

EFFICIENT AND ENVIRONMENTALLY FRIENDLY INSULATION WEBS

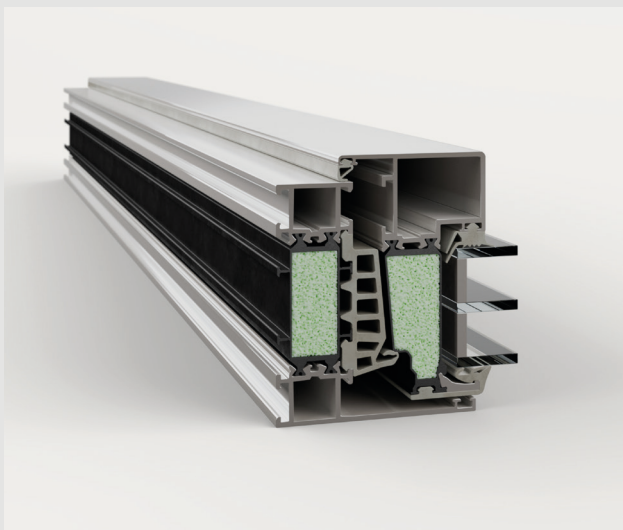
Problem – Challenge

Insulation webs are ubiquitous in buildings: They are stuck inside aluminum and metal profiles for windows and facade glazing – as thermal separators between the outside and inside, because cold or heat would otherwise flow unchecked through the metal frames. An inconspicuous component, but one that is becoming ever more important due to global warming and the urgent need to curb CO₂ emissions – and there is potential for improvement: insulation webs with even lower thermal conductivity and a higher level of sustainability.

Solution

A team from Empa's Mechanical Systems Engineering lab, together with experts from the Swiss company hochuli advanced, has developed a novel variant. The highlight of the Alpet insulation web: Inside the glass-fiber-reinforced plastic is a foam strip made of PET from recycled bottles. Within this layer, numerous air pores provide efficient insulation: The thermal conductivity of the prototypes averages about 0.1 W/mK, depending on the web width – far less than a standard insulation web made of polyamide (about 0.25W/mK) and significantly lower than high-end products available today.

Turning the idea into a viable product required a lot of conceptual work. Take the production method, for instance: After testing different processes, the experts decided on extrusion, in which heated, molten plastic is pressed through a slot as a soft dough and shaped in this way. From numerous samples, the developers distilled seven variants for testing, from which the final prototype emerged as the basis for commercial products. According to hochuli advanced, there are already official certifications for fire behavior, static load capacity and thermal insulation. Detailed tests are also carried out by the manufacturers in their own laboratories and with their own profile systems. Negotiations on this are underway; the first customers are already involved in trials.



Alpet insulating web made of plastic.
 The greenish color of the filling material
 comes from the use of PET from recycled bottles.
 Image: Hochuli advanced