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FOAM EXTRUSION USING NOVEL PHYSICAL BLOWING AGENTS AND INJECTION TECHNIQUE

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In foam extrusion, a new injection technique for physical blowing agents has been developed and established at the market under the trade name "OptiFoam". The advantage of this injection system is the modular setup, which allows physical foaming on standard extruders. Once engineered for the use with carbon dioxide, further investigations have been conducted to reveal the suitability for other physical blowing agents. Besides nitrogen, tetrafluoroethane and a similar, novel blowing agent with a significantly lower global warming potential (tetrafluoropropene) were tested. As polymer a polypropylene (PP) was used. The results show, depending on the blowing agent, characteristic foam structures, which have been analysed by scanning electron microscopy (SEM). The resulting densities vary between 100 and 400 kg/m³ for the different blowing agents. As a final result, a bigger operational window was detected with the use of the tetrafluoroethane and the novel blowing agent instead of carbon dioxide, which led to a lower density as well.