Highlight

Aachen,
August 30, 2012

Evaluating colour-absorber-combinations for laser PP polymer welding

When designing new products the colour is of increasing importance and the colour choice must not be limited by a welding process. Therefore it's of high importance that the effects of absorbers and colours are understood. Also the effect of using wavelength in the higher NIR range is important to investigate within PolyBright's WP6

Figure 1:
top: welded PP samples used for the trials
Bottom: Coloplast laboratory laser welding equipment (808 nm / 300 W diode laser)

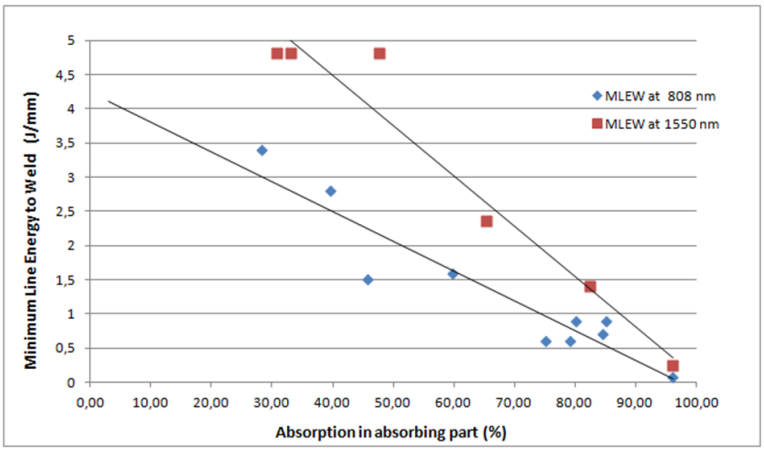

Figure 2: Minimum Line Energy to weld at 808 nm and 1550 nm

In Figure 2 the minimum line energy to weld PP samples is plotted in relation to the calculated absorption of the absorbing PP part. It seems there is linearity between these parameters as long as the wavelength is the same.

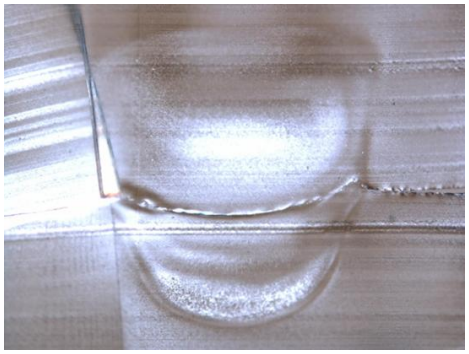

Figure above shows transparent -transparent PP, welded at 1940 nm. This is possible because the polymer itself absorbs

SEVENTH FRAMEWORK PROGRAMME

approximately 28% at this wavelength. It's clear that a large volume is melted in both parts.

Contact at Coloplast
Kim Bager
Phone: 0045/49/111-111
dkkba@coloplast.com
Holtedam 1
3050 HUMLEBAEK, Denmark

Contacts at Fraunhofer ILT
Dr. Alexander Olowinsky
Phone +49 241 8906-491
alexander.olowinsky@ilt.fraunhofer.de
Fraunhofer Institute for Laser Technology ILT
Steinbachstrasse 15
52074 Aachen, Germany

SEVENTH FRAMEWORK PROGRAMME