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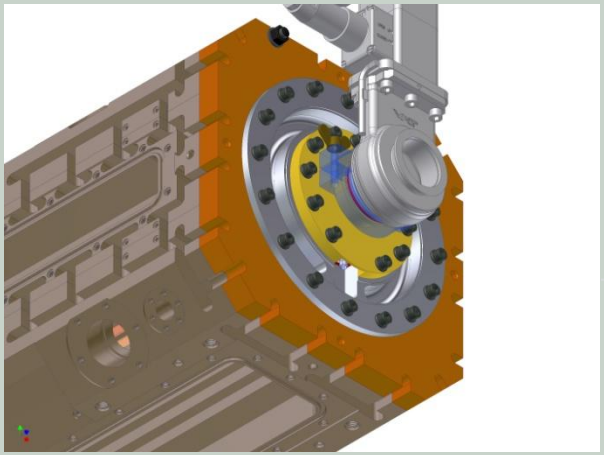
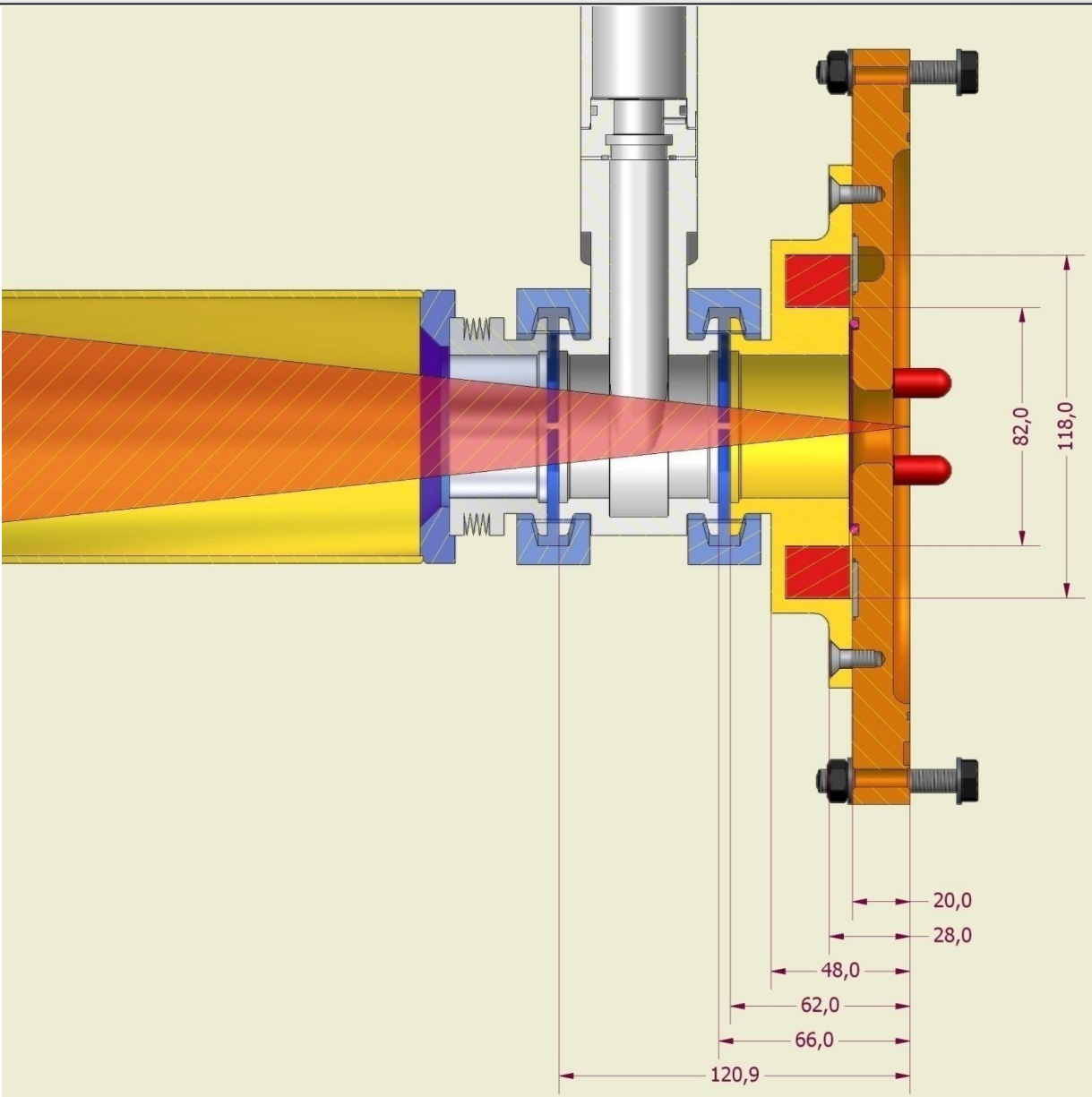
FETS RFQ End Flange Design MkII (High energy end)

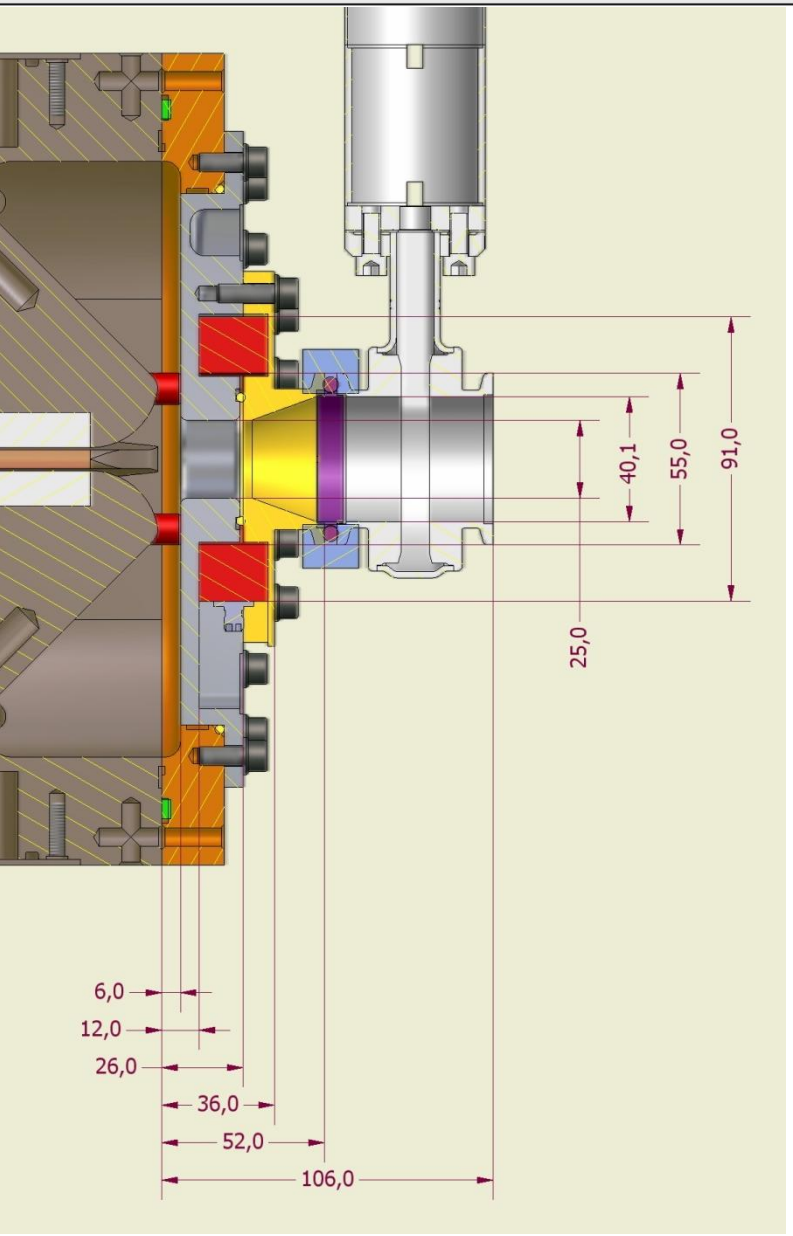
6th June 2011



by Peter Savage



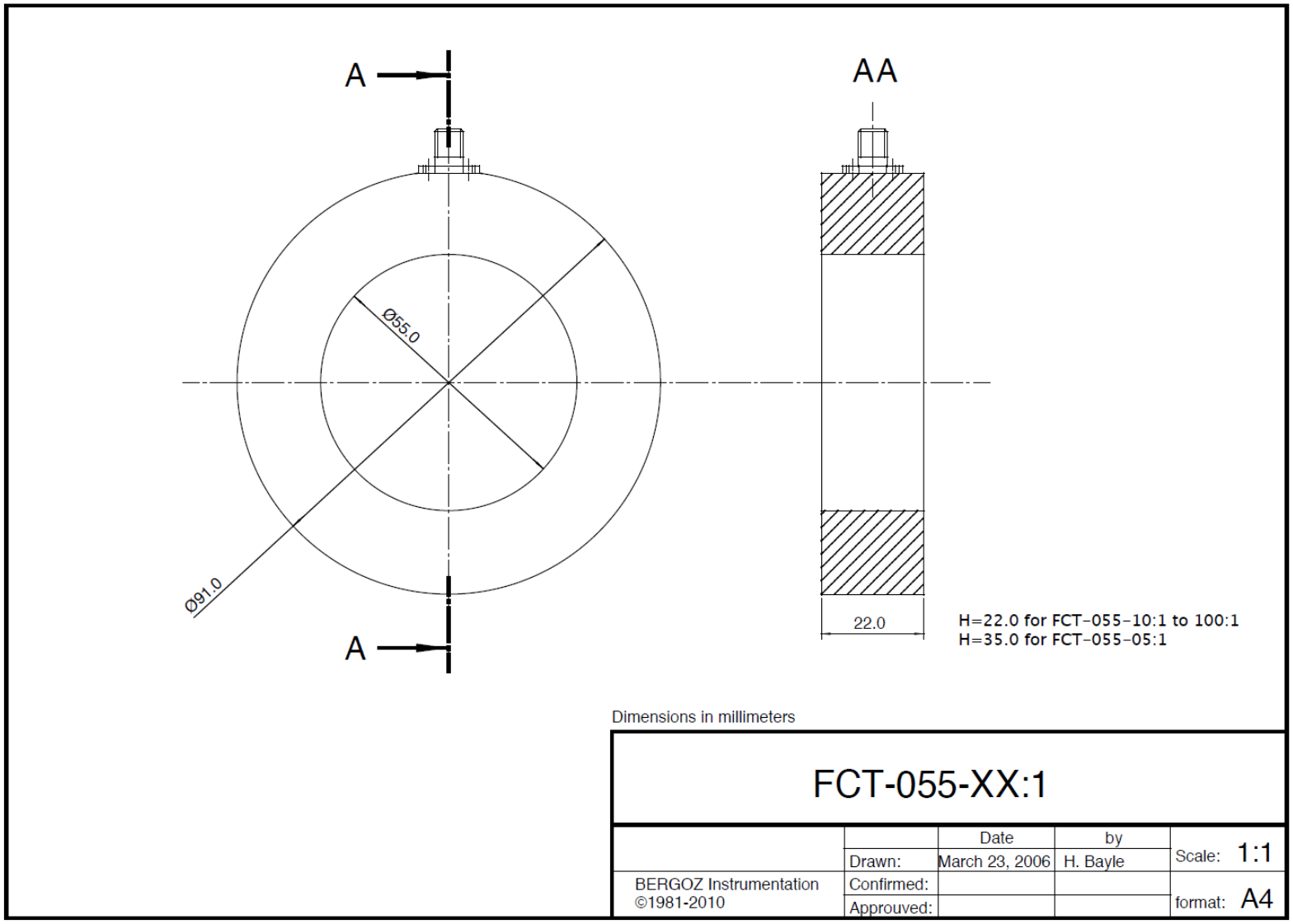
At the RFQ input end the end flange design was optimised to keep the beam drift distance short and to keep the vacuum valve bore large.

