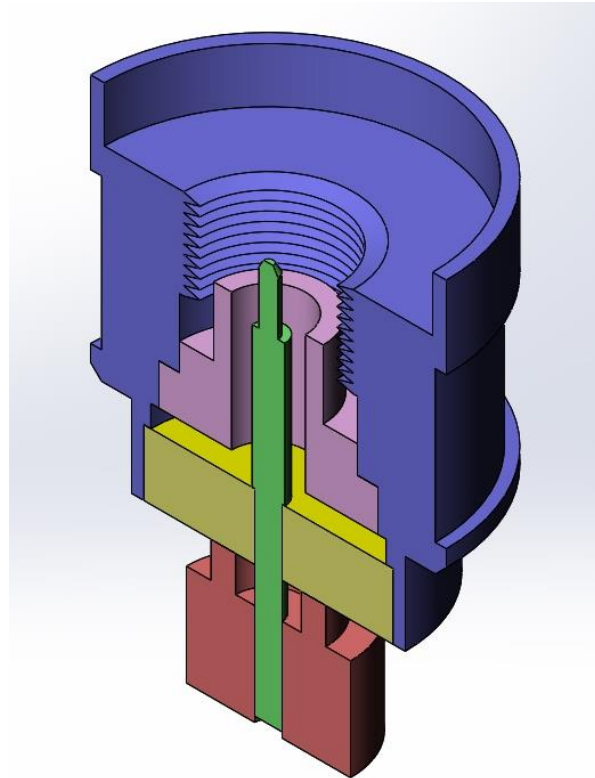


UHV leakage problems with the new EBS-ESRF-BPM buttons



ESRF-EBS

Extremely Brilliant Source

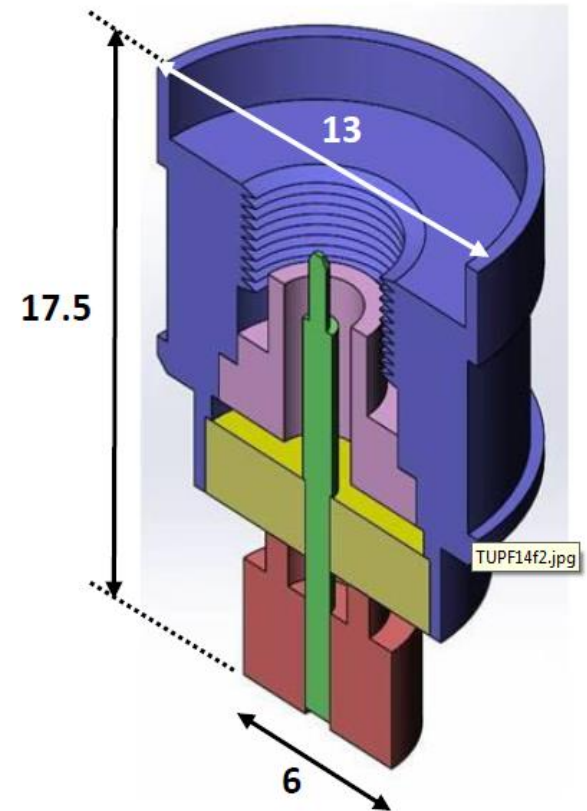
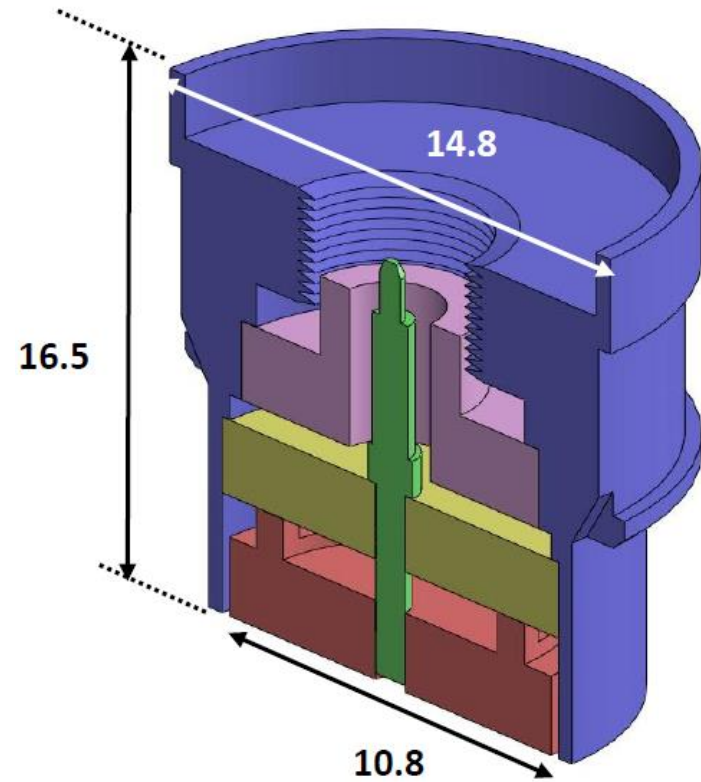


