

„Erste Erfahrungen zum Thema Polarität aus Laborversuchen für den Wärme- und Automotivbereich“

Polaritätsworkshop - 19.06.2018 in Berlin

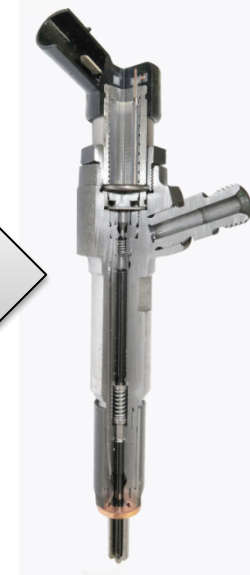
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- Motivation
- Fit for purpose testing
- Storage stability of: Middle Distillate(MD)/FAME/HVO
blends
- Deposit and mix ability issues –Examples out of the lab

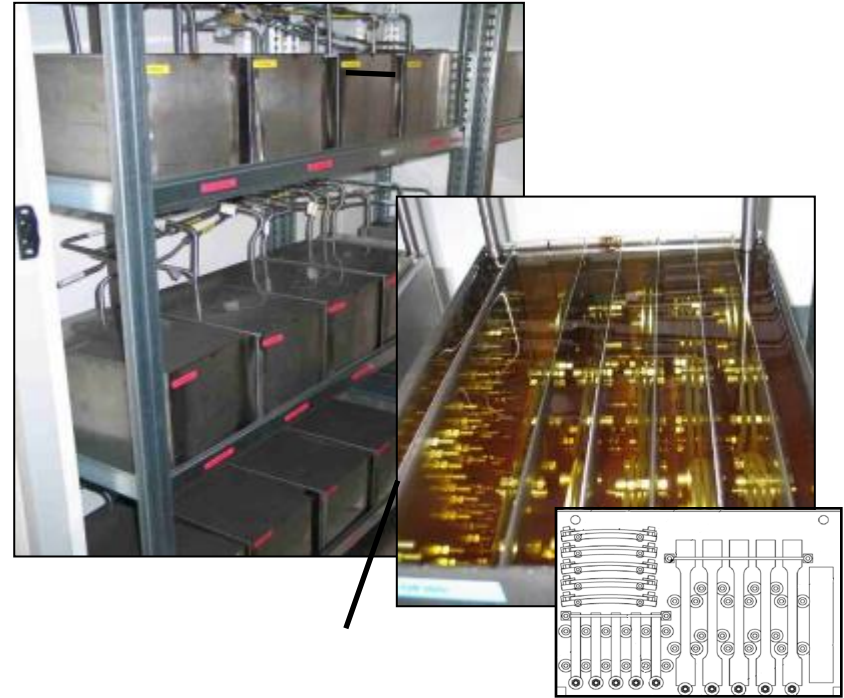
- Diversification of energy sources (de fossilisation)
- Multi-component fuels (Middle distillates, FAME and Paraffinic fuels)
- Technology development: Efficiency, Hybrid concepts
- **Storage times are increasing so a high long-term storage stability and a good drop in capability is required**