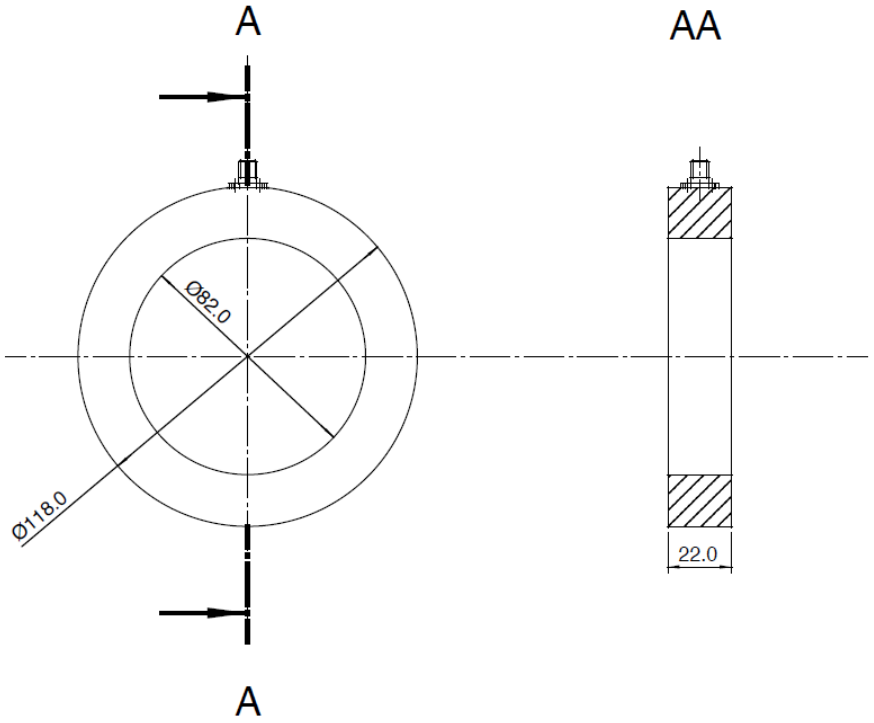


At the RFQ output end the end flange design has been optimised to keep the beam drift distance short also.

But the beam is smaller than at the input end enabling the use of a Bergoz FCT-055 toroid instead of a FCT-082 and a DN40KF VAT valve instead of a DN50KF.

In addition the end flange design has been changed to include an un-boltable centre section. This allows the Pi mode stabilizing fingers to be changed without disturbing the main RFQ 3D O ring seal.


A
AA
Ø55.0
Ø91.0
A
22.0
H=22.0 for FCT-055-10:1 to 100:1
H=35.0 for FCT-055-05:1
Dimensions in millimeters
FCT-055-XX:1
Date
by
Drawn:
March 23, 2006
H. Bayle
Scale: 1:1
BERGOZ Instrumentation
©1981-2010
Confirmed:
Approuved:
format: A4



H=22.0 for FCT-082-10:1 to 100:1
H=35.0 for FCT-082-05:1

Dimensions in millimeters

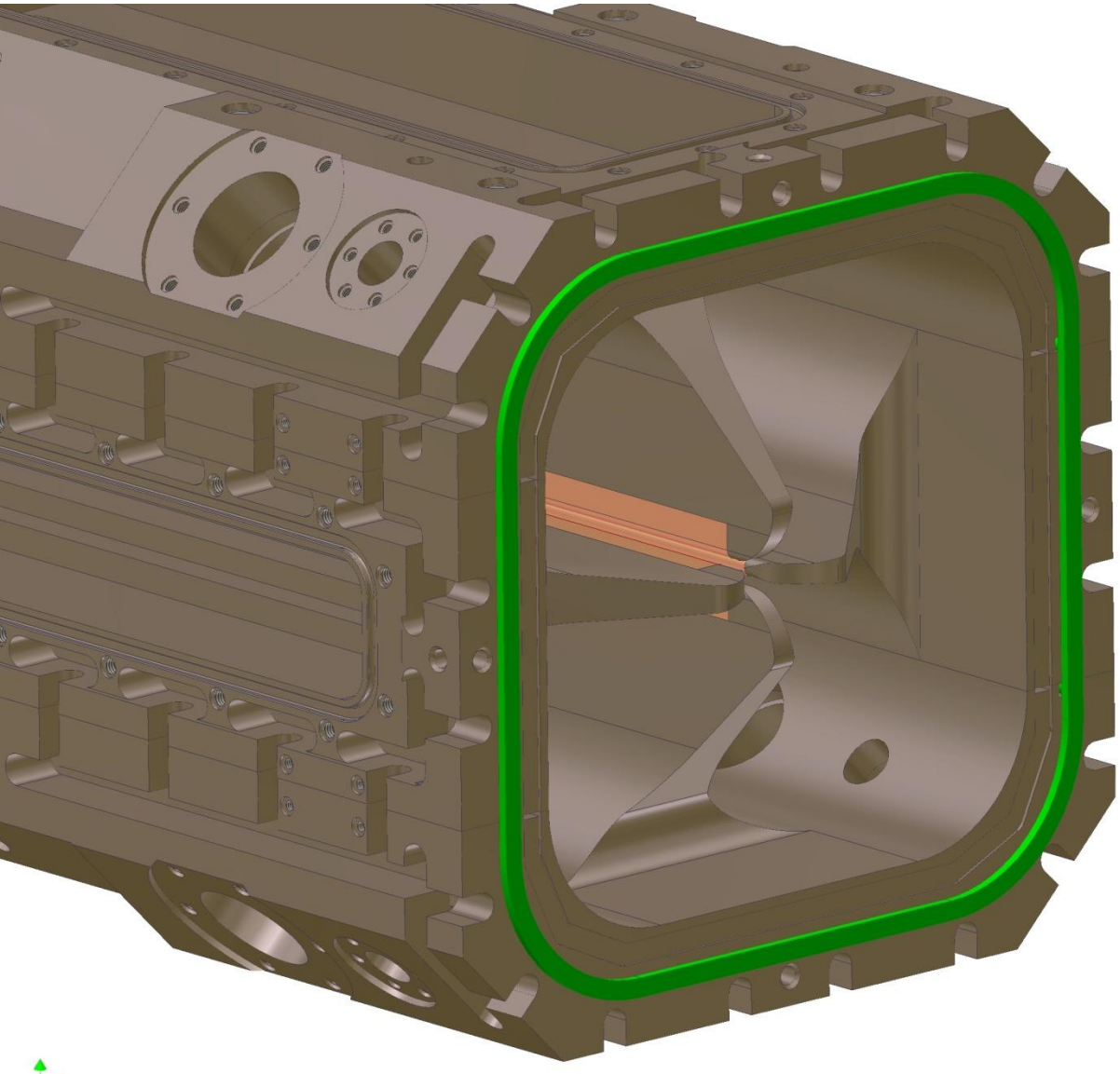
FCT-082-XX:1

		Date	by	
	Drawn:	March 23, 2006	H. Bayle	Scale: 1:2
BERGOZ Instrumentation ©1981-2010	Confirmed:			format: A4
	Approuved:			

The following slides show the end flange assembly sequence for the high energy end.

