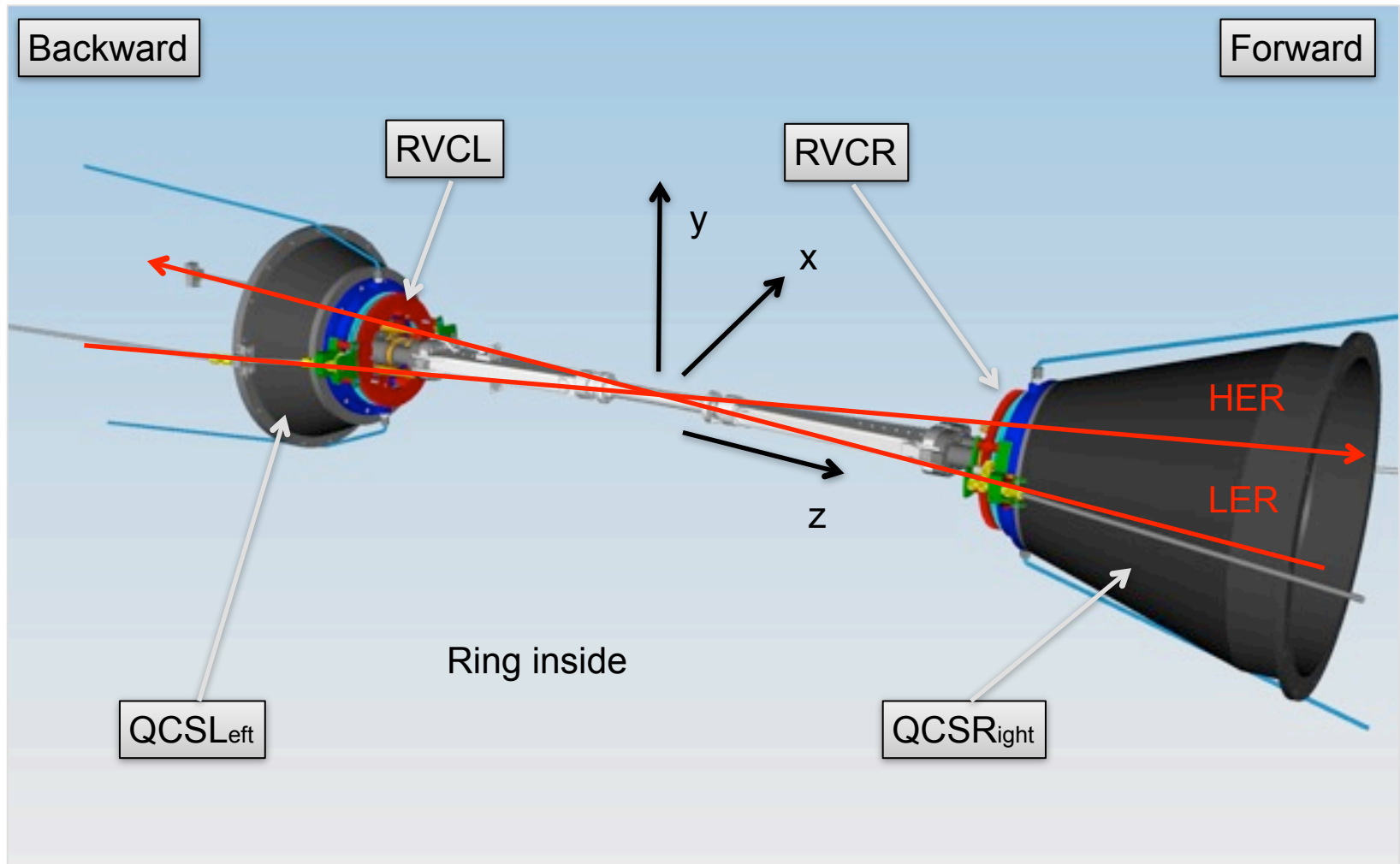


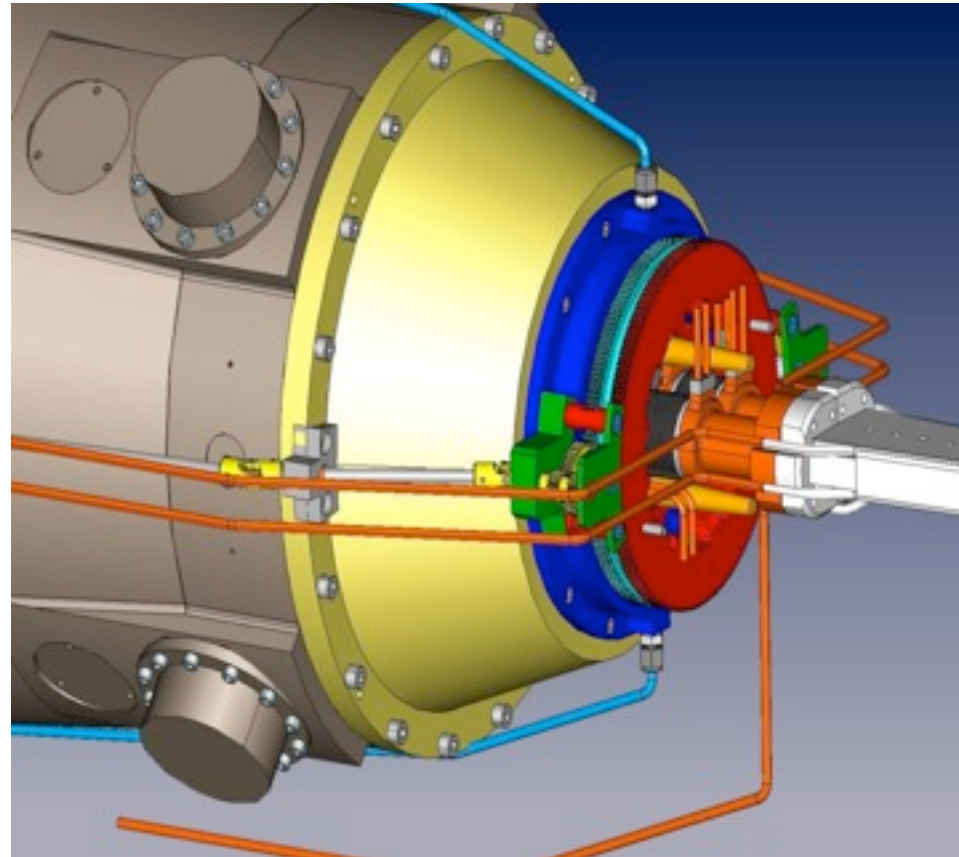
Status of RVC

C.Niebuhr for K.Gadow

