

Well Servicing applications

Flow - Level - Density - Viscosity

Reliable in experience
and technology.



Well Servicing Applications



Cementers

- Slurry Density for Cementers



Cementers

- Slurry Density for Cementers



Cementers

Coriolis:

Cement Density (& maybe Flow)

Typical size: 3" or 4"

Preferred Model: Promass 83F model

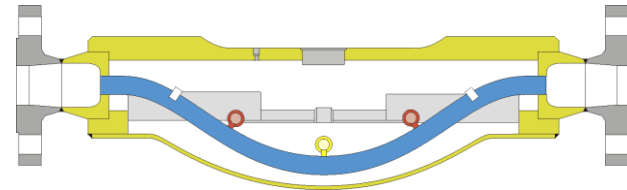
316L SS tubes

150# flanges



Density Accuracy: ± 0.0005 g/cc

Flow Accuracy: $\pm 0.1\%$ mass flow



Cementers

Magnetic:

Typical size: 3" or 4" for water

Preferred Model:

Promass 55S model

Teflon liner, 316L SS

electrodes

150# flanges

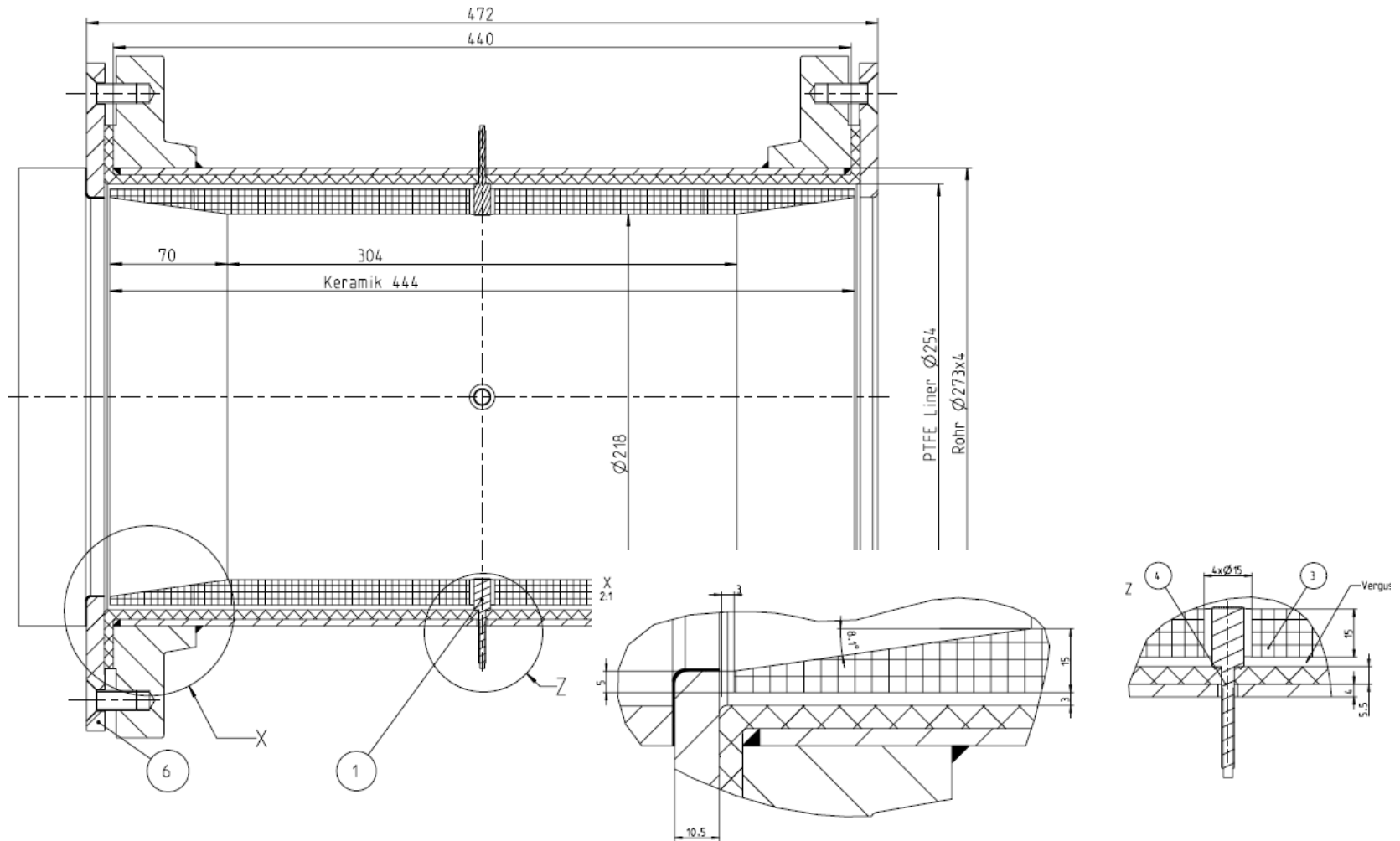
Flow Accuracy: +/- 0.2% to 0.5% volumetric flow



