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Cross-linked polyethylene foams: How to change the perception of a commodity material starting from the (bio-based) source

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Chemically cross-linked polyethylene (XLPE) foams can be considered as a commodity material, due to the high volumes and the relatively low price compared to other polymers and foams. Furukawa Electric, the shareholder of Trocellen Group, filed the first patent on this topic in 1968, almost 50 years ago, so we are not talking about an innovative technology. However, polyethylene is still an interesting material with a lot of different application, ranging from insulation to footwear, from automotive to sport and tapes. Our new vision is "Making a difference – shaping the future", so we have started to think about a solution to provide a safe and comfortable future with products that make a difference. For this reason, we have decided to develop Trocellen Bio, a new foam that anticipates a precise request from the market, giving to our customer the opportunity to decide between the normal grade and a more sustainable one. This is because with this approach we can strongly reduce the CO2 emission, something it was never done in this field, at least at industrial scale. The most important thing is we can do it without any compromise in terms of physical- mechanical properties. As you can see in Figure 1, the compression stress at 25 and 50% is the same for the foam produced with Bio-based and petrochemical based polyethylene.

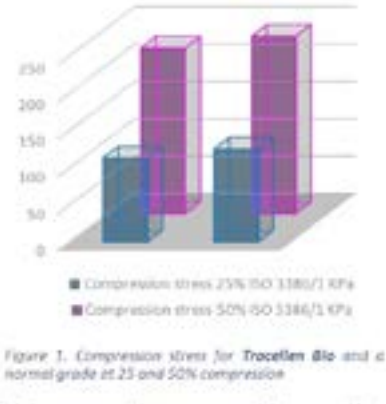

Figure 1. Compression stress for **Trocellen Bio** and a normal grade at 25 and 50% compression

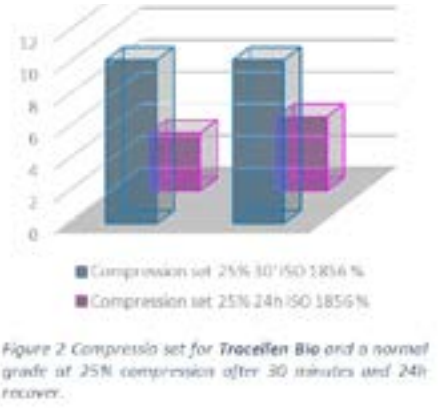

Figure 2 Compressio set for **Trocellen Bio** and a normal grade at 25% compression after 30 minutes and 24h recover.

Biography

Fabio Silvestri obtained his PhD in Material Science from University of Milano-Bicocca working on organic electronics (Prof. G. A. Pagani). During the doctoral studies, he also worked at Northwestern University (Prof. T.J. Marks) and Universidad Autonoma de Madrid (Prof Torres) on synthesis and characterization of new materials, and as a post-doctoral fellow at ETH Zürich, in the Prof. F. Diederich group. He then moved to Dow Chemical, working on polyurethane foams, and later on he joined Trocellen as Product Development Manager. He is now Innovation Manager for Trocellen group: his focus is to find new technology driven opportunities.

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