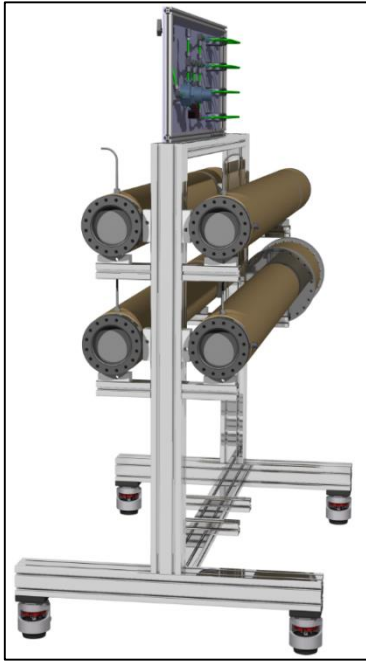


Barrel DIRC – Material Screening Test Set-Up

Andreas Gerhardt
PANDA CM

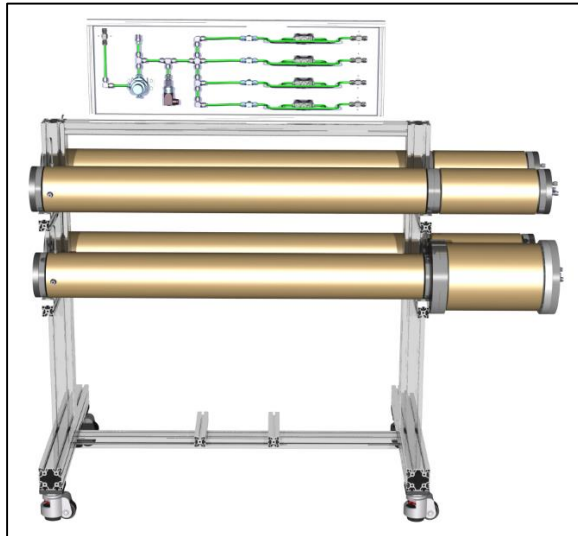
2023/03/09

Barrel DIRC – Material Screening Set-Up



Detection of possible impacts on the bar surface caused by outgassing of bar box materials.

- 4 independent bar/material container (1 for reference)
- System monitoring and data logging with Siemens SPS S7-1500
- Adjustable nitrogen flow rate in range 0.002...0.1 l/min
- Optional material container heating
- Measurements started end of Jan 2023



Nitrogen Supply

Pressure regulator inside:
work pressure 1 bar (relative)



Nitrogen batteries outdoor:
DIN 1066 – Nitrogen 5.0
99.999 Vol. %



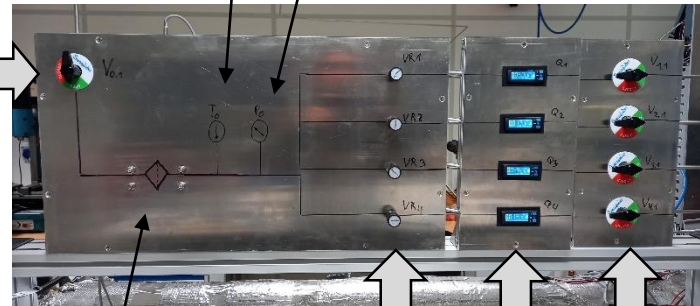
Safety issue:
single gas detector for oxygen



