

ILC R&D Board Meeting: SRF Cavities Status and Plans

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Outline

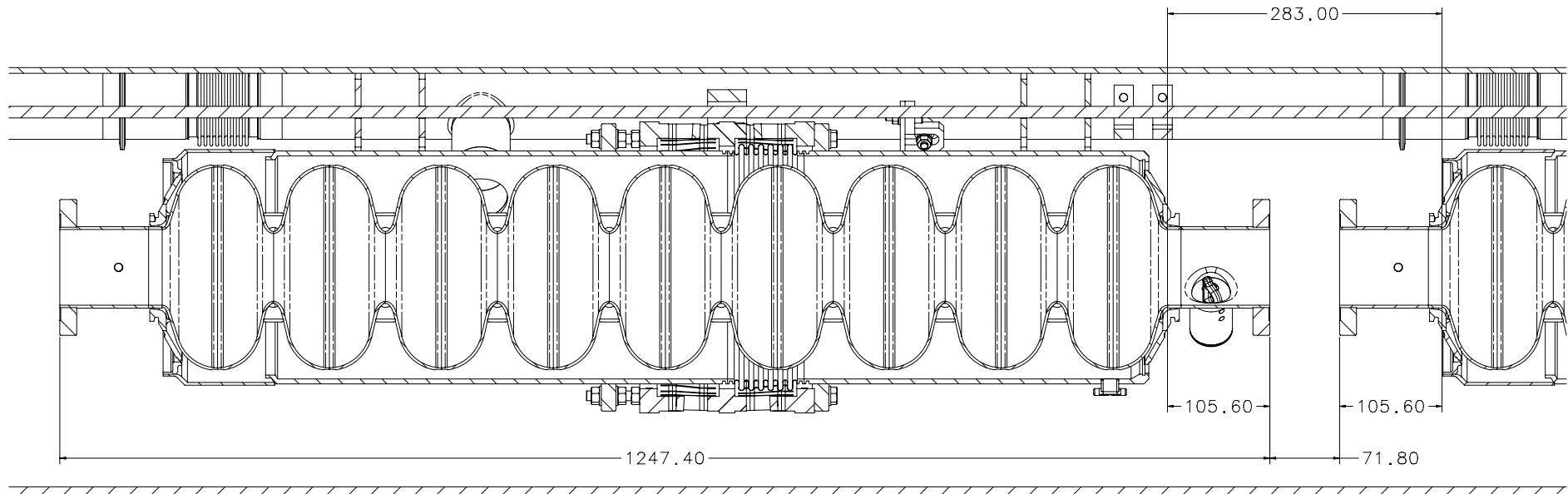
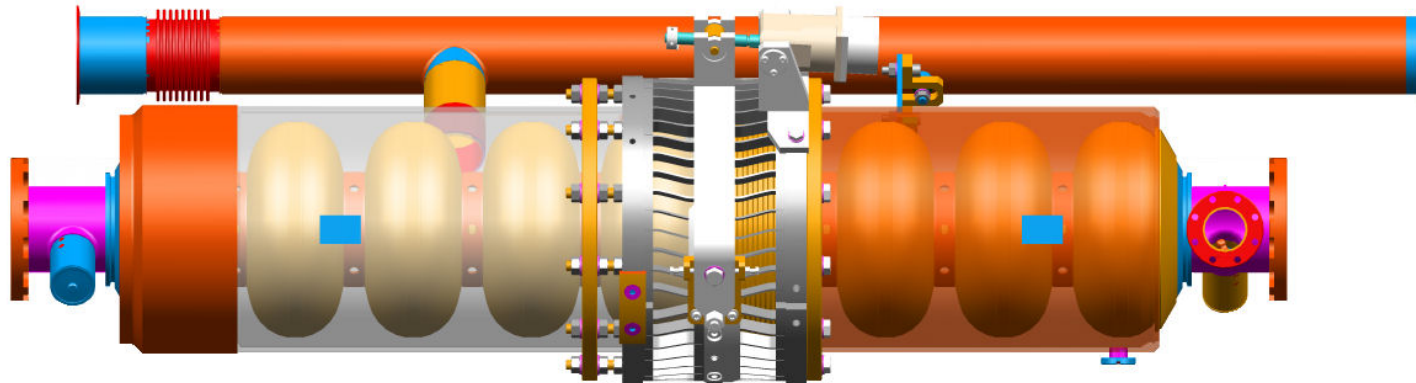
- **Tesla Style Cavities Status**
- **ILC Style Cavities Status and Plans**
- **SRF Material Procurement Plans**
- **Supporting Infrastructure Status and Plans**



TESLA Style Cavities

- Four cavities were manufactured by ACCEL and delivered to FNAL in FY05
 - No chemistry was done on cavities by manufacturer
 - Cavities were not tuned for field flatness
 - 2 cavities are now at Cornell for BCP and vertical testing
 - Other 2 cavities are here at FNAL and will be sent to JLab soon for EP processing
 - Plan to use these cavities in CM2 (to be assembled in FY07) if they can be qualified at $\geq 25\text{MV/m}$
- Four cavities are currently being manufactured by AES
 - Contracted in FY05-06
 - To be completed by end of CY06
 - Will either be processed at JLab (EP) or Joint ANL/FNAL facility (BCP)
 - Intend to be used in ILC CM2 if they qualify at $\geq 25\text{ MV/m}$
- There are no plans to produce any more TESLA style cavities in the U.S. after these 8 cavities plus the two JLab cavities are completed

