

Webinar 4: Friday, December, 17, 2021, 13:00-14:00

Hydrogen as a fuel for industrial heating processes; what are the challenges

By Dr. Martijn van Essen and Dr. Sander Gersen, DNV GL

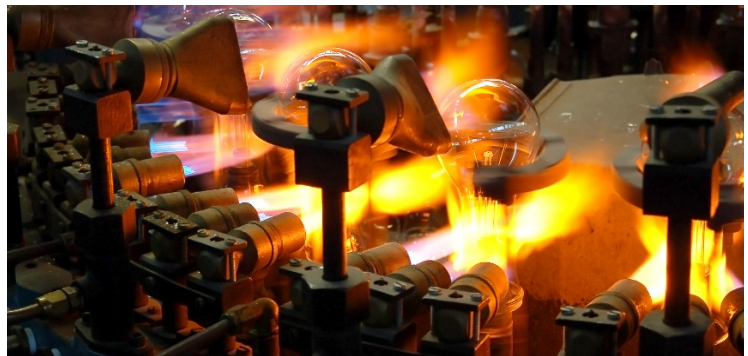
Energy-intensive industrial production processes, for example in the glass, food and ceramic sectors, have a major challenge to decarbonise existing heating processes. A fast and sustainable route to reduce the carbon intensity of these processes is to replace natural gas with hydrogen. However, the technology for this is not yet available. The major challenge for the industry is that the combustion properties, such as flame velocity and flame temperature, of hydrogen are significantly different from natural gas. In the initial phase of the energy transition it is unlikely that there always will be enough hydrogen available to satisfy the entire industrial energy demand, whose processes usually run continuously (24/7) throughout the year. To avoid shutting the production process down due to lack of (pure hydrogen) fuel, an attractive solution is to utilise a burner systems that can flexibly utilize the full mix of fuel compositions: 100% hydrogen, 100% natural gas and all possible mixtures of hydrogen and natural gas without manual adjustment of the burner for the different fuel compositions. The major economic advantage of such a system is that it offers robust fuel flexibility with only a limited investment: the same burner system can be used throughout the transition, supplied initially with varying natural/gas hydrogen mixtures, and in the end with pure hydrogen when the supply has risen to the challenge.

In this presentation the technical challenges will be discussed when adding hydrogen to natural gas with regard to burner performance. Special attention will be paid to NO_x mitigating measures that are often required when hydrogen is added to natural gas.

BIO Sander Gersen, Sander

Sander Gersen is an expert in combustion processes. He is involved in several projects to assess the impact of the introduction of “new” (sustainable) fuels on the performance end-use equipment such as gas engines and industrial burners. Sander finished his PhD on the experimental study of the autoignition properties of methane/hydrogen mixtures in 2007 at the University of Groningen.

Sander is the project leader of the TKI project “Hydrogen as a fuel for heating processes”.



High temperature glass production with natural gas