

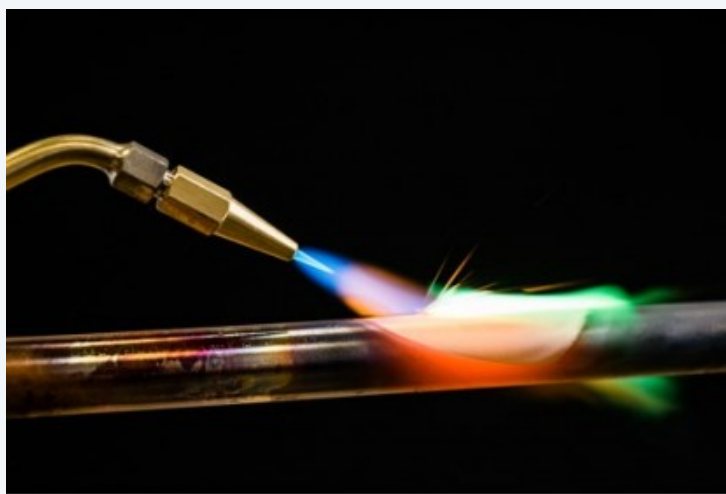
## French SME Bulane takes on the challenge of generating clean fuel for welding from water and electricity

*The Chimie Balard Cirimat Carnot Institute and Bulane have been setting standards with innovative developments using hydrogen flame since 2009. Their efforts have enabled the transformation of the underlying concept into a sales mechanism for industrial companies, small businesses and craftsmen alike.*

### Supporting Innovation

Brazing and welding processes require a fossil fuel-based source of significant heat, such as acetylene. The storage of liquid fossil fuels in an industrial setting or within the context of artisan manufacturing imposes particular constraints. It is necessary to take into consideration the entire supply logistics chain, any potential risks and implications, as well as degradation products during production. Thanks to *dyomix®*, an intelligent gas generator, Bulane allows to eliminate all stages for the transport of fuels, by using an Oxy-hydrogen flame through real-time monitoring of water electrolysis. Indeed, the device only requires water and an electrical connection to operate. The result is a clean, performing flame, which effectively improves operator comfort and safety. Experts in their field have recognised the device as a major technological innovation. For that matter, the project has won 2 awards in 2017: the "Gold Award of Excellence in Innovation" during the *Batimat\** trade show and the "Application Innovation Trophy" remitted by the regional Chamber of Commerce of Montpellier (southern France).

\* International exhibition dedicated to innovations in the building, construction and architecture sector.



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### The client needs

**Bulane** sit through as early as 2009 with the idea of using hydrogen instead of fossil fuels with respect to welding applications across the industrial sector. Recognising the efforts motivating such technological breakthrough in terms of Research and Development, Bulane engages partners, including the Chimie Balard Cirimat Carnot Institute, very quickly. They do so through studies, patents and ongoing exchanges of views and rich interactions. Such co-operation made it possible to improve the conditions of the flame and energy efficiency, the development of innovative electrodes and the filing of international patents. Bulane and the Chimie Balard Cirimat Carnot Institute have demonstrated the need for such a mechanism through industrial facilities as of 2013. They have actively continued to pursue joint programmes with the objective of selling it to both the local artisans and professional market. An intense collaborative R&D has further enabled miniaturisation of the device along with the fitting of composite electrodes to a mobile piece of equipment. With its extensive portfolio of about 150 industrial systems used on a daily basis, Bulane can market a wide range of clean, efficient and secure mobile *dyomix®* brazing stations.

### Partnership

As part of the **Chimie Carnot Balard Cirimat Carnot Institute**, the Charles Gerhardt Institute areas of interest include, among other subjects, solid-state and divided matter chemistry. For this reason, the AIME\* team has facilitated access to its expertise in materials in addition to electrode and electrolysis design. Advanced particle/polymer composite electrodes have been jointly developed to optimise formation of hydrogen and oxygen on electrode surfaces. The contributions were vital to deliver energy efficiency improvements in gas production. They can enable miniaturisation accordingly while increasing the power-to-weight-to-density compactness device ratio. The Carnot teams involved in the project goals since the outset have supported Bulane each and every year with the aim of taking into account the constraints of all potential buyers from the commercial and industrial enterprises. The results prove to be very positive for the SME from Southern France. Present in 11 countries already, Bulane has created 10 jobs in just 20 months and foresees 100% growth in 2017. As a French Tech ambassador at COP21, Bulane has additionally been recognised for its environmental practices. The French Institute for Research and Security INRS has furthermore highlighted the positive impact of Bulane's work on working conditions.

\* Aggregates, Interfaces and Materials for Energy