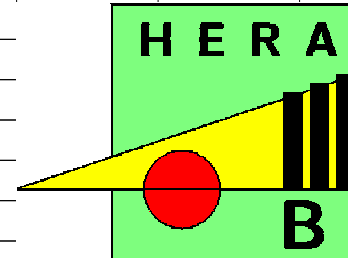


Dimensions of Al proton beam-pipe '96 and '97

The beam-pipe for the '96 and '97 run includes segments 1 - 15*.
 Segments 1 - 26 were the final pipe as planned in '96.
 Beam-pipe segments start at Z0, have a length of ΔZ , and inner diameter of Di.
 Wall thickness = **0.5 mm**, segments 25 + 26 have **2 mm**.
 Welding joints are positioned at Z0, width of joint = +-2.5 mm, outer diameter = Do.
 Stiffener rings are positioned at Z1,2,3..., width = +- 1.5 mm, outer diameter = Ds.



Seg.	Di	Do	Z0	ΔZ	# of rings	Ds	Z1	Z2	Z3	Z4	Z5	Z6	Weight(g)
1	38	41	1980	640									115
2	40	49	2620	432									84
3	45	56	3052	307									67
4	50	61	3359	584	1	58,0	3651						144
5	55	66	3943	532	1	63,4	4209						148
6	65	76	4475	420	1	74,2	4685						141
7	70	81	4895	398	1	79,8	5094						143
8	75	86	5293	542	2	85,0	5474	5654					239
9	85	96	5835	467	2	95,8	5991	6146					216
10	90	101	6302	437	2	101,2	6448	6593					225
11	95	106	6739	407	2	106,6	6875	7010					206
12	100	111	7146	522	3	112,0	7277	7407	7537				320
13	105	117	7668	482	3	117,4	7789	7909	8029				297
14	115	127	8150	442	3	128,0	8261	8371	8481				306
15*	120	132	8592	149	1	133,4	8698						212
													2863
												welding material:	+ 3%
													2949

15	120	132	8592	422	3	133,4	8698	8803	8908				
16	125	138	9014	502	4	138,6	9115	9215	9315	9415			
17	135	149	9516	467	4	149,2	9610	9703	9796	9889			
18	140	154	9983	447	4	154,6	10073	10162	10251	10340			
19	145	159	10430	437	4	160,0	10518	10605	10692	10779			
20	150	165	10867	500	5	165,2	10951	11034	11117	11200	11283		
21	160	175	11367	470	5	175,8	11446	11524	11602	11680	11758		
22	165	180	11837	534	6	181,2	11914	11990	12066	12142	12218	12294	
23	170	186	12371	513	6	186,4	12445	12518	12591	12664	12737	12810	
24	180	196	12884	485	6	197,0	12954	13023	13092	13161	13230	13299	
25	180	207	13369	600	0								
26	180	207	13969	600	0								

Support rings start at Z0, have a width of ΔZ , inner and outer diameter Di and Do

Support	Di	Do	Z0	ΔZ
1	56	76	4242	10
2	91	111	6600	10
3	116	166	8520	10
4	166	186	11810	10

Dimensions of Al back-up beam-pipe for '96 and '97

Back-up beam-pipe for '96 run includes segments 1 - 5.

Beam-pipe segments start at Z0, have a length of ΔZ , and inner diameter of Di.

Wall thickness = 2.0 mm

The 4 segments are connected by special flanges.

The Al-sealings have a length of 2 or 4 mm.

Seg.	Di	Do	Z0	ΔZ
1	38	42	1929	119
2	46	50	2052	1446
3	66	70	3502	1397
4	86	90	4901	1598
5	116	120	6501	2199

Support rings start at Z0, have a width of ΔZ , inner and outer diameter Di and Do

Support	Di	Do	Z0	ΔZ
1	70	130	3597	6
2	90	150	4997	6
4	120	180	6597	6