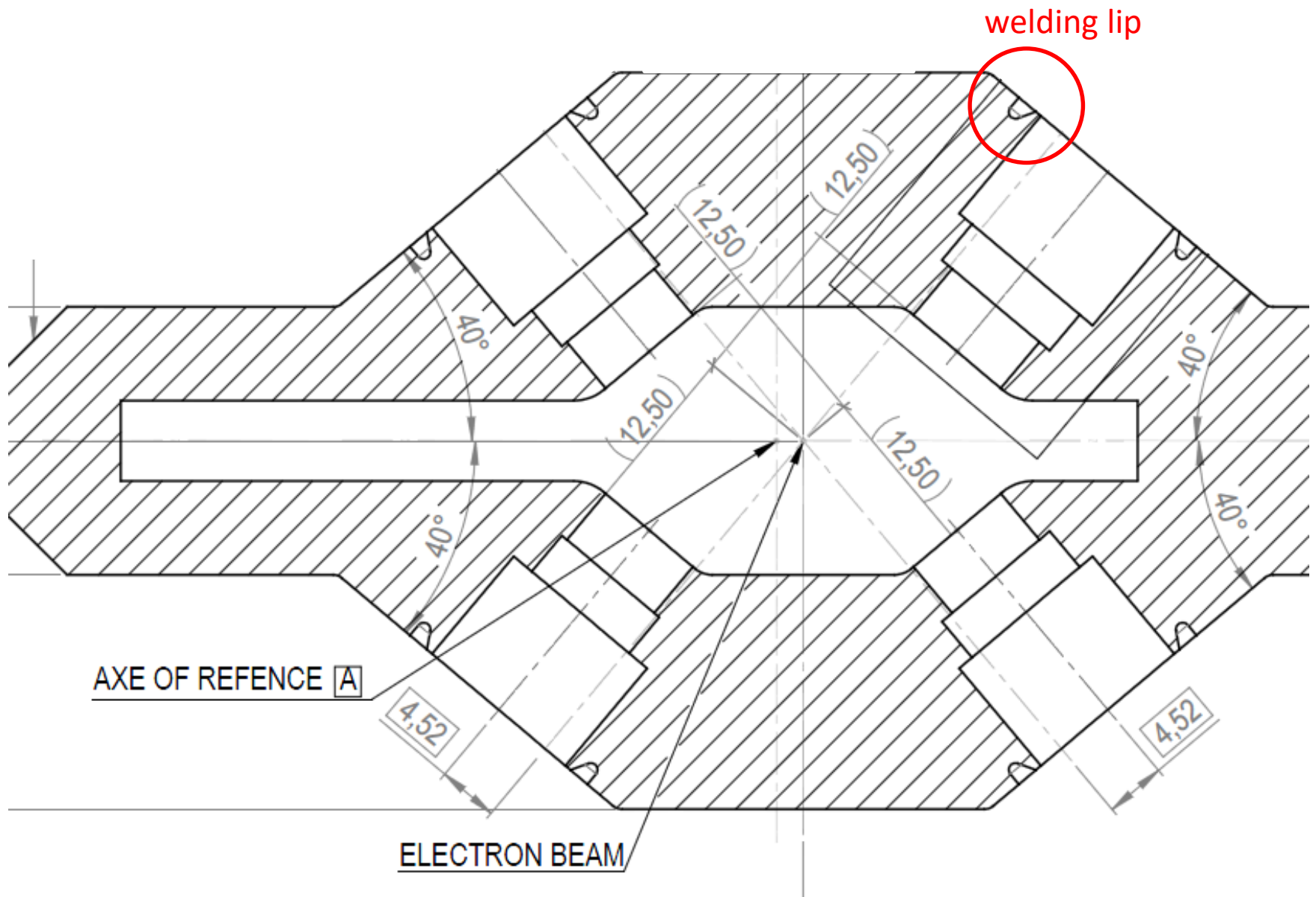
BPM-button vacuum leaks

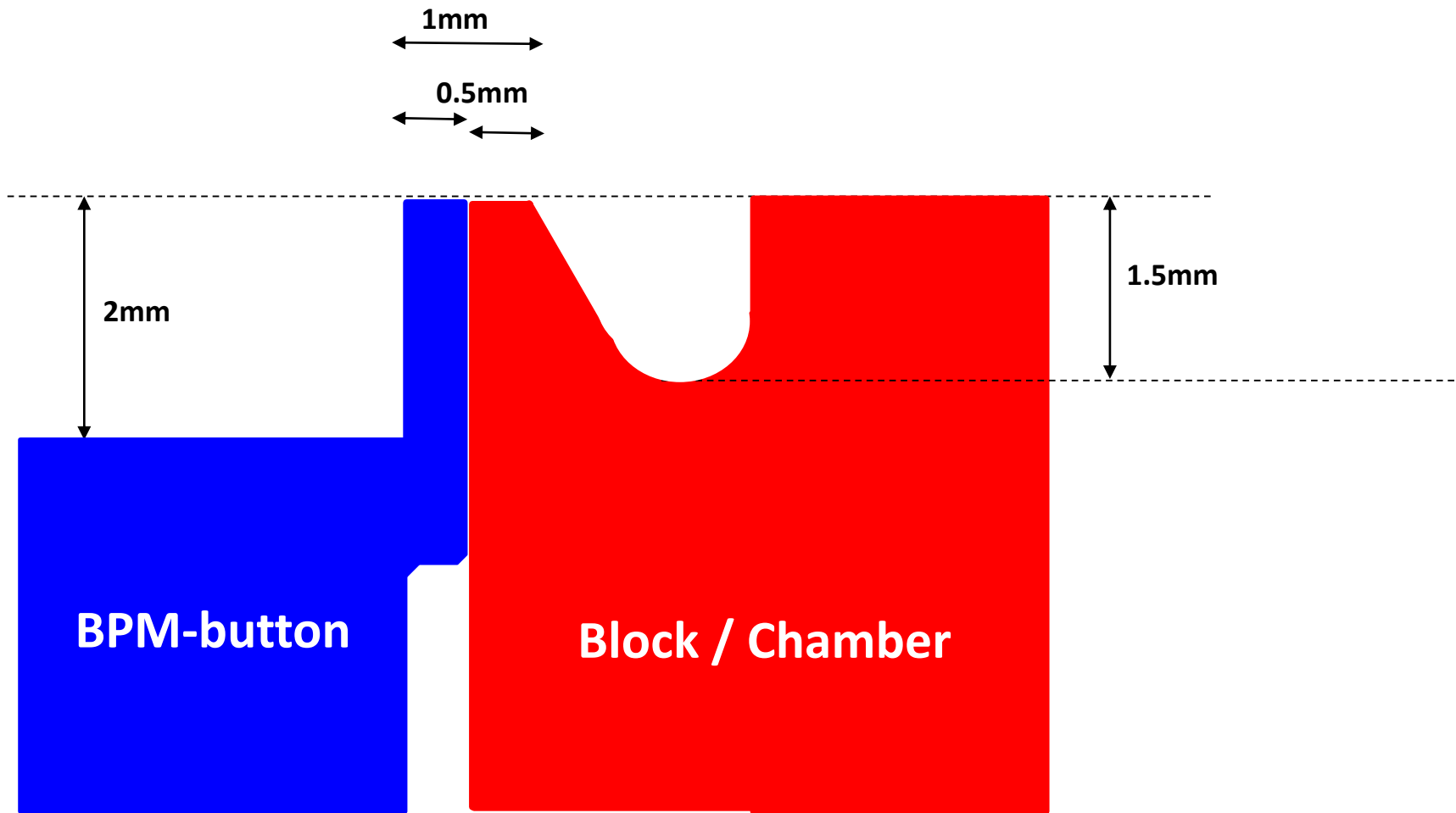
old button, serving since 1992,
~1000 in Storage Ring, ~300 in Booster

delivery (1500 units *) : March 2016
total costs < 350 KEuros

* 600 with 6mm, 900 with 8mm button diameter







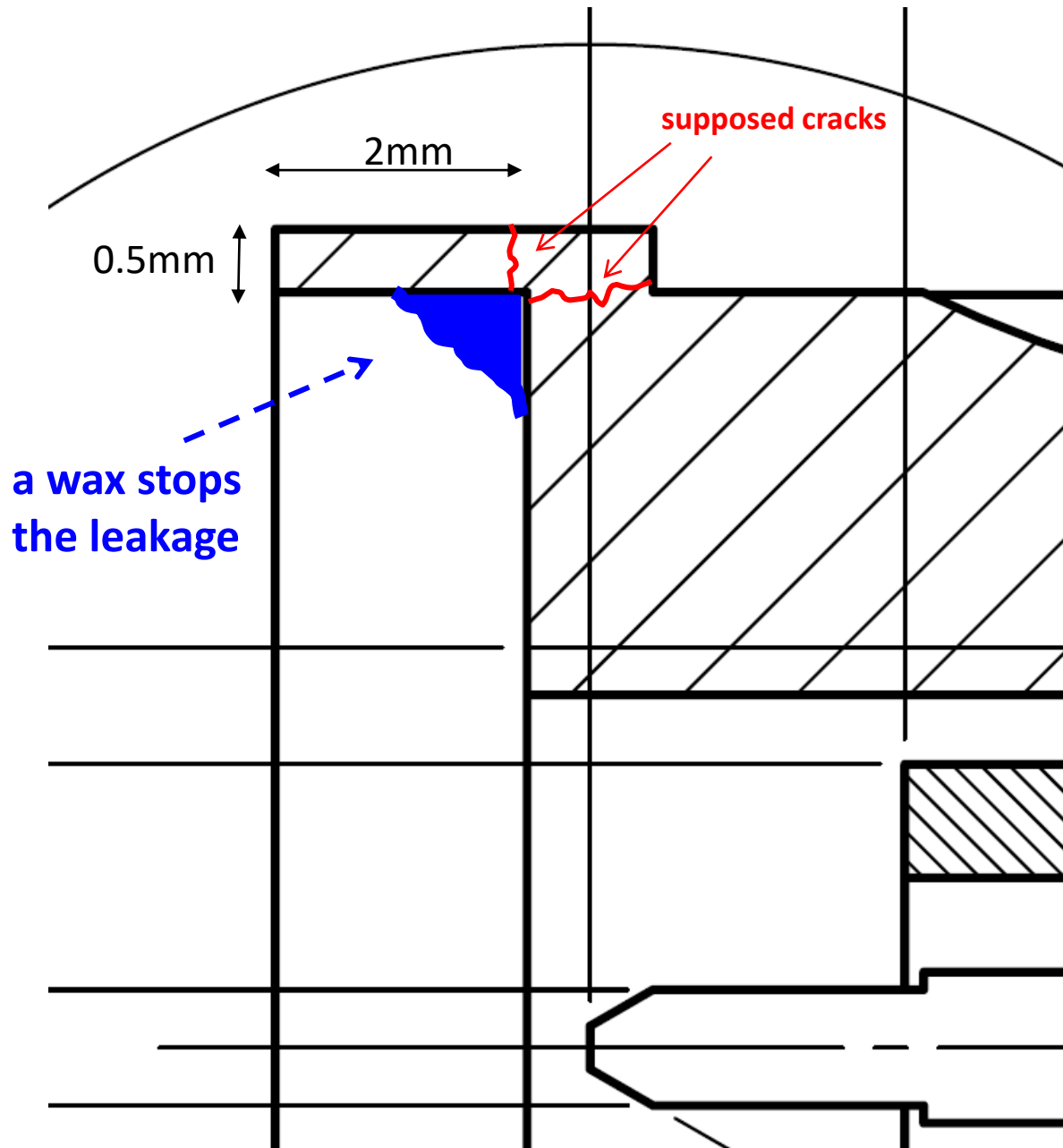
**FMB experience (December) : 4 failures out of 16 buttons welded
→ 25% failure-rate !**

