

CMS Phase 2 Beam Pipe Status update meeting

17th of February 2020

Josef Sestak On behalf of TE-VSC-BVO

CMS central chamber

Official acceptance – payment milestone

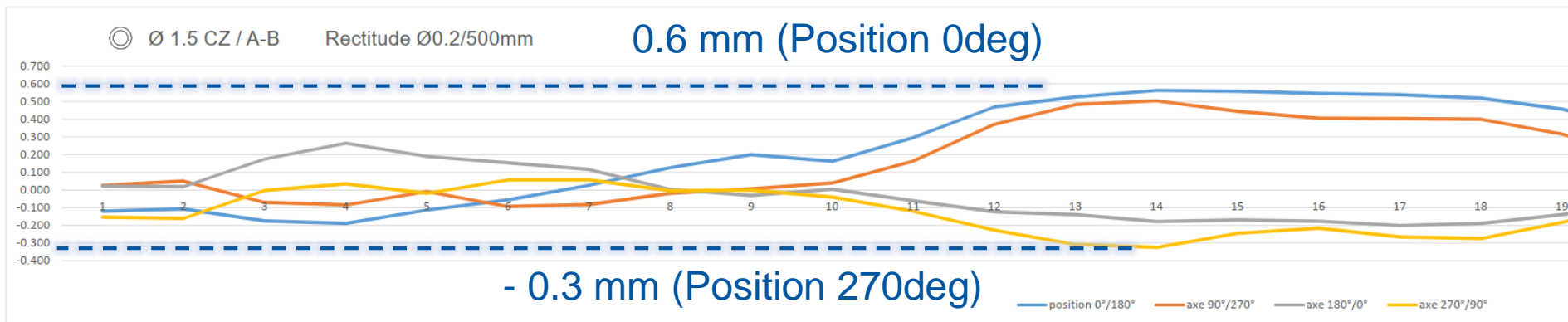
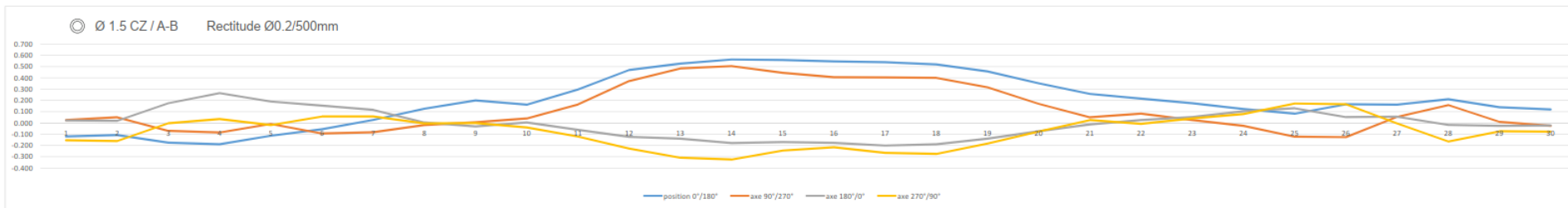