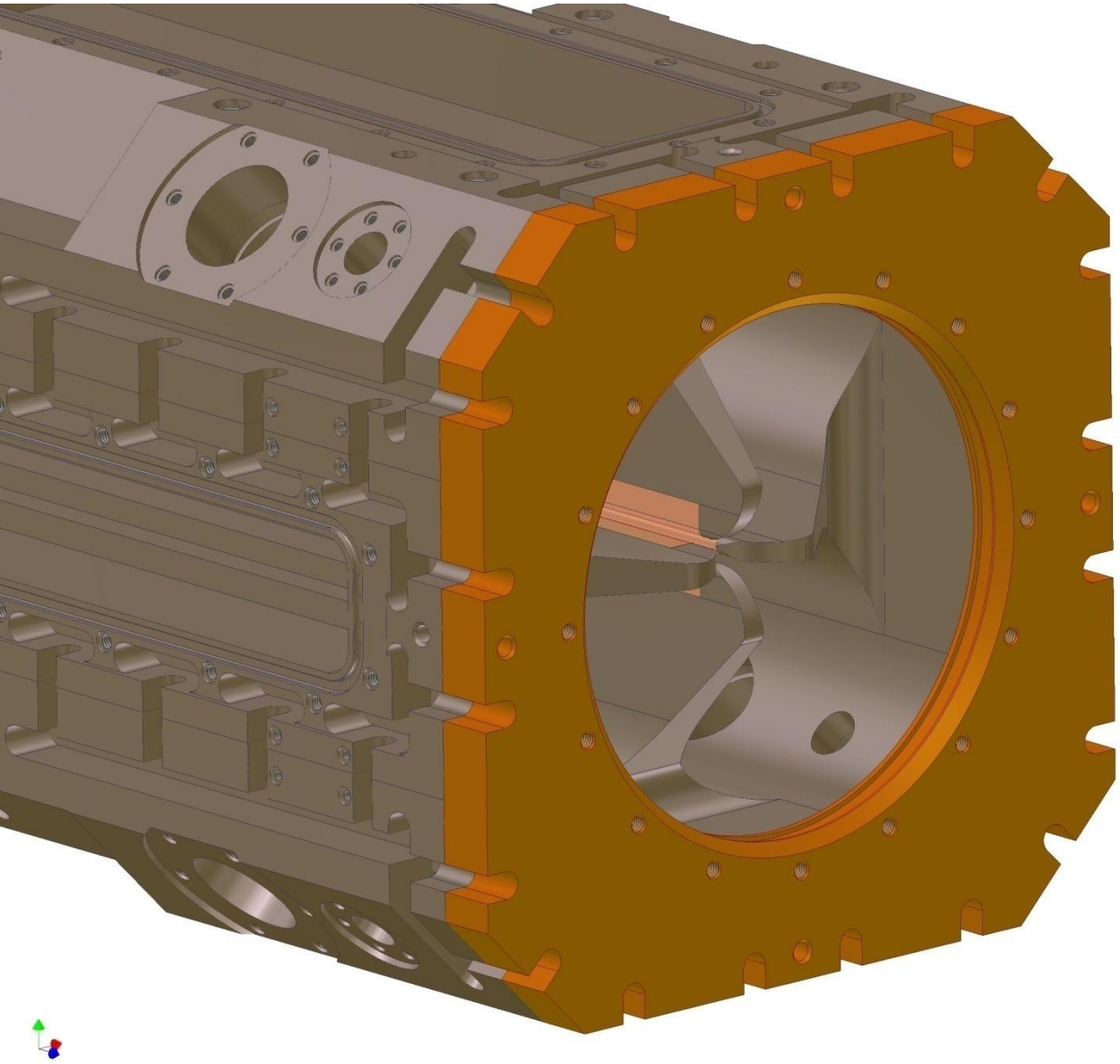
It is imagined that if the design concept of using the removable centre section is preferred then this will be used at the low energy end also. However, my guess is that we should keep the DN50CF VAT valve at the low energy end to allow for the larger beam.

Note that not every detail has been included.

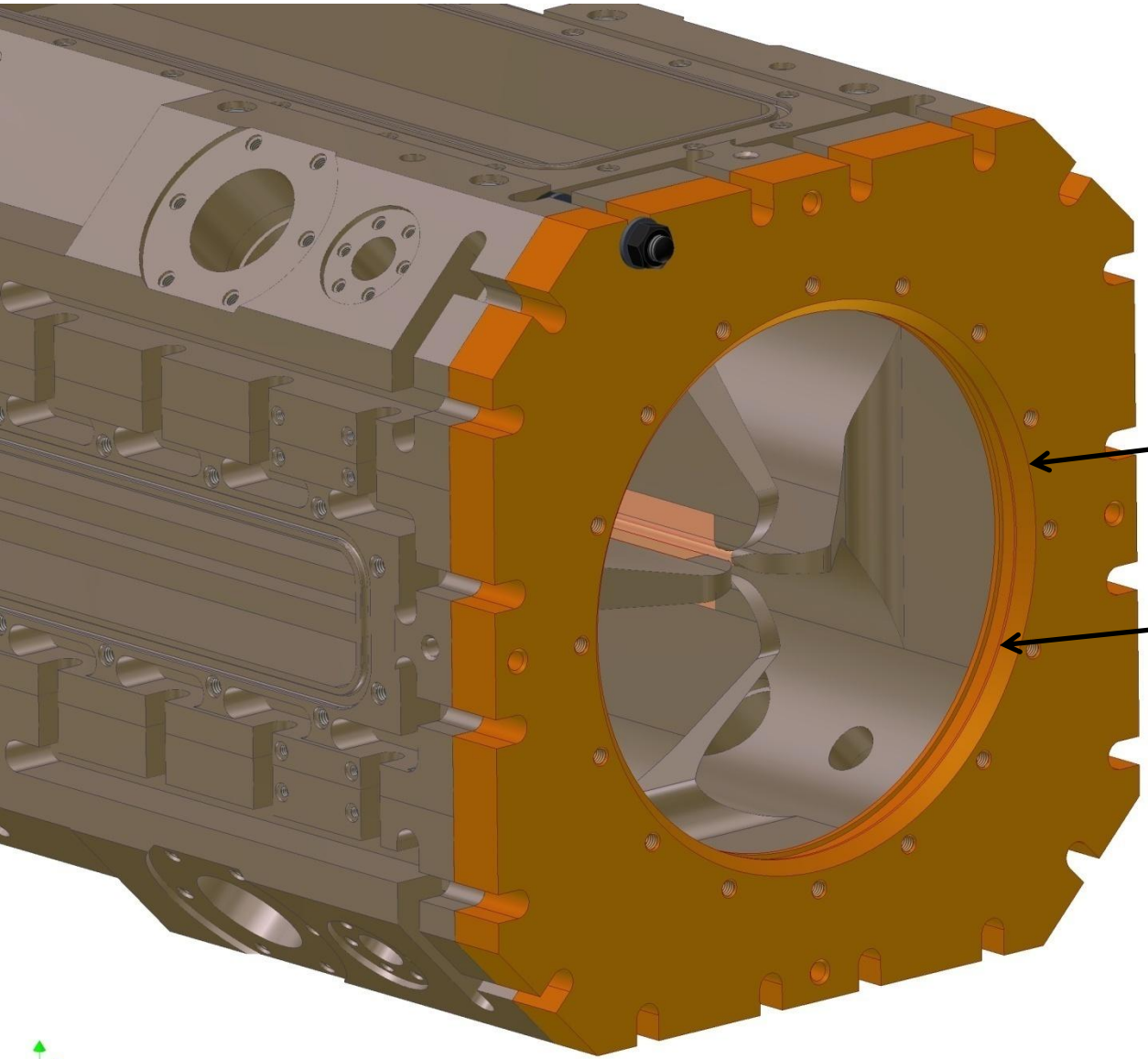


Starting with an aligned bolted together RFQ section 4.

(Section 1 shown here but is not important for the purpose of this presentation)



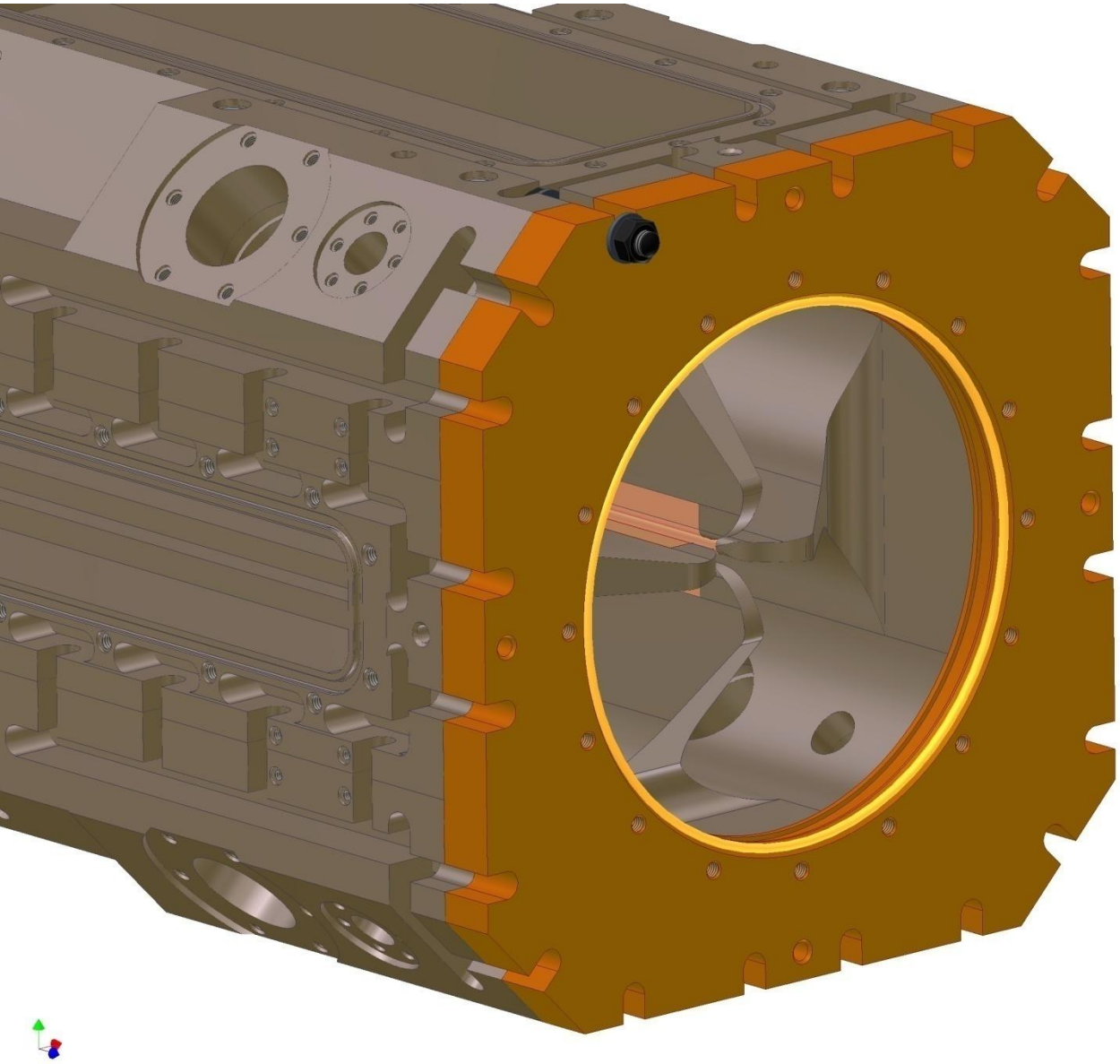
New design of end flange with large centre opening.



