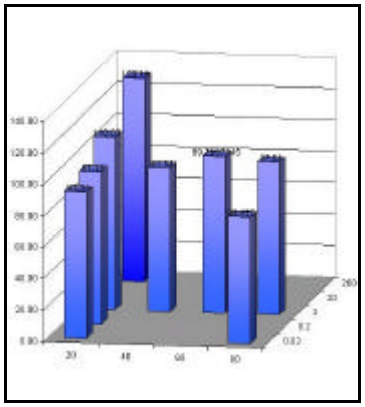
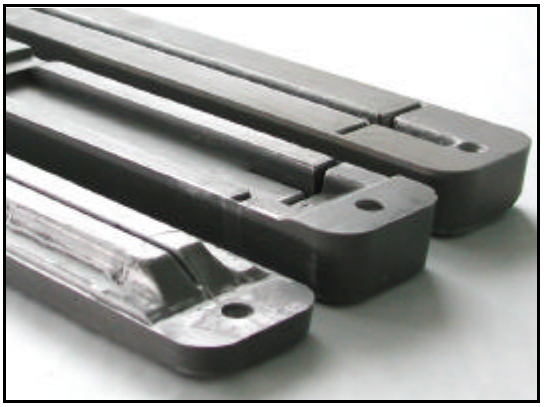
NEW PRODUCTION PROCESSES

ESORO develops innovative production processes on behalf of its customers. One example of this is the development of the new E-LFT process which was presented to the public for the first time in late 2002. This new process is based on the need of low-cost, environment-friendly, lightweight components with a high structural loading strength. It was developed, patented and made ready for series production on behalf of the Albert Weber GmbH company.





E-LFT PROCESS

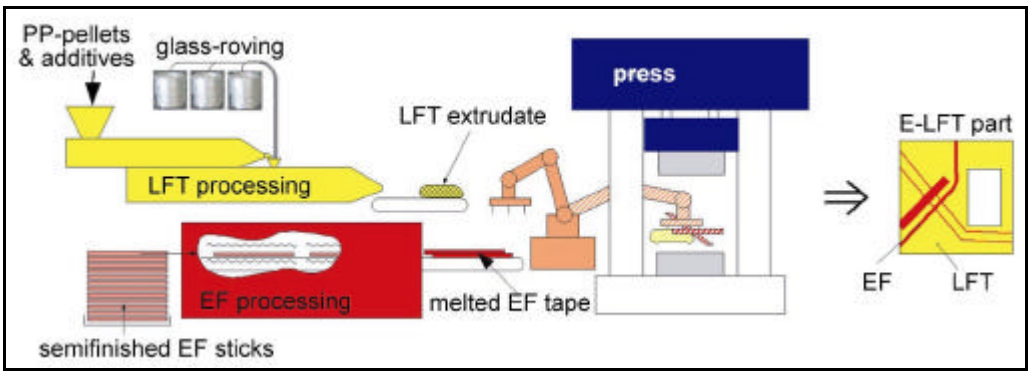
E-LFT stands for Endlessfiber reinforced Long Fiber Thermoplastic. This one-shot production process is a combination of the well established LFT compression moulding with the direct implementation of unidirectional continuous fibers. The main idea of the E-LFT process is to reinforce a component exactly in its high-stressed areas and to create structural lightweight components on a cost efficient basis. E-LFT can be used for many challenging applications, since it is the only process to build real framework structures with the intermediate EF layers to substitute metals.

BASE MATERIALS

EF and LFT consist mainly of the same materials: glass fibres in a polypropylene matrix. However, it is also possible to process other fibers (e.g. carbon or aramide) and matrices (e.g. PET, PBT, PA and ABS). LFT moulding compound has relatively modest mechanical values but it features excellent design freedom and allows an efficient production of large components. Unidirectional continuous filament strips (EF) have excellent mechanical properties and can be inserted threedimensionally according to the load paths and the component geometry. Thus LFT components can be reinforced specifically to solve local stress problems.

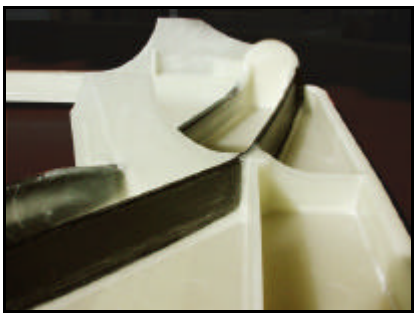
PROCESSING

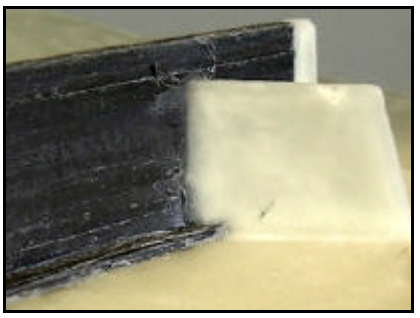
The system engineering of the E-LFT process is designed for a fully automatic production. The main components are EF processing, LFT processing, handling (robot) and press. The LFT extrudate can be provided either directly (LFT-D) or with conventional rod granulate processing (LFT-G). The EF processing and the handling system for this process are completely new developments. In the E-LFT process a frame press with parallel mechanism is used as it is the case with LFT processing. LFT and EF are processed parallel and placed together into the mould by a handling-system. Old parts and scrap can be recycled in the LFT-extruder.



DESIGN FREEDOM

One of the big advantages of the E-LFT process is its design-freedom. EF tapes can be placed in almost any shape according to the load paths and the component geometry. They can be placed plane or as rip-geometries. The integration of different 3D-shaped EF's allows an optimal reinforcement of critical sections with a minimum of additional weight. Due to this, the E-LFT process has an immense potential for the light-weight industry.

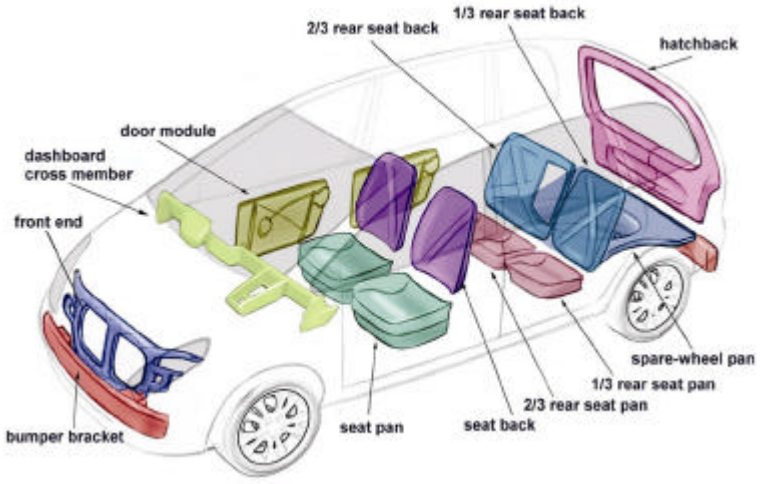




APPLICATION FIELD

The E-LFT process is designed for high volume production of large components with high structural loads and a high integration potential and where light-weight and cost efficiency are important requests. Therefore automotive components are the main application sector. E-LFT components can be applied where conventional GMT or LFT components come to their limits. E-LFT parts offer up to 50% weight savings compared to steel. E-LFT products will furthermore replace components, which are up to date the sole domain of metallic solutions due to their excellent structural behaviour.

As first serial application, the structural part and the inner cover of the tailgate of the new smart fortwo have been produced in the E-LFT production process. In 2007, over 100'000 sets have been delivered by WeberFibertech.



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