MTF registration
HCVC5C0038-MN000001

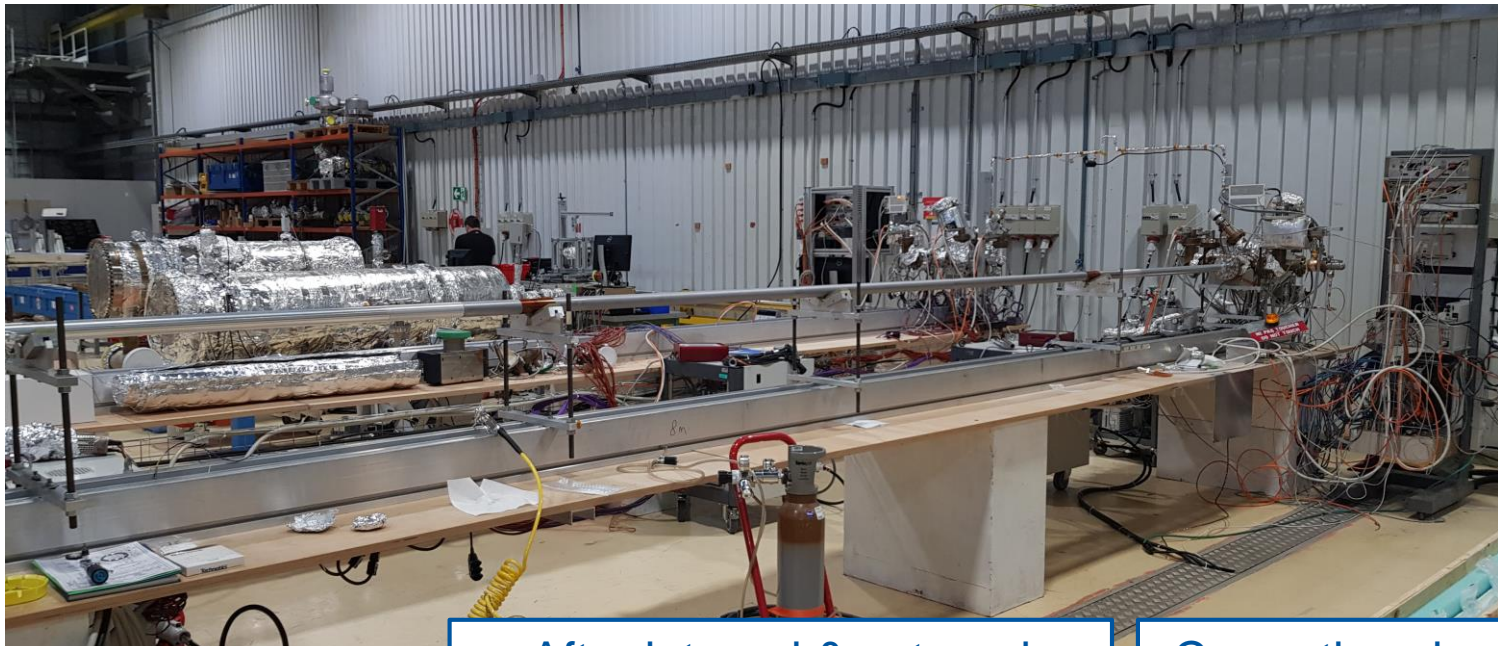
Equipment Identifier: HCVC5C0038-MN000001
Other Identifier: LHCVC5C_0038
Description: CMS CENTRAL VACUUM CHAMBER

Main	Made of	Equipment data	Manufacturing	Operation	Documents	History	Map
Actions: Attach document Detach document						Display: Extended	
2315187 v.1 J30.....		- CMS CHAMBRE CENTRALE PHASE 2 BERYLLIUM				In Work	
Doc. page		EDMS.2315187_-_CMS_CENTRAL_CHAMBER_PHASE_2_-_BERYLLIUM pdf (171 Kb)					
2046252 v.2		CMS Central Chamber VC5C (LS2) - Quality Assurance Plan				Released	
Doc. page		Updated_QAP_Docs_for_CMS zip (182 Kb)					
		CMS_Drawing_List pdf (48 Kb)					
		CMS_Project_Schedule_-_20180720 pdf (122 Kb)					
		CMS_Standard_Document_List pdf (63 Kb)					
		CMS_Project_Responsibilities pdf (57 Kb)					
2046253 v.1		CMS Central Chamber VC5C (LS2) - Detail Design File				Released	
Doc. page		CMS_Detailed_Design_File_Documents zip (743 Kb)					
		CMS_Detailed_Design_File_Drawings zip (1 Mb)					