Overview

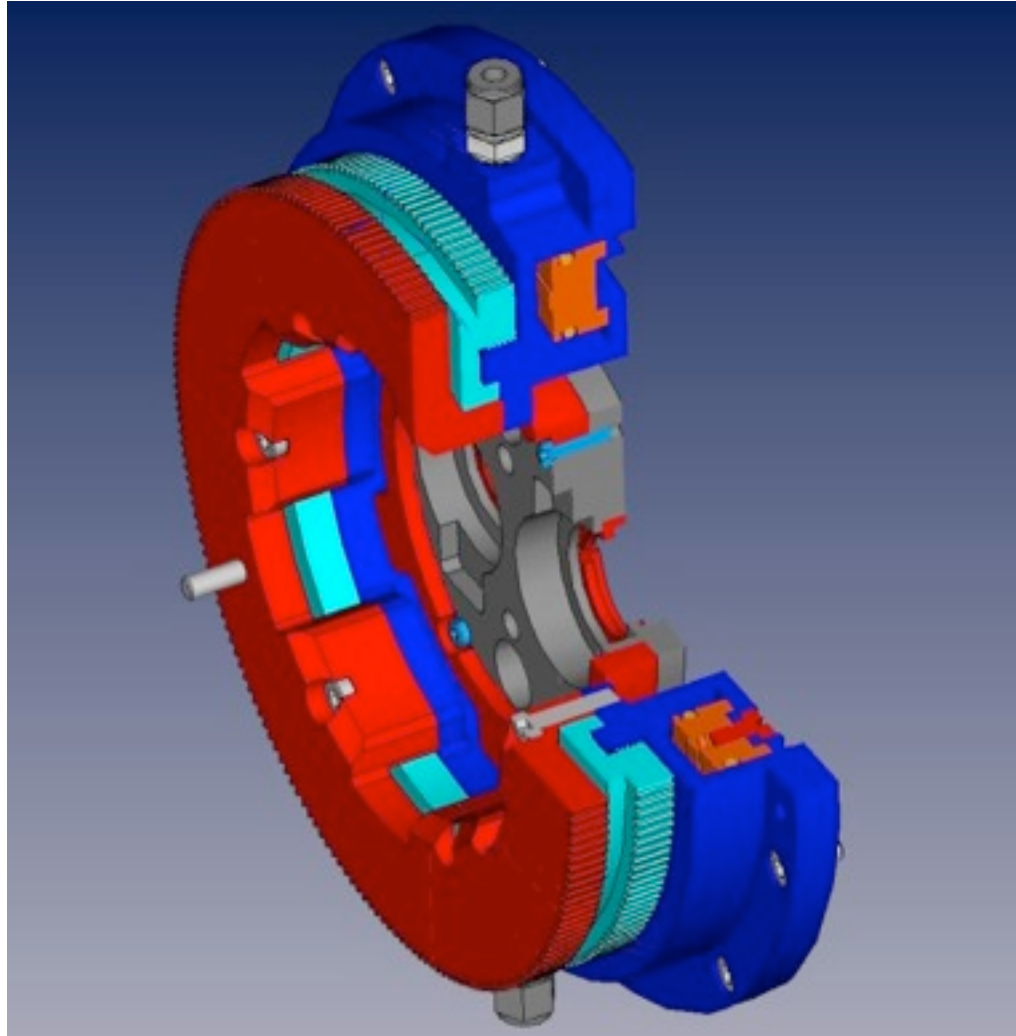


RVC Design



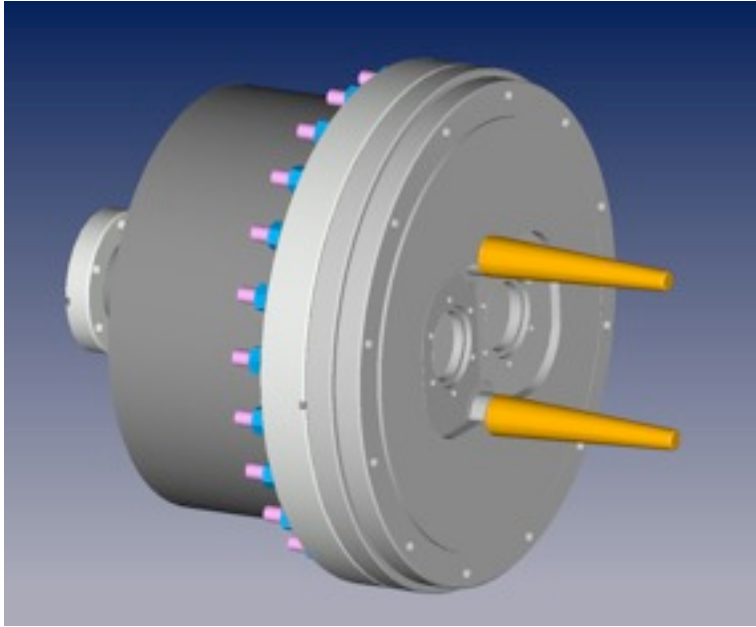
- Final pipe routing