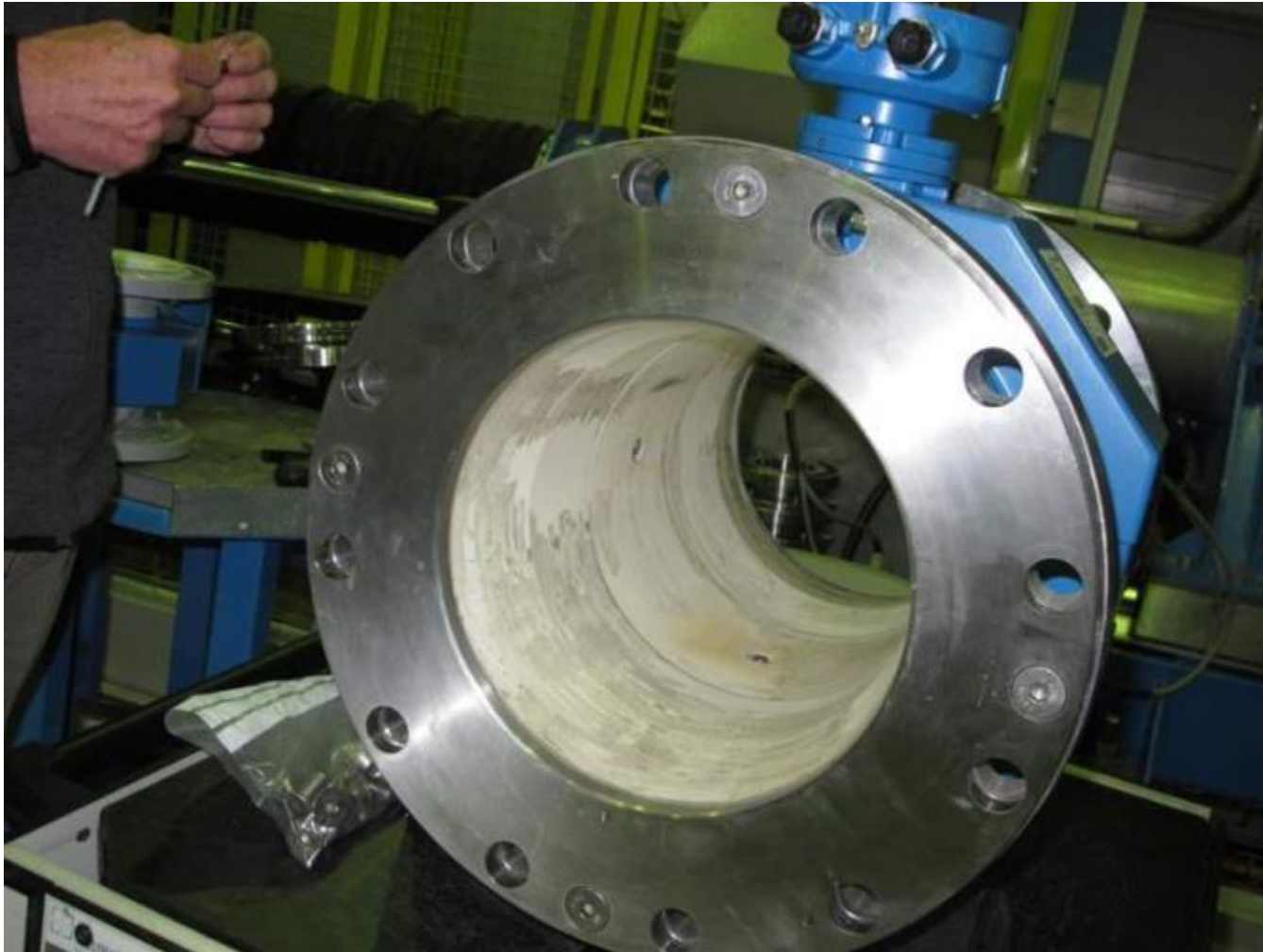
NEW - Ceramic MAG Specs

- For fracturing fluid (incl. sand, Diesel etc.) & mining applications
- DN 25 (1") to DN 250 (10")
- PTFE-line tube with additional ceramic tube inserted
- ASME B16.5 ANSI 10" Cl. 150
- Coated protective flanges in 316L or C22 (depending on application)
- Tungsten Carbide Electrodes

Ceramic MAG details



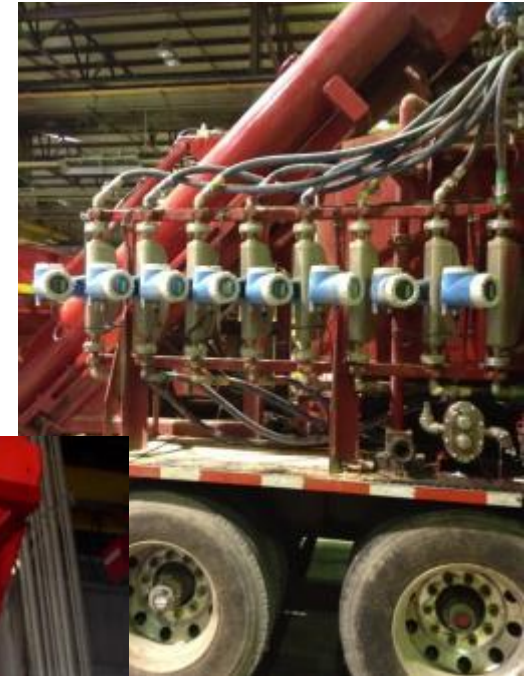
Ceramic MAG



Ceramic MAG



Chemical Addition - Dosing



Chemical Addition - Dosing

Coriolis:

Typical size: 3/8" or 1/2"

Preferred Model:

Promass 80/83 : **S**, **E**