CMS central chamber



CMS central chamber



Problem with tightness of the Helicoflex seals

After internal & external examination – insufficient preload from the seal

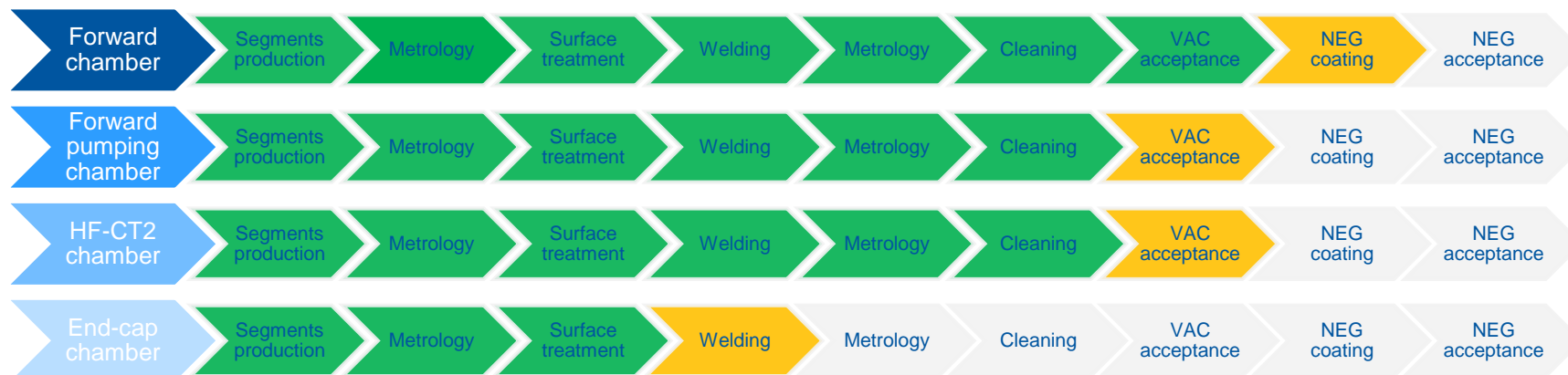
Currently using ATLAS seals; New seals foreseen in 1-2 weeks

Aluminium chambers



End-cap chamber before welding with double bellow assembly

Forward layout Production status

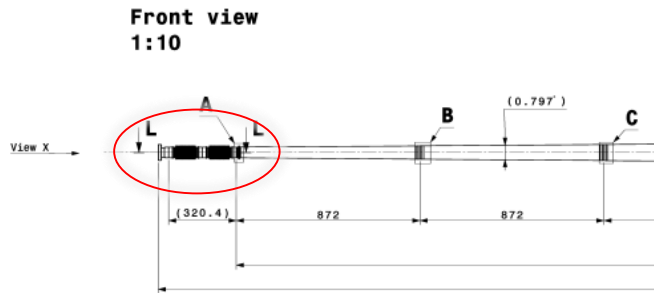


Foreseen production readiness dates:

- Forward chambers March 2020
- Forward pumping chambers March 2020
- HF-CT2 chambers April – May 2020 (spares comes last)
- End-cap chambers May – June 2020 (spares comes last)
- Central chamber March 2020

End-cap production

- Issue during double bellow assembly welding

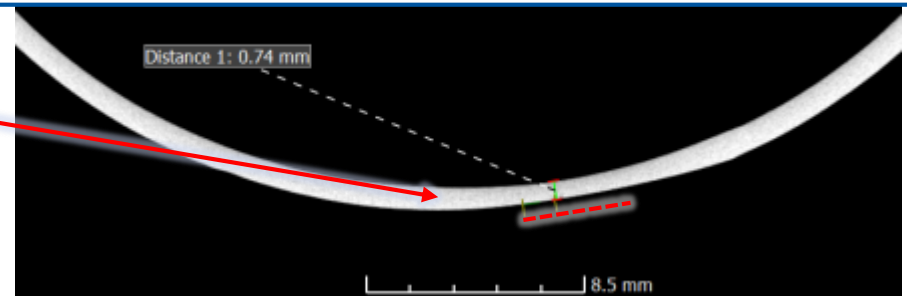


Sub-assembly leak test before the last end-cap weld

- 3 production assemblies prepared;
- Porosity issues on 2 assemblies – process issue;
- Repaired by AP (re-welded)**
 - Porosity removed – **checked and leaktight**
 - Wall thickness reduced from 1 to 0.74mm