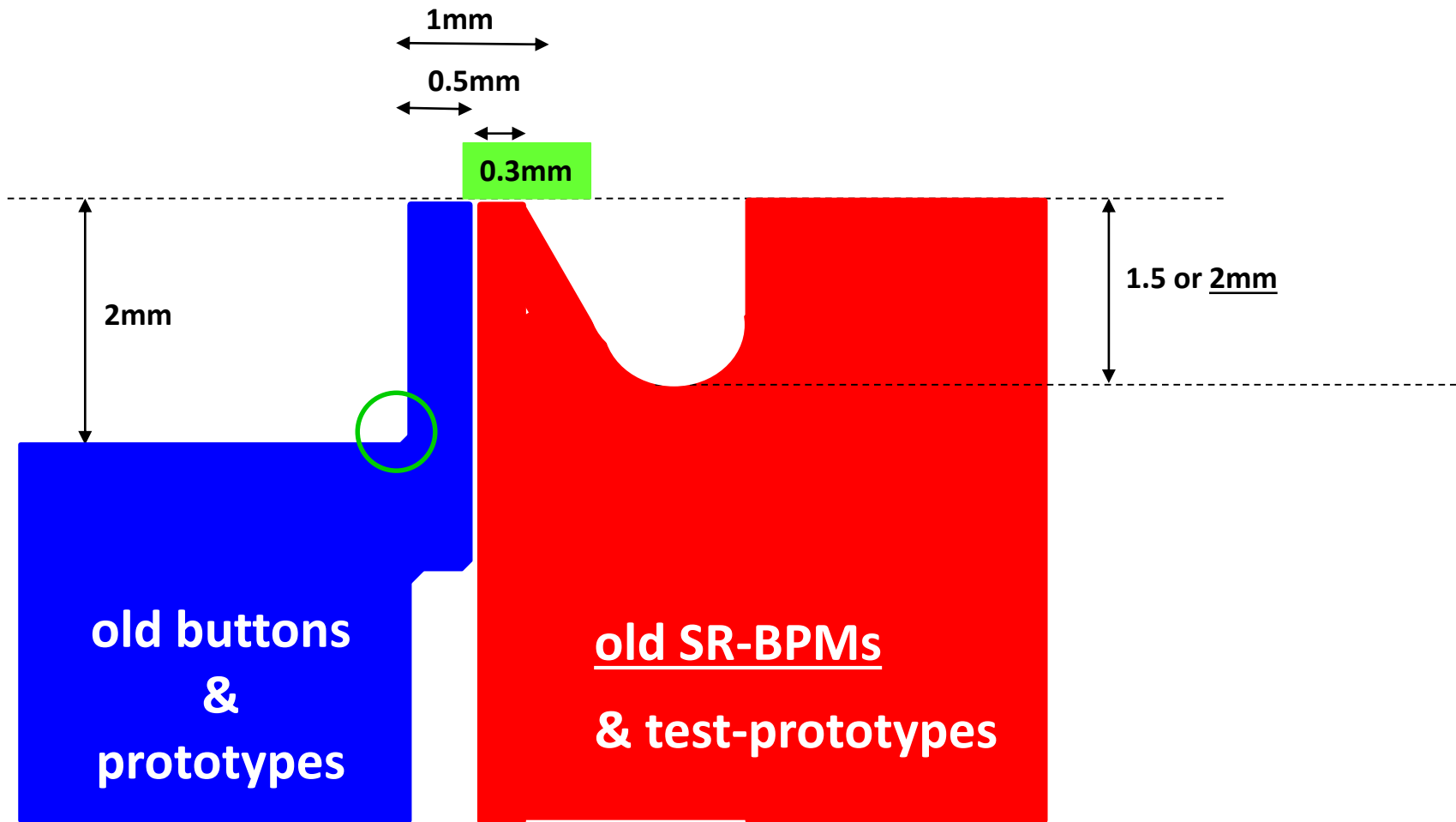
vacuum wax applied : the leak is stopped !



vacuum wax applied :
the leak is stopped !

the vacuum wax is applied in the corner, i.e. between
the transition of the lip & the main body,
the leak (fracture) must be situated there, not on the welding

