Status of

AIM

Alternative **I**nstallation **M**ethod for the **VXD**

8th Belle 2 Workshop, Trieste (Italia), 9.9.15

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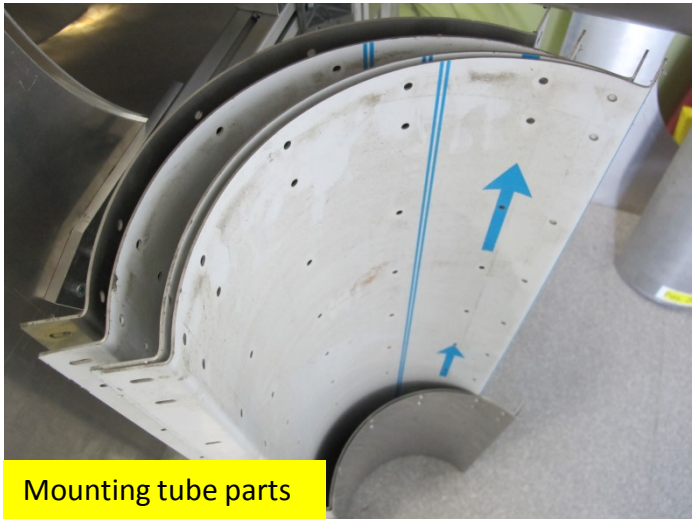
Overview

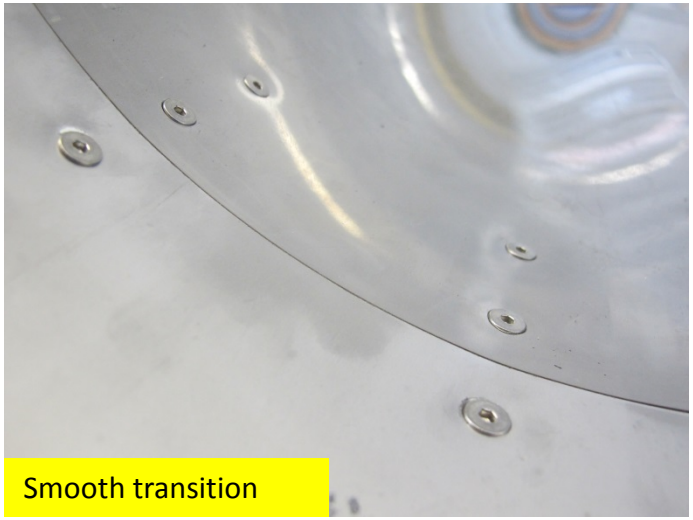
- Manufactured **Mounting-Tube**-System
- Designed **VXD-Installation-Ring**
- Connection **Cable Tray / VXD-Installation-Ring**
- **Crane**-transportation-tool
- Connection VXD / CDC (**brackets, pin**)
- Possible plan for checking the **VXD-position** during installation