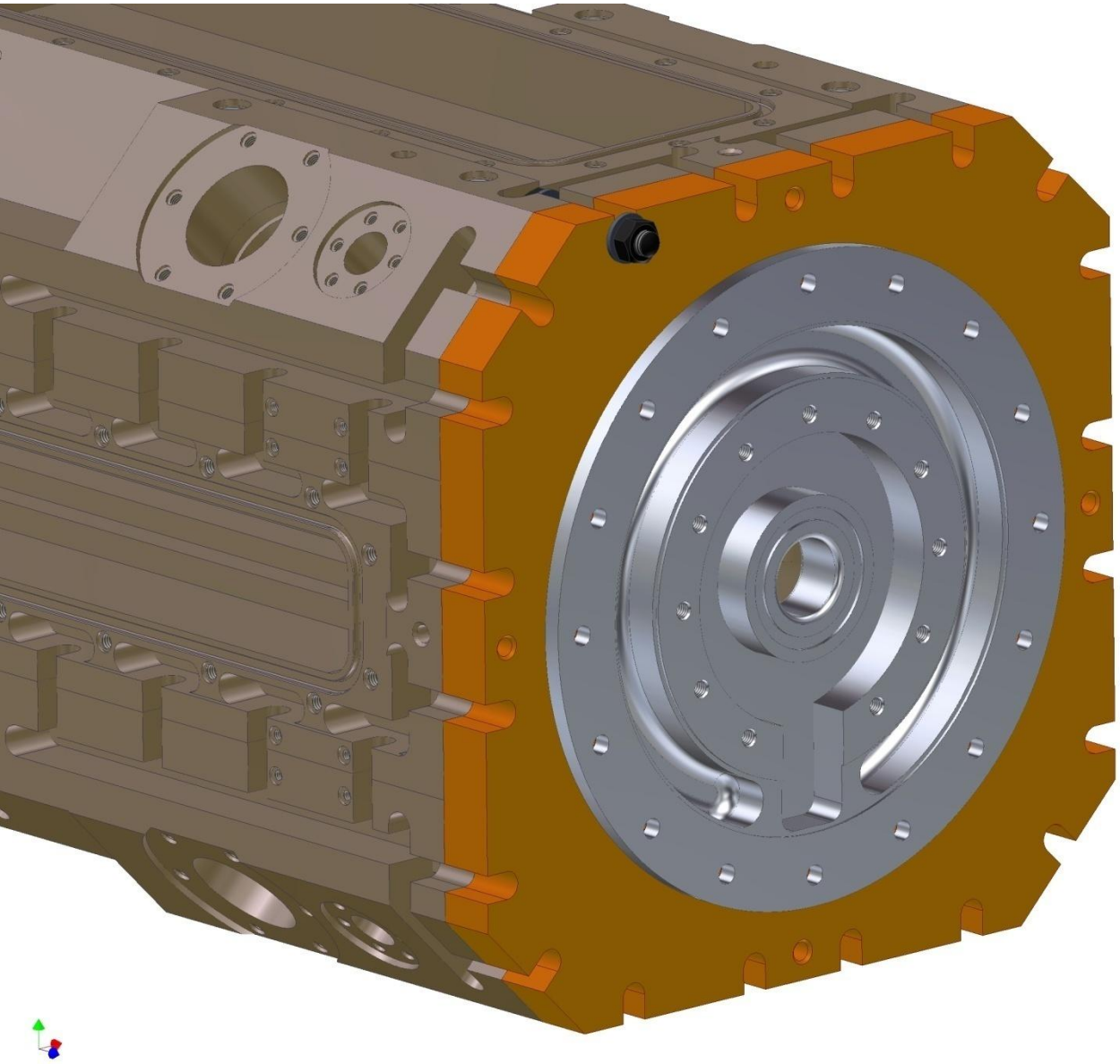
Align using dowels and bolt up all round using 20 M8 x 50 bolts.

