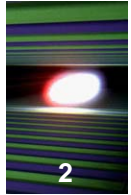


# Strategy and Status of Reference Cavities for European XFEL

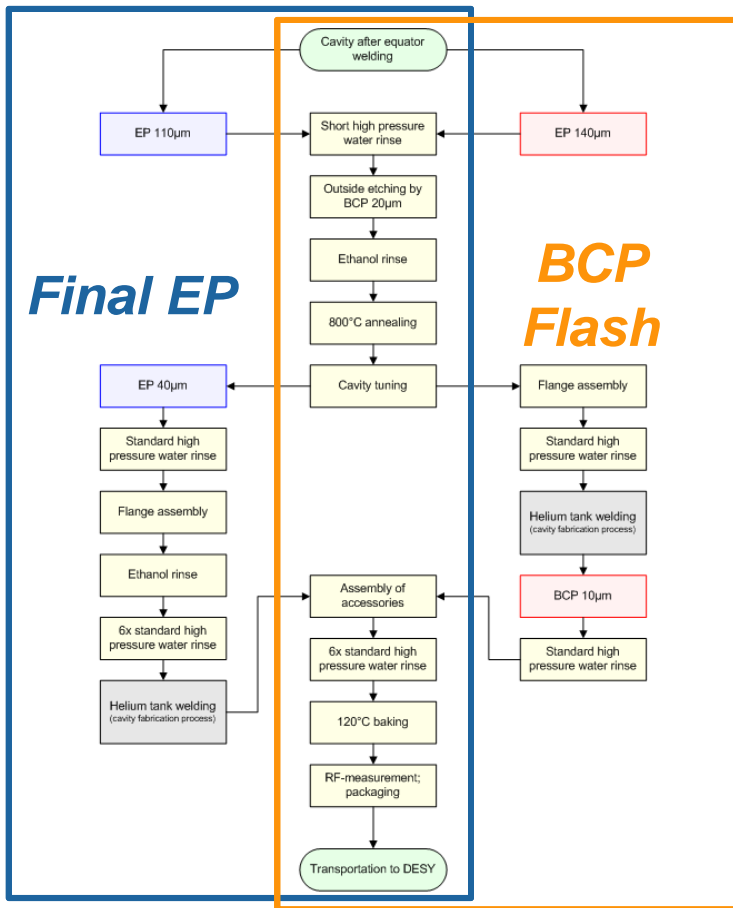
Detlef Reschke / DESY



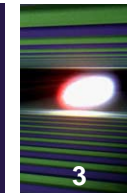


■ **Two schemes** for the final surface treatment:

- E. Zanon: **BCP Flash**
- Research Instr.: **Final EP**



- At each company:
  - 4 Cav's for set-up of infrastructure
  - 4 Cav's for qualification of infrastructure
- **Close supervision of infrastructure, processes, procedures and handling by DESY + INFN Milano required**
- **No performance guarantee results in:**
  - the risk of unexpected low gradient or field emission is with DESY
  - responsibility for re-treatment at DESY

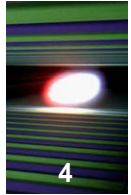


- **Four reference cavities fabricated at each company**
- **First surface treatment and vertical acceptance test w/o He-tank at DESY**  
(following the company preparation scheme: Final BCP for EZ; Final EP for RI)
- **Stepwise qualification of surface treatment infrastructure at companies**  
(after successful set-up of infrastructure with further dedicated cavities)

