middlesbrough
TS6 6US
United Kingdom

Contact Details:
t: +44 (0)1642 382000
enquiries@mpiuk.com
www.mpiuk.com

CERTIFIED LR ISO 9001 · ISO 14001

1944 - 2019 75 YEARS OF INNOVATION