Chamfer for O ring seal

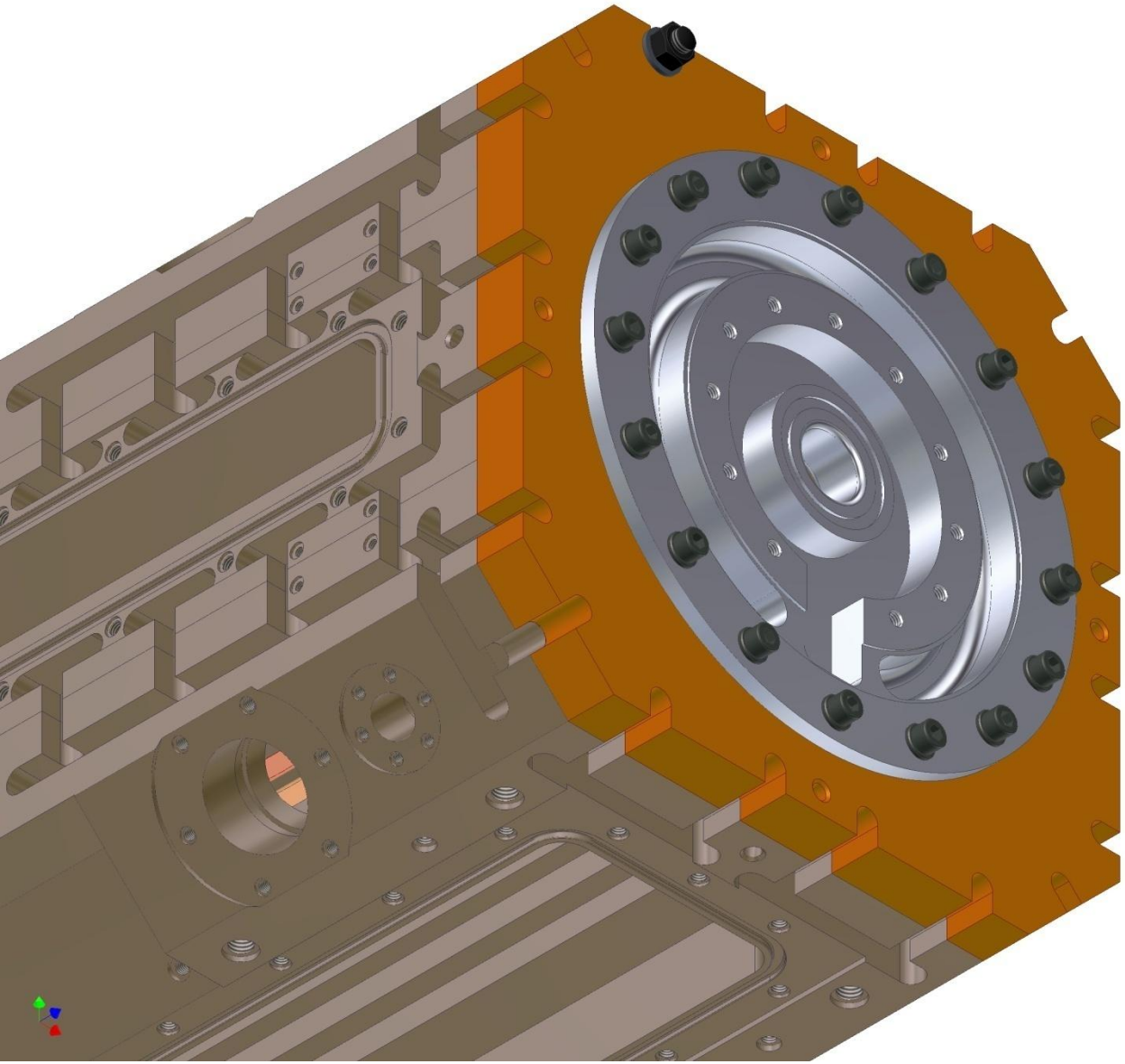
Finger strip groove



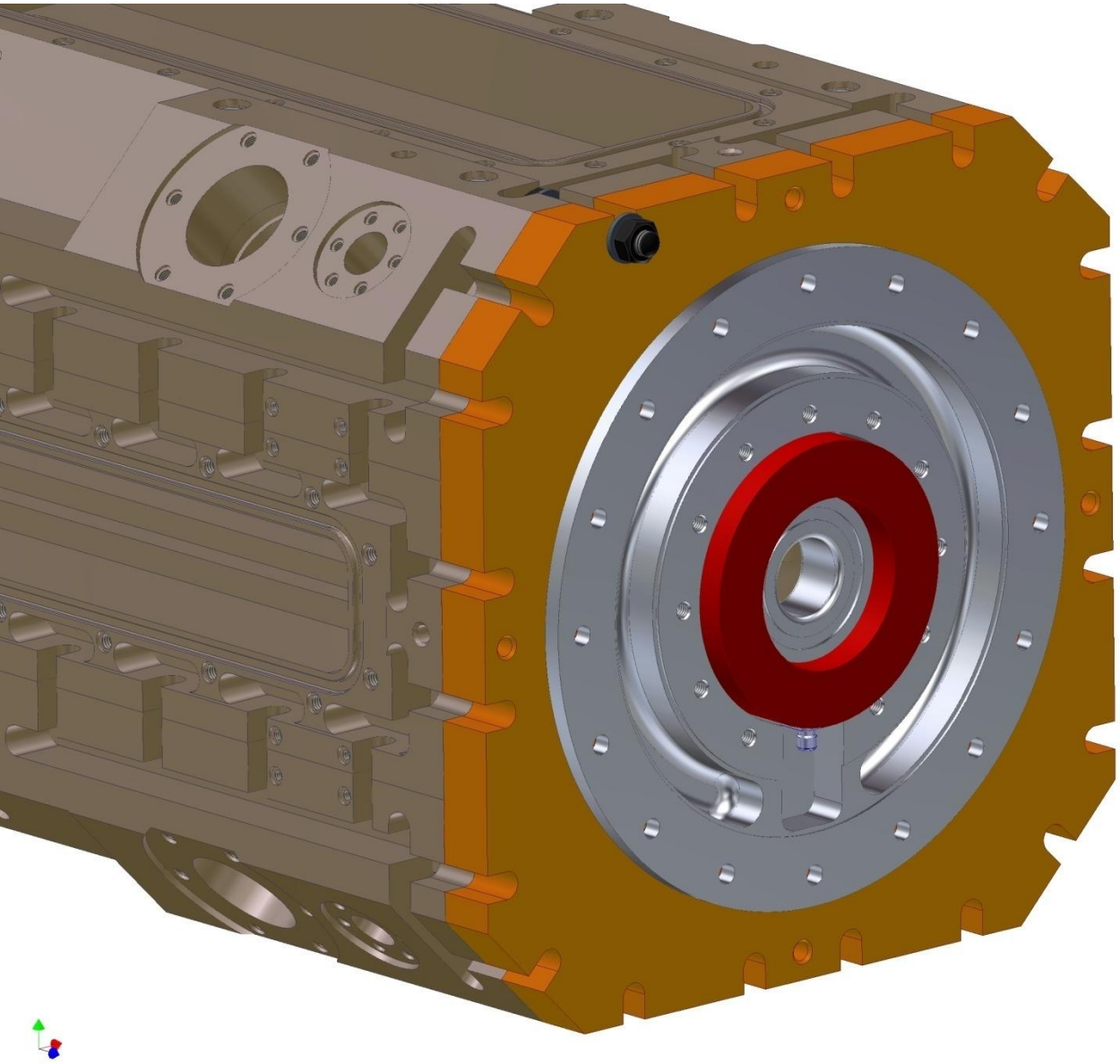
O ring in place



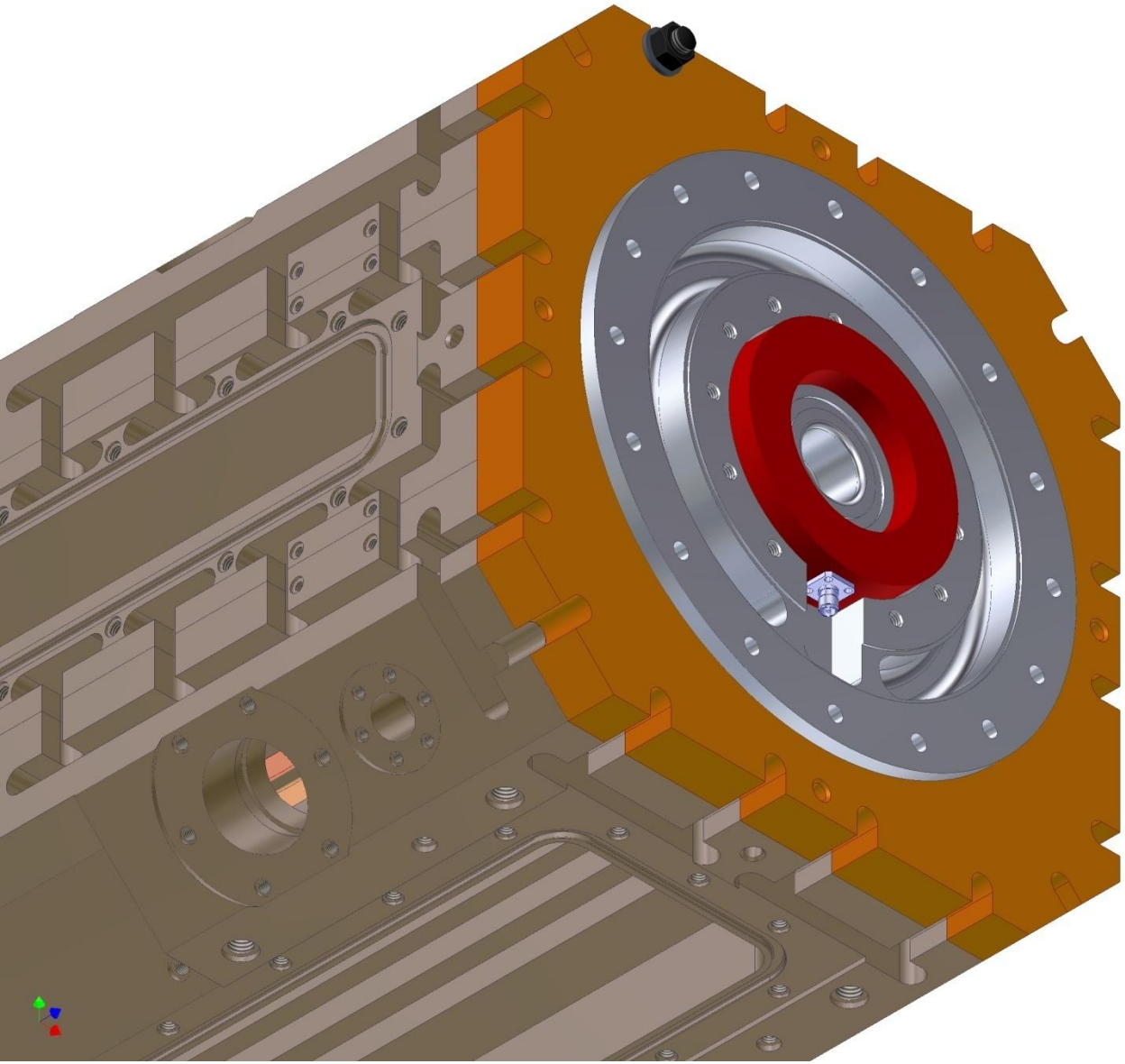
Insert showing inner circular groove for toroid and outer circular groove for cooling water.



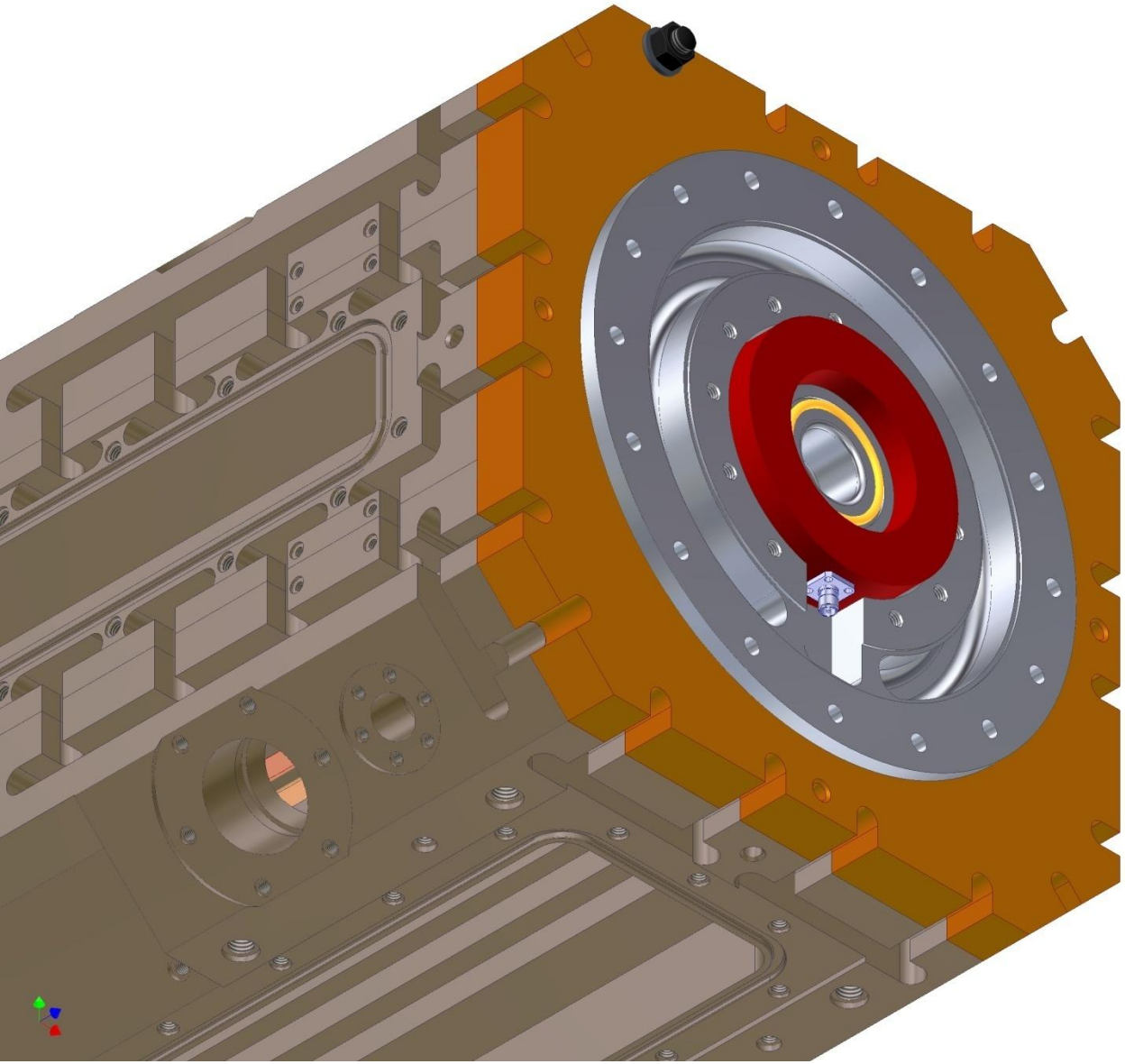
Secure insert with 16 M6 caphead bolts.