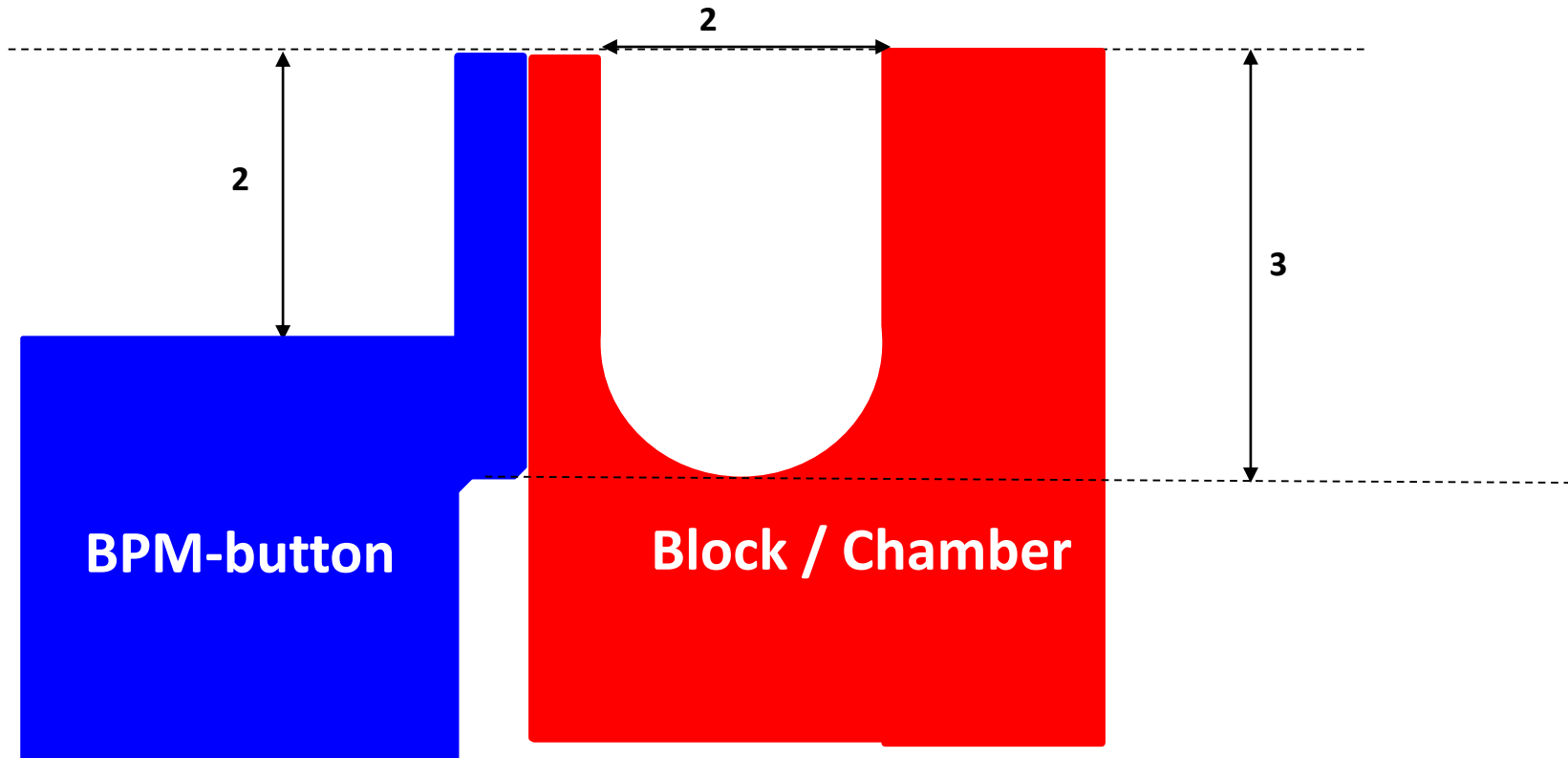
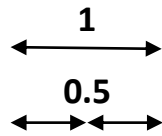




old buttons / BPMs : never any leaks (SR- & SY- >1300)

the 12 protos : no leaks

**FMB proposal for different lip
on the block/hole side**

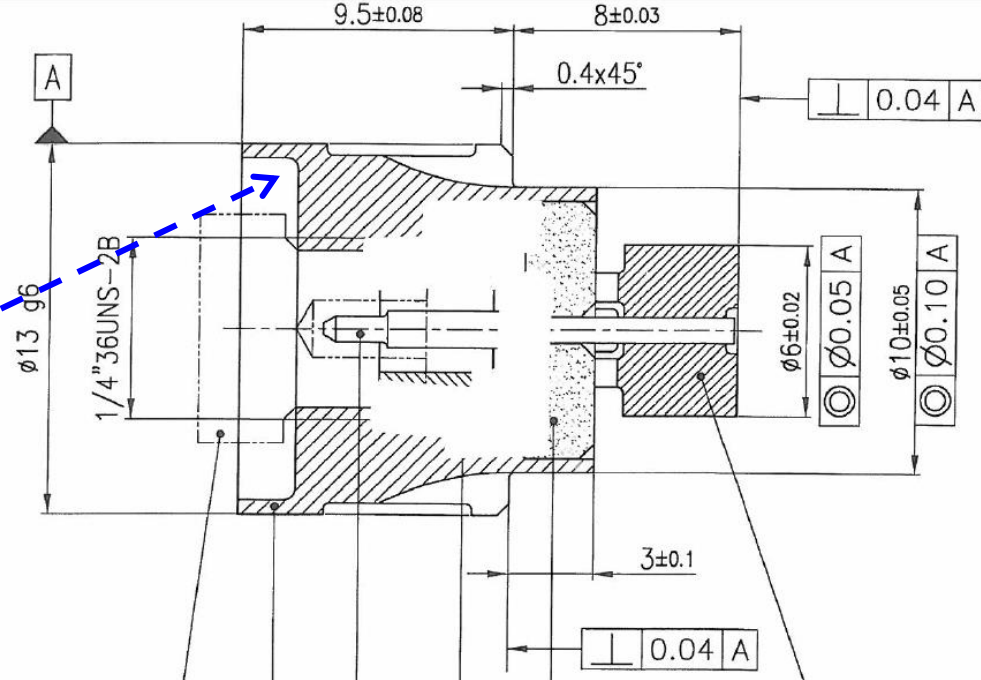


FMB experience (Jan-April) : 2 failures out of 24 ...

more rigourous test (May) : 5 failures out of 60 ...

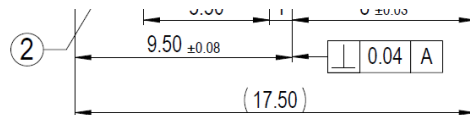
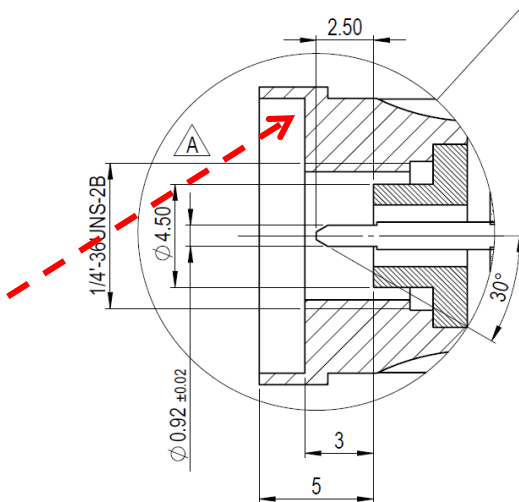
DLS

rounded corners



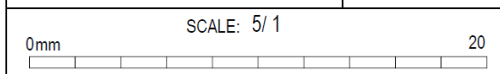
ESRF

sharp corners



5	1	ELECTRODE	304L
4	1	CERAMIC	Al2O3
3	1	PIN	MOLYBDENUM
2	1	SLEEVE	304L
1	1	FLANGE	304L
ITEM QTY DESCRIPTION / REMARKS			MATERIAL