Promass E100, **S100**
SS tubes

150# flanges

Flow Accuracy: +/- 0.1% mass flow



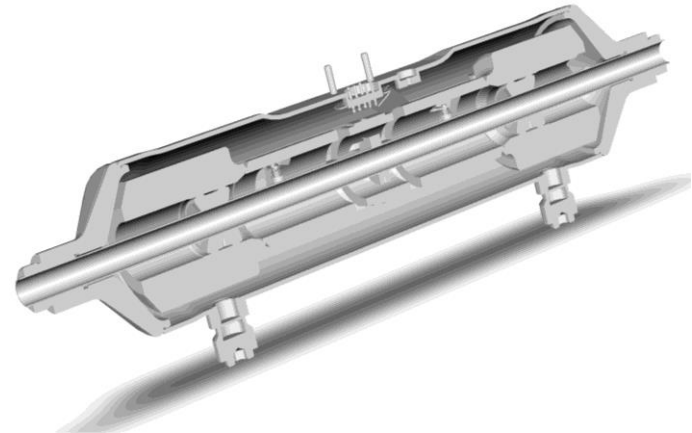
Promass 100: IP69 rated

Chemical Addition Option: Promass I

Diameter range **2" Full Bore**

Single straight tube design

- Considered for additional viscosity measurement
- Titanium tube

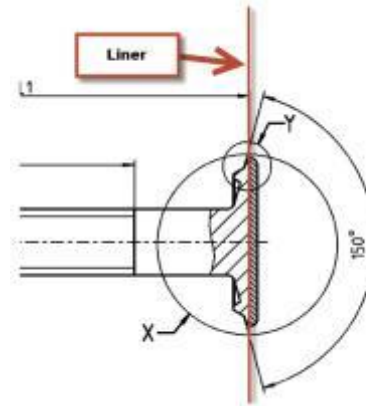


MAG meter on Frac Blenders



MAG meter on Frac Blenders

Magnetic: Typical size: 6", 8" or 10" for water/sand mixture
Preferred Model: Promass 55S model
PU or Teflon liner
Tungsten Carbide electrodes
150# flanges
Flow Accuracy: +/- 0.2% to 0.5%