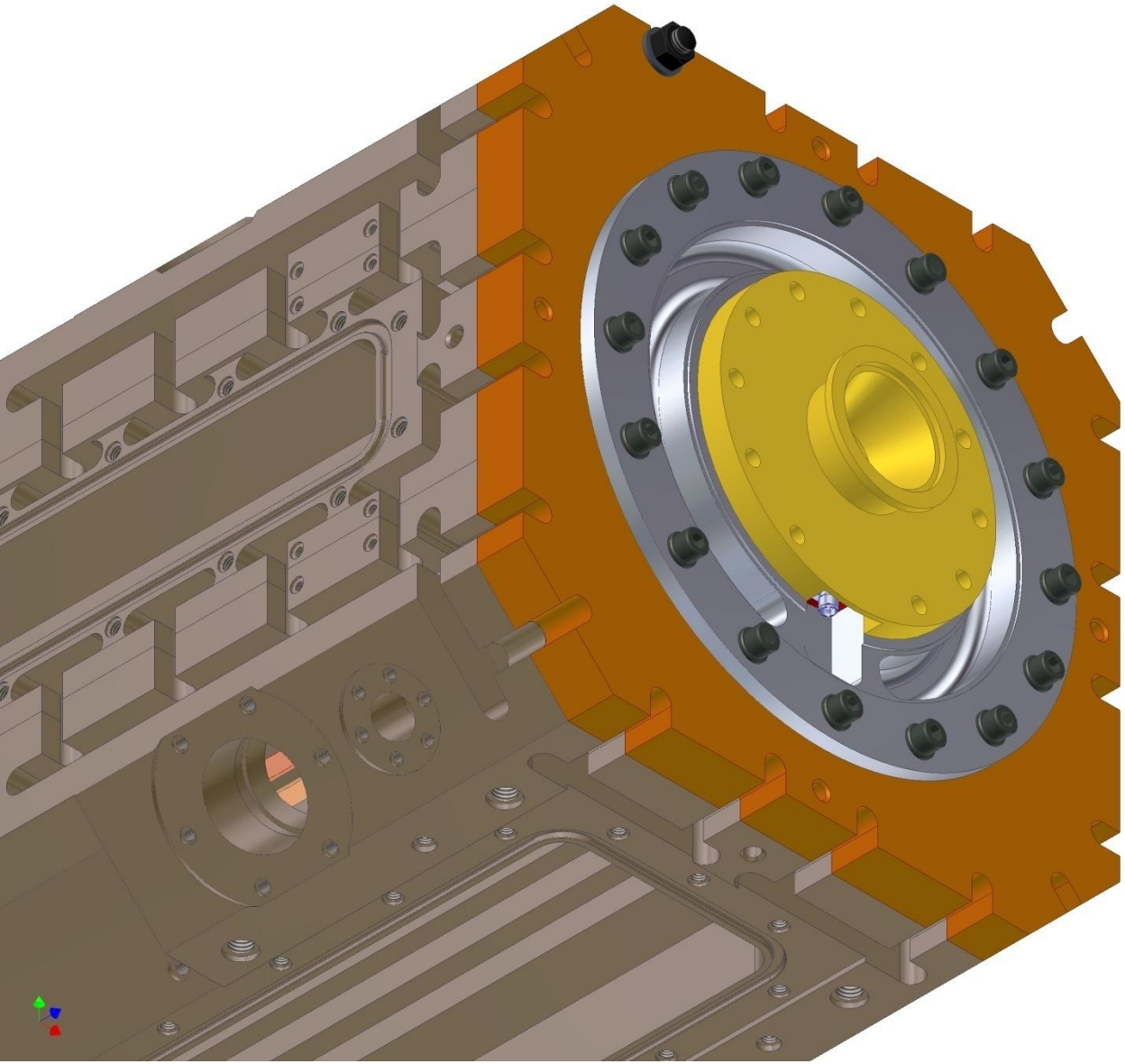
Toroid in place



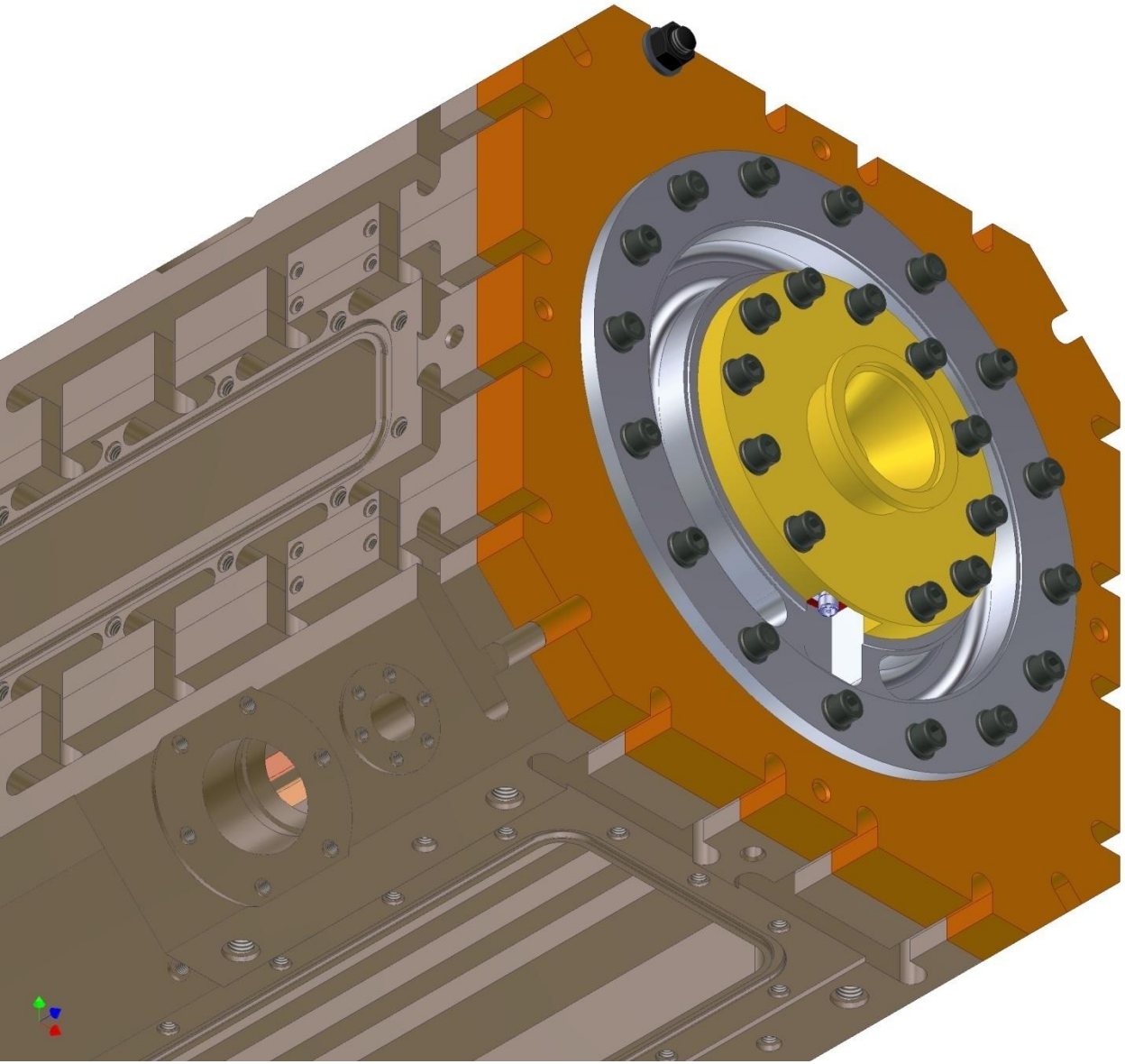
Toroid showing SMA connection.



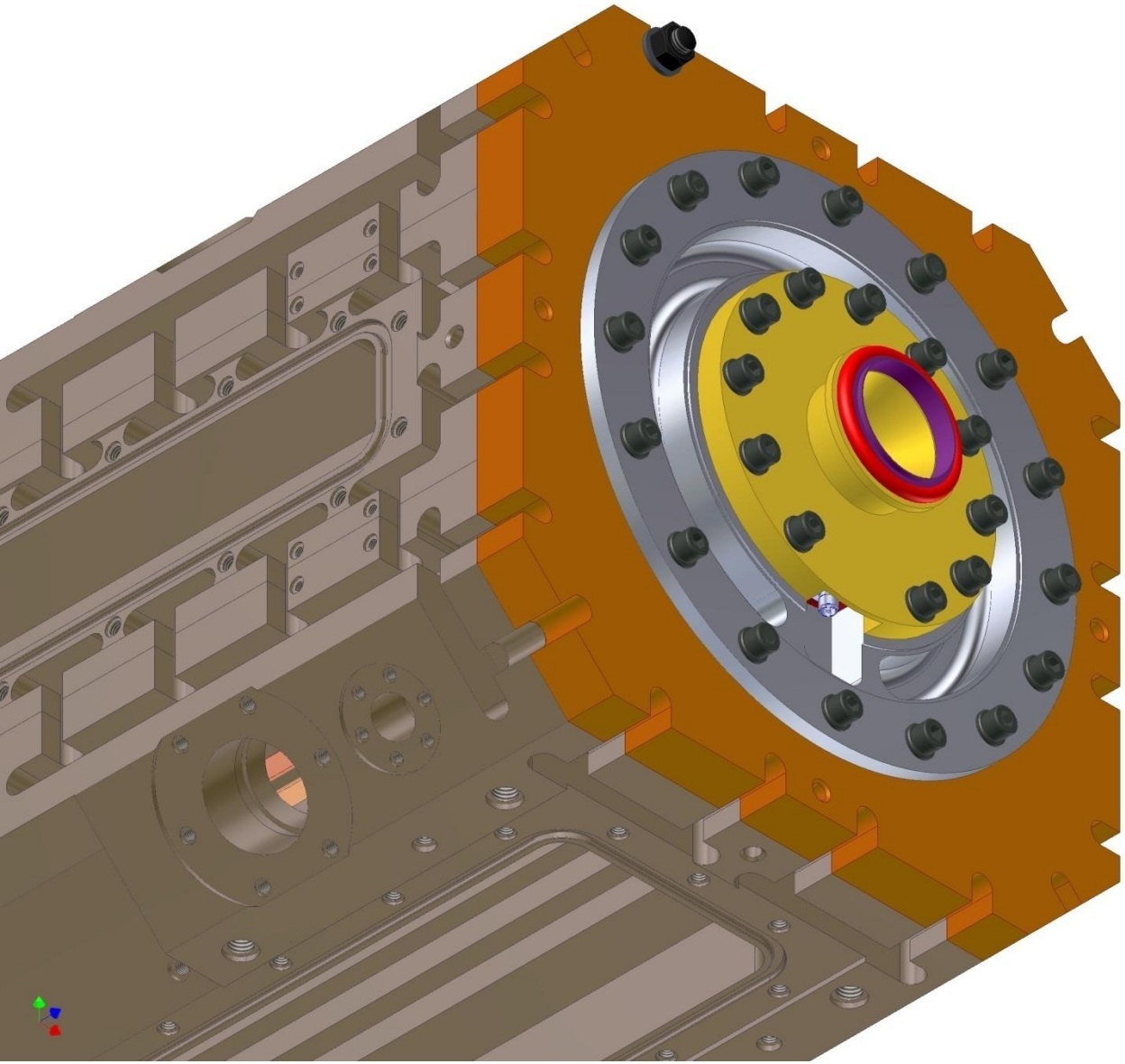
Centre O ring in place. Toroid cover will clamp against O ring seal.



