THE OPTIMISED POST-FITTED FOAM SANDWICH INSERT

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Summary. One of the biggest difficulties in the sandwich industries today is load introduction. It is very important that the insert has a well-designed load carrying geometry to ensure the strength of the load introduction and the sandwich structure. Well-designed optimised lightweight sandwich structures are often penalised with added weight when the load introductions require higher density core/thicker face sheets or larger inserts. A shape optimisation of core insert geometry was performed by Shipsha, Söderlund and Zenkert and presented at the 4th International Conference on Sandwich Construction. Inserts with this optimised geometry can be both pre- and post-fitted. A disadvantage of pre-fitted load introductions is that it makes it necessary to predetermine the locations of all inserts before the sandwich panel is assembled, which is very time-consuming during design and manufacturing. On the other hand it is also very work intensive to Post-fit this kind of insert, which requires replacing or repairing of the face sheet. To solve those problems, a concept for post-fitted inserts has been developed.

With a special milling tool [SWE pat & int. pat. pending], a cavity, which corresponds to an optimised geometry, is created without damaging the sandwich skin apart from the necessary opening for the load introduction. The cavity is filled with adhesive and if there is a need for stronger fastening an insert with internal threads can be added. This concept can also be applied on a through sandwich load introduction. By using this new non-destructive post-fitted insert system with an optimised geometry for load introductions in sandwich structures you are able to cut manufacturing costs, minimise weight and simplify design.