Dosing on Frac Blenders

Coriolis:

Typical size: 3/8" or 1/2"

Preferred Model: Promass 83E or 83F or 83S,

Promass E100, F100 or S100

SS tubes

150# flanges

MAG meter on Flow Blenders: +/- 0.1% mass flow



Promass 100: IP69 rated

Typical Level Applications for Cementing

- Displacement tanks (water mixed with chemicals to slow down cement curing)
- Mixing tubs (dry cement mixed with water)
- Surge tanks (dry cement storage)
- Chemical storage tanks (portable plastic or stainless steel)

Reasons for E+H success in these applications:

- Coating does not effect E+H contacting level transmitters
- Foaming problems.....GWR not effected
- Movement of product in tanks effects free space radar.....GWR works great in these applications!

Level on Cementers with GWR



Water Flow on Cementers



Level on Cementers with GWR



Surge Tank Level with GWR



GWR mounted to tank bottom



Tub Level with GWR measuring water



Cementer Truck



Cementer Truck

- E+H Equipment on Cementer
- 3" 83F Coriolis Meter—density
- GWR Level Transmitter---level mixing tank



Cementer Truck online Density



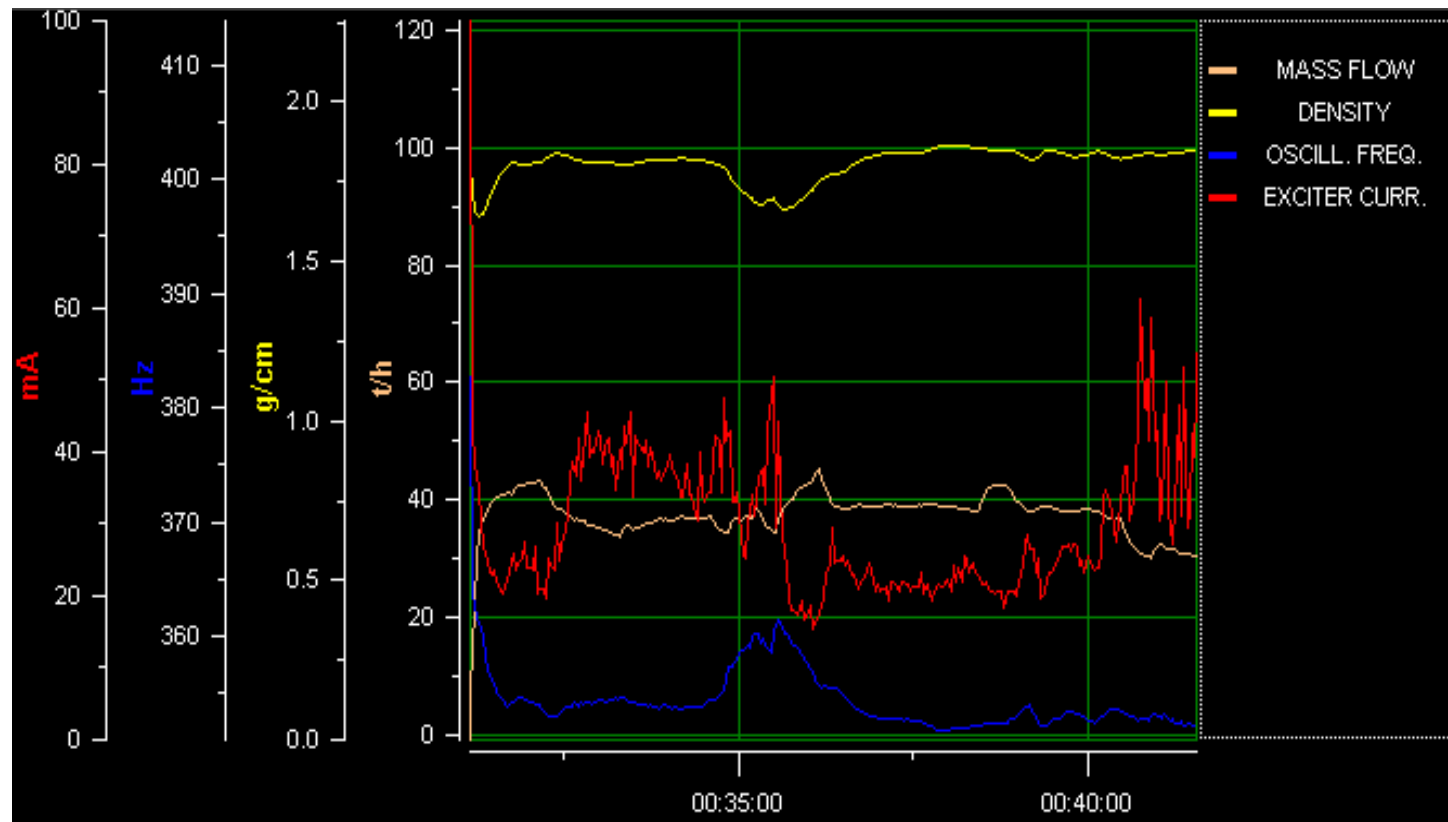
Promass 83F

Hand density
testing



Cementer Truck online Density

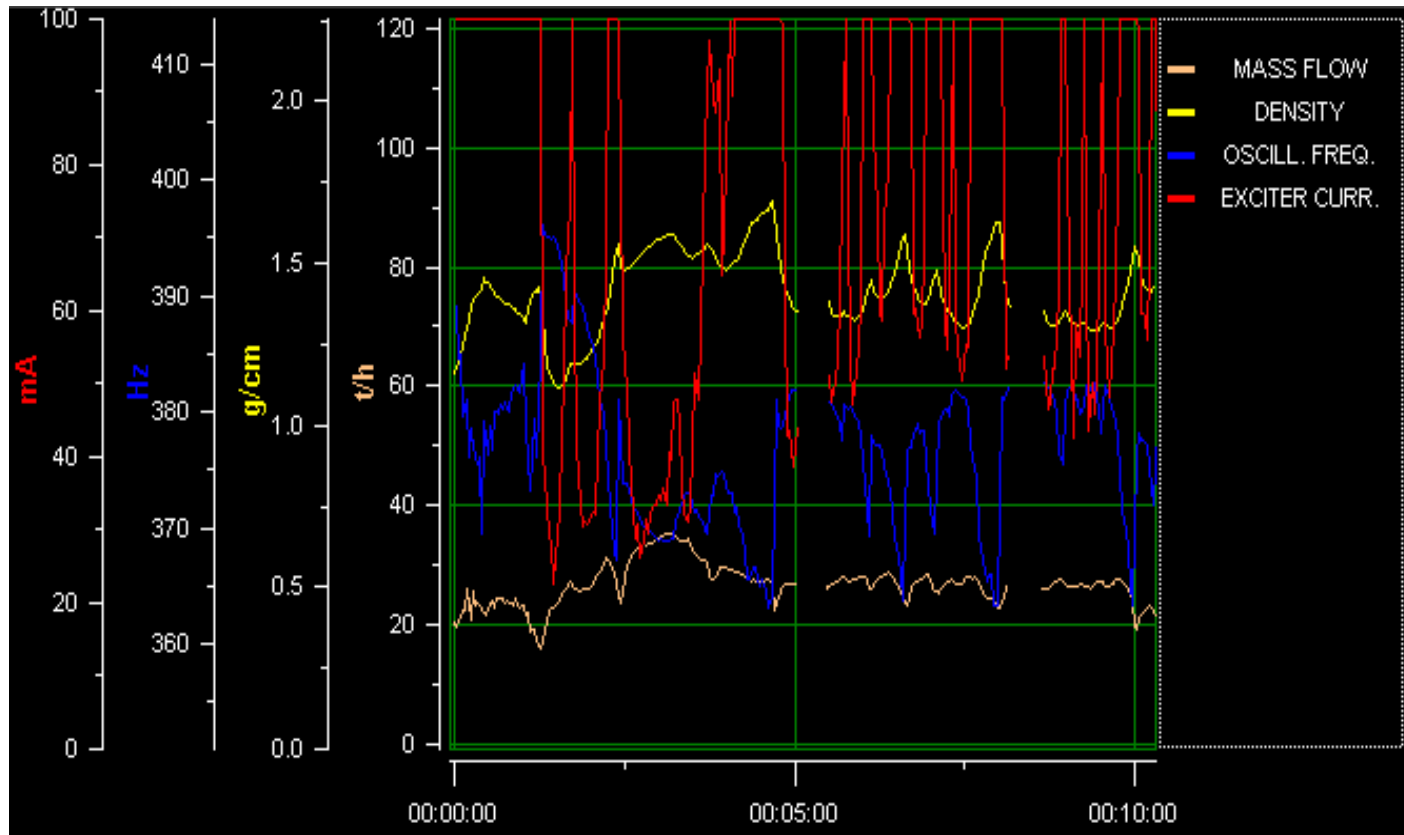
High density application (1.6-1.8 g/cm³)