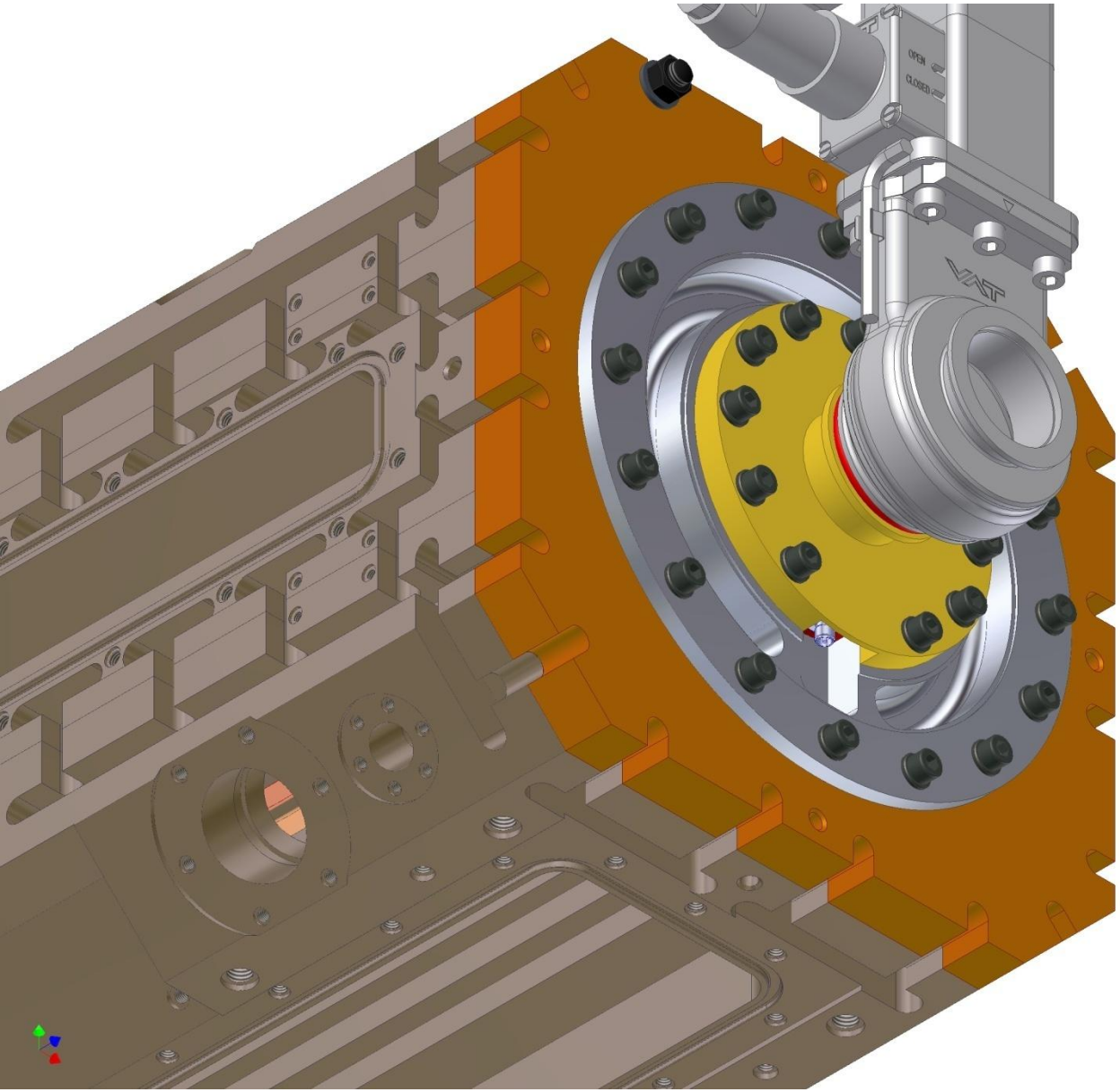
Toroid cover in place.



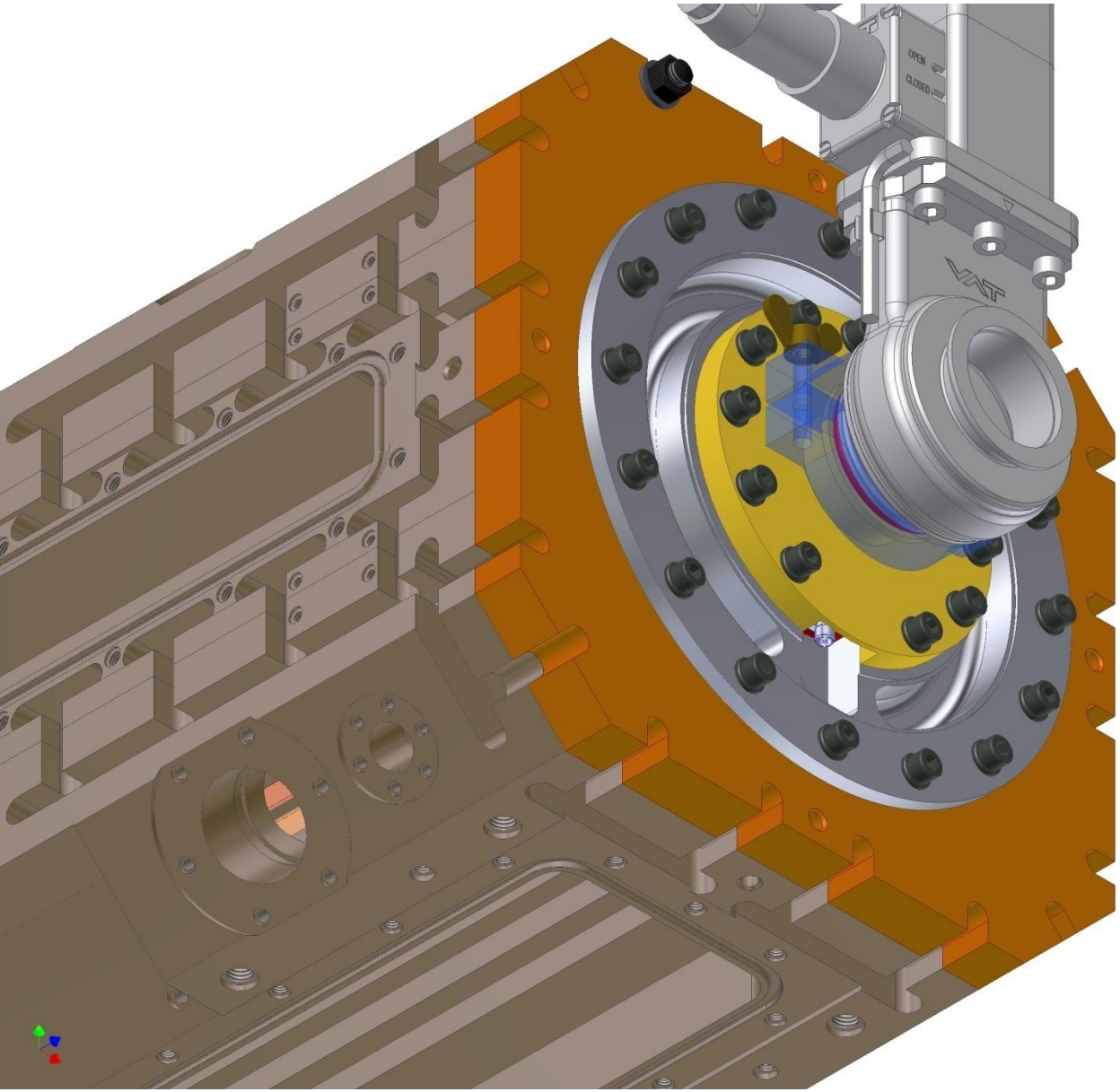
Toroid cover secured with 11 M6 caphead bolts.



