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Defined removal of highly reinforced concrete structures (DefAhS)

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Motivation: decontamination of concrete





Manual work during:

- Removal, dismantlement and transport of contaminated components
- Characterization and decontamination of surfaces





Driver for automated systems and robots with high precision

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Basic Tool Analysis





- Theoretical model for the dynamics of the cutter
- Classification of the main influencing parameters on the mechanical load of the cutter



Hentschel, S. (2015) Optimization of the procedural chain 'Removal of contaminated surfaces' - under the aspect of maximizing the removal rate

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Ablation Process Using an Impact Cutter





Müller, S. (2018) Investigations on the Influence of the Geometry of Carbide Lamella in Concrete Milling

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Defined removal of highly reinforced concrete structures (DefAhS) (finished 31.03.2018)



- **Problem:** Cracks in the surface that you can not measure
- Solution: Combined tool to remove both materials
 - Decontamination of cracks (goal: up 300mm depth)
 - Removal of built-in elements (e.g. anchor plates, dowels)



Cooperation between:

Patented: DE102015114122B3







l Leibniz 2 Universität 4 Hannover Federal Ministry of Education and Research

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A new approach





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in Construction (TMB)

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Deep Decontamination of Concrete (Version 1)





05.12.2016 11:36:35 1300 1624,4[ms] 640×643, 800 Hz, 500 μs, *2, MotionBLITZ Cube2 #00601, V1.11.28

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Deep Decontamination of Concrete (Version 2)





24.02.2017 10:49:33 -3769,0[ms] 000000000 EoSens mini2 816x696 1000fps 300µs

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Test specimens



- 2 specimens highly reinforced (left)
- 1 specimens contains e.g. tubes, anchor plates, anchor bolts (right)



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Test bench



- 419 cuts from the top (left)
- 17 cuts from the side (right)



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Insights to the carried out test





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Preliminary Simulation in Colaboration with IFE

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System Demonstration

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Current work

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3D-Scans

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Thank you very much for your attention!

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