Manufactured Mounting Tubes



Mounting tube parts

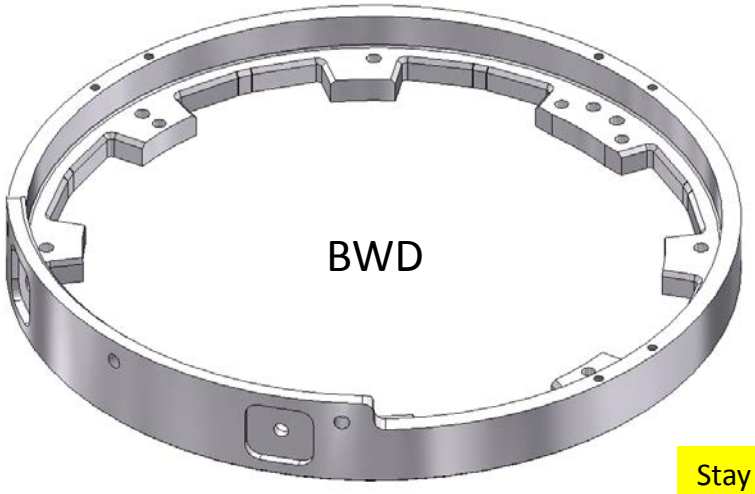
Connection unit

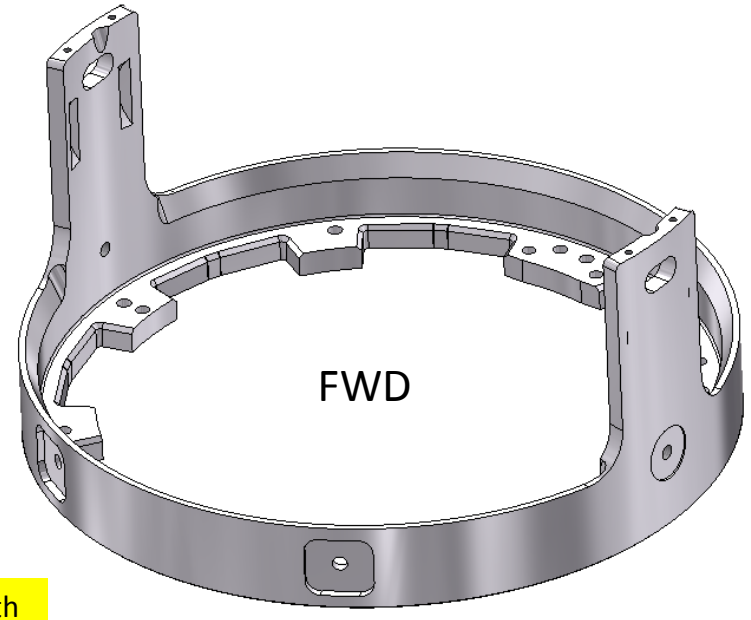


Smooth transition

Connected MT 2100 to MT 1100

Design VXD-Installation-Ring





Stay in contact with KEK (Koriki san)

Only BWD features:

- Height adjustment (KEK)
- Connections to CDC (KEK)
- Connection to cable trays (MPI)
- Connection to cran (MPI)

Same features for BWD&FWD:

- Notches for sliding parts (MPI)
- Hole-pattern for VXD-halves (KEK)

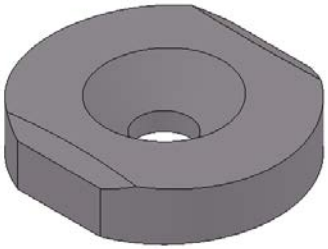
Only FWD features:

- Notches and cut-out for EDI-hooks (MPI/DESY)
- Ear-design (MPI/DESY)
- Connection to cable trays (MPI)
- Connection to cran (MPI)
- Connections to CDC (MPI)
- Chamfers for cable-laying (MPI)

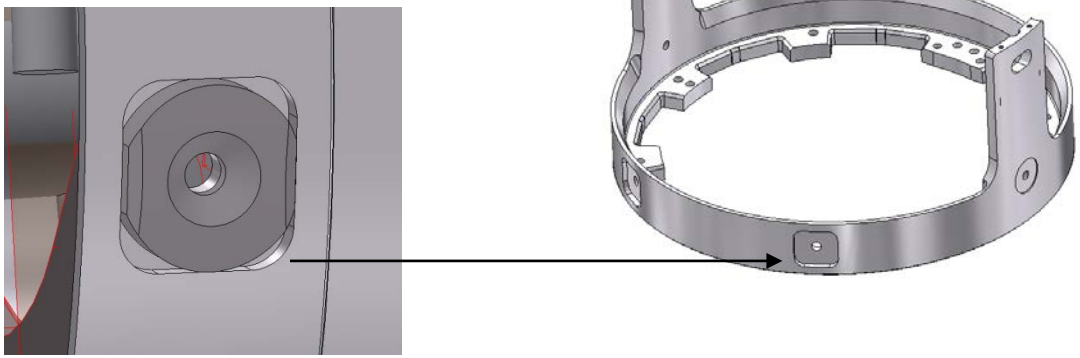
Gliding Pads

Same design and material for the glide pads in FWD and BWD.

Design-suggestion:



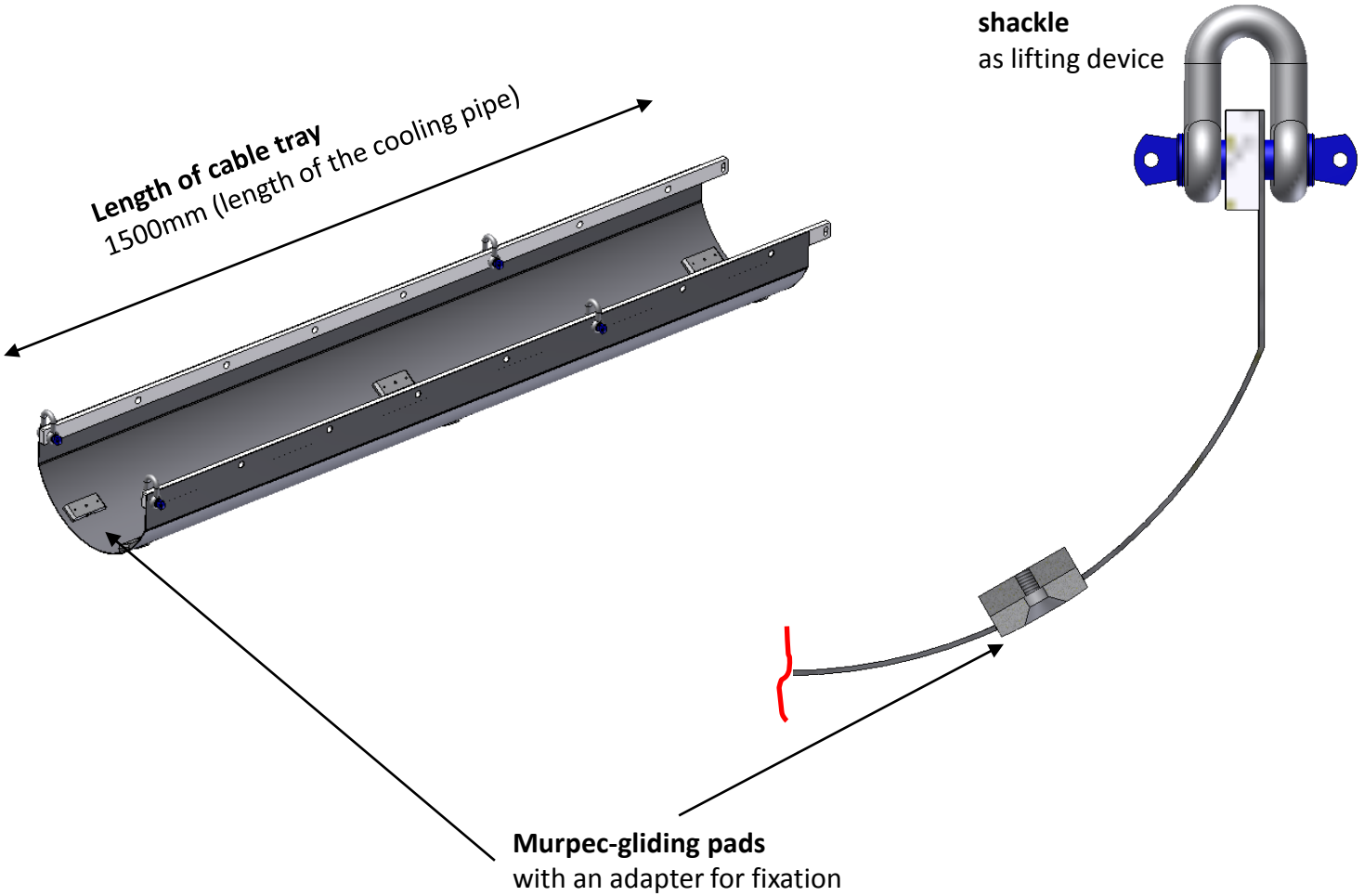
Assembled on the VXD-Installation-Ring



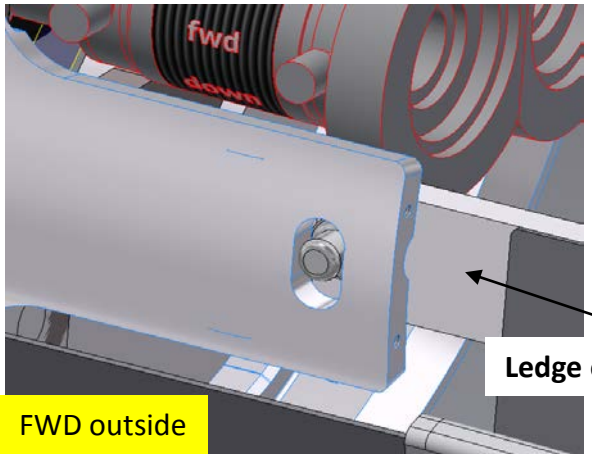
Material: **Murpec** by Murtfeldt

- Based on PEEK
- High radiation resistance
- Low frictional coefficient
- Electriccally isolating
- High compressive resistance

Cable trays

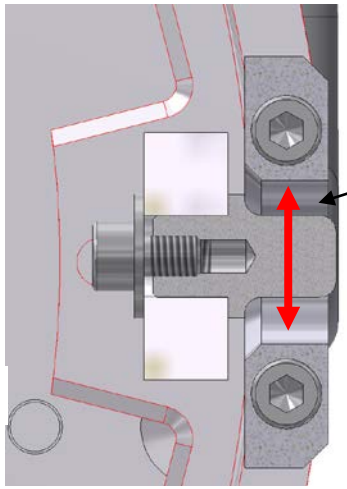

shackle
as lifting device
Length of cable tray
1500mm (length of the cooling pipe)
Murpec-gliding pads
with an adapter for fixation

