

# DYEING OF HIGH-STRENGTH AND TEMPERATURE-RESISTANT ARAMID FIBRES IN SUPERCRITICAL CARBON DIOXIDE

B. Schulz<sup>1,2</sup>, E. Cleve<sup>1</sup>, K. Knopf<sup>1</sup>, E. Bach<sup>2</sup>, D. Knittel<sup>2</sup>, P. Nünnerich<sup>3</sup>, M. M. Ouarzazi<sup>4</sup>,  
E. Schollmeyer<sup>2</sup>

<sup>1</sup> *Institute for High Polymers and Hygiene Products (IHHP), Niederrhein University of Applied Sciences, Frankenring 20, 47798 Krefeld, Germany*

<sup>2</sup> *Deutsches Textilforschungszentrum Nord-West e.V. (DTNW), Adlerstrasse 1, 47798 Krefeld, Germany*

<sup>3</sup> *Uhde High Pressure Technologies GmbH, Buschmühlenstrasse 20, 58093 Hagen, Germany*

<sup>4</sup> *TAG Composites & Carpets GmbH, Glockenspitze 36, 47800 Krefeld, Germany*

[bjoern.schulz@dtnw.de](mailto:bjoern.schulz@dtnw.de)

## Summary (Poster)

For technical products made of high-performance fibres, e.g. protective clothing, coverings and tarpaulins, there is an increasing demand for the processing of dyed fabrics. This relates mainly to aramid and copolyaramid fibres of the meta- and para- type. Water dyeing methods used up to now produce unsatisfactory levels of light fastness and colour depths. Water dyeing is only possible in the presence of carriers. These are substances that are classified into water hazard classes 1 and 2, such as acetophenone and benzyl alcohol.

Based on the results of the water free CO<sub>2</sub> high-pressure dyeing method for synthetic fibres such as polyester, polypropylene etc., initial analyses of the high-pressure dyeing of aramids with liquid and solid solubilisers are presented.

In a first step, CO<sub>2</sub> aramid dyeings were carried out in the presence of liquid substances such as used as carriers in conventional water dyeing (1-methyl-2-pyrrolidone, acetophenone, benzyl alcohol and benzaldehyde), as well as with various alcohols and acetone. The depths of colour of the dyed aramids were not satisfactory.

In a second step, further experiments on aramid dyeing in which solid substances such as nicotinamide, benzoic acid and acetylsalicylic acid were selected as solubilisers display promising results under appropriate dyeing conditions.