DESCRIPTION / REMARKS	MATERIAL	TREATMENT
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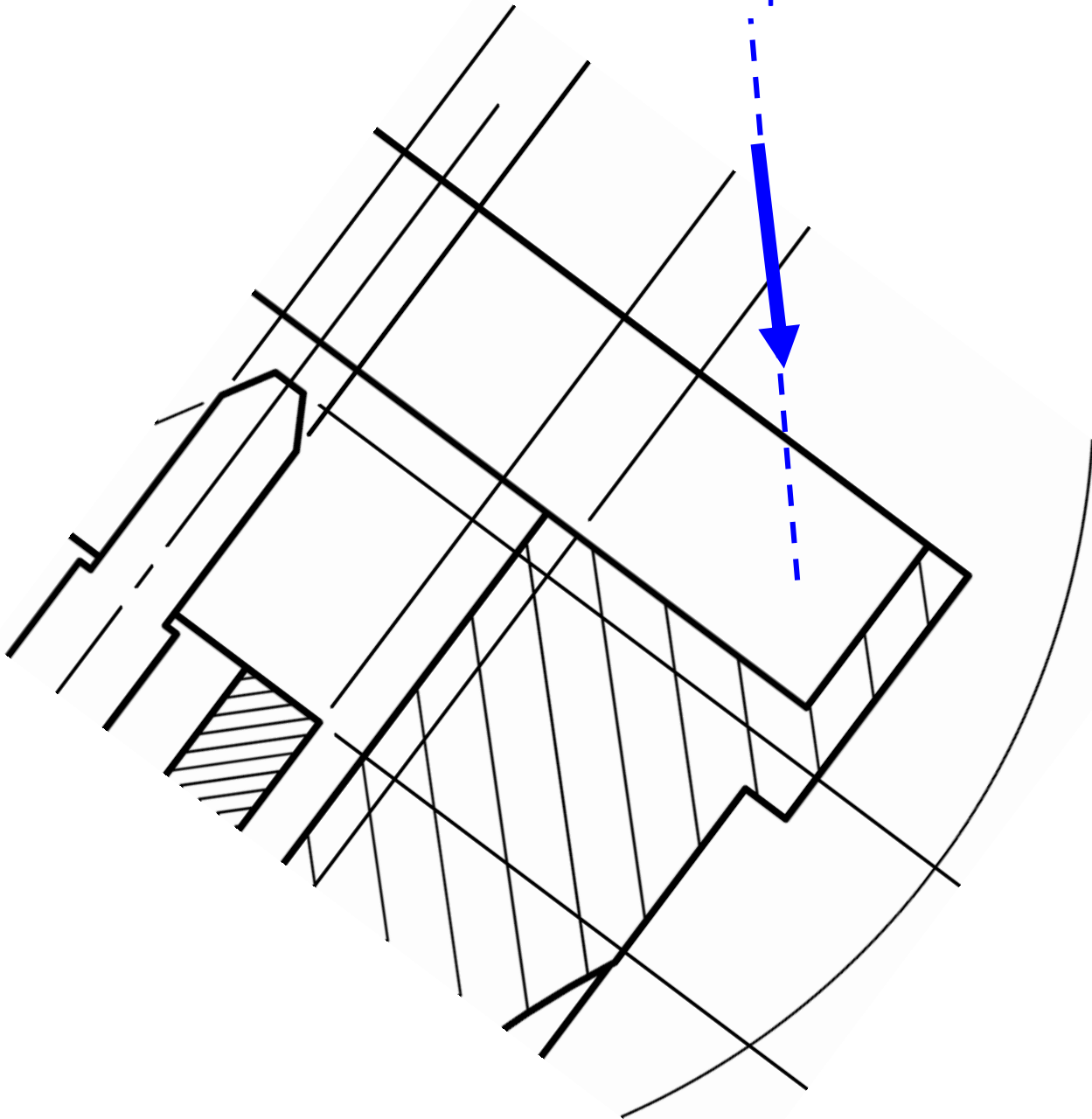
SR, BEAM DIAGNOSTICS BPM PROJECT BUTTON BPM Ø8		NAME	
		DRN.	N.BENOIST
		CKD.	K.SCHEIDT
		APPD.	L.GOIRAND
GEN. TOL. :		GEN. SURFACE FINISH :	
		VALID FOR MANUFAC	
		21 Dec 15	

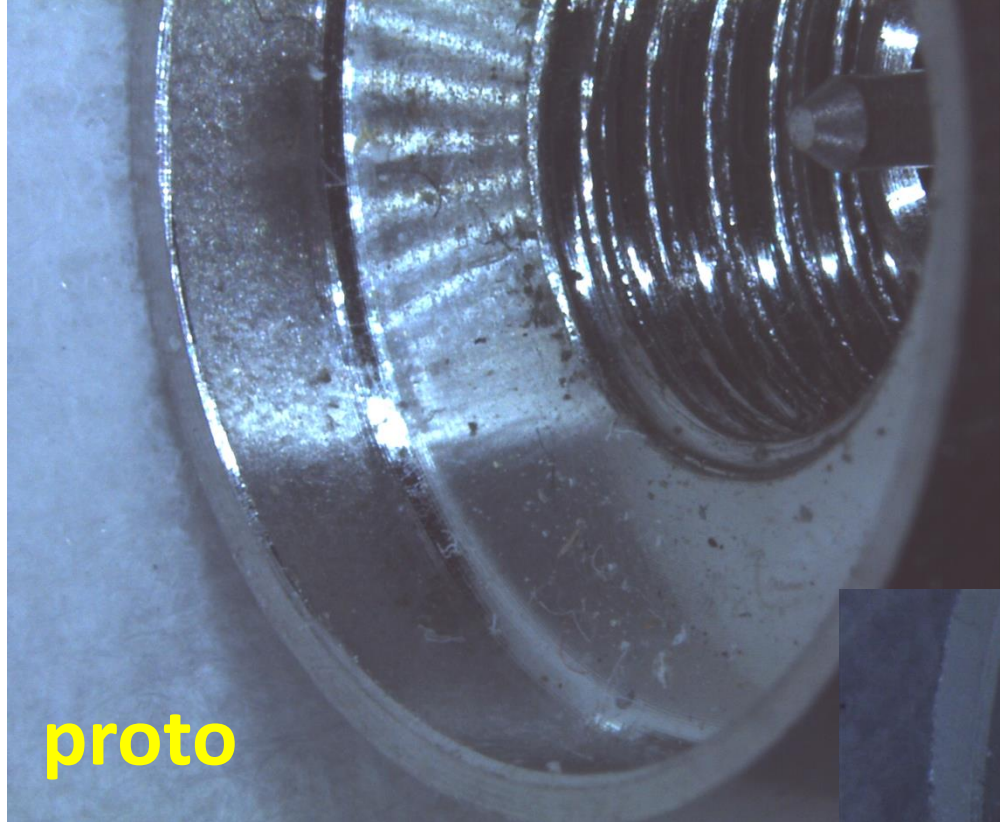
AND	ELECTRODE 304L in stead of MOLYBDENUM
AND	
D.	DESCRIPTION