still to be optimized

RVC Production

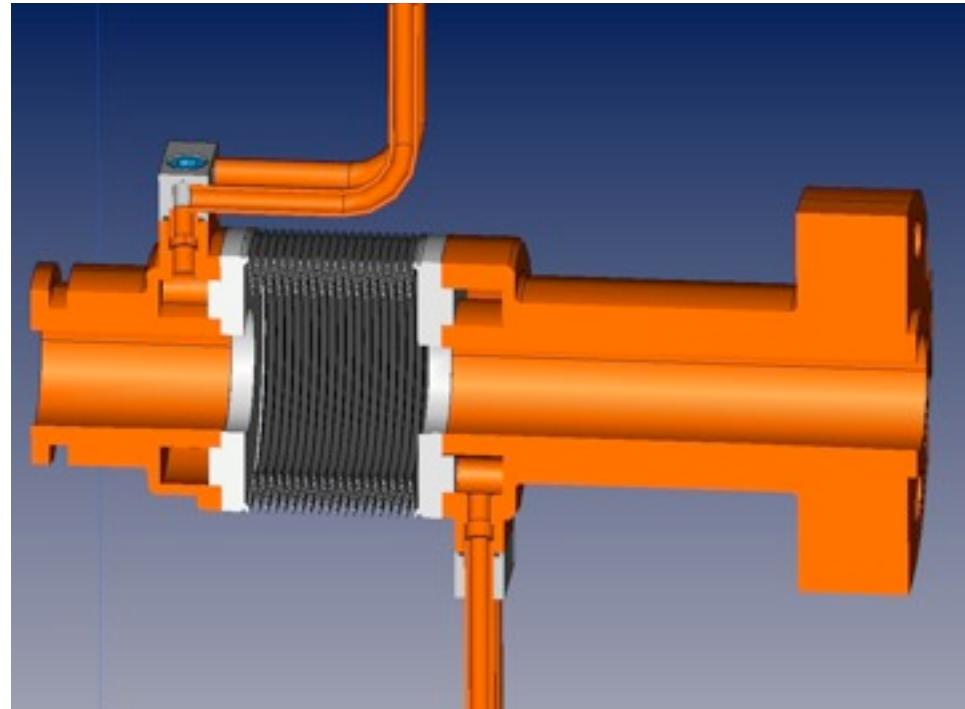
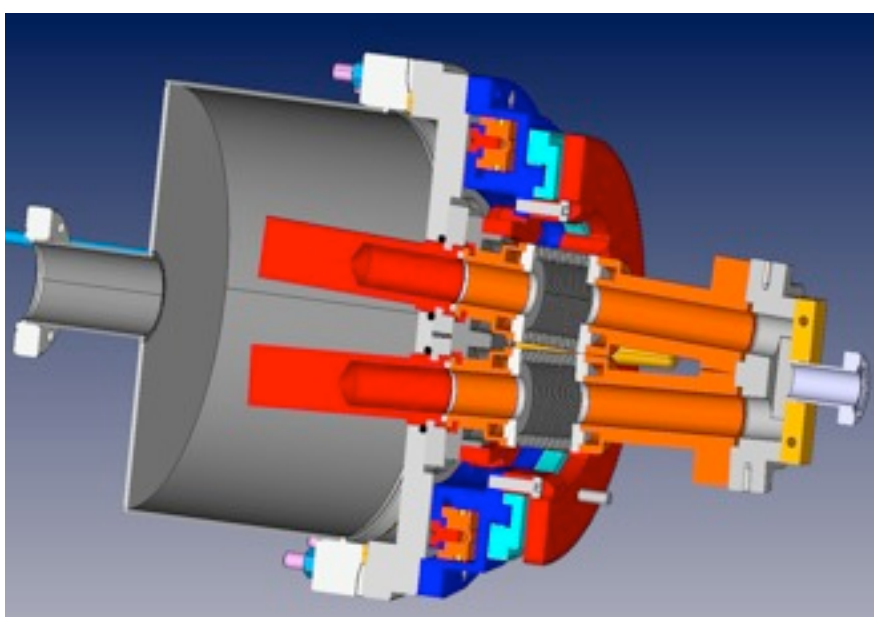