Content: API cement and water...

Cementer Truck online Density

Low density application (1.3-1.5 g/cm³)



Content: API cement / water / Chemical / coal dust

Cementer Truck



Cementer Truck



- E+H Equipment on Cementer
- 3" 83F Coriolis Meter—density
- 4" 83F Coriolis Meter --- density
- 3" 53P Mag Flow Meter---mix flow
- GWR Level Transmitter---mixing tank

Cementer Skid



- E+H Equipment installed on skid
- 4" 83F Coriolis Meter (Density)
- 3" 53P Mag
- GWR (displacement tanks and mixing tank)
- FTL51 Tuning Fork (mounted on displacement tank)
- GWR Surge Tank (contains bulk Portland cement powder)

Cementer Truck



Frac Truck



- MAG - 55S-Fracing liquid flow
- MAG - 50P-Mixed acid flow
- GWR- Fracking liquid tank level
- Nuc -Fracking liquid density
- Coriolis 83I-Chemical viscosity

Frac Truck

Promag 55s – Fracking liquid flow



Frac Truck

Levelflex GWR – Tank level



Frac Truck

83I—Chemical viscosity



Frac Trucks – Cementers

Measuring task:

Density measurement on a
10" or 12" line on a truck

Challenges:

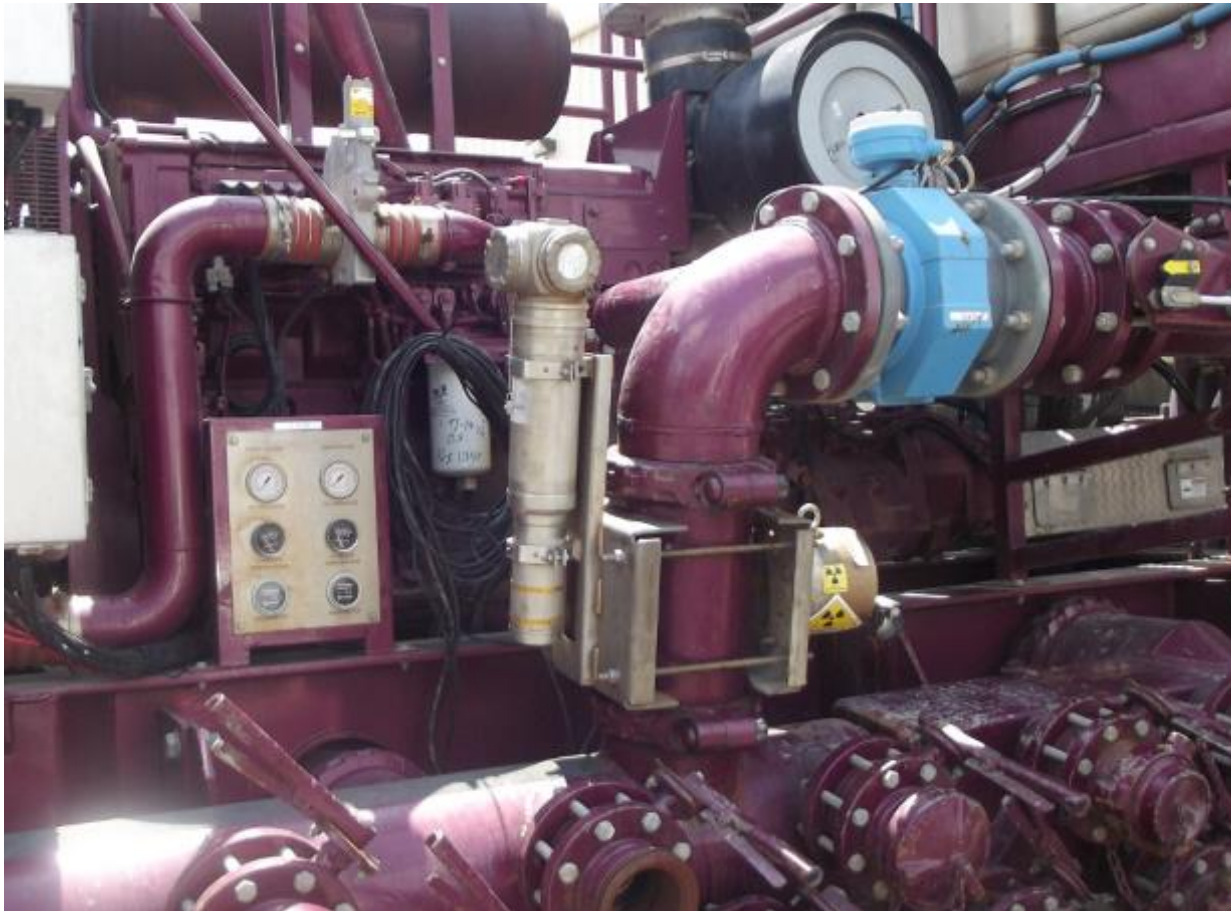
- Less space
- Vibrations during pumping and in motion on rough roads
- Calibration of system