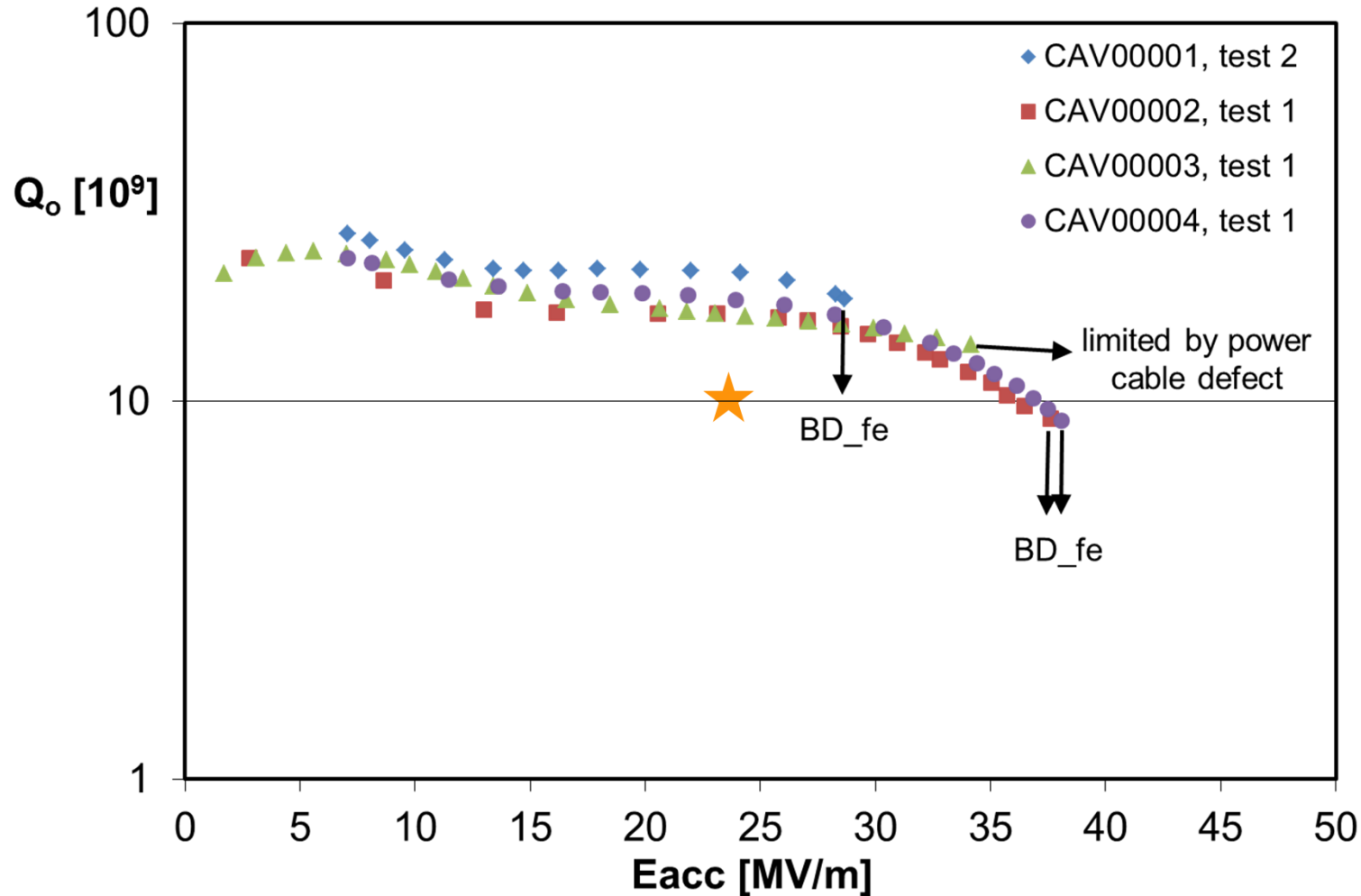
	RCV#0	RCV#1	RCV#2	RCV#3	RCV#4
Transportation to + from company	OK	OK	OK	OK	OK
+ slow venting / slow pumping (incl. leak check + RGA)		ok(EZ)/ not ok(RI)	ok(EZ) /x	ok(EZ) /x	ok(EZ) /x
+ disassembly of beam tube flange (short side), full HPR-cycle, drying, assembly of beam tube flange			not ok(EZ) /x	X	X
+ disassembly of all flanges, assembly of flanges, leak check				X	X
+ Final 40µm EP (RI)/Final 10µm BCP (EZ), first HPR, ethanol rinse, FMS, 120°C bake					X

- Remark: Full preparation cycle will be done with CAV for set-up of infrastructure, only

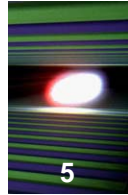
# Starting Performance of Reference Cavities: RI (after surface preparation at DESY)



