

Next generation cavity infrastructures

Convenors:

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- Goals
- Open questions
- Contributions

Goals of WG2

- Assessment of existing infrastructure
 - Identification of limitations of existing infrastructure
 - What are the requirements for a next generation (large-scale) cavity preparation infrastructure?
- More than one meeting required
 - Concentrate on **site-independent** issues
 - First meeting concentrates on
 - collecting ideas, information + interests
 - possible contributions of different labs
 - **industrialization and technology transfer**

Topics + open questions

- Operational experience with existing cavity preparation systems. A review of existing systems is needed.
 - Different **HPR systems** exist.
What are the strength and the weaknesses of those designs?
Is there online monitoring of the cleaning process?
Can this be achieved at all?
A "scientific" evaluation is needed of the HPR process/cleaning efficiency with respect to nozzle configuration, pressure, flow, distance to surface, method of "scanning" the surface (# of passes...)
 - A similar discussion can be done for the **etching and electropolishing systems**.
What designs exist? Strengths? Weaknesses?

Electropolishing, cont'd

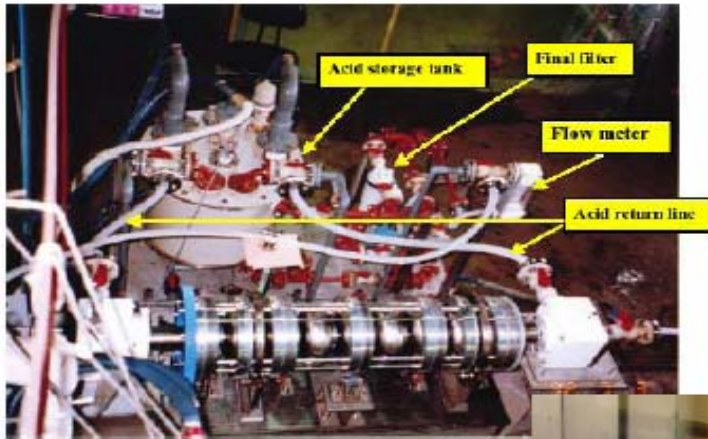
Activities

Lab	What has been done/is being done?	Reference
KEK/ Nomura Plating	Developed EP based on Siemens Recipe Successfully applied to Tristan & B- factory cavities Developed Hydrogen -free EP: HNO ₃ add	K.Saito(1991) T.Higuchi,K.Saito (2003)
DESY/ TTF	Implemented,commissioned and uses system for multi-cell EP CARE: optimizing parameter (Saclay) industrializing/automating (INFN)	CARE 2004- Meeting
Jlab	Implemented and commissioned system in 2003/2004, starting to develop parameters	
Cornell <small>March 18, 2005</small>	Vertical system for single cells <small>ERL 2005, Jefferson Lab</small>	R.Geng(2004)

