

CarboDesize

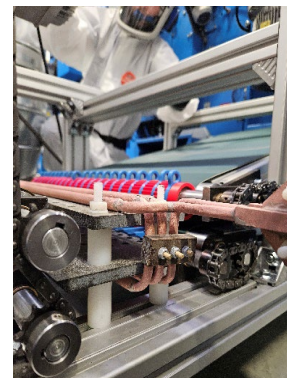
Inductive desizing of carbon fibres for economic recycling

Introduction

- Problems in the recycling of carbon fibres with regard to sizing type and sizing age
- Missing technical solution for homogenisation of sizing systems for waste carbon fibre fractions

Experimental

- Simulative investigations of the heating behaviour with COMSOL Multiphysics on simplified fabric models for inductor selection
- Validation of the results in empirical tests on needle-bonded nonwovens and unbonded fibre material
- Scaling of the machine in steps to working widths from 25 – 400 mm
- Carrying out investigations with regard to the lowest possible fibre shortening with a simultaneous high degree of opening through mechanical tearing
- Conception and technical implementation of a technology prototypes



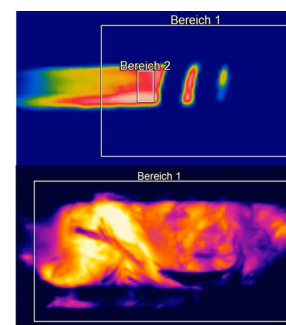
Reactor chamber for inductive desizing of carbon fibres in the existing technology demonstrator

Results

- Desizing of carbon fibres to a residual sizing content of less than 0.5 wt. %
- Power-controlled desizing in the range of 20 – 40 kW at a working width of 400 mm
- Desizing times shorter than 10 seconds
- No fibre damage could be observed in more than 200 fibres examined
- Implementation of a demonstrator with a throughput up to 100 kg/h

Conclusion

- Successful testing (TRL 5) of inductive heating for desizing carbon fibres
- Validation of process parameters for an economical desizing process
- Open issues with regard to exhaust gas routing and resizing are part of current research work



Homogeneous heating on needled punched nonwovens (top), diffuse heating on non-bonded fibre material (bottom)

Acknowledgement

We would like to thank the German Federal Ministry for Economic Affairs and Climate Protection for funding the research project "CarboDesize – Inductive desizing of carbon fibres for economic recycling" (Reg. No. 16KN086822) as part of the Central Innovation Programme for small and medium-sized enterprises (ZIM) and VDI/VDE Innovation + Technik GmbH. All project partners would like to thank for the opportunity of collaborating on the research project.



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