OP-10-387

Wednsday, May 11, 2011, 09:45-10:05 am
Room: Karam 2

LASER WELDING OF INCOMPATIBLE THERMOPLASTICS BY MEANS OF INTERMEDIATE LAYERS

W. Michaeli[1], Ch. Hopmann[1], T. Arping[1], M. Weber[1]*

[1]*Institute of Plastics Processing (IKV), RWTH Aachen University, Germany – zentrale@ikv.rwth-aachen.de*

**Corresponding author: weber@ikv.rwth-aachen.de*

Laser welding of thermoplastics is a technology that has been improved to serial production in the last few years. The so called intermediate layer technique offers the possibility to limit the absorbing material to a narrow layer in the weld seam by using a carbon black pigmented film. In this way it is possible to obtain more choices for the colour of the parts.
However, the main disadvantage of all conventional welding methods still is that besides some few exceptions only similar materials can be welded due to their chemical incompatibility. This is especially a problem if properties of different materials are to be combined. Preliminary analyses showed that the intermediate layer technique can be advanced in order to weld incompatible thermoplastics. Therefore coextruded multilayer films are inserted between the joining members. An adhesive agent provides a chemical bond between the layers of the film. By means of the multilayer technique it is possible for the first time to weld different semi crystalline thermoplastics. Previous investigations at the IKV showed that parts made of polyamide 12 (PA12) can be welded together with parts made out of polybutylene terephthalate (PBT), polyethylene (PE) or polypropylene (PP) using special multilayer films.