

# Comparison of soot deposition in diesel particulate filter segments operating with diesel fuel and biodiesel

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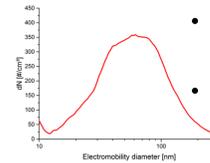
## BACKGROUND

- Necessity of diesel particulate filters (DPF) in order to protect environmental and human health [1,2]
- Application of biodiesel in passenger cars has attracted growing attention during the last decade [3]
- Lack of knowledge about soot emissions from biogenic diesel fuels and especially their influence on diesel exhaust aftertreatment systems

➔ **How do different fuels influence the characteristics of the soot deposition in diesel particulate filters?**

## CHARACTERIZATION METHODS

### Scanning Mobility Particle Sizer (SMPS)



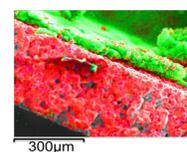
- Particle size distribution by different electrical mobility diameter
- 2-stage dilution

### Helium gas pycnometer



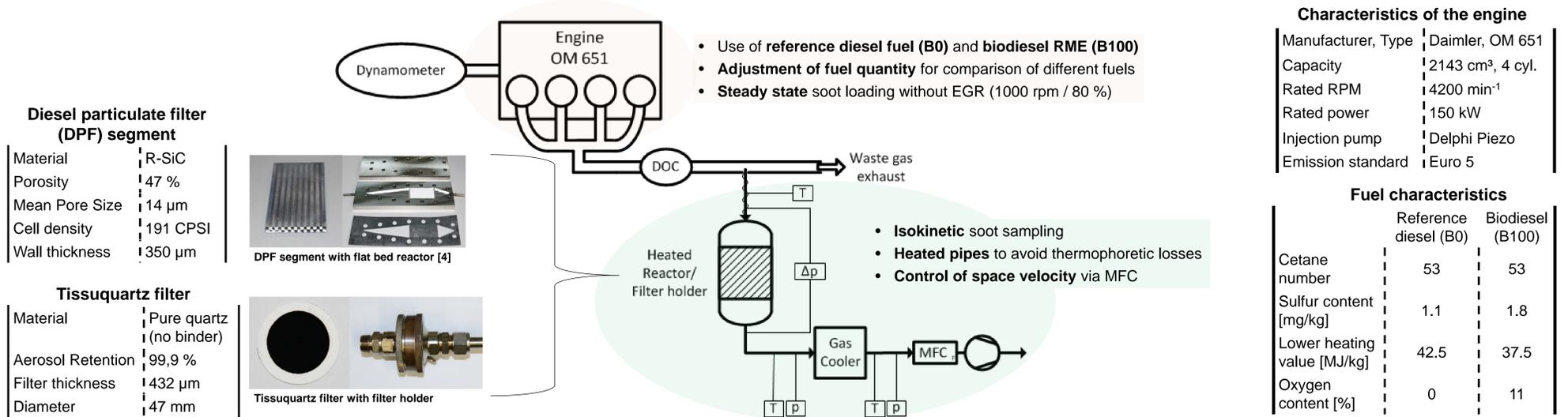
- Micrometrics helium gas pycnometer
- Determination of gross density of soot loaded particulate filter segments

### Scanning Electron Microscopy (SEM)

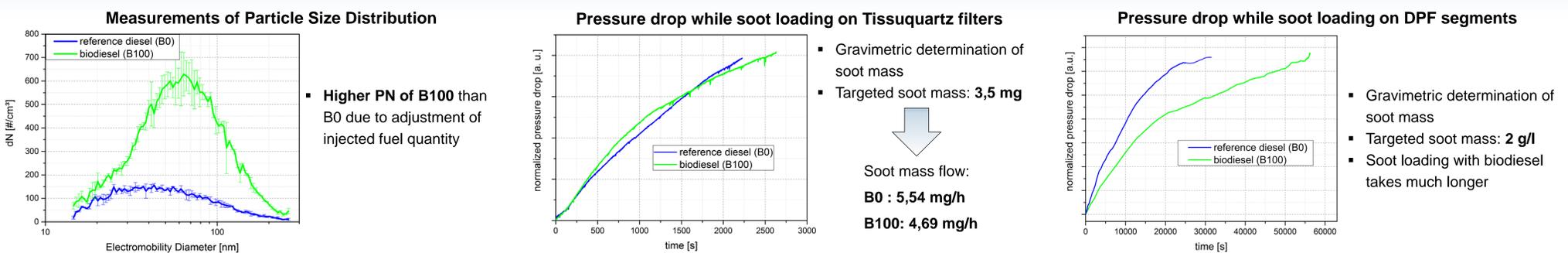


- Determination of soot cake thickness
- Magnification between 45x und 500x

## EXPERIMENTAL SETUP

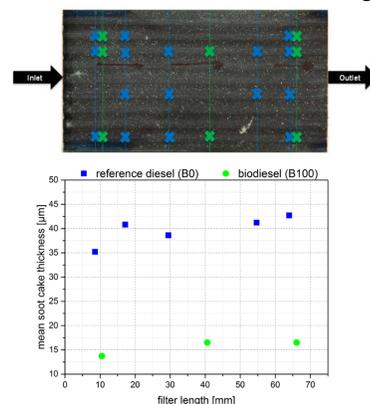


## RESULTS



### Density and thickness of accumulated soot inside a DPF segment

	Gross density via gaspycnometer [g/cm³]	Bulk density via soot layer thickness [g/cm³]
Reference diesel soot	3,16 ± 0,02	0,049
Biodiesel soot	3,21 ± 0,01	0,115



- B100 forms a **much thinner soot cake** than B0
- Both fuels show a **thicker soot cake at the end of the inlet channel**
- Gross density of B100 soot is higher than of B0 soot
- Bulk density of B100 soot is **twice as high** as B0 bulk density

## CONCLUSIONS

- B100 fuel emits higher PN but lower soot mass** than B0
- Soot deposition in DPF segments is strongly affected by the use of different fuels
- B100 soot forms a thinner layer** in a DPF with **much higher density**

### Acknowledgements

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### References

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