



HBI C-Flex

Reoxidation behaviour and stability of direct reduced and hot briquetted iron with variable iron and carbon content to promote safe handling and transport for a future decarbonised steel production

The project in a nutshell

HBI C-Flex is a 3.5-year project funded by the European Union's Research Fund for Coal and Steel research programme and demonstrates the direct reduction of iron ore using various qualities (including lower-grade ores being typically not used for direct reduction) followed by hot briquetting. The consortium consists of 10 partners and includes steel producers, technology providers, RTOs and universities from Austria, Germany, Belgium, France and Netherlands. Each of whom has specific knowledge, skills and equipment to achieve the project objectives. A Supportive Advisory Board (SAB) led by the International Iron Metallurgy Association assists with their knowledge and expertise regarding HBI production and handling.



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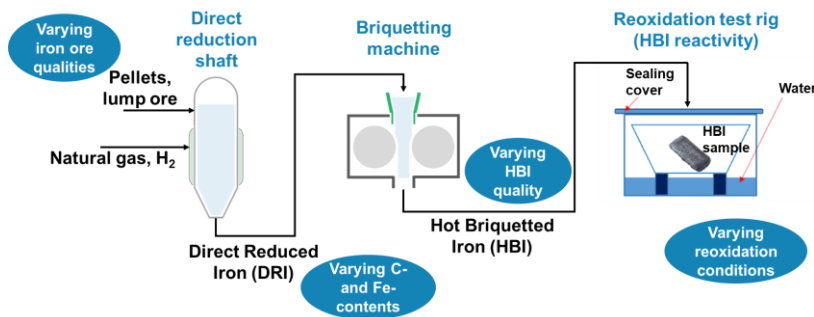
Coordinated by: K1-MET, Austria

www.hbi-c-flex.eu



Motivation

Since not all steel demand can be met by recycling scrap due to scrap availability and quality requirements of high-tec steel grades, primary steel production will still be necessary and therefore has to decarbonise. This requirement induces the need to increase the production and use of Direct Reduced Iron (DRI) and Hot Briquetted Iron (HBI). These materials serve as enablers of the steel circular economy by diluting the metallic and other impurities present in lower quality grades of scrap. A large amount of the iron ore available today does not meet the required grade for DRI-based Electric Arc Furnace (EAF) steelmaking. As a result, there is a need for the utilization of this higher share of lower-grade ores. The pathway to decarbonisation of the steel industry envisages DRI/HBI being produced using hydrogen (H_2) rather than natural gas with a consequent impact on product properties, notably carbon (C) content. The HBI C-Flex project takes an ambitious step towards contributing to new, sustainable and low-carbon materials for steel production.



Objectives

HBI C-Flex demonstrates the direct reduction of iron ore using various qualities (including lower-grade ores being typically not used for direct reduction) followed by hot briquetting. The figure above shows the project concept. Flexible carbon contents will be reached also including zero-carbon products. HBI, as well as DRI will be subject of reoxidation trials under changing ambient conditions (dry and wet atmosphere, enhanced temperature) to quantify exothermic reactions during onsite storage, rail and maritime transportation. Mineralogical, mechanical and metallurgical analyses of the DRI/HBI before and after reoxidation will be performed. The knowledge about reactivity and stability (dust formation) during HBI handling will be valuable for steelmakers in terms of logistics and up-skilling of workers awareness how to avoid hazard situations during their daily work.



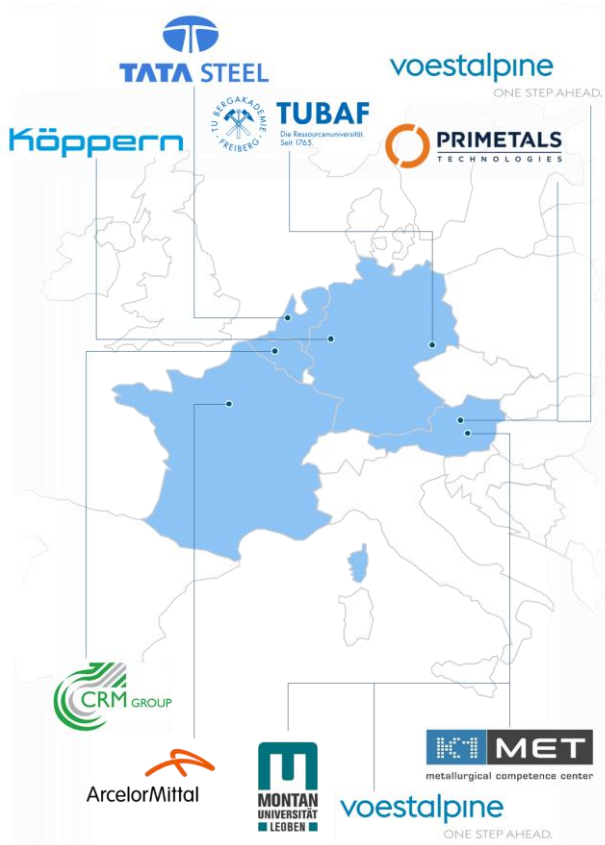
A word from our coordinator

Welcome to the HBI C-Flex project. In our project, we contribute to the decarbonisation of the steel industry, support the use of hydrogen-based direct reduction and examine the influences on HBI production. We are grateful to have an excellent international team of partners from the steel industry, technology providers, raw material suppliers, industry associations, universities and research centers. Together we take the next step to handle low-carbon HBI production, storage and transport. Our research work comprises the whole value chain: from the ore selection to the reduction and briquetting before we test the HBI reoxidation behaviour.

If you are interested in our topic and ongoing activities in HBI C-Flex, please subscribe to our newsletter, have a look at our website www.hbi-c-flex.eu and get in touch with us.

Yours faithfully, Lukas Schmidt





Consortium

K1-MET (a research organisation from Austria) coordinates the project and is supported by two universities (University of Leoben in Austria and TU Bergakademie Freiberg in Germany), three steel producers (Tata Steel Nederland Technology BV from the Netherlands, voestalpine Stahl GmbH and voestalpine Stahl Donawitz GmbH from Austria), two research and technology organisations (ArcelorMittal Maizières Research S. A. from France and CRM from Belgium) and two technology providers (Primetals Technologies Austria GmbH from Austria and Maschinenfabrik Köppern GmbH & Co. KG from Germany). The international consortium and the numerous partners allow a comprehensive approach to the topic and contribute to a more sustainable steel industry. Each of the partners has specific knowledge, skills and equipment to achieve the objectives of the project.



Kick-off meeting

In the beginning of July, the consortium met in person and online in Linz to launch the HBI C-Flex project. Each partner provided a short overview of their company and their task. Furthermore, the work packages and first steps were discussed. Coffee breaks and meals served as an opportunity to get to know each other and forge connections beyond the formalities of the meeting room. Afterwards, the H2Future facility at the voestalpine plant could be visited. This kick-off meeting not only marked the beginning of a strategic project, but it also laid the foundation for a strong and interconnected partnership.

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