Connection Cable Trays / VXD



FWD outside

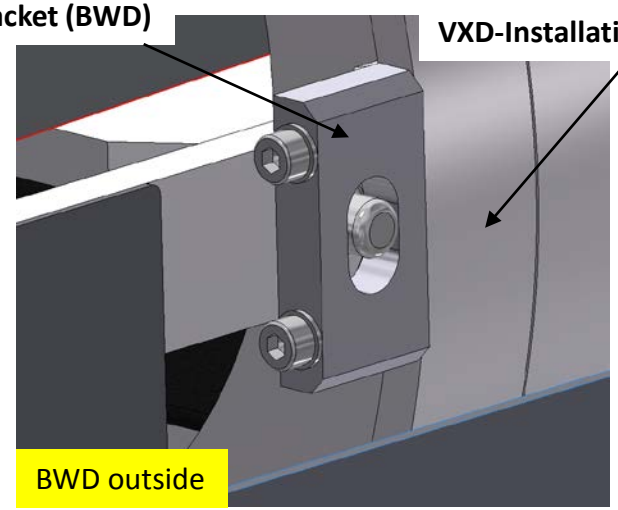
Ledge of the Cable Tray



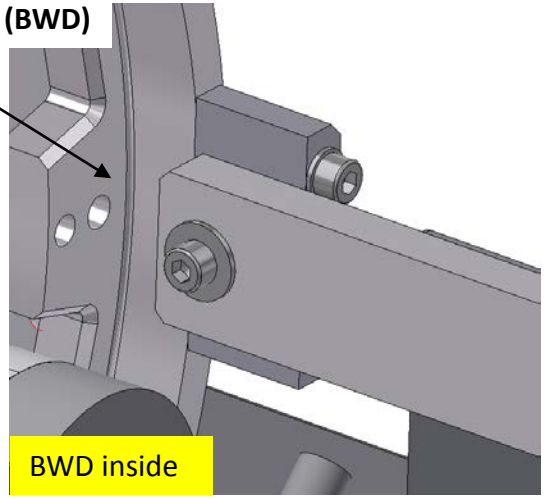
Long hole / pin connection
Transmites only pull/push force
No torque moments on VXD

Adapter-bracket (BWD)

VXD-Installation-Ring (BWD)



BWD outside

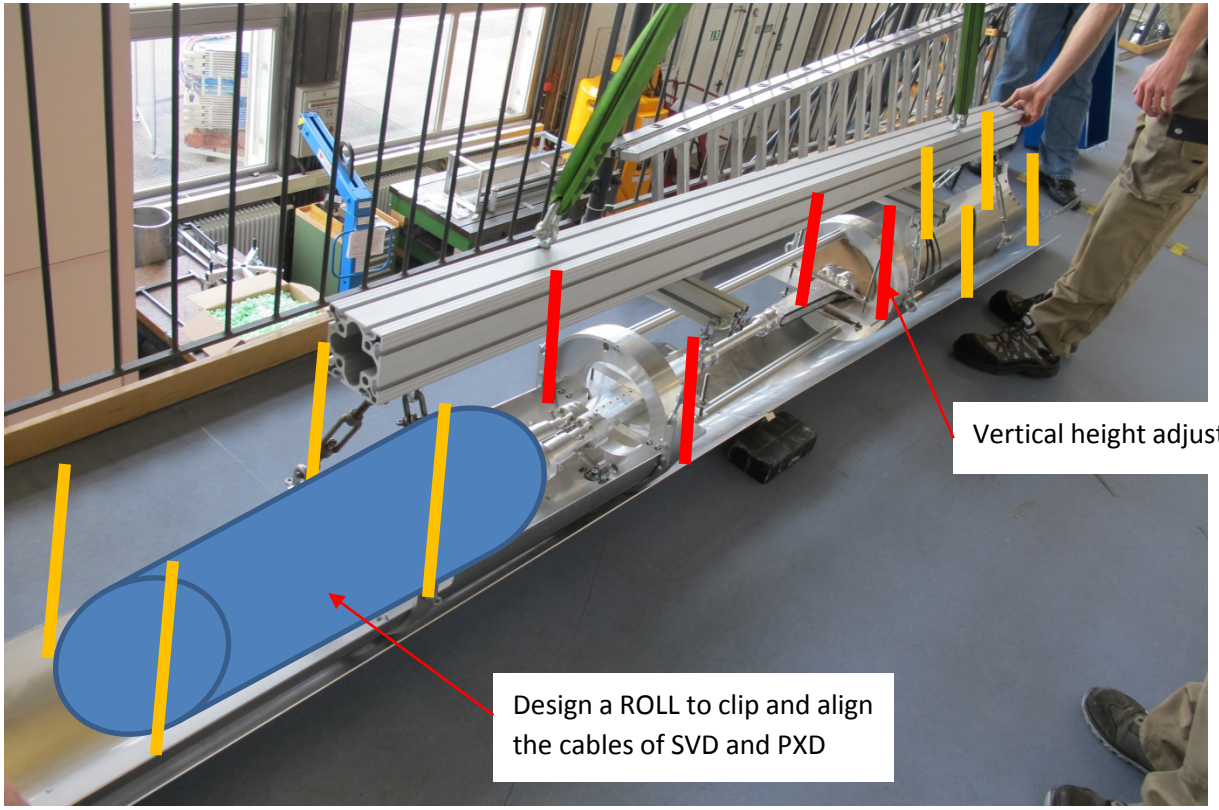


BWD inside

Crane-transportation-tool

Modifiy the existing crane-tool from the AIM-mock-up for the AIM-process

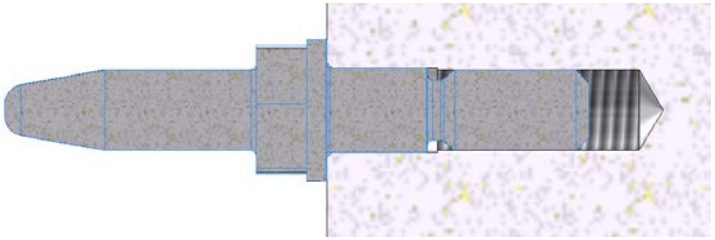
GOAL: Separate support for cable trays and VXD guaranteed by the long hole / pin connection