EUROPEAN SYNCHROTRON
 RADIATION FACILITY
 CS 40220 - 38043 Grenoble Cedex 9
 TEL. 04-76-88-20-00 WWW.ESRF.FR

ASSY.
88.50.0002

angle of view
micro-scope

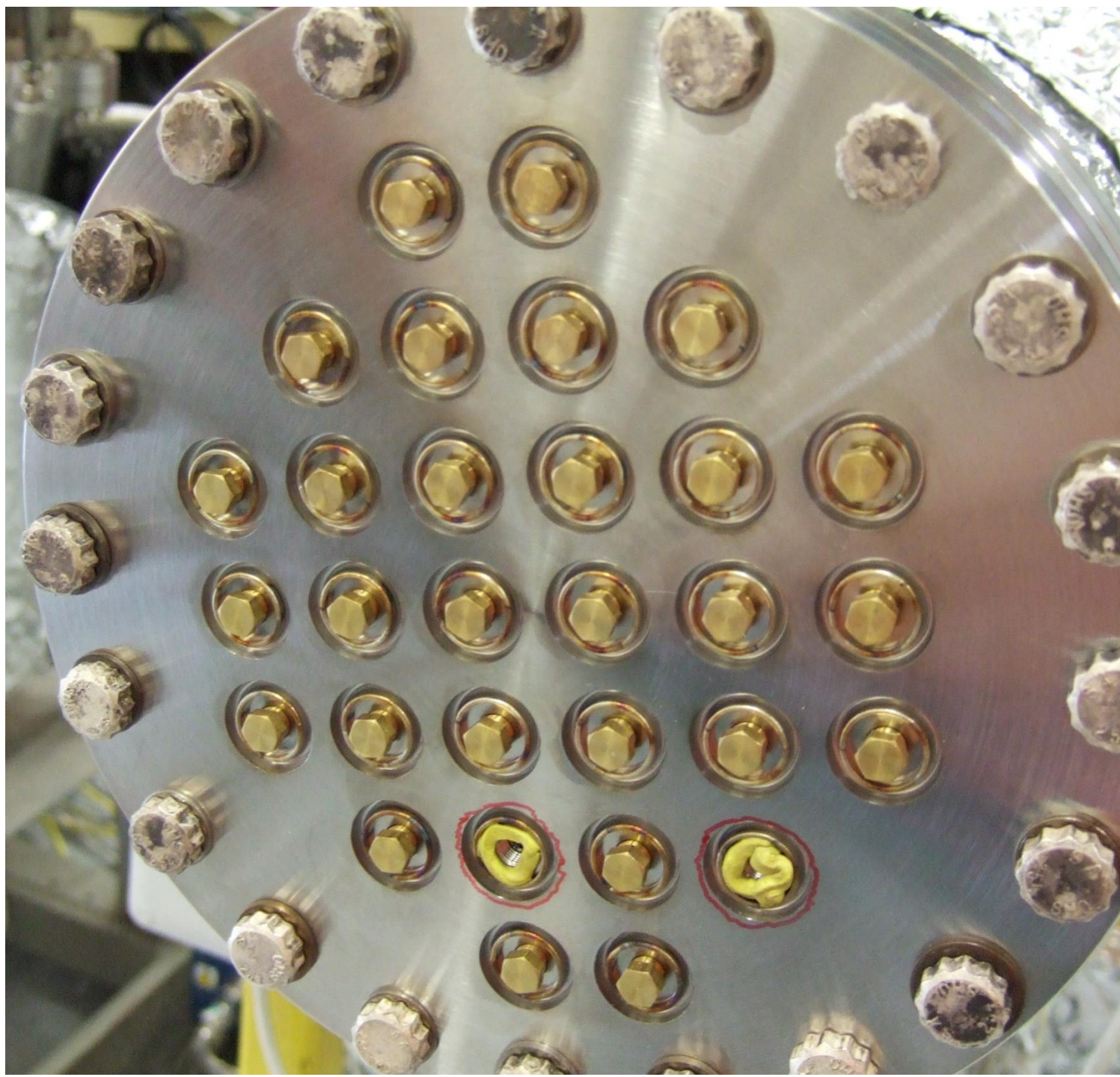




proto



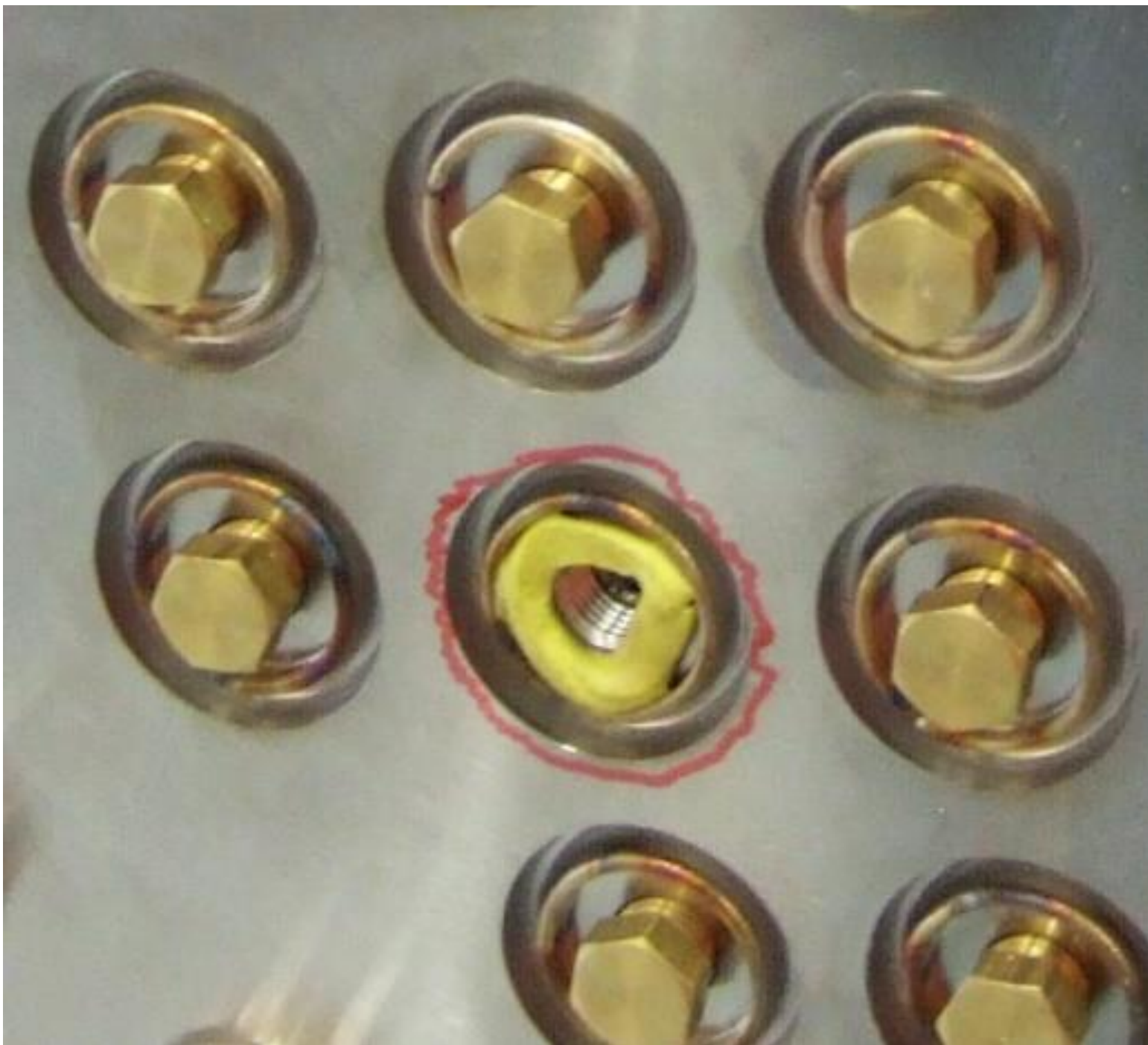
series



30 BPMs in one
CF150 flange

done 2 x
so **60 units** tested
→ **5 leaks**

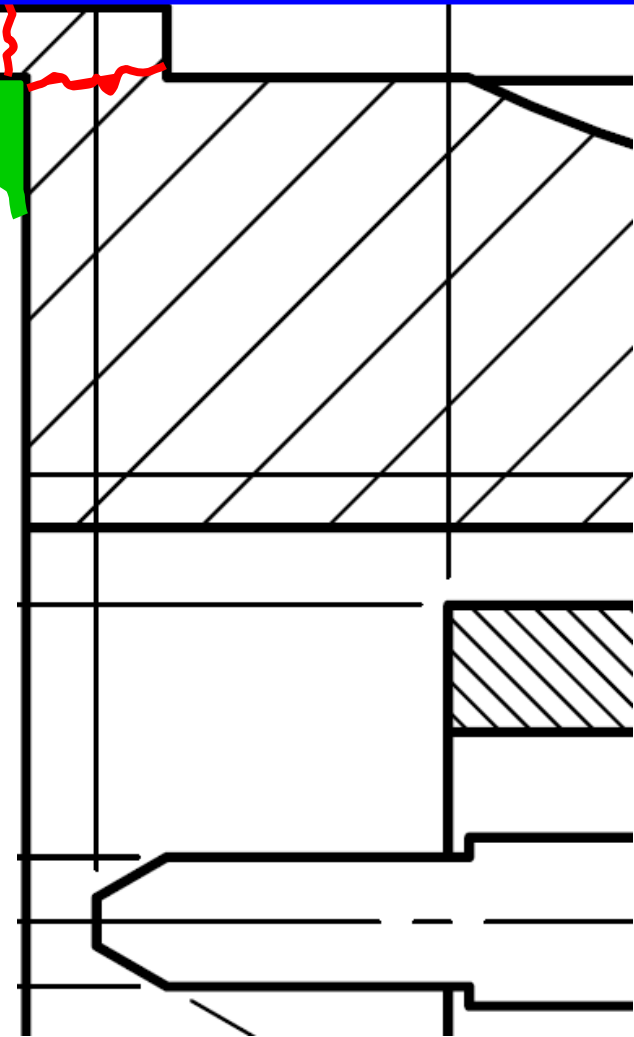
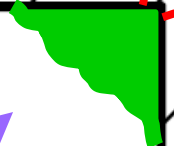
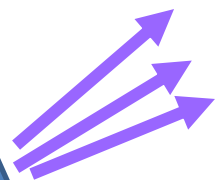
the leaking spots
are confirmed to
be in the lip-corner