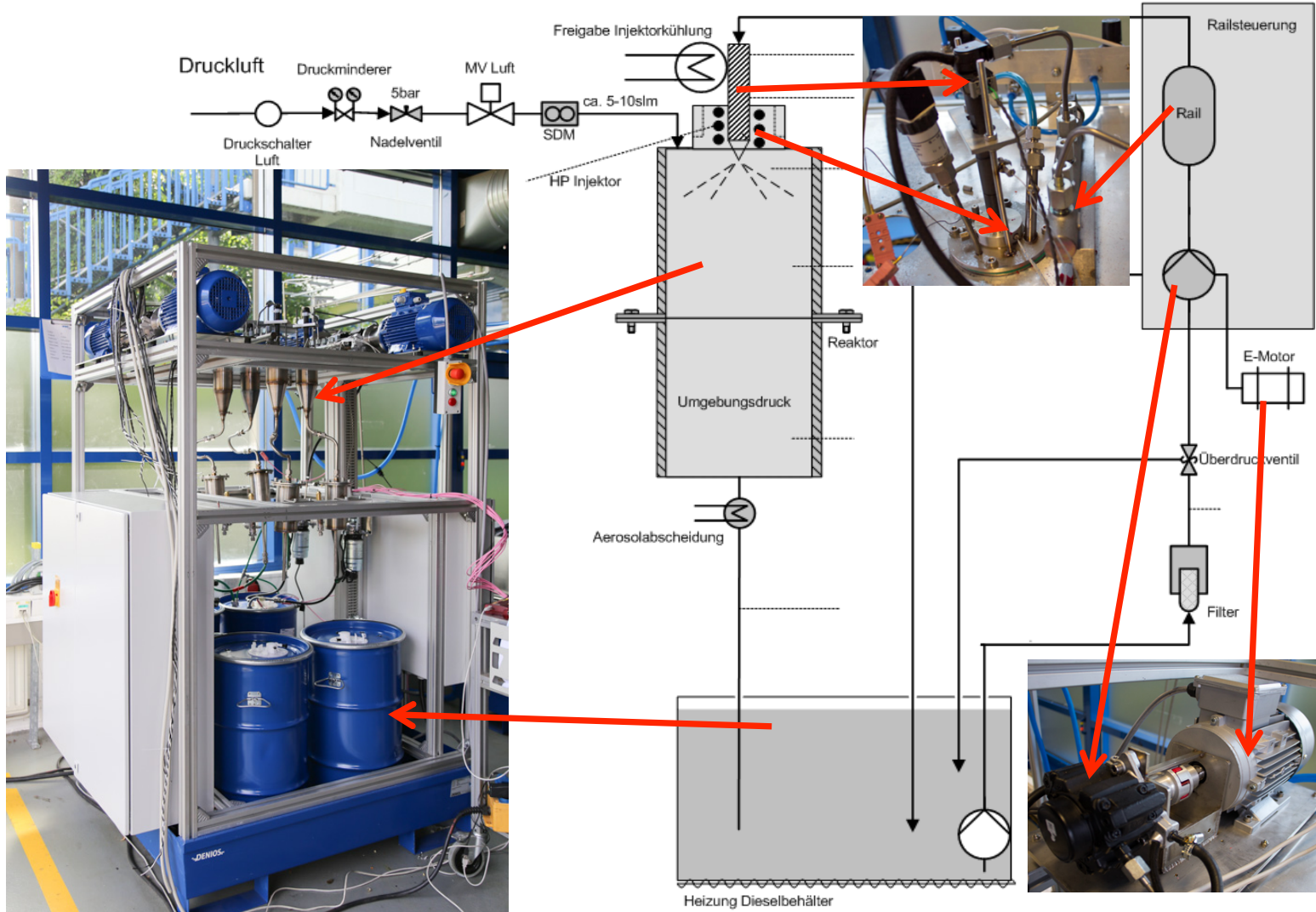
Fuel Aging

- Long term storage stability at various temperatures
- Development of accelerated Test methods (Additives or Blending recipes)



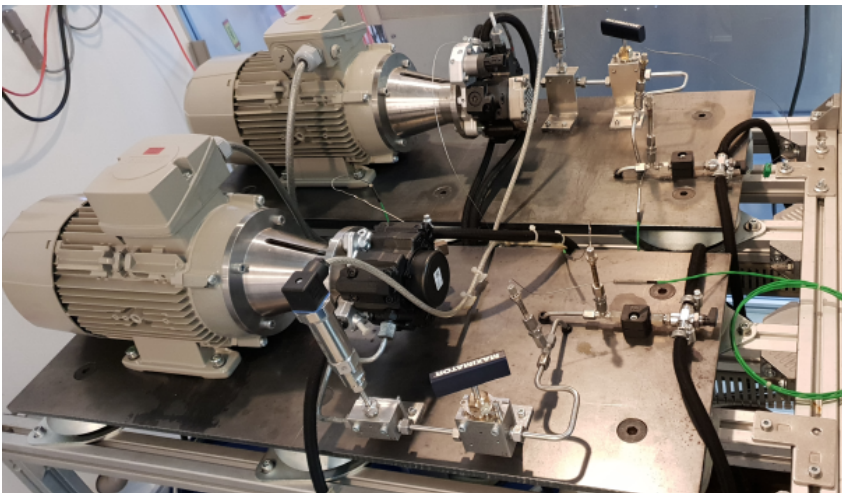
Fuel-Material Interactions

- Metal corrosion
- Swelling of elastomeres
- Operability of components and systems



