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Title

THERMOPLASTIC COMPOSITE SELECTION METHOD FOR POWERING AN AUTOMATIC THERMOFORMING LINE

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Short presentation

Composite material 1 from a feed drum 2 is spun on the cutting table 3 then transferred to the furnace 4, where it is heated until it reaches a temperature higher than the melting temperature of the thermoplastic matrix. A feeding mechanism 6 takes the material and transfers it to the forming press 7 where it is consolidated by cooling in a mold. Finally, the consolidated part is taken over by the robotic cell 8, for finishing the contour. The method involves the division of products into classes with a representative benchmark, then static studies are performed by the finite element method and the minimum wall thickness is determined so as to simultaneously meet the requirements of the permissible safety factor and deformation for each available composite material, after which determine the department cost of the representative part for each available material and select the composite that offers the minimum department cost, and for any other part of the representative part group the FEA analysis will be done only with the material selected for the representative part and the wall thickness will be determined which satisfies the technical restrictions, and then the number of overlapping layers will be determined, and the data that will be transmitted to the automatic thermoforming line.

Applicability

The method was developed for the efficient choice of a thermoplastic composite as a fibrous layer, that will be consolidated in parts, on an automatic thermoforming line. The invention is intended to choose the most suitable composite material taking into account the requirements of the part, the properties and cost of the material as well as the manufacturing costs. The object of the invention is to select the available material which best satisfies the technical-functional requirements of the part at the lowest cost.

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