- The RVC forward and backward housings are under production and will be delivered end of September

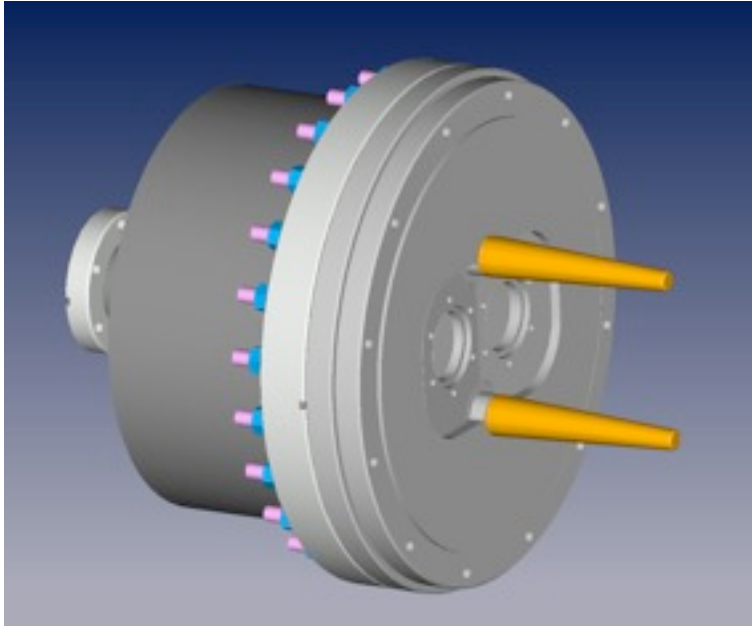
RVC Test Set-up at DESY



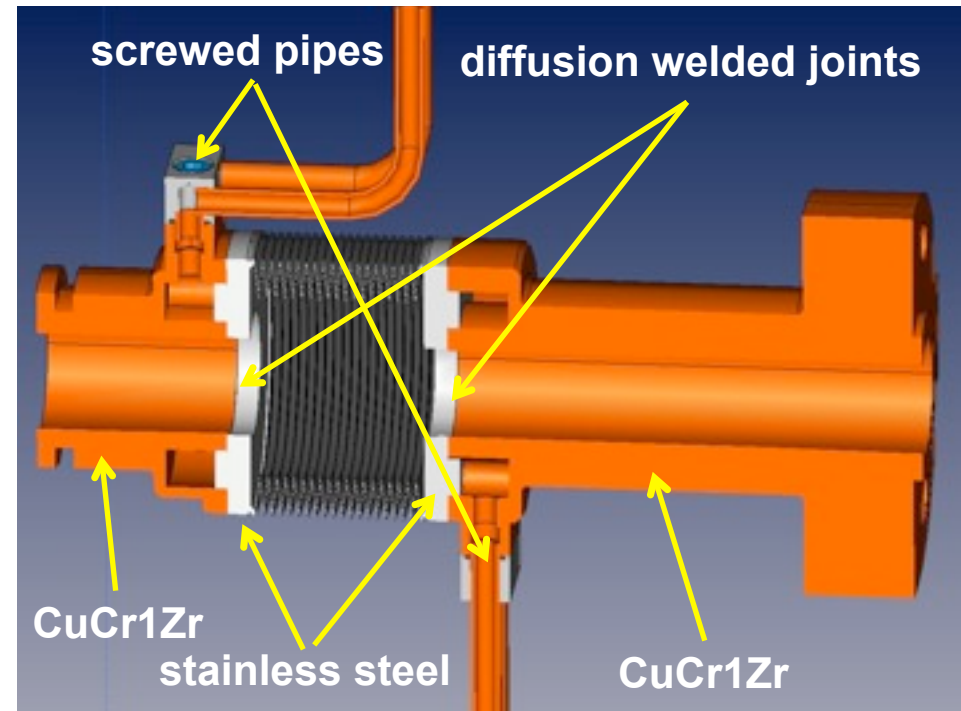
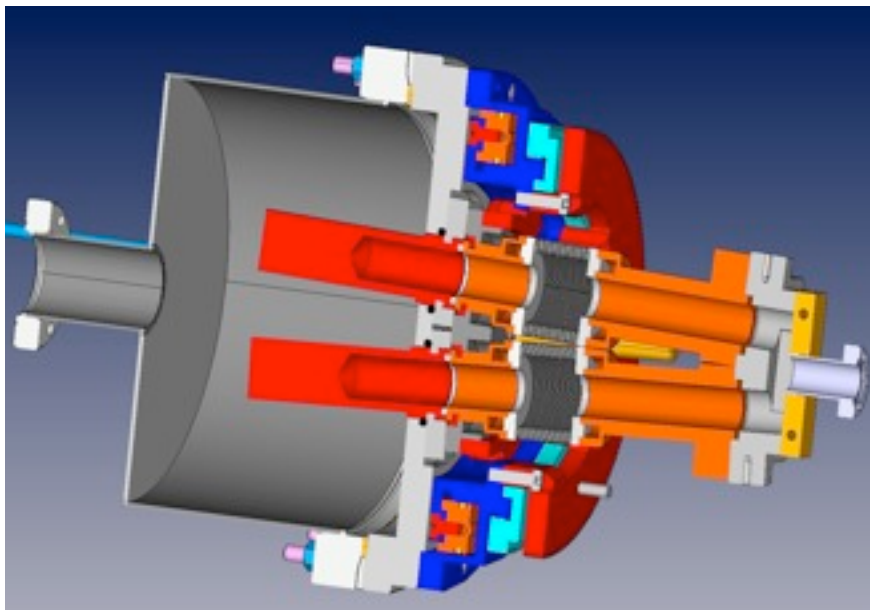
- QCS vacuum vessel flange (SS)
- QCS pipes (SS)
- QCS beam pipe flange (SS)
- Bellows pipe (CuCr1Zr)
 - updated design