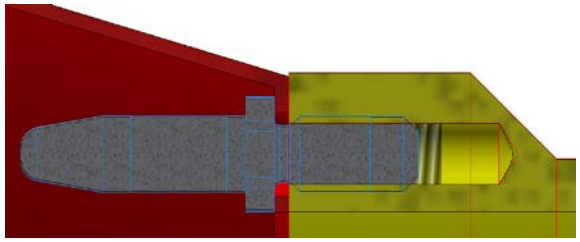
Connection VXD/CDC

Pin-Design

OLD DESIGN

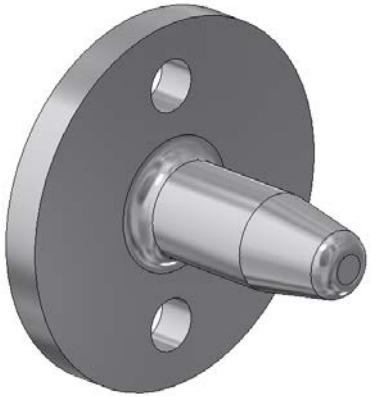


With shaft fit and thread

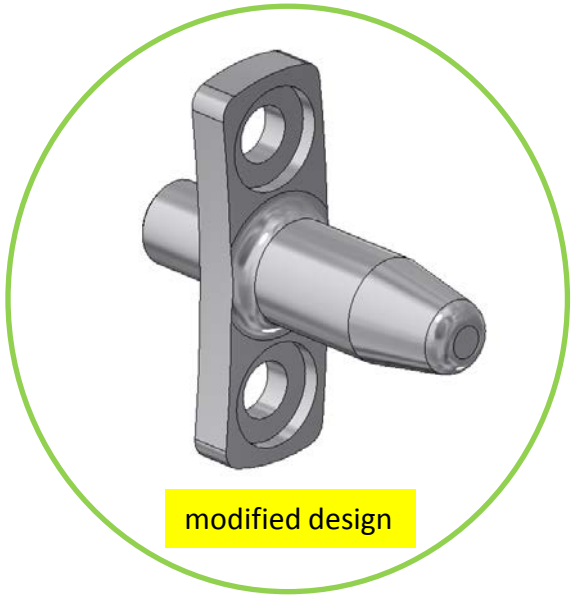


Only with thread

NEW DESIGN



Ideal design

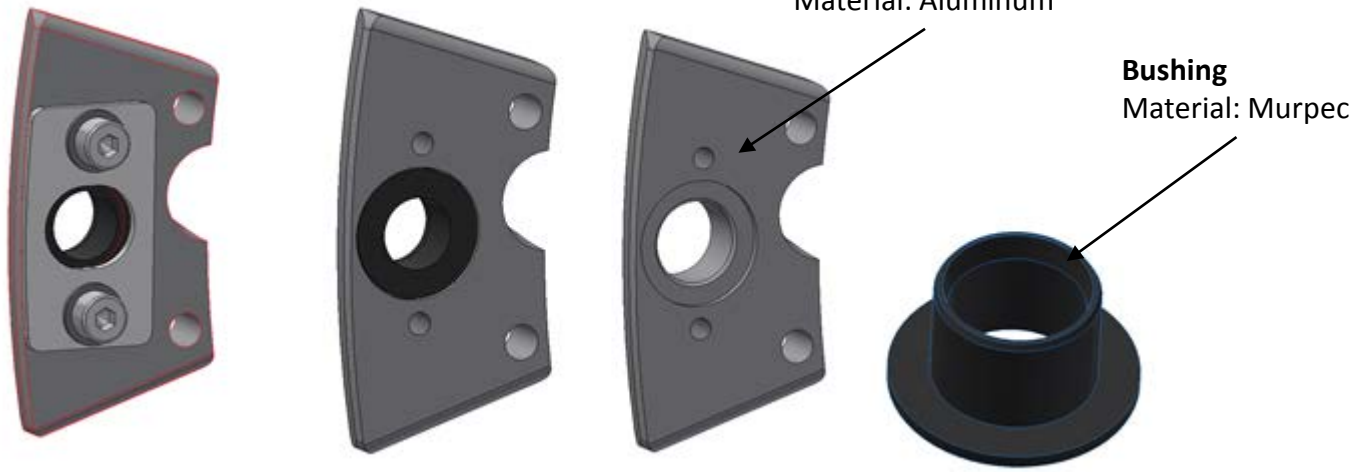


modified design