Solution:

- Source container
- Source
- Detector - NaI



Frac Truck services – Density measurement



Density Measurement on Trucks



Frac Truck – Cementing



Frac Trucks – Cementing / Blending



NEW – Housing concept

Housing concept

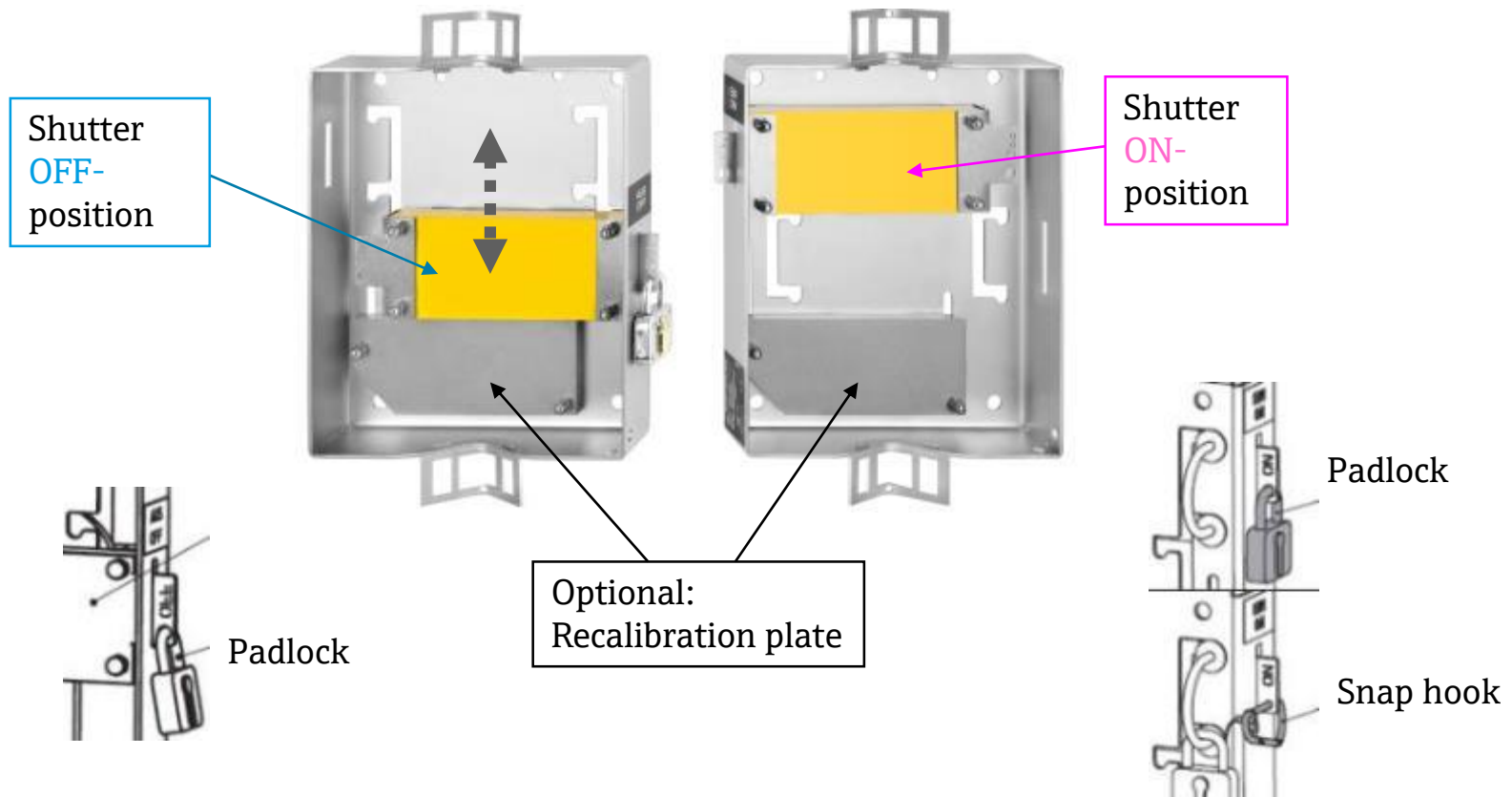
- Half clamp integrated
- Calibration plate optional
- 3 versions for emission angle (Application 3/4/5)
- 2 versions for locking (switch position ON) B/C
- Source loading:
Cs137 until 30 mCi/1,1 GBq
(7.5 μ Sv/h in 1m distance)