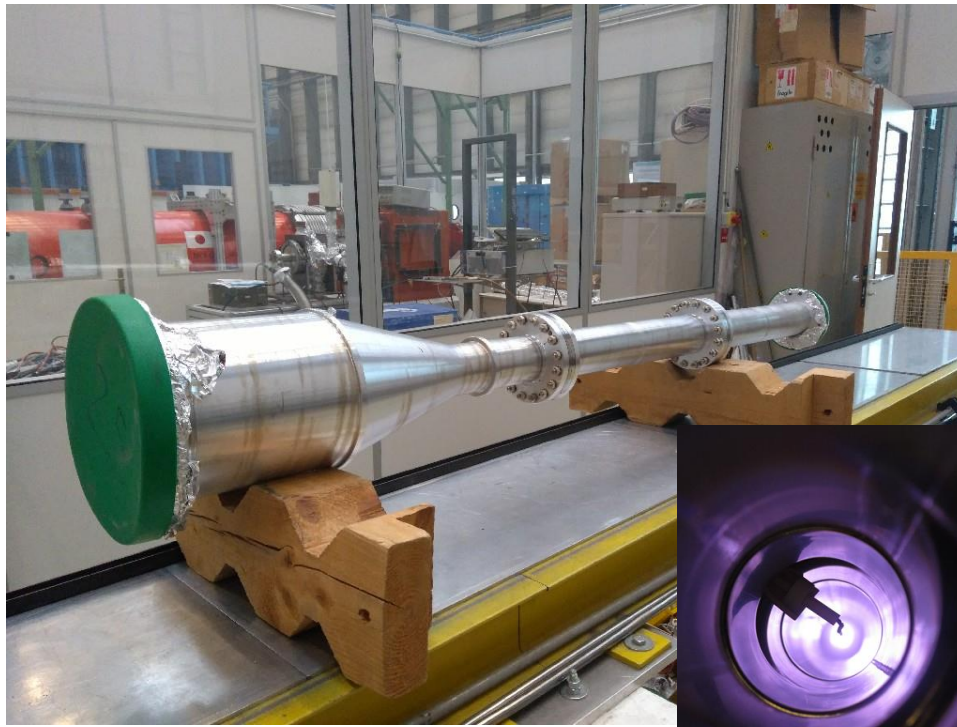


Weld AW5083-AW5083
between two bellows.

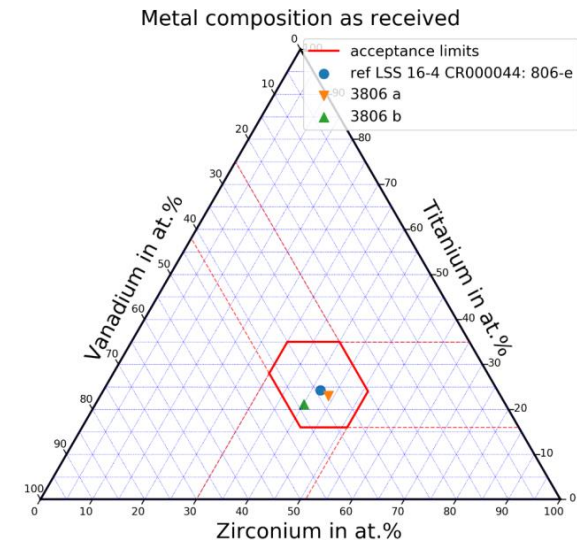


Coating qualification chambers

- Aluminium test chambers to verify NEG coating process;
- NEG coating completed; No sign of peel-off;
- Additional heat cycle tests ongoing;