ILC Cavity Dimensions



ILC Style Cavities: Status and Plans

- Four cavities currently being manufactured by JLab
 - 2 fine grain (ILC style)
 - 2 large grain (Tesla Style)
- Plan to order 10-12 more ILC style cavities this fiscal year
- Plan to order 24-36 ILC style cavities in FY07
- Plan to order 48+ ILC style cavities in FY08

Vendors
to supply
material

Cavity Summary Table

<u>Cavity style</u>	<u>FY05</u>	<u>FY06</u>	<u>FY07</u>	<u>FY08</u>
TESLA- fine grain	4 — ACCEL	6 — 4 AES — 2 JLab		
ILC- fine grain		12 New — 12	24-36	48+
ILC- large grain		JLab — 2		
ILC- single crystal				
Yearly Totals	4	20	36	48
Grand Totals	4	24	60	108



Niobium Material: Status and Plans

- Large Grain and Single Crystal
 - Plan to procure ~\$100K of large grain material from at least two vendors
 - No plans currently to procure single crystal material
- Fine Grain Stockpile
 - Maintain sufficient inventory in house to fabricate ~10 cavities
 - Currently have sufficient inventory for five ILC cavities
 - Plan to order \$200K of material in next few weeks (~8 cavities worth)



Infrastructure in Support of Cavity R&D

- Eddy Current Scanner
 - Located in IB3
 - Have two trained operators
- Material Control Department Support
 - CMM measurements of cavities
 - Vacuum leak checking of received parts
 - Parts inventory control
- Vacuum Furnaces (up to 1200 deg C, 10E-7 torr)
 - Large vertical furnace: 50 cm. dia. X 1.8 m hot zone
 - Small horizontal furnace: 30 cm. x 30 cm. x 38 cm. hot zone



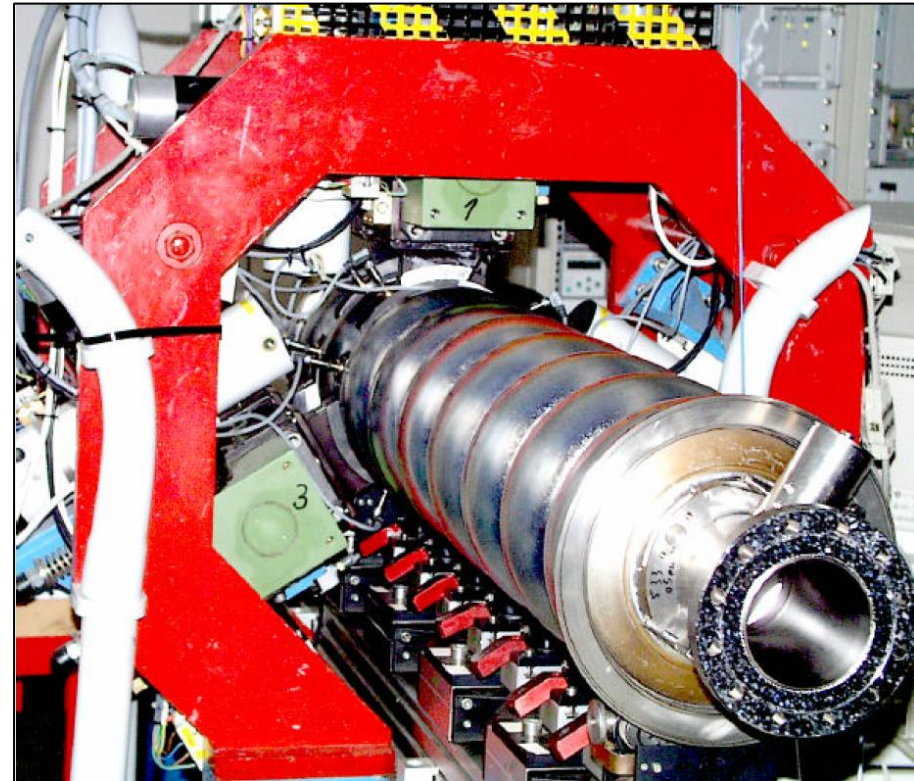
Infrastructure in Support of Cavity R&D

- SRF Lab in IB4

- Located in Class 1000 clean room area
- Half cell and dumbbell RF measurements
- Cavity bead pull system
- Manual cavity tuning capability

Infrastructure Development Plans

- DESY plans to build two more tuning machines to support XFEL production
- As a TTC collaborator, Fermilab is investigating providing designer support for tuning machine drawing revisions and will purchase a third machine for use at FNAL on ILC cavities
- Machine will be located in IB4 RF measurement clean room area



DESY Semi-automatic cavity tuning and straightening machine