inlet
pressure
transmitter

inlet
temperature
sensor

shut-off
valve

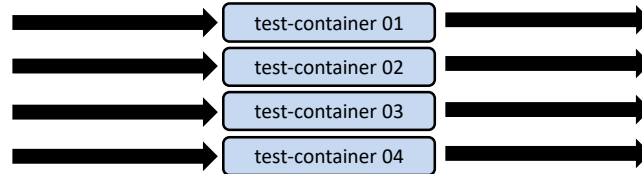


coalescing/particle
filter

metering
valves

flow rate
sensors

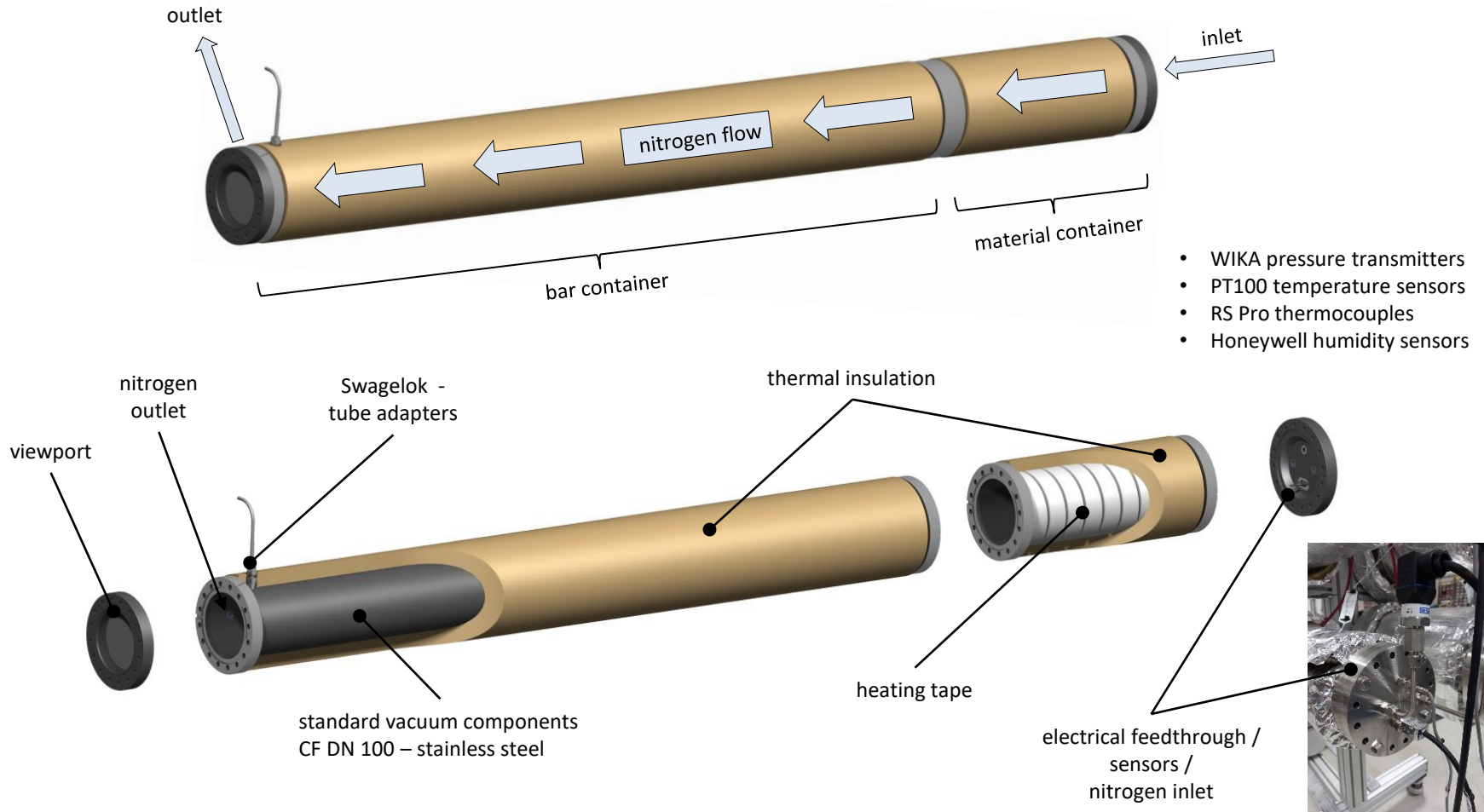
shut-off
valves



Nitrogen outlet:
outdoor line

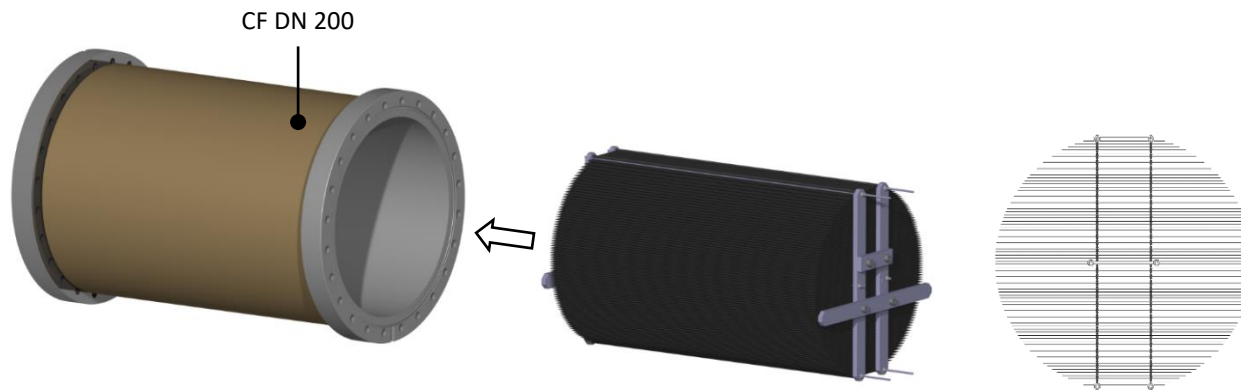
Test-Container Design

Separated bar/test-material container to enable the exchange of material containers.



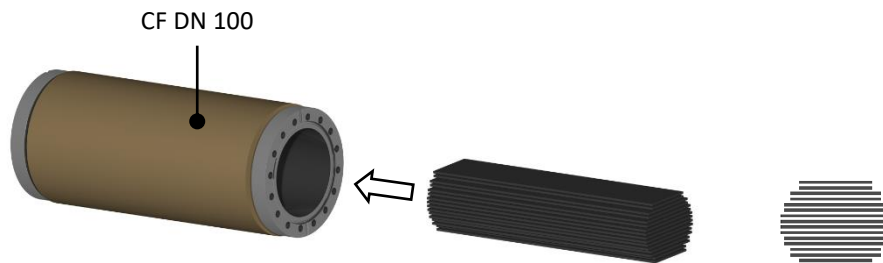
Material Stacks (CFRP)

- First measurements started with “common” CFRP stack
- “original” CFRP stack will be ready soon (manufactured ca. 1 year ago)
- Replacement with a recently manufactured material is possible



“common” CFRP stack:

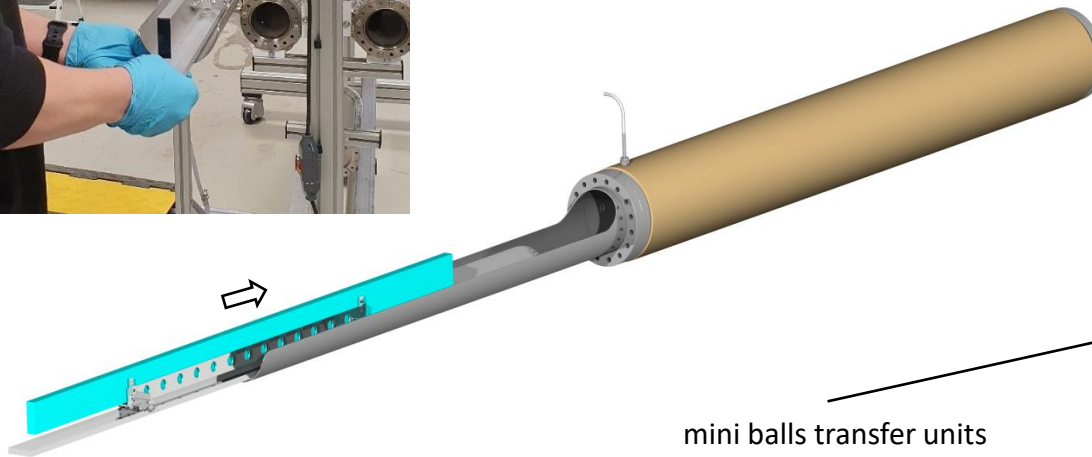
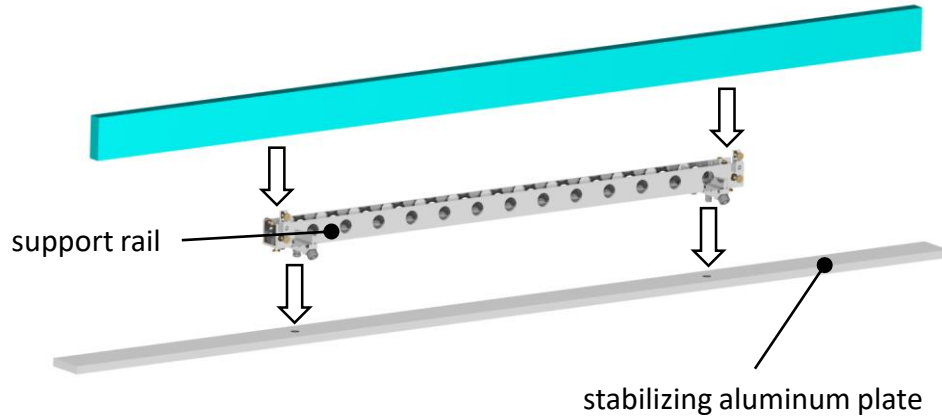
- stacked 0.3mm sheets on 2mm spacers
- reached surface area $\approx 3.99\text{m}^2$ (bar-box inner surface $\approx 0.95\text{m}^2$)
- exact composition of sample is unknown



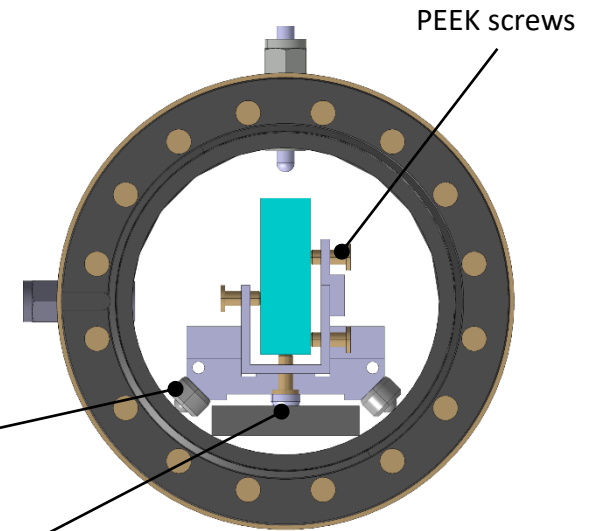
“original” CFRP stack:

- remaining material from first bar-box prototype
- stacked 2.6mm sheets on 2mm spacers
- reached surface area $\approx 0.4\text{m}^2$ (bar-box inner surface $\approx 0.95\text{m}^2$)
- exact composition is known