RVC Test Set-up at DESY



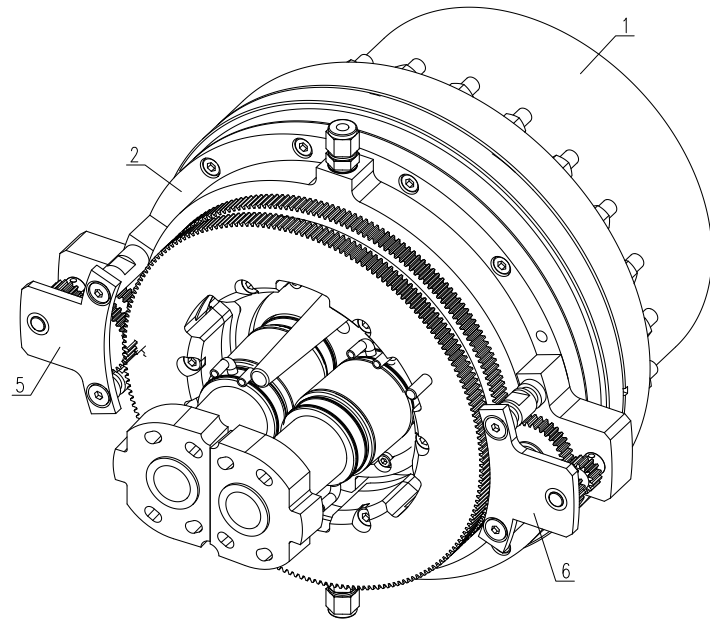
- QCS vacuum vessel flange (SS)
- QCS pipes (SS)
- QCS beam pipe flange (SS)
- Bellows pipe (CuCr1Zr)
 - updated design



Other Mock-up parts for Lab-Test at DESY

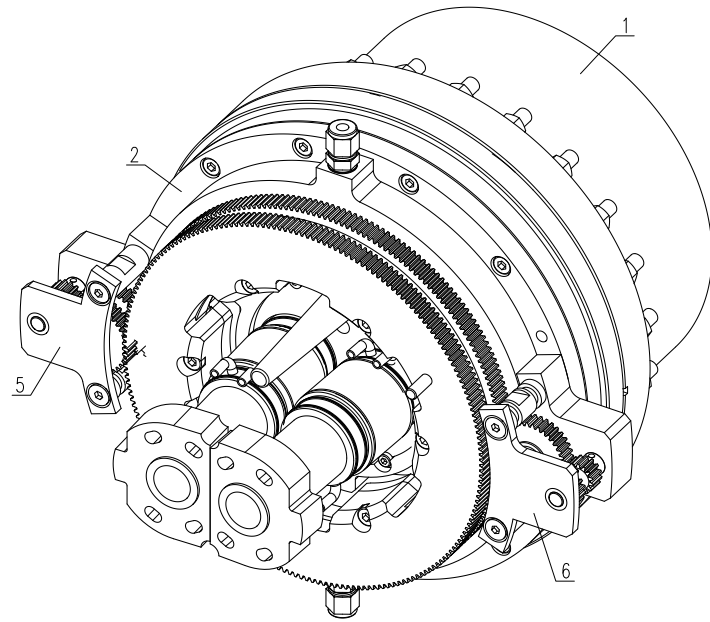
● QCS vacuum vessel flange (stainless steel)	<i>production ongoing ready KW38</i>
● QCS pipes (stainless steel)	<i>ready</i>
● QCS beam pipe flange (stainless steel)	<i>ready</i>
● Diffusion welding between stainless steel and CuCr1Zr for bellow beam pipe	<i>ongoing ready KW 40</i>
● Stainless steel weld bellows	<i>delivered (5 pieces)</i>
● No RF-bridge	<i>ok</i>
● No BPM	<i>ok</i>
● Cooling channel with real dimension	<i>done</i>
● Stainless steel cover removed	<i>ok?</i>
● New cooling tube connection	<i>done</i>
● Stainless steel cooling tube	<i>ok</i>
● Helicoflex Delta seal	<i>delivered (32 pieces)</i>
● Rubber seal between the QCS vacuum vessel flange and the QCS pipe (Viton)	<i>delivered (10 pieces)</i>

