

Highlight

Aachen,
February 01, 2012

Advanced materials, additives and product design for high speed laser welding.

One of the main objectives of EU PolyBright collaborative project is to try and broaden the range of polymer material combinations that can be welded thanks to the development of high power brilliance lasers with new wavelengths between 1500 and 1900 nm.

A preliminary step within Workpackage 6 has been to carry out the characterisation of the intrinsic properties of several materials, including polyolefins, styrenic copolymer and polyamides that have been targeted for the project in collaboration with the end-users, also members of the project.

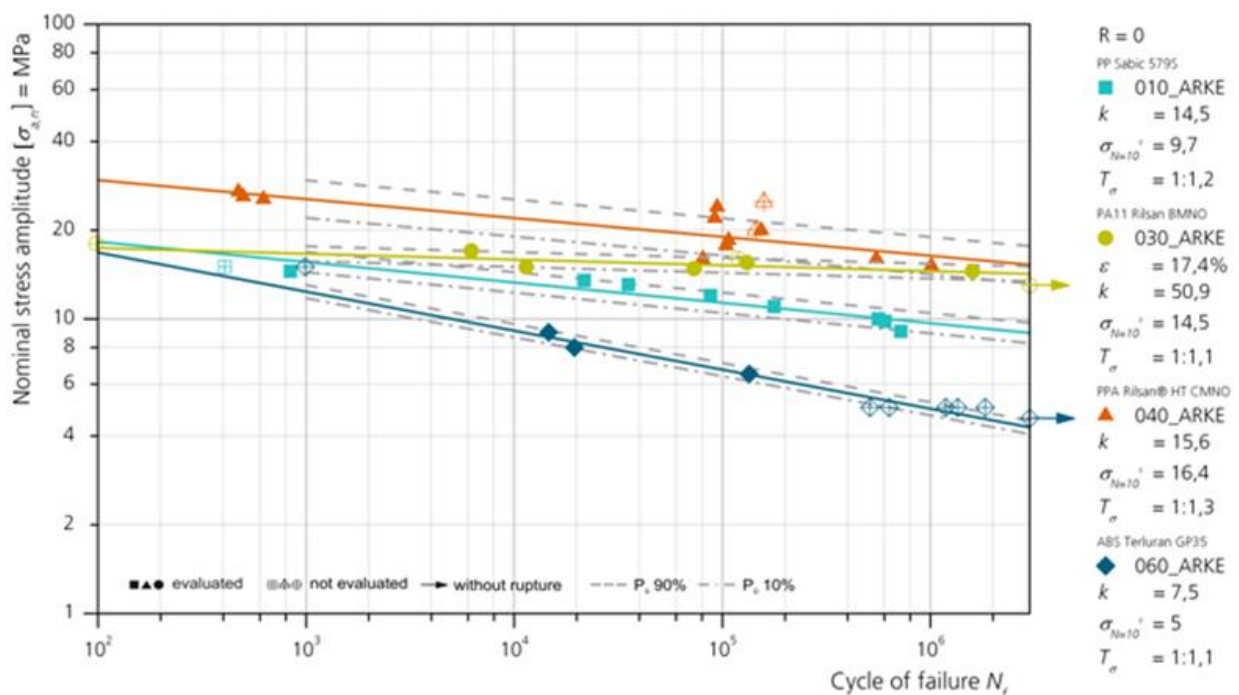


Figure 1: Fatigue tests carried out on neat resin (PP, ABS, PA11 and PPA) using a stress ratio $R = 0$



January 16, 2012
Page 2

They were tested neat but also with 0.5 % of carbon black as absorber. The addition of such a low amount of absorber doesn't have any significant impact on the thermal or mechanical properties. The resins have been analysed to better know their optical, thermal (melting point, specific enthalpy and heat capacity, thermal conductivity) and mechanical properties (tensile test, fatigue test, see Figure 1). Some of these analysis will be used for the temperature distribution simulation model developed within the Workpackage 4. They will also be a reference for the ongoing laser welded materials analysis.

For any further questions our experts will be pleased to provide you assistance:

Contacts at Arkema

Frédéric Malet,
Arkema
420 Rue d'Estienne d'Orves,
FR 92705 Colombes Cedex

+33 2 32 46 64 86,
frederic.malet@arkema.com

Contacts at Fraunhofer ILT

Dr. Alexander Olowinsky
Phone +49 241 8906-491
alexander.olowinsky@ilt.fraunhofer.de
Dipl.-Phys. Gerhard Otto
Phone +49 241 8906-165
gerhard.otto@ilt.fraunhofer.de

Fraunhofer Institute for Laser Technology ILT
Steinbachstrasse 15
52074 Aachen, Germany
Phone +49 241 8906-0
Fax +49 241 8906-121
www.ilt.fraunhofer.de