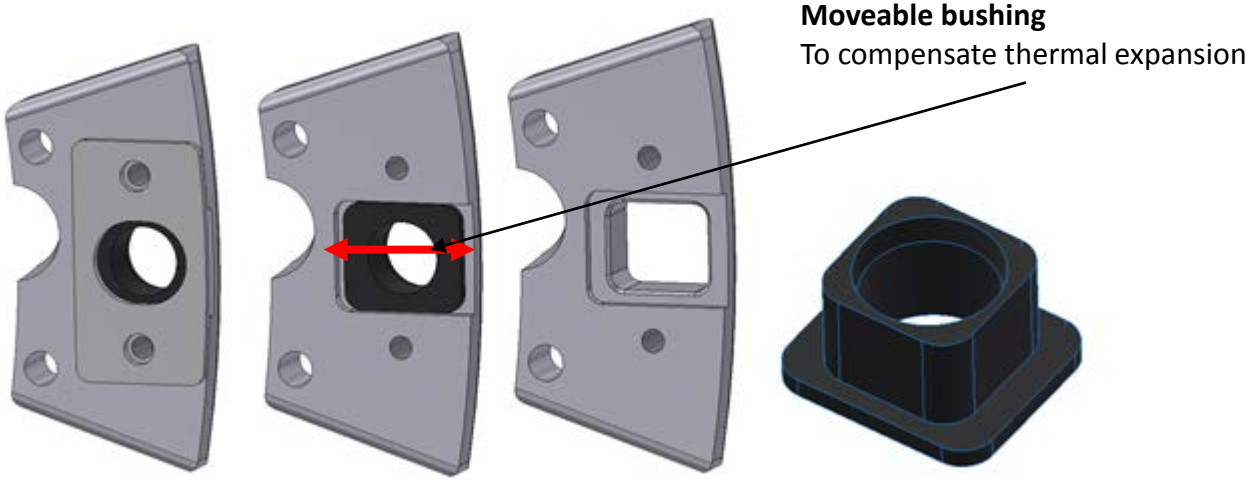
Connection VXD/CDC

Bracket-Design

LEFT SIDE

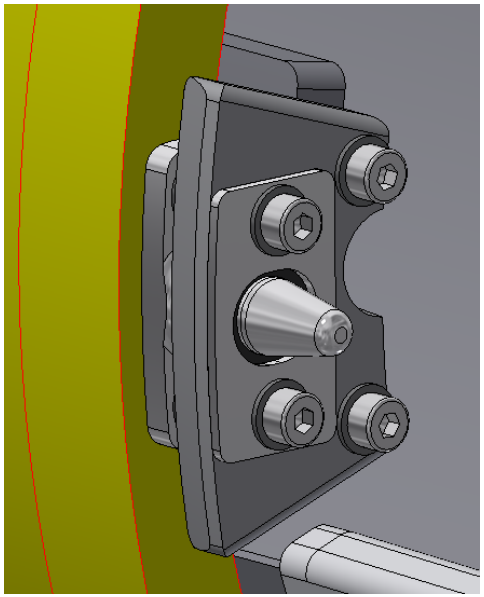


RIGHT SIDE

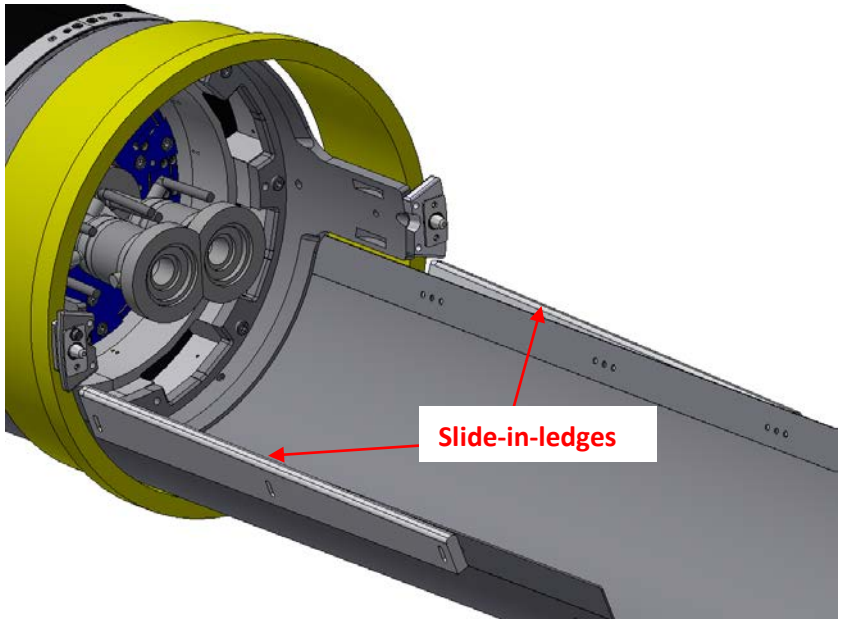


Connection VXD/CDC

Installation situation

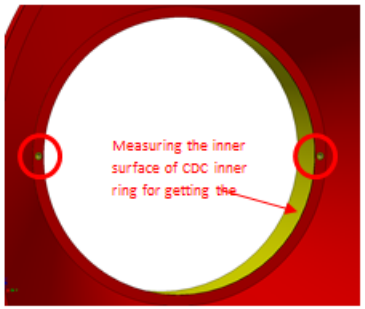
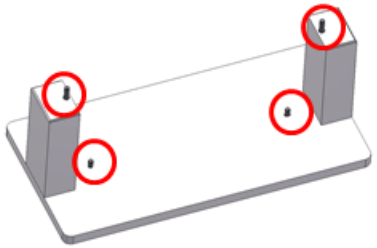