Some RVC Parts / Lab-Equipment



- Components being ordered or in the workshop
 - all parts ready beginning of September

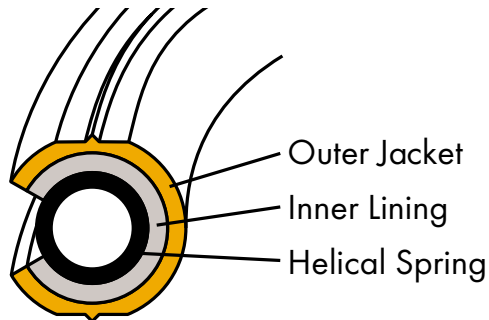
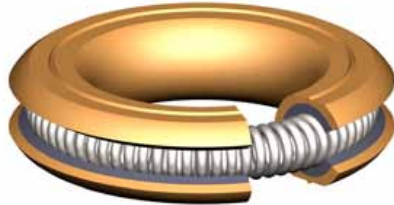
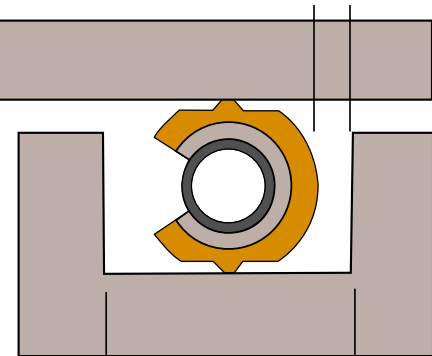
Some RVC Parts / Lab-Equipment



- Components being ordered or in the workshop
 - all parts ready beginning of September

Helicoflex Delta Seals

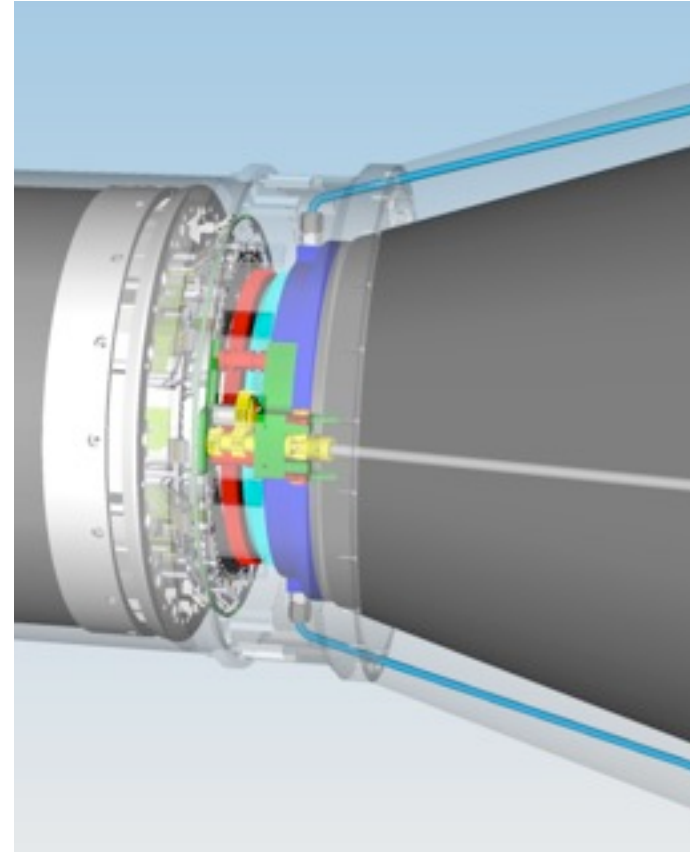
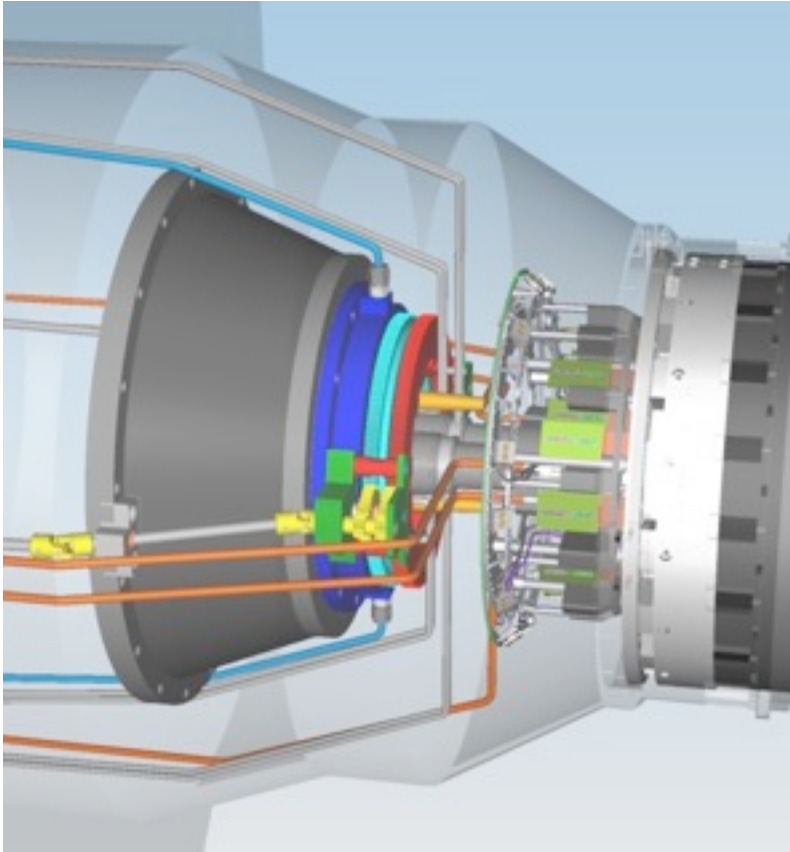
softening temperature
electr. conductivity
hardness