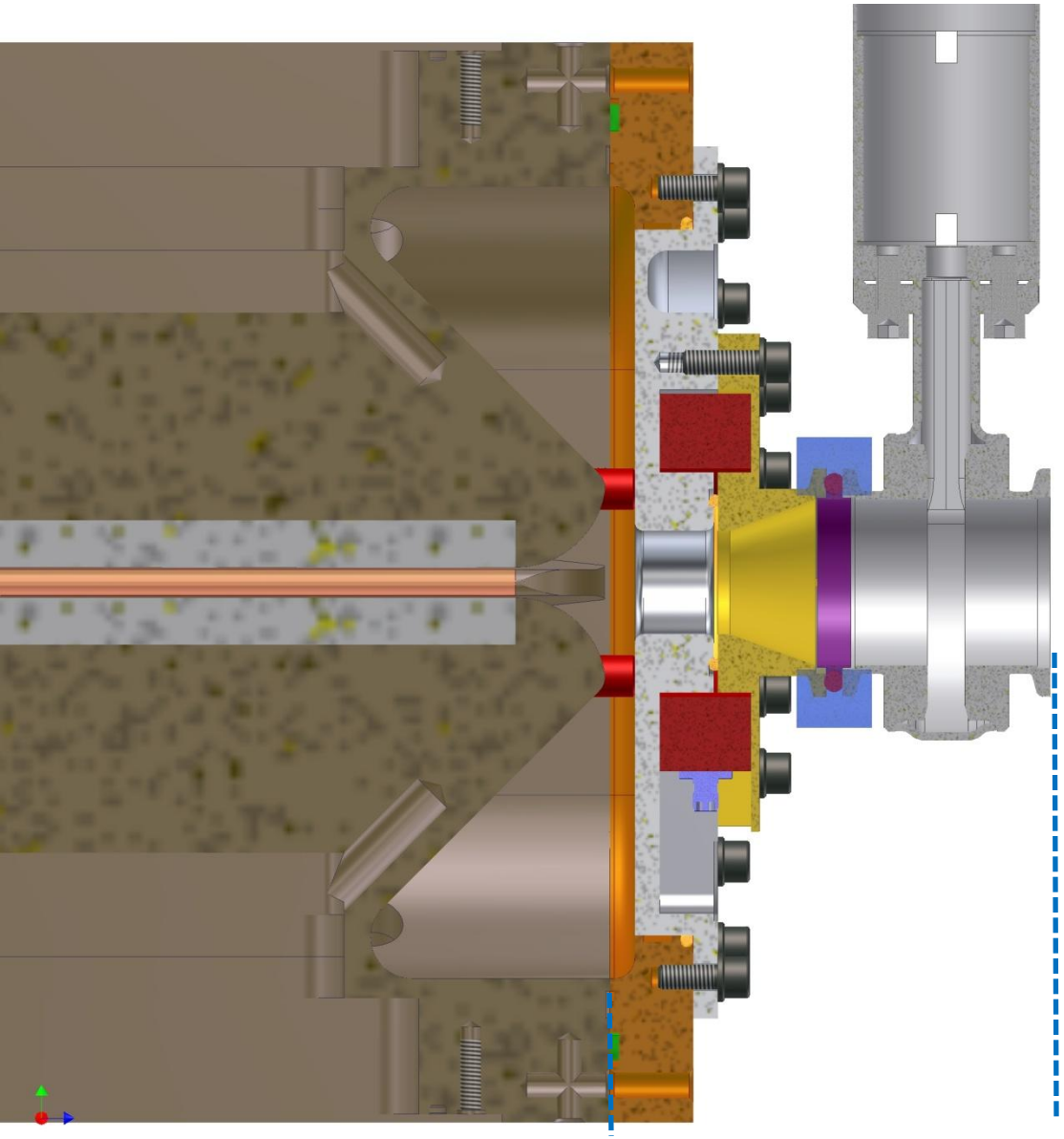
DN40KF centring ring with O ring in place.



VAT valve in position.

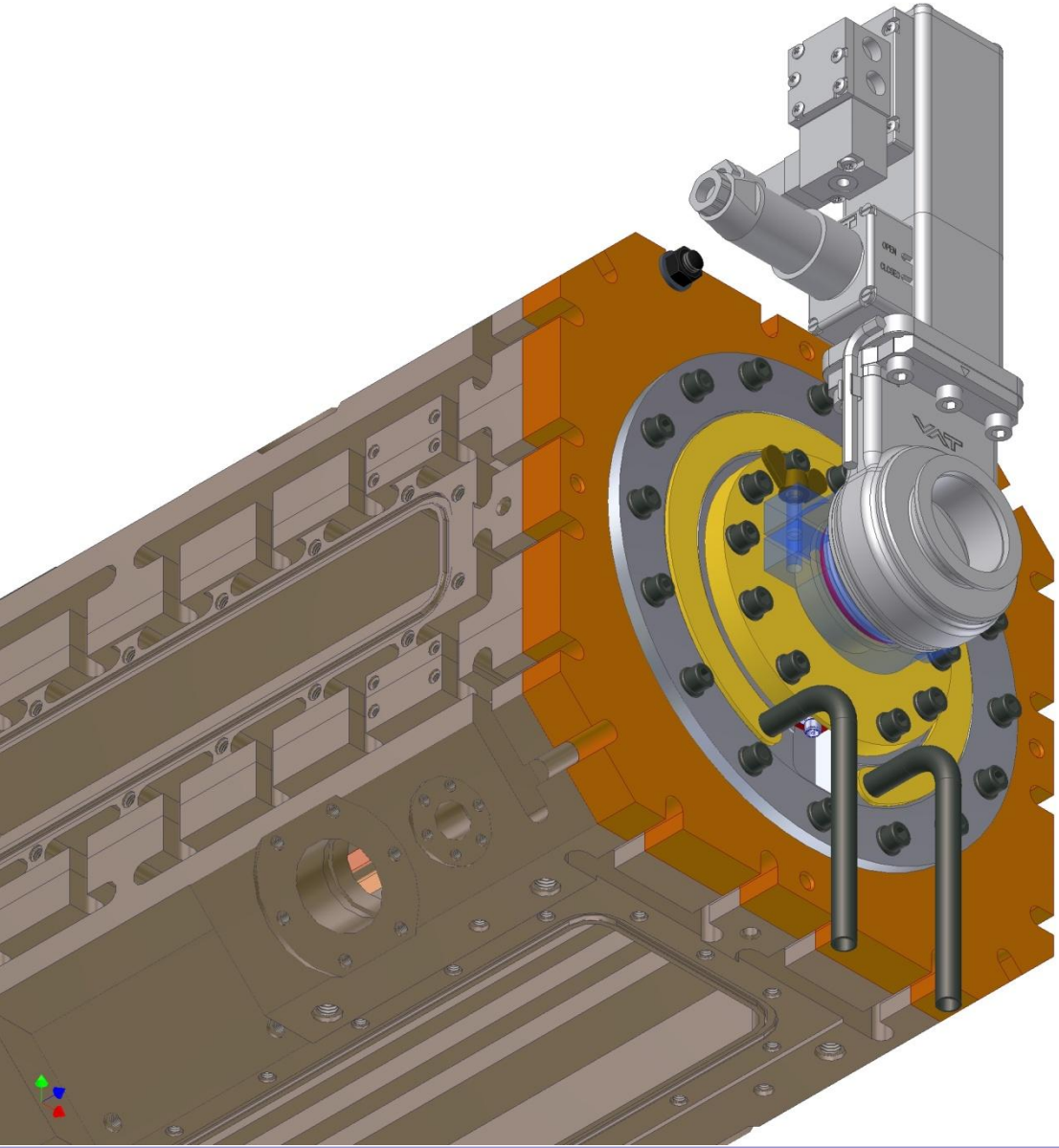


VAT valve with DN50KF clamp.

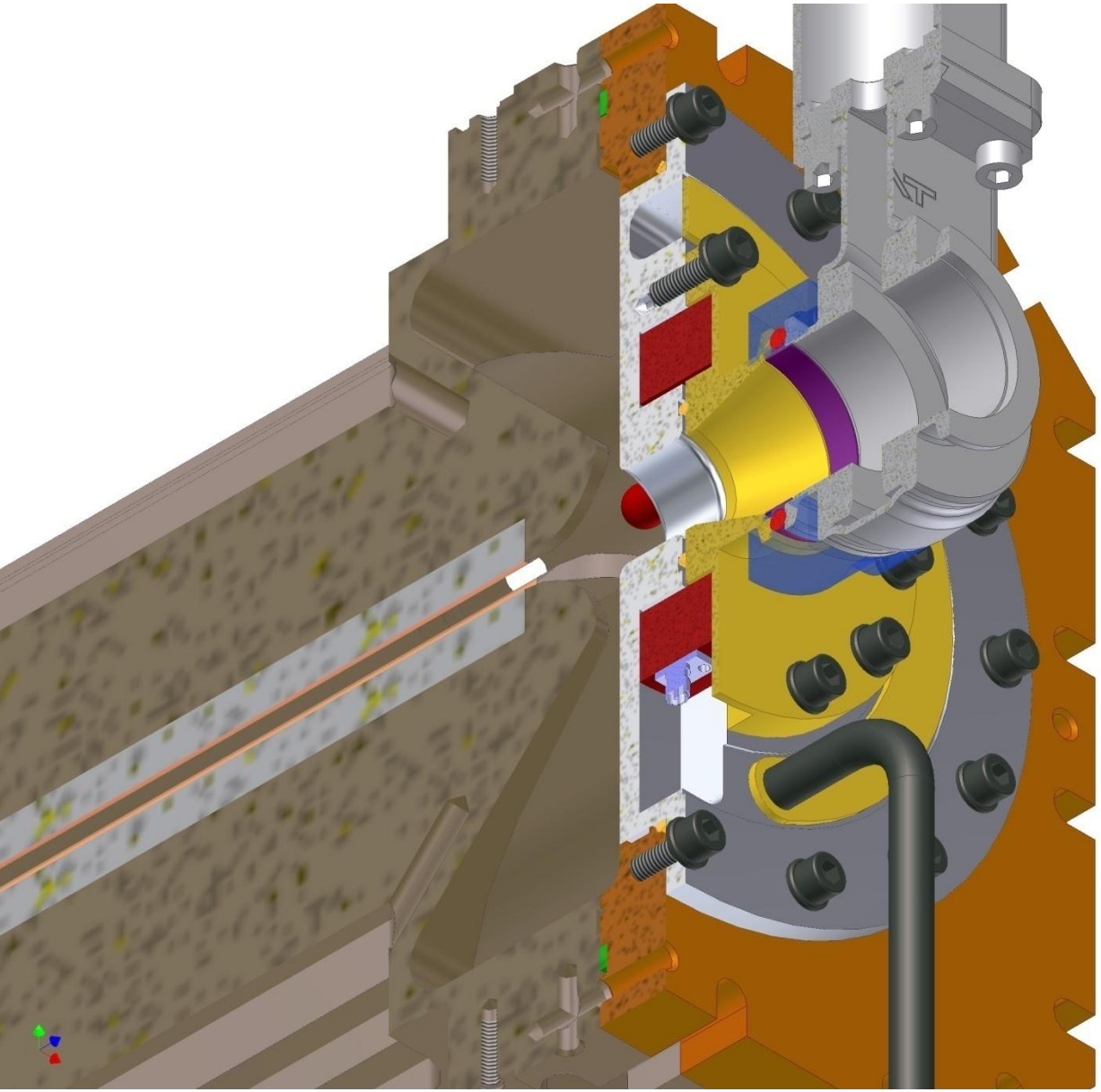


Side section view.

Distance from RFQ end face to end face of valve has been reduced from 120,9 mm (input end) to 106 mm.



Cooling channel cover will be vacuum brazed or bonded in place.



I'm looking for feedback on this design.

Particularly with respect to the toroid cover – what are we shielding from – the first quad?

What's missing from this design is a bellows which could potentially sit further down the MEBT line.

END