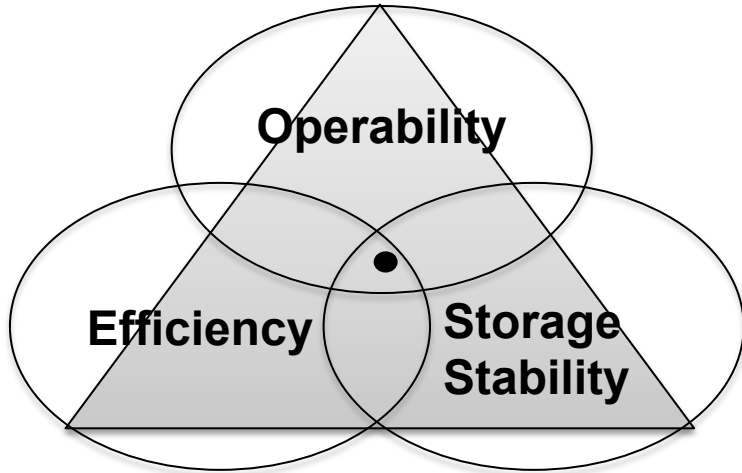
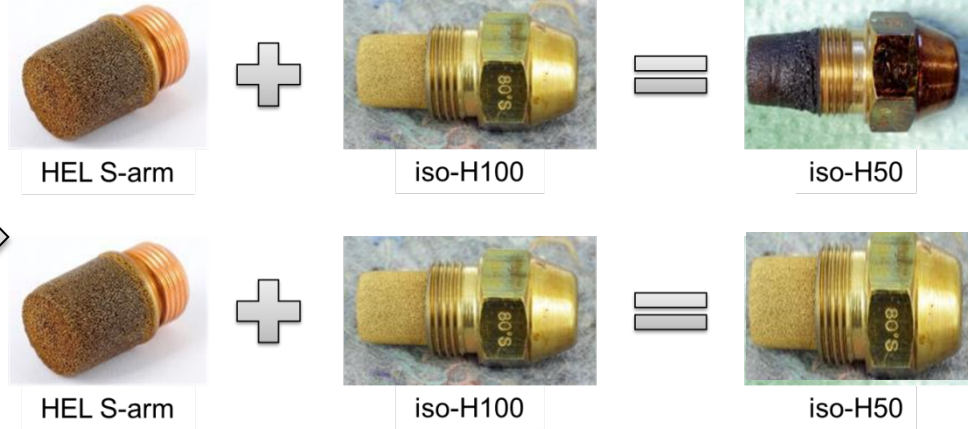
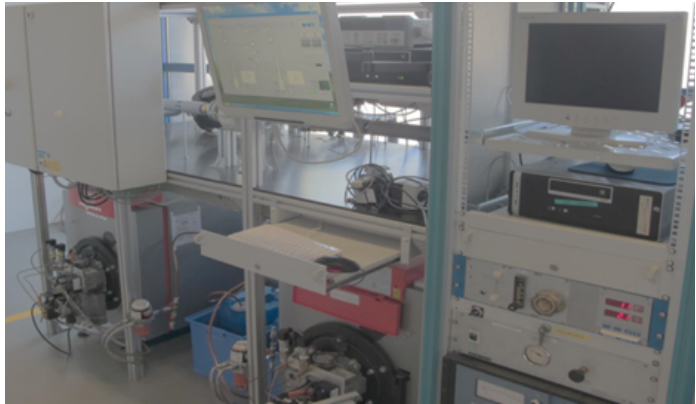


- Detection of characteristic pump curve (voltage, back pressure)
- Variation of power input of pumps
- Correlation of fuel degradation, component failures and fuel analysis
- Life cycle assesment analysis

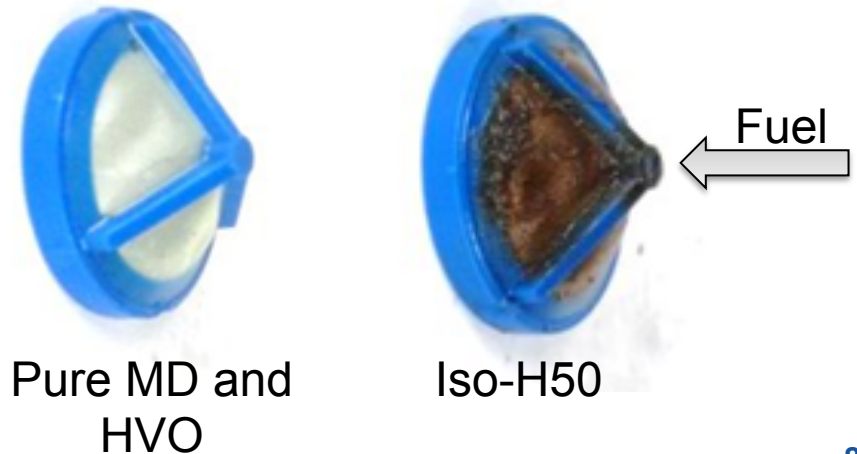


- An electric motor spins the high pressure pump
- The high pressure pump sucks the fuel out of the fuel drum
- The pump's metering unit is completely open – all pressurized fuel is conveyed out of the pump
- A manual throttle is used to set a constant rail pressure of 1,300 bar
- The fuel is cooled down after expansion and fed back to the fuel drum