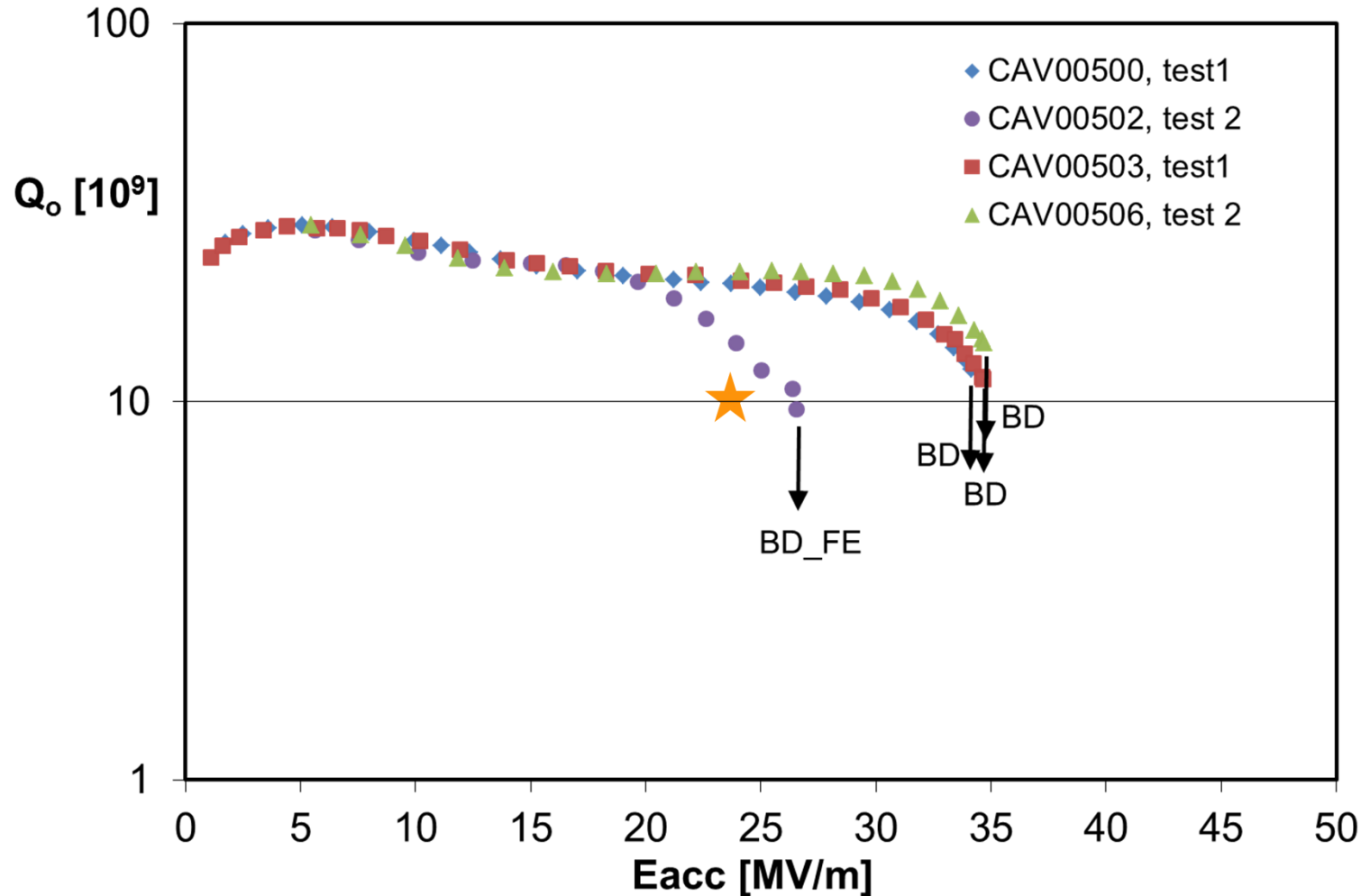
- Acceptance test of four RI reference cavities successful:  
All cavities with  $E_{acc} > 28$  MV/m!

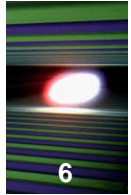


# Starting Performance of Reference Cavities: EZ (after surface preparation at DESY)



- Three cavities vertical acceptance test successful (no FE)
- CAV00502 accepted for full treatment though strong radiation (field emission)



■ **RI:**

**RCV#0:** CAV00002, t1 => t2 (ok)  
**RCV#1:** CAV00001, t2 => t3 (not ok)  
**RCV#1.1:**  
**RCV#2:**  
**RCV#3:**  
**RCV#4:**

■ **EZ:**

**RCV#0:** CAV00500, t1 => t2 (ok)  
**RCV#1:** CAV00506, t2 => t3 (ok)  
**RCV#2:** CAV00503, t2 => t3 (not ok)  
**RCV#2.1:** CAV00500, t2 => t3 (test in preparation)  
**RCV#3:**  
**RCV#4:**