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Improving sustainability of Cold Rolling of Low-Carbon Steels via Oil Free Lubricants

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The European steel sector is committed to improve sustainability of the whole steel production chain, from decarbonisation of major upstream processes up to all downstream operations, including rolling. In particular, in the cold rolling process, oil-in-water emulsions/dispersions are usually applied to lubricate the cold rolling process of low-Carbon steel. Such emulsions present some drawbacks mainly related to emulsion bath maintenance, subsequent production stages and waste disposal. Past research works showed that in some application areas, Oil Free Lubricants (OFL) show lubricant properties that are comparable to conventional lubricants, while providing significant environmental benefits. The project entitled "Transfer of aqueous oil free lubricants into stee cold rolling practice"(Ref. RollOilFree II –G.A. No 101112433) aims at developing an Oil-Free Lubricant for the cold rolling process of low-Carbon steel for applications in the automotive and packaging sectors by assessing its performance in industrial conditions. To this aim, the project combines tests at laboratory scale and simulations with trials in an industrial pilot cold rolling mill and, finally, field trials at industrial scale.
The paper will overview the work which has been undertaken in the first period of the project including laboratory investigations, part of the pilot trials and the preliminary concepts for simulation of cold rolling with Oil Free Lubricants. Preliminary outcomes will be presented and discussed.

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