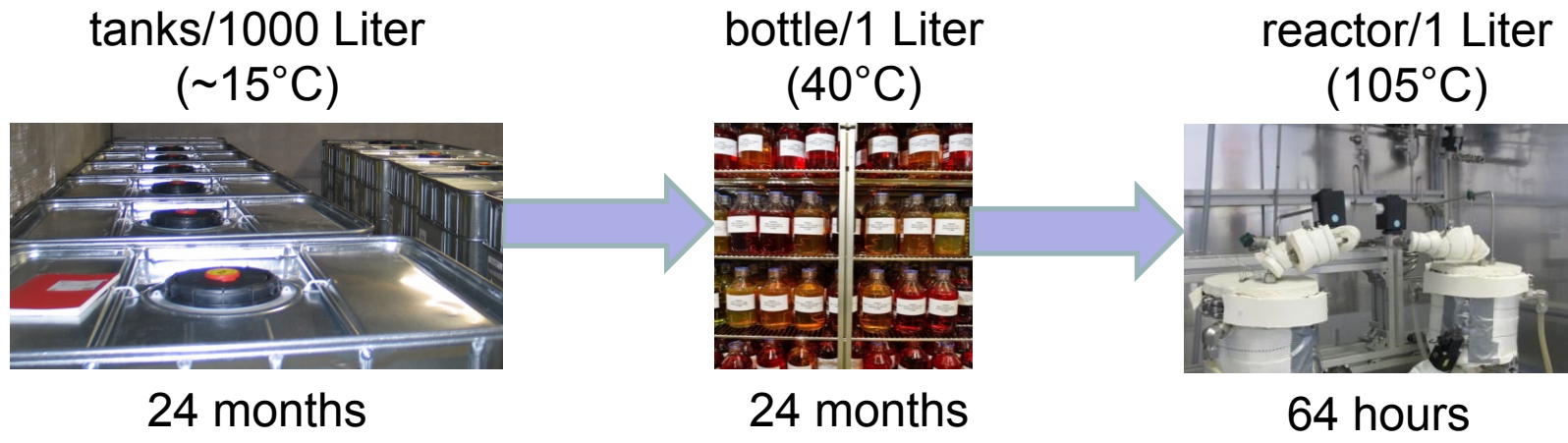
Combustion Tests: Long-Term-Evaluation



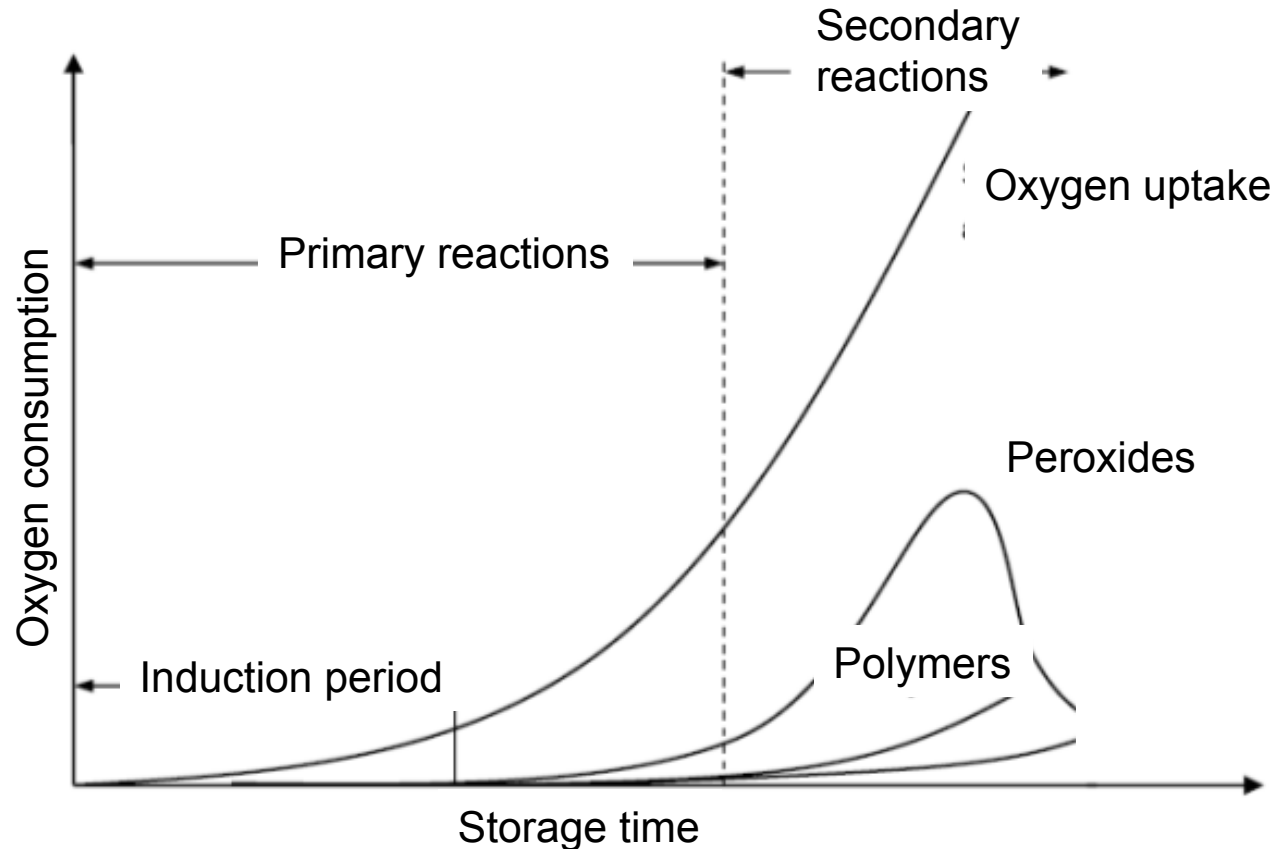
Fuel Filter Piston Pump: Long-Term validation