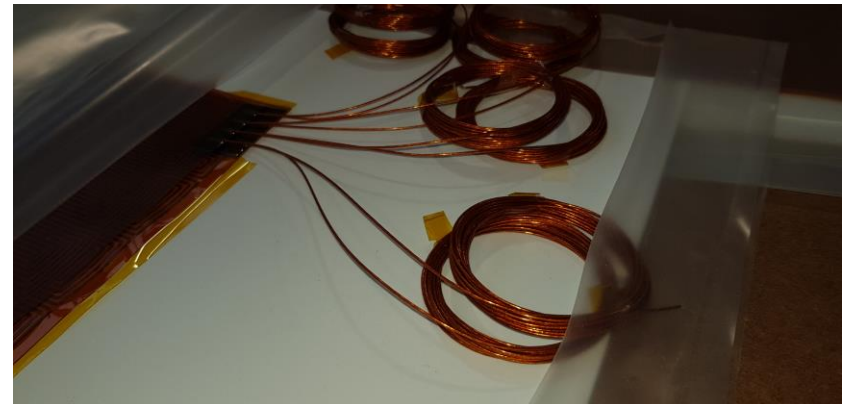
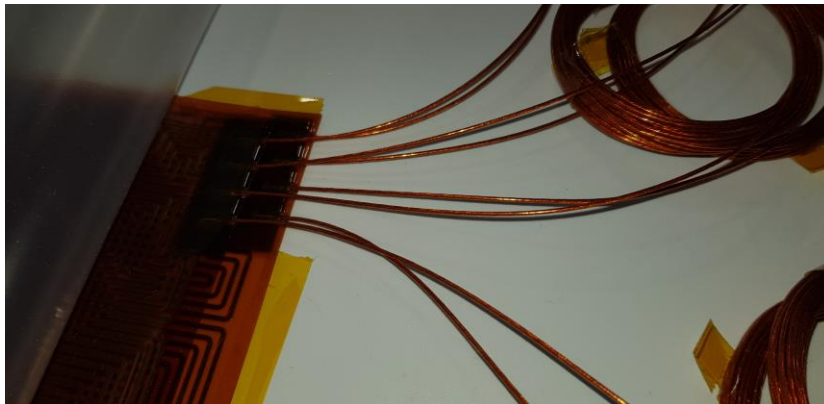


NEG composition and
activation OK



Bake-out wrapping

- All heaters for permanent bake-out at CERN



Bake-out wrapping

- Forward chamber wrapping ongoing

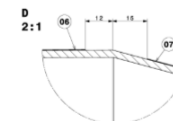
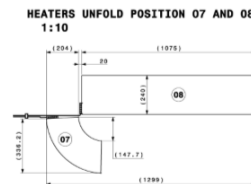
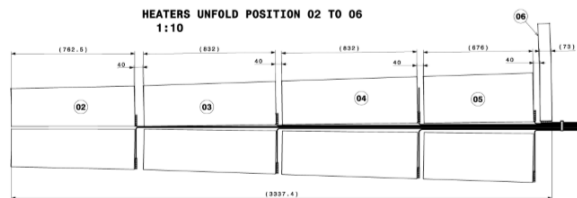
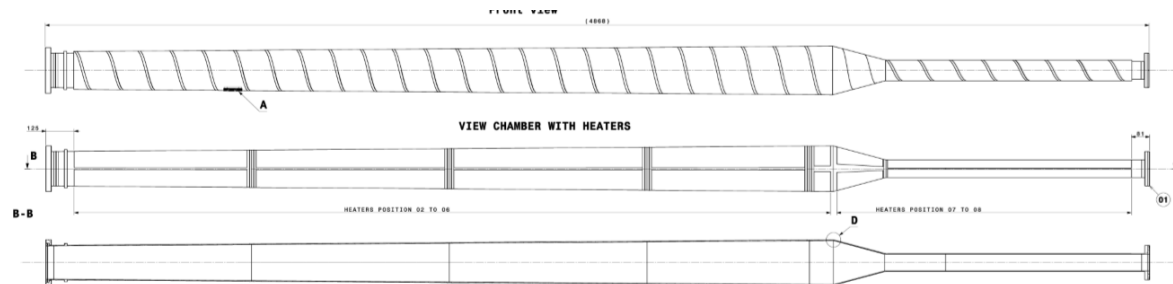