Slide-in-ledges
Bring the VXD smoothly in position to align with the pins
Material: Plastic



Connection VXD/CDC

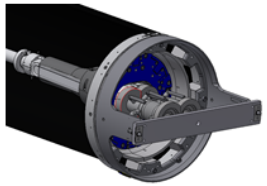
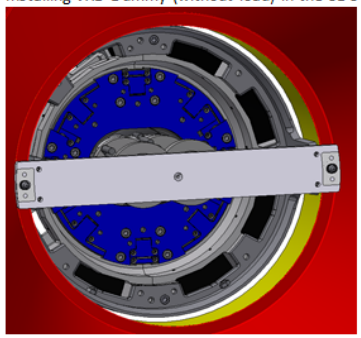
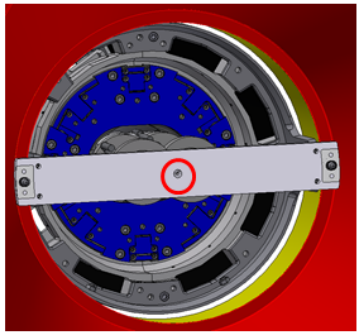
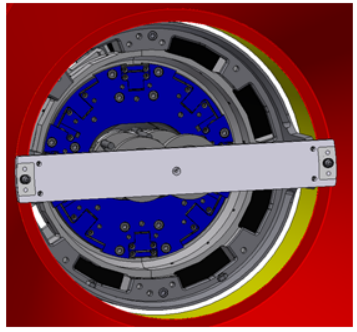
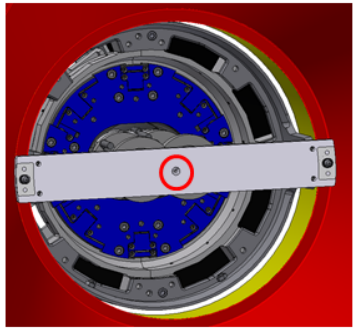
Possible plan for checking the VXD-position during installation

No.	Installation/Mounting	Measurement
1	-	Measure CDC – Center and pin-position 
2	-	Measuring ring adjustment JIG – pin-position 
3	Mounting VXD-installation-ring & mock-up-shield on the JIG 	Measuring mock-up-shield on the JIG – center 

FARO 3D-measurement-arm

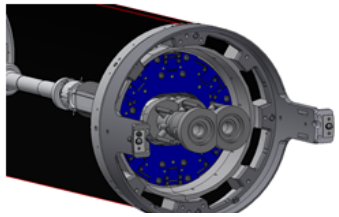
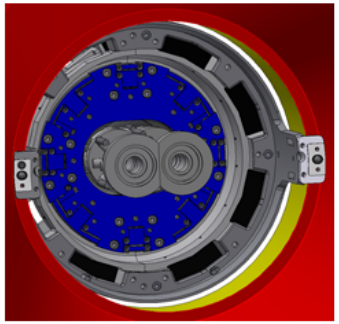
Connection VXD/CDC

Possible plan for checking the VXD-position during installation

4	Mounting VXD-installation-ring with mock-up-shield on the VXD-Dummy (without load) 	-
5	Installing VXD-Dummy (without load) in the CDC 	Measuring VXD-Dummy (without load) in the CDC – Center 
6	Installing VXD-Dummy (with load) in the CDC 	Measuring VXD-Dummy (with load) in the CDC – Center 
7	Now we know the actual position of the VXD relative to the CDC!!!	

Connection VXD/CDC

Possible plan for checking the VXD-position during installation

8	Mounting VXD-installation-ring & brackets on the JIG 	-
9	Mounting VXD-installation-ring with brackets on the VXD (original) 	-
10	Installing VXD(original)in the CDC 	-
11	VXD should be in the same position like the VXD-Dummy (with load) before!!!	

Connection VXD/CDC

TOLERANCES: For the installation of the VXD in the CDC

For the installation of the VXD in the CDC will be a tolerance of ±0.5mm in x- & y-direction. It will be controlled by the FARO 3D-measurement-arm.