No.	表示	公称成分値 %	形状 mm	硬さ HV (30 kg) min	電気 伝導度 S/m min	軟化 特性温度 ℃min
1	Cu-ETP	Cu (+Ag) min.99.90	引抜き25以上	85	56	150
			引抜き25未満	90	56	
			鍛造	50	56	
			鋳造	40	50	
2	CuCd1	Cd 0.7 ~ 1.3	引抜き25以上	90	45	250
			引抜き25未満	95	43	
			鍛造	90	45	
1	CuCr1	Cr 0.3 ~ 1.2	引抜き25以上	125	43	475
			引抜き25未満	140	43	
			鍛造	100	43	
			鋳造	85	43	
2	CuCr1Zr	Cr 0.5 ~ 1.4 Zr 0.02 ~ 0.2	引抜き25以上	130	43	500
			引抜き25未満	140	43	
			鍛造	100	43	
3	CuCrZr	Cr 0.4 ~ 1.0 Zr 0.02 ~ 0.15	熱処理	160	43	500
4	CuZr	Zr 0.11 ~ 0.25	研磨材45未満	160	43	500
			熱処理 研磨材30未満	130 130	47 47	

- 32 pieces ordered
 - 110€ per piece
- Impact on CuCr1Zr surface needs to be checked

Open Issues



- Final dimensions of driving systems
- Integration of Emergency Deinstallation (EDI) hooks
- Pipe routing
- Mechanical stiffness of membrane bellows

Summary

- RVCs will be mounted into the test setups beginning of October
- Detailed mechanical tests will start in November
- Vacuum tests will be performed in December
- Detailed documentation will be provided to the 23rd B2GM

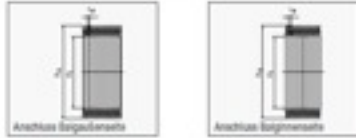
Stainless Steel Membrane Bellows in use at DESY

