RollOil Free II Newsletter No 2

2024 was a very intense year for the RollOilFree II consortium. The project took significant steps towards to a **comprehensive test of Oil Free Lubricants (OFLs) under industrial conditions for cold rolling**. The project considers both packaging and automotive steels. This newsletter summarises the main achievements of this year.

Our intense 2024

In the context of Work Package (WP) 2, the industrial partners of the project, namely Tata Steel in IJmuiden, thyssenkrupp Packaging Steel in Rasselstein and thyssenkrupp Steel Europe in Duisburg selected the **materials for the pilot and industrial investigations**. The most important lubricant parameters for an efficient cold rolling such as pH, viscosity and temperature were identified. Moreover, two conventional "reference" lubricants, one used for the cold rolling of packaging steel, the other for the cold rolling of automotive steel (soft and hard grades) were selected and their performance assessed within the laboratory tests at Quaker Houghton (QH) and the the 3-roller wear testing equipment available at Betriebsforschungsinstitut (BFI) (see Fig. 1). Physical-chemical properties, emulsion stability and consistency as well as lubrication properties, corrosion behaviour and cleanliness were assessed. Finally, based on the outcomes of the previous analyses and tests, **the technical, economic and environmental requirements for the OFLs** to be tested were defined by the steel companies and QH.

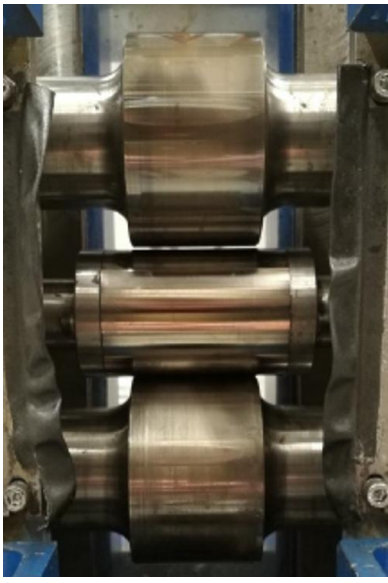

Figure 1. BFI's 3 roller testing equipment.

Within WP3 an important milestone was achieved: the **first set of pilot trials** was carried out in September at the semi-industrial cold rolling mill of Tata Steel IJmuiden (see Fig. 2). The reference conventional oils and 3 selected OFLs were

Project co-funded by the Research Fund for Coal and Steel (RFCS) G.A. **101112433**

Figure 2. Semi-industrial cold rolling mill of Tata Steel Ijmuiden.

The first results of the pilot tests show that the OFL possesses good lubricating properties even up to high rolling speed (11 m/s). Two further sessions of pilot tests are planned in the project together with industrial tests.

Finally, within WP4 Scuola Superiore Sant'Anna started the development of a **mathematical model of the cold rolling mill** that is intended to be an investigation tool, which will also support the planning of the future test stages.

Dissemination

The first paper generated the RollOilFree II project was presented by Leon Jacobs, MSc., from Tata Steel at the ***10th International Conference on Tribology in Manufacturing Processes ICTMP 2024*** in Alcoy (Spain) and was awarded with the second place award for the best presentation.

An abstract was also submitted and accepted for presentation at ***AISTech 2025 The Iron & Steel Technology Conference and Exposition*** and will be presented in Nashville (TEN. USA) in May 2025 by QH.

Project co-funded by the Research Fund for Coal and Steel (RFCS) G.A. **101112433**