TIG-welding



He jet

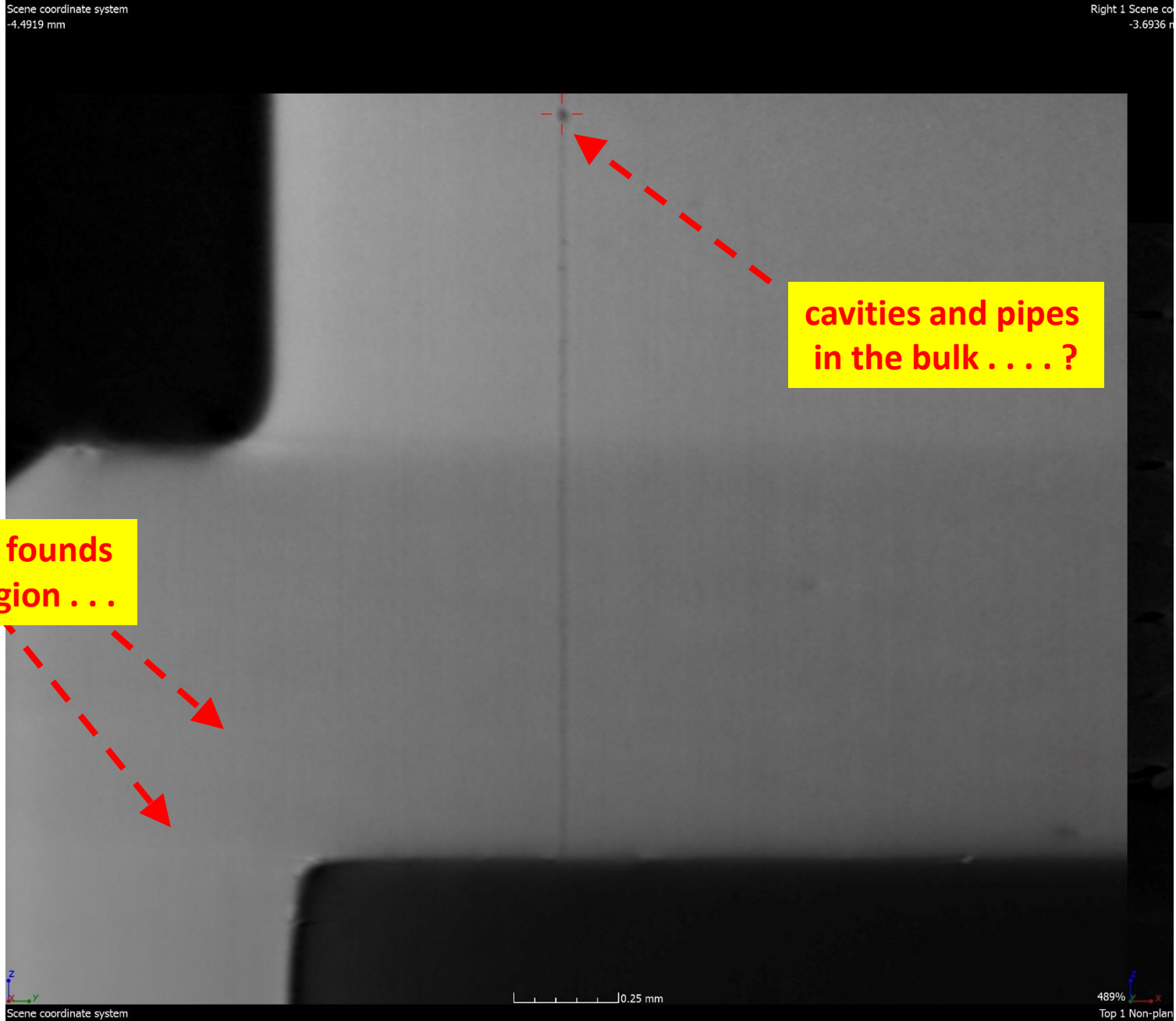


UHV side

RGA

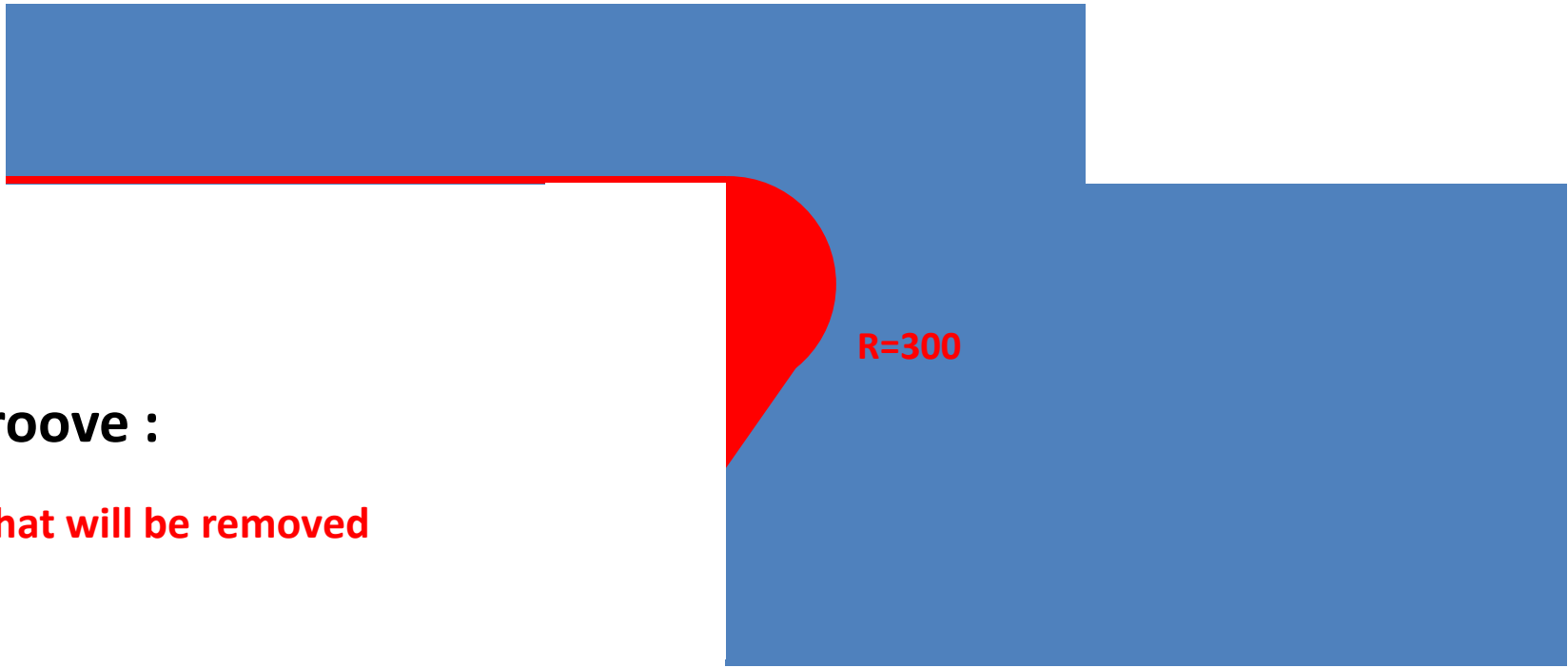
Residual
Gas
Analyser

X-ray tomography done at a dedicated ESRF beamline on a leaking BPM-button :



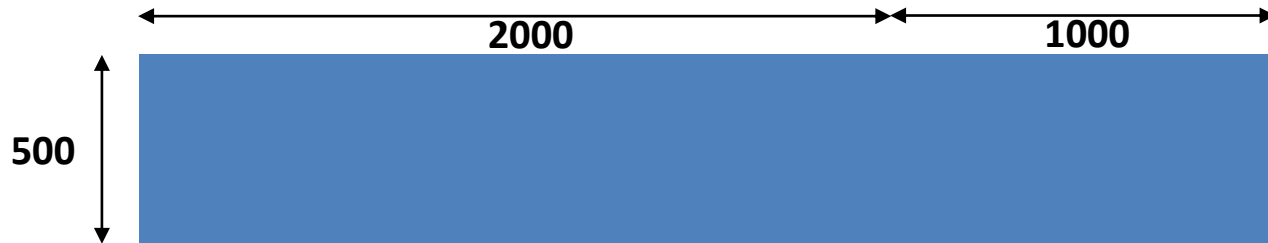
min : 450

max : 50



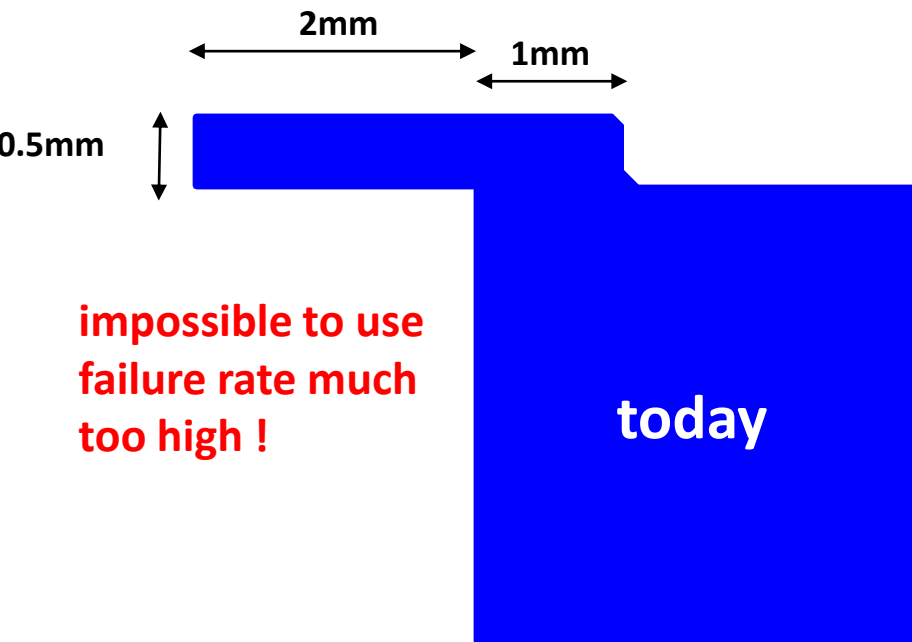
with groove :

in red what will be removed



