# Press release

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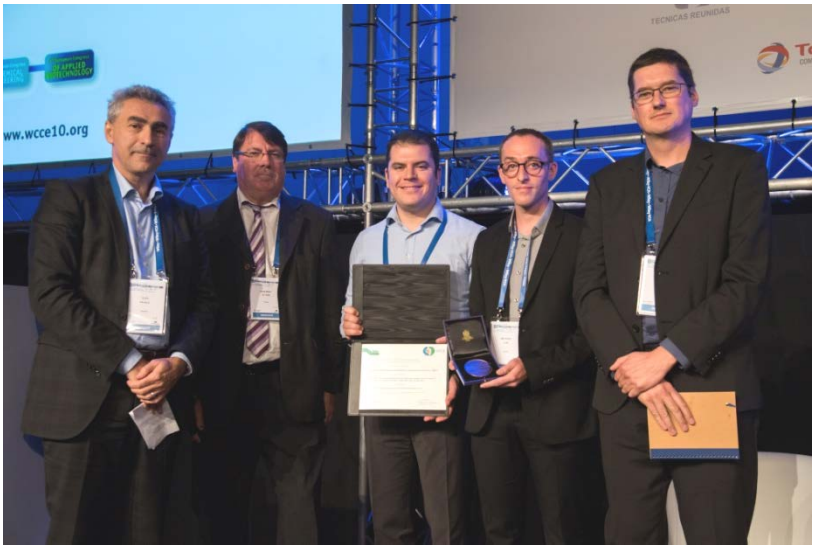
http://www.efce.org

## EFCE names Air Liquide winner of the 2017 Process Intensification Award for Industrial Innovation




A new reactor design that significantly increases the efficiency of hydrogen production has won the 2017 Process Intensification Award for Industrial Innovation, awarded by the European Federation of Chemical Engineering (EFCE).

Developed by an 11-strong team working for the French industrial gases specialist **Air Liquide**, the 3D printed, milli-structured heat exchanger reactor was designed to improve the efficiency of producing hydrogen by steam reforming natural gas. It does so by reusing heat originally used to produce excess steam, and by increasing the heat transfer between the hot process streams. The improved reactor is expected to reduce operating costs up to 20% and $CO_2$ emissions up to 12% compared with existing technology.

EFCE's Working Party on Process Intensification, which judged the award, said: "This reactor is a very interesting example of the use of 3D printing in the manufacture of this new intensified reactor, and has the potential to be a disruptive innovation for industry."

The award was received by the team's representatives, Matthieu Flin and Raphael Faure.

The team notes that key to the development was optimizing the internal design that includes the fluidic and thermomechanical constraints. Other factors were the use of 3D printing to manufacture the reactor, and bespoke catalyst management.

Development work largely took place in 2015, and a lab scale version was successfully operated at Air Liquide's Paris Saclay research centre for more than 4000 hours in 2016. An industrial pilot plant is now under construction and due for start up in late 2018, with first commercial applications expected for 2020.

Air Liquide expects the reactor will be of interest to a wide range of industries requiring hydrogen, ranging from oil and gas production to household hydrogen microgeneration.

The 2017 EFCE Process Intensification Award for Industrial Innovation was presented during the 10th World Congress of Chemical Engineering in Barcelona, Spain, on 2 October 2017.

The EFCE Process Intensification Award for Industrial Innovation is presented to an employee or a team of employees of a company, who have made excellent contributions to industrial application of process intensification.

The 2017 EFCE Process Intensification Award for Industrial Innovation is generously sponsored by Perstorp AB.

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## Related links

EFCE media centre (http://www.efce.info/Media+Centre.html)

EFCE Working Party on Process Intensification (http://www.efce.info/WP_PI.html)

10th World Congress of Chemical Engineering (http://www.wcce10.org)

**Photograph caption (L-R):** Professor Oleg Pajalic, Vice President Process Innovation, Perstorp AB; Professor Jean-Marc Le Lann, EFCE Scientific Vice-President; Mr. Raphael Faure, Air Liquide; Mr. Matthieu Flin, Air Liquide; Professor Tom Van Gerven, Chairman of EFCE Working Party on Process Intensification. (photography by Alicia Garcia)

## Notes to media

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## About chemical engineers

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## About EFCE

Founded in 1953, The European Federation of Chemical Engineering (EFCE) is a non-profit-making association, whose object is to promote co-operation in Europe between non-profit-making professional scientific and technical societies in 30 countries for the general advancement of chemical engineering and as a means of furthering the development of chemical engineering. See www.efce.org

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