

Materials Processing Institute Launches Hydrogen Agreement

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A new partnership based in the North East is to look at the potential impact of hydrogen on industrial processes.

The Materials Processing Institute has announced the three-year partnership with Trent Refractories and Kanthal to focus on the effect of hydrogen on refractories, the heat resistant materials that form the linings for high-temperature furnaces, crucibles, ladles, and kilns - primarily used in the iron and steel industry.

It will also test a range of electrical elements, for use in high temperature applications to discover any advances that need to be made to ensure full operating demands are fulfilled in a hydrogen atmosphere.

Chris McDonald, CEO of the Material Processing Institute, a UK centre for research and innovation in the foundation industries, said: "The results of this collaborative research programme could have far-reaching effects given the range of industries that depend on refractory solutions, including iron and steel, aluminium, glass, power generation, petrochemicals and chemicals, and cement.

"Hydrogen is widely used here at the Institute, and it is crucial that we assess how it is used to help deliver long term solutions that shape and support the UK's transition to a low carbon economy."

The initial phase of the work will involve the testing of refractory materials supplied by Scunthorpe-headquartered Trent Refractories to mitigate any degradation caused by hydrogen.

Samples will undergo a complex and advanced range of testing at the Institute in hydrogen-rich atmospheres. Then Swedish industrial heating technology company Kanthal is seeking to advance the use of electric furnaces and green steel.

Combined with advances in hydrogen production process, their widespread adoption is set to transform the global steel industry over the next two decades.

The Teesside-based Materials Processing Institute will also test a series of electrical elements designed by Kanthal that can tolerate hydrogen's high heating values at its hydrogen research facilities. It will also investigate and test new materials to ensure they are industry ready as clean hydrogen is introduced across many industrial processes over the next few years.

Bob James, Technical Collaboration Lead at the Institute, added: "It's already proven that hydrogen is an alternative clean fuel source capable of powering the majority of industrial processes. However, research is essential to assess how hydrogen may impact on the processes themselves, including its effect on refractory lining systems, the corrosion of certain compositions, and accelerated wear."

Katy Moss, Managing Director of Trent Refractories Ltd and the President of the Institute of Refractory Engineers, said: "We are very much looking forward to working with such dynamic

partners. It means a lot to the team here at Trent Refractories, to be part of the solutions that enable our foundation industries not only to survive but to sustainably thrive.”

Jesper Ejenstam, R&D Manager of Kanthal, added: “Industry is entering a new age of decarbonisation with a mass shift towards electrification and the use of clean fuels such as hydrogen. Kanthal is proud to be part of the research that will ensure such innovations are industry ready.”