

Information sheet

Bio-based polyamides for insulating profiles

Insulating profiles
for windows, doors
and facades

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Why is Technoform working on bio-based polyamides?

Sustainable use of resources and environmentally friendly products is rapidly becoming more and more important. The use of renewable raw materials can significantly improve the carbon footprint of products. This can have a positive impact on environmental product declarations (EPD) and building certificates like LEED, BREEAM or DGNB.

Current status at Technoform Bautec

There are three bio-based polyamides which come into consideration for insulating profiles, due to their good mechanical properties and their high temperature resistance: PA10.10 (100% bio-based), PA6.10 (62% bio-based) and PA4.10 (70% bio-based). In detailed research, Technoform Bautec successfully tested the processability of these different types of material. The mechanical properties fulfill the specifications of the Technoform material data sheet for standard material. The characteristic values of the assembly (tested using a standard geometry) reach the same values as standard profiles. On the basis of these findings we are now planning to launch a joint project for interested customers to explore the quality of these materials in their special systems.

What are bio-based polymers?

The group of "biopolymers" includes "bio-based" polymers made of renewable raw material and "bio-degradable" polymers, which degrade in water or other chemicals and thus are used e.g. for packaging items. For insulating profiles, bio-based polyamides made from the fruits of the castor oil plant are qualified.

Availability / Commercialization

Generally the bio-based material is not commonplace as commercialization has just started and the production capacity is still low. Of the different bio-based polyamides, PA6.10 is the raw material with the best availability and is the one offered by different suppliers. There are currently a limited number of suppliers offering PA10.10 and PA4.10.

Pros and Cons: Food vs. animal feeds vs. industrially used raw material

The naturally irrigated potential arable land available on earth is limited, so there will be always a competition between the cultivation of food, animal feed and industrial material. A study by the Nova-institute concluded: "Even if an increasing share of arable land is used for energy and industrial material use, there is still much scope for the expansion of agricultural areas and even more scope for productivity increases" [M. Carus, Dr. S. Piotrowski]. Moreover, the castor oil plant has the advantage that it also grows in very dry areas. Additionally a by-product of the cultivation of plants for bio-plastics is very often high-value protein-rich animal feed.

We gladly offer our support should you have specific questions or problems.