Loading and Unloading Bars



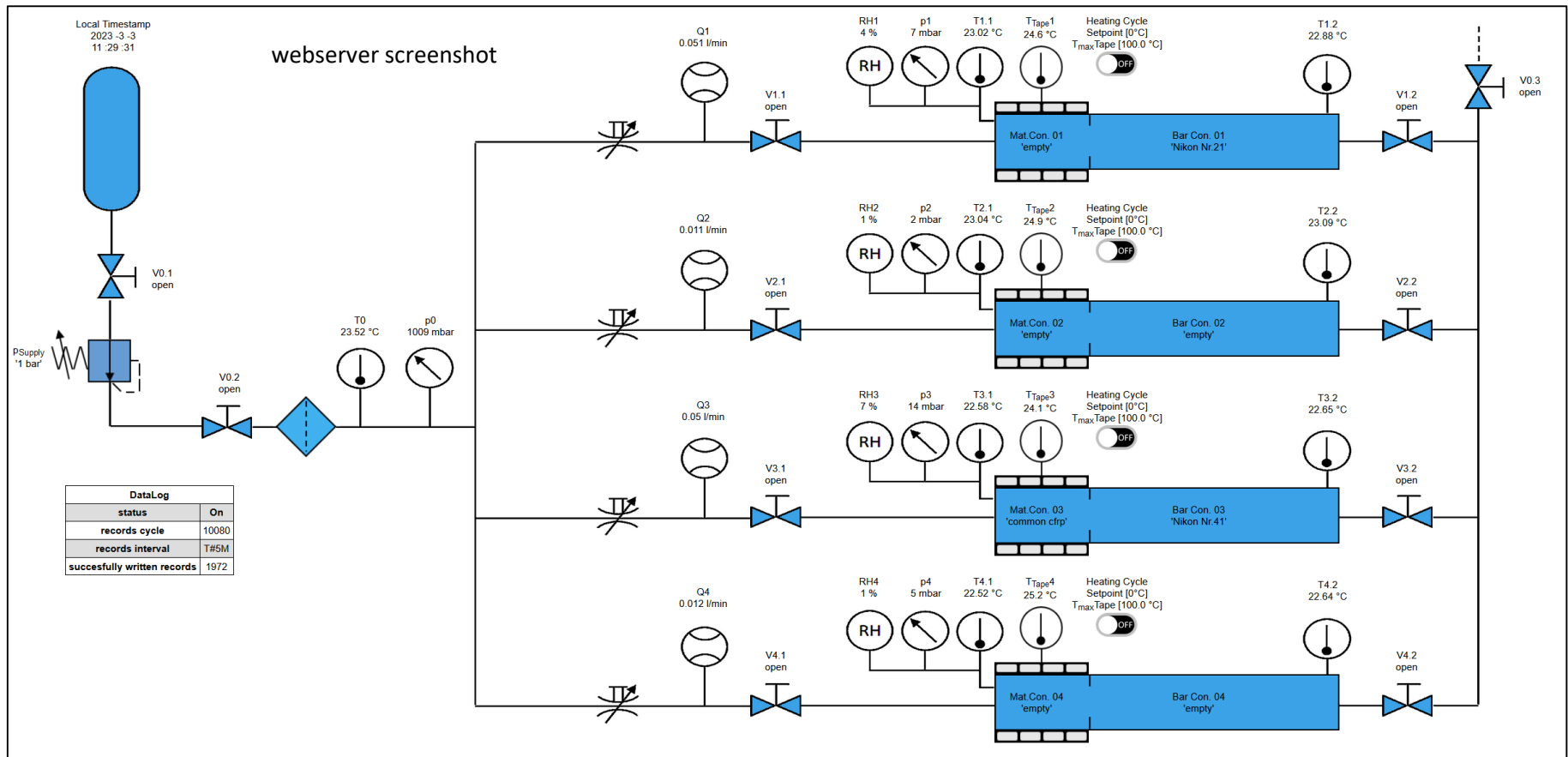
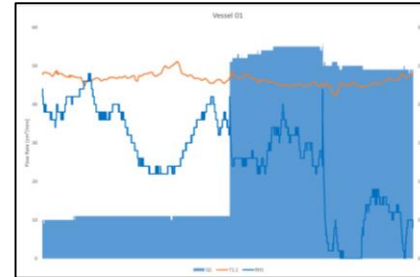
mini balls transfer units



joining pins

Data-Logging

- Records interval: 5min
- SPS webserver access



Thank you for your attention.