Courtesy of Peter Kneisel

EP- Systems

KEK/Nomura Plating



DESY



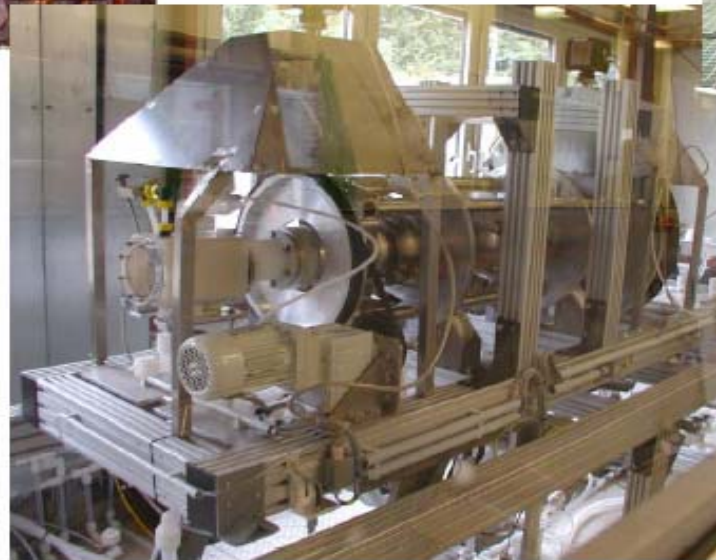
JLab



INFN

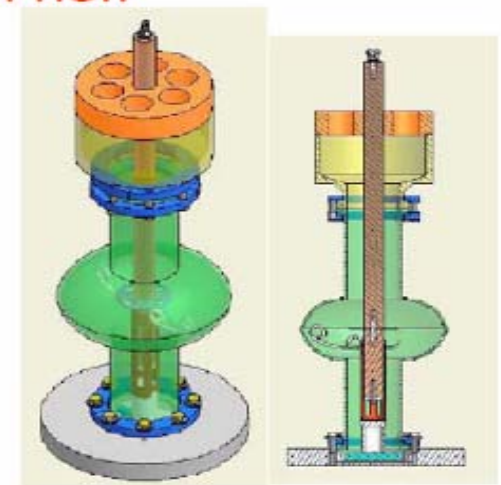


March 18, 2005



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Cornell



Courtesy of Peter Kneisel

Detlef Reschke



04.04.2005

High Pressure Rinse Systems



DESY-System



March 18, 2005



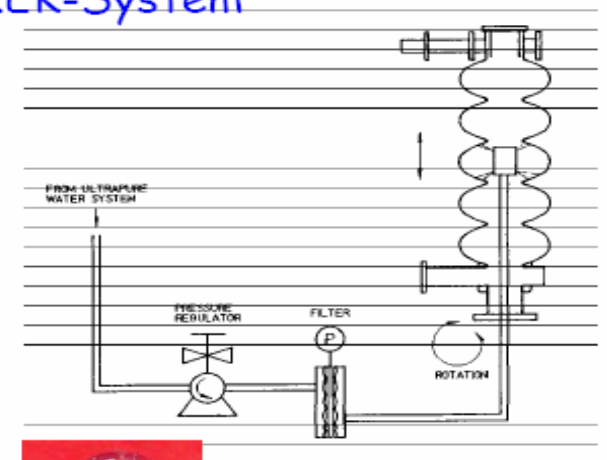
Jlab HPR Cabinet



ERL 2005, Jefferson Lab



KEK-System



Courtesy of Peter Kneisel

Topics + open questions II

- The complete **cleanroom layout** itself needs to be questioned.
 - What is the state-of-the-art cleanroom technology today?
What quality is needed for the air and the liquid media in the preparation process?
- Evaluation of the danger of re-contamination by the **assembly process**:
 - can the process be improved ?
 - Is the cleaning of auxiliary parts appropriate ?
 - Are the materials used appropriate?
 - Can the designs for e.g. clamps be improved ?
 - Is automation/semi-automation possible ?
 - Can the presently successfully used processes be simplified ?

Contributions (preliminary)

- Cleanroom technology:
 - State-of-the-art cleanroom technology (v. Kahlden, CCI company)
- HPR:
 - Experience with the HPR system for SNS (John Mammosser)
 - Experience with the HPR system for TTF (Axel Matheisen)
 - Experience with the HPR system at CERN (Dieter Bloess)
 - Quality control at the DESY HPR System (Nico Krupka)
- BCP/EP:
 - Experience with the BCP + EP system for SNS (John Mammosser)
 - Experience with the (BCP +) EP system for TTF (Nico Steinhau-Kuehl)

Contributions II (preliminary)

- Alternatives to the standard methods :
 - Status of dry-ice cleaning? (Detlef Reschke)
 - Ideas on in situ treatment: O₃, condensation rinse, glow discharge and laser blasting (Dieter Bloess)

WG1

In this first iteration information and ideas should be collected. A list of potential treatment should be developed. The interests and contributions of the different labs should be listed. After some discussion we would propose the following topics to be looked at:

WG1: ----

1. Review of production (inlc. preparation) experience This part of the meeting should asked the question which are the techniques that have been used. - What were the results on the cavities? - Which are the positive experiences? - What should not be considered for the future? Candidate talks for this part of the discussion are and potential subtopics: SNS cavity production: - experience with scanned niobium material, no Ti treatment, etching, HPR TTF cavity production (L. Lilje tbc): - scanned niobium material, Ti treatment, etching, electropolishing, HPR LEP cavity production (Dieter Bloess): - large-scale industrial production, industrialisation of processes CEBAF: - etching
2. Which of the processes is promising for future application and what R&D is still needed? - Example for discussion: What is needed to make the EP results at DESY more reproducible? - What needs to be done to understand 'in-situ' baking? - FE measurements at Wuppertal (Arti Dangwal) - Is scanning of formed sheets or dumb-bells possible / worthwhile?
3. Are there cavity design changes needed for a new large-scale production? - What are the changes from the TTF design towards the XFEL? (W.Singer ~15 min) - More detailed specification, 3D-Measurement, ZANON production, single-cell program - Is large-grain material a candidate for a large-scale production? (JLab) - Roughness measurements at Wuppertal (G. Mueller)