- A combined observation of different fuel aging parameters is necessary to evaluate fuel aging:
 - acid formation
 - water formation
 - oxygen consumption (autoxidation)
 - sediment formation



- An accelerated aging test method was developed to evaluate the long-term-storage-stability of liquid fuels



- Increase and decrease of aging products
- The analytical intervals are defined empirical and the data base is low (few supporting points)
- Therefore the creation of a mathematical model to describe the changes of the analytical parameters is not possible for all “fuel aging parameters”

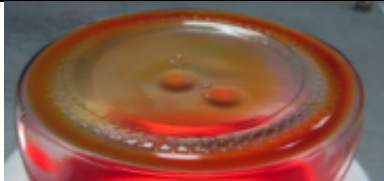
12 months

18 months

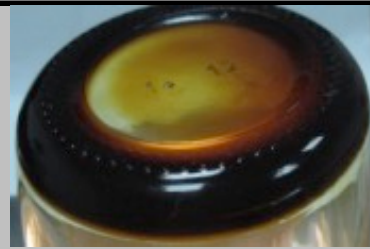
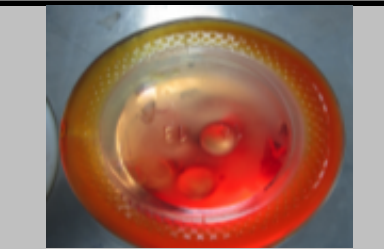
B0



B10



B20



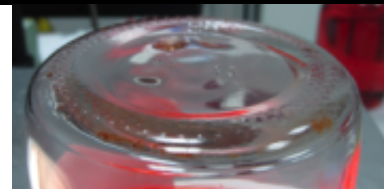
B20+Add



H10



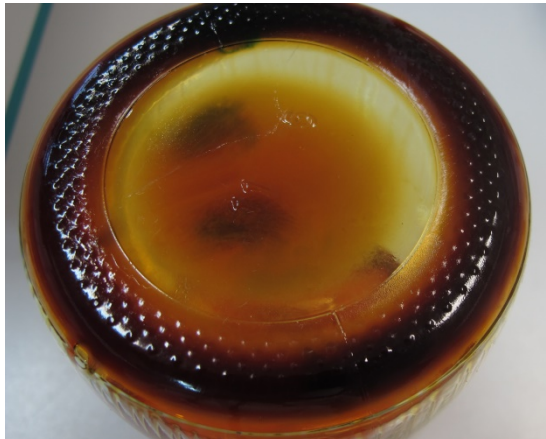
R33



Open Issue:

- It should be pointed out that fuel analytics is carried out in the liquid phase
- Sediment formation can also occur

R33_RME/4 Monate



R33_UCOME/4 Monate



**Thank you for your
attention !**

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