6.7 | HYDRA-Membranbälge Schmalprofil
Vorzugsreihe

HYDRA

6.7 | HYDRA-Membranbälge Schmalprofil
Vorzugsreihe

HYDRA



Bezugs- durch- messer	Nenn- druck P _N **	Baigprofil				Werkstoff	Länge je Membran- paar l _M	max. Anzahl Membran- paare*	D-Toleranzen		Nennauslenkung je Welle (für 10.000 Lastspiele)			Federrate je Welle (± 30%)			wirts. Querschnitt A	Gewicht je Membran- paar
		d ₁	d ₂	n ₁	s				d ₁	d ₂	axial 2h _{0,5}	angular 2h _{0,5}	lateral 2h _{0,5}	axial c ₁	angular c ₂	lateral c ₃		
mm	bar	mm	mm	-	mm	-	mm	-	mm	mm	mm	Grad	mm	N/mm	Nm/Grad	mm	cm ²	g
12	8,0	12,8 x 20,8 x 1 x 0,10	1.4571	1,0	145	±0,3	±0,3				0,60 ± + 0,10 / - 0,40	±0,72	±0,0021	200	0,11	78000	2,1	0,42
	12,0	12,8 x 20,8 x 1 x 0,15	1.4571	1,0	145	±0,3	±0,3				0,60 ± + 0,08 / - 0,32	±0,57	±0,0017	500	0,28	192000	2,1	0,63
17	3,5	17,0 x 31,8 x 1 x 0,10	1.4571	1,5	95	±0,3	±0,3				0,90 ± + 0,18 / - 0,72	±0,86	±0,0038	100	0,13	38400	4,85	0,84
	6,0	17,0 x 31,8 x 1 x 0,15	1.4571	1,5	95	±0,3	±0,3				0,90 ± + 0,16 / - 0,64	±0,76	±0,0033	100	0,24	72900	4,85	1,27
25	8,0	25,5 x 36,5 x 1 x 0,10	1.4571	1,2	230	±0,3	±0,3				0,80 ± + 0,12 / - 0,48	±0,44	±0,0016	105	0,22	105000	3,6	0,85
	12,0	25,5 x 36,5 x 1 x 0,15	1.4571	1,2	230	±0,3	±0,3				0,80 ± + 0,10 / - 0,40	±0,37	±0,0013	280	0,59	280000	3,6	1,27
29	6,0	29,5 x 42,5 x 1 x 0,10	1.4571	1,4	200	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,45	±0,0018	710	0,31	109000	10,3	1,16
	9,0	29,5 x 42,5 x 1 x 0,15	1.4571	1,4	200	±0,3	±0,3				0,80 ± + 0,12 / - 0,48	±0,38	±0,0016	265	0,75	243000	10,3	1,34
34	6,0	33,5 x 46,5 x 1 x 0,10	1.4571	1,4	200	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,40	±0,0016	105	0,37	129000	12,7	1,29
	9,0	33,5 x 46,5 x 1 x 0,15	1.4571	1,5	185	±0,3	±0,3				0,80 ± + 0,12 / - 0,48	±0,34	±0,0016	247	0,86	243000	12,7	1,84
	6,0	34,5 x 47,5 x 1 x 0,10	1.4571	1,3	215	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,39	±0,0016	100	0,27	148000	13,3	1,32
	9,0	34,5 x 47,5 x 1 x 0,15	1.4571	1,4	200	±0,3	±0,3				0,80 ± + 0,12 / - 0,48	±0,34	±0,0014	250	0,82	322000	13,3	1,98
36	4,0	36,0 x 53,0 x 1 x 0,10	1.4571	1,9	145	±0,3	±0,3				0,80 ± + 0,16 / - 0,64	±0,47	±0,0023	70	0,30	57000	15,6	1,88
	6,0	36,0 x 53,0 x 1 x 0,15	1.4571	1,9	145	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,38	±0,0020	150	0,85	123000	15,6	2,82
37	6,0	37,0 x 50,0 x 1 x 0,10	1.4571	1,5	185	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,37	±0,0016	103	0,43	130000	15,0	1,40
	9,0	37,0 x 50,0 x 1 x 0,15	1.4571	1,5	185	±0,3	±0,3				0,80 ± + 0,12 / - 0,48	±0,32	±0,0014	210	1,28	301000	15,0	2,71
39	6,0	39,5 x 52,5 x 1 x 0,10	1.4571	1,5	185	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,35	±0,0016	97	0,45	110000	16,7	1,48
	9,0	39,5 x 52,5 x 1 x 0,15	1.4571	1,5	185	±0,3	±0,3				0,80 ± + 0,12 / - 0,48	±0,30	±0,0013	300	1,38	423000	16,7	2,23
42	6,0	42,5 x 55,5 x 1 x 0,10	1.4571	1,5	185	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,33	±0,0014	92	0,48	147000	19,0	1,58
	9,0	42,5 x 55,5 x 1 x 0,15	1.4571	1,5	185	±0,3	±0,3				0,80 ± + 0,12 / - 0,48	±0,28	±0,0012	210	1,62	487000	19,0	2,37
44	6,0	44,5 x 57,5 x 1 x 0,10	1.4571	1,5	185	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,31	±0,0014	100	0,57	179000	20,5	1,85
	9,0	44,5 x 57,5 x 1 x 0,15	1.4571	1,6	175	±0,3	±0,3				0,80 ± + 0,12 / - 0,48	±0,27	±0,0013	250	1,42	381000	20,5	2,47

* für Anschluszlängen > 25 mm, bei längeren Anschluszlängen verringert sich die maximale Membranpaarzahl
** Außendruck, bei Innendruckbelastung muss zusätzlich die Stützfähigkeit (Knickstabilität) gewährleistet sein

140

147

Bezugs- durch- messer	Nenn- druck P _N **	Baigprofil				Werkstoff	Länge je Membran- paar l _M	max. Anzahl Membran- paare*	D-Toleranzen		Nennauslenkung je Welle (für 10.000 Lastspiele)			Federrate je Welle (± 30%)			wirts. Querschnitt A	Gewicht je Membran- paar
		d ₁	d ₂	n ₁	s				d ₁	d ₂	axial 2h _{0,5}	angular 2h _{0,5}	lateral 2h _{0,5}	axial c ₁	angular c ₂	lateral c ₃		
mm	bar	mm	mm	-	mm	-	mm	-	mm	mm	mm	Grad	mm	N/mm	Nm/Grad	N/mm	cm ²	g
34	6,0	33,5 x 46,5 x 1 x 0,10	1.4571	1,4	200	±0,3	±0,3				0,70 ± + 0,14 / - 0,56	±0,40	±0,0016	105	0,37	129000	12,7	1,29

27 mm / 1,4 mm per profile ~ 20 profiles

5 mm ?

1 mm ?

645 N/mm?