Pipeline

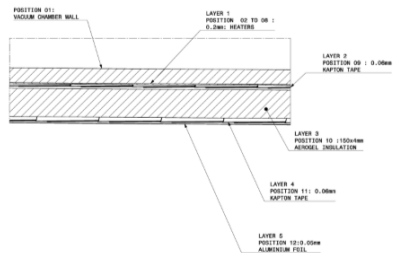
- ☐ Forward-pumping (week 9-10)
- ☐ HF-CT2 chambers (week 12 – 17)
- ☐ End-cap chambers (week 18 – 23)



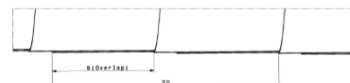
- CMS fiber method to be confirmed;
- CMS fiber team to be available;
 - Chambers should stay in b112;
- Another requests on the wrapping design must be agreed by February.



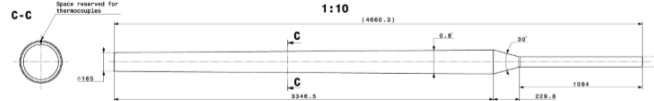
A STANDARD ASSEMBLY
5:1



POSITION 09/11 :KAPTON TAPE Thk: 0.06mm
10:1



POSITION 10: AEROGEL 150x4mm
1:10

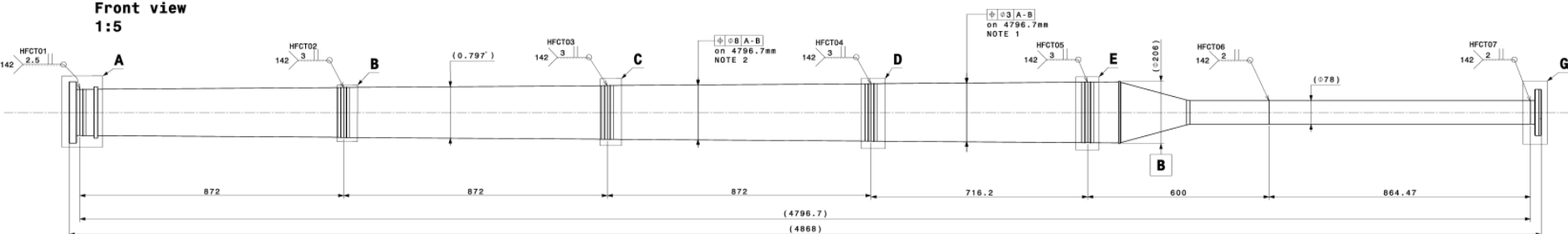


POSITION 12 :ALUMINIUM FOIL 0.05mm
2:1



NO	DESCRIPTION	UNIT	QTY	REMARKS
01	HEATERS	mm	1	
02	HEATERS	mm	1	
03	HEATERS	mm	1	
04	HEATERS	mm	1	
05	HEATERS	mm	1	
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99	HEATERS	mm	1	
100	HEATERS	mm	1	

Front view
1:5



Installation calendar

2020 Re-installation of the LHC experimental beam vacuum system

v 17_02_2020

Date	January	February	March	April	May	June	July	August	September	October	November	December
1												
2						LHCb					CMS	
3						Meca		ATLAS			Bake-out	
4								Meca - C				
5												
6				ALICE								
7				RB26 valve change								
8												
9												
10												
11					ALICE							
12					Post-meca							
13												
14				ALICE					CMS			
15				Meca IP		LHCb			Meca			
16						Bake-out						
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27				ALICE								
28				Bake-out								
29												
30												
31												

2/19/2020

Document reference

12





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