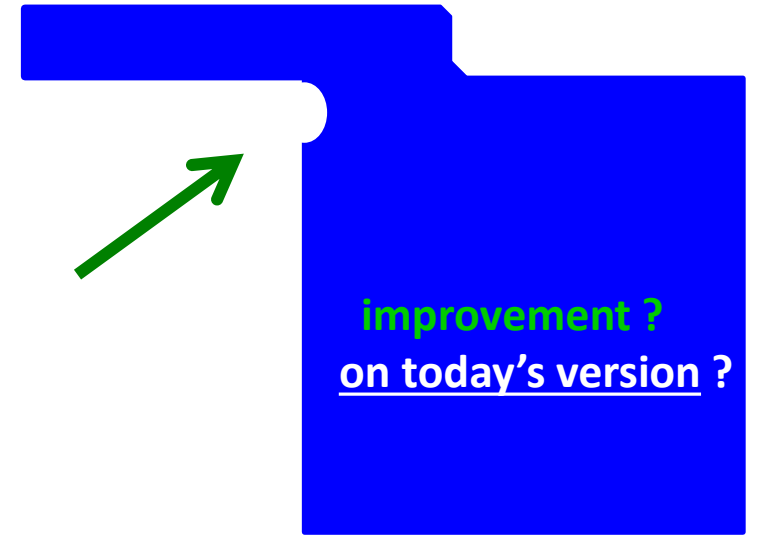
now :



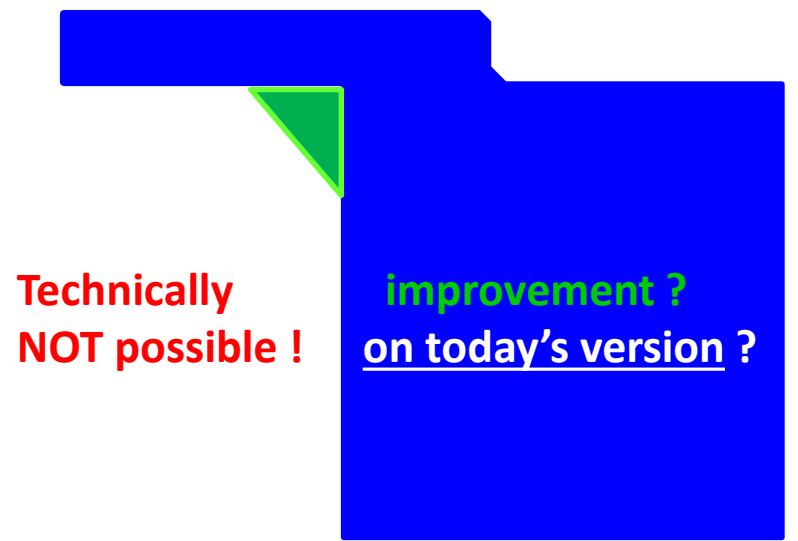


impossible to use
failure rate much
too high !

tests to be done in July
on 60 units



ideal ... but will
cost us 300KEuros
extra !



UHV leakage problems with the new EBS-ESRF-BPM buttons

lecon :
do NOT indicate sharp-corners
unless you really need them

thank you for
your attention