Optimized for low Cs137 activities
until 1.1GBq (30mCi).
For higher activities and Co60 sources
are FQG61/62 and QG2000 available.



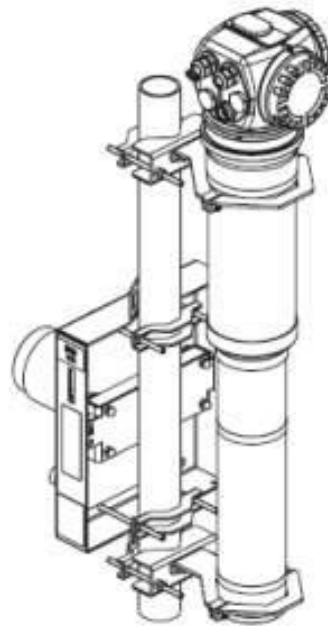
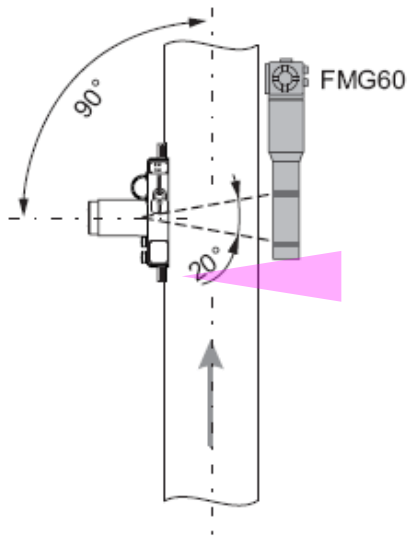
NEW – Shutter Position ON/OFF

- Container with shutter for manual ON-/OFF - switch
- Source containers are available in two locking versions
- Optional: Calibration plate for quick and easy density recalibration



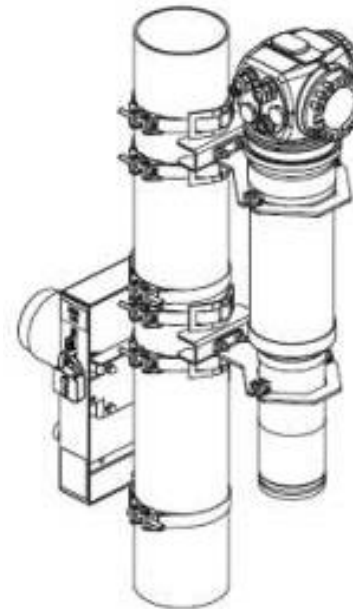
NEW – Mounting for Density

for density (3)
20° emission angle



with clamping device

48-77mm (1.97 – 3.15 in)



with tensioning band

80-273mm (>3.15 to 11.8 in)



Advanced Clamp On design