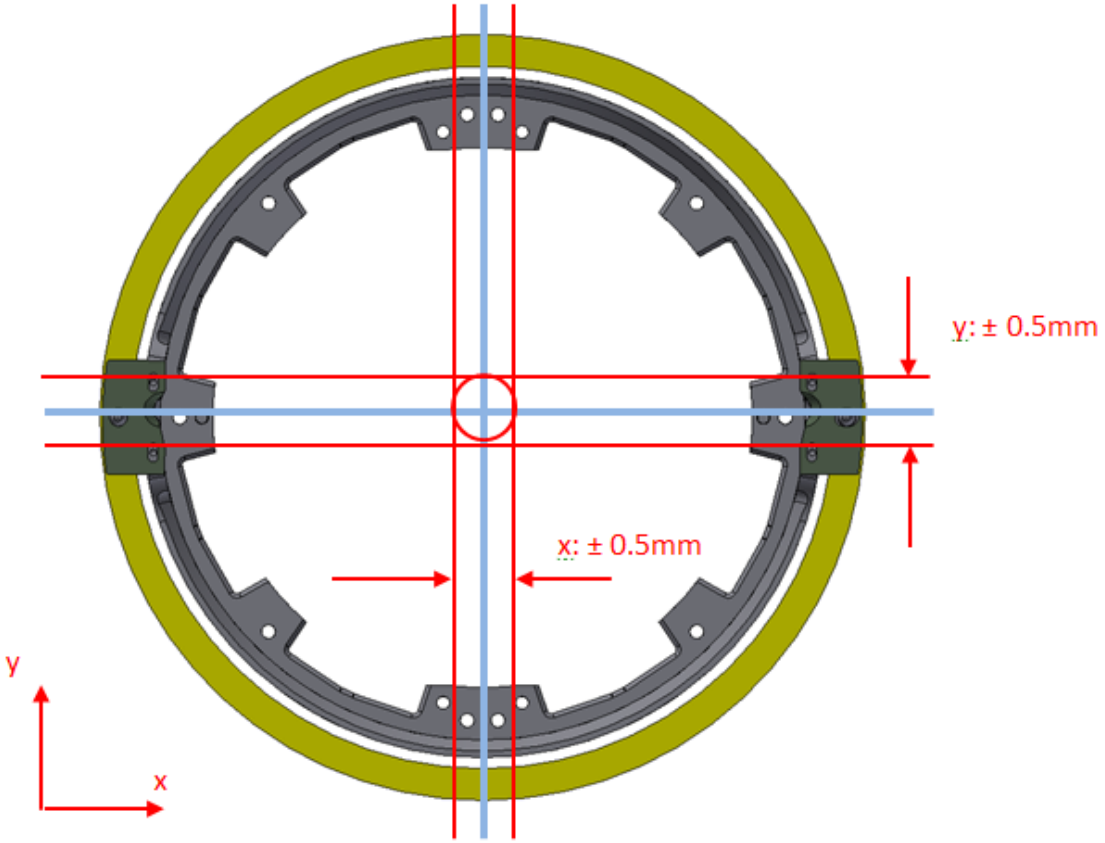


Fig. 13: positioning-tolerance (±0.5mm in x-y-direction) for the VXD in the CDC for the installation

Need to be defined till/at next B2GM:

- How much is the sagging of the VXD in the CDC?
- Should it be compensate in advance to avoid stress on the bellows? -> Via adjustable jig
- Integrate our 3D-measurement-method (MPI) in the optical-measurement-method (KEK) !

Summary

- DONE: Manufactured **Mounting-Tube**-System

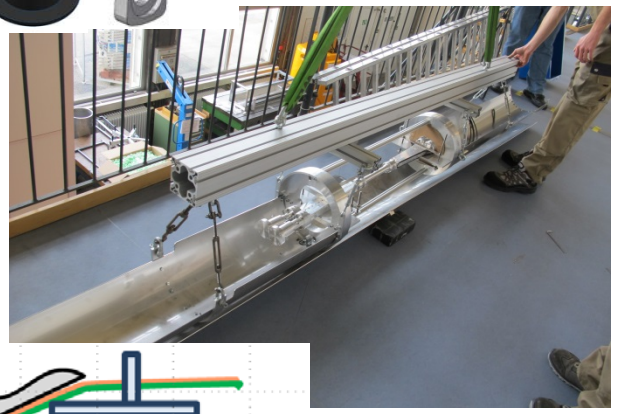
- DESIGN-PREVIEW: Design- and manufacturing-details for:
  - **VXD-Installation-Ring**
  - **Pin** and **bracket** connection between VXD/CDC
  - **cable tray** / VXD connection

- PLAN: **Position-check of the VXD during the installation**

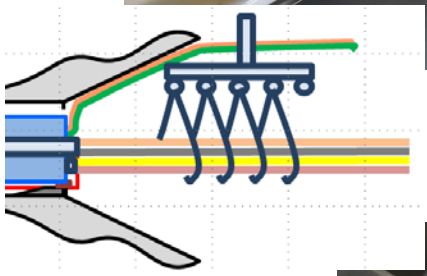
Next

- Manufacturing pins and brackets

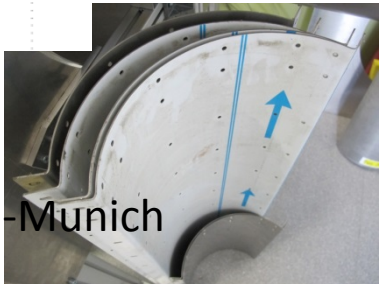
- Final plan of the VXD/CDC-position-check



- Modifiy the mock-up-cran-tool for AIM



- Cable handling device during/after installation



- Testing the new installation-equipment at the AIM-mock-up in MPI-Munich

Thank you for your attention!

Do you have any questions?

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