



ACCEL

Current Industrial SRF Capabilities and Future Plans

Review:

Capabilities in view of

- Design
- Engineering
- Manufacturing
- Preparation
- Testing
- Assembly
- Taking into operation

Comments on:

Future Plans

- Participate in and contribute to development issues, provide prototypes
- Provide turn-key modules and Systems
- Provide studies for “large scale series production”
- Build up facilities for series production



ACCEL

Current Industrial SRF Capabilities Conclusion

Industrial Capabilities in SRF technology are available at different levels.

- Companies offering manufacturing resources (prototyping and series production)
- Companies offering design, engineering, and manufacturing
- Companies offering the complete scope from design up to operational training
- For ERL projects we believe that the user will find sufficient support in industry from engineering capability, prototyping, up to delivery of turn key systems

**This talk focuses on SRF technology/SRF Modules
and Technology Transfer Aspects**



ACCEL

Technology Transfer to Industry

Examples of successful technology transfer

- Cavity manufacturing (350 MHz cavities, Nb/Cu LEP 200)
- Linear Collider Technology (normal conducting)
- SRF Modules (CORNELL, Rossendorf)



ACCEL

Technology Transfer to industry

Examples of successful technology transfer to industry

- Cavity manufacturing (Nb/Cu LEP 200)
- Linear Collider Technology
- SRF Modules (CORNELL, Rossendorf)

Transfer of Coating Technology (Niobium on Copper Cavities) within the frame of a fixed price contract

- Copy of installations (chemical and coating facilities, clean rooms)
- Transfer of procedures to industry (chemical processing, ..., assembly)

Proof by the institute that procedures are mature is absolutely necessary to enable industry to give guarantee for performance

**Delivery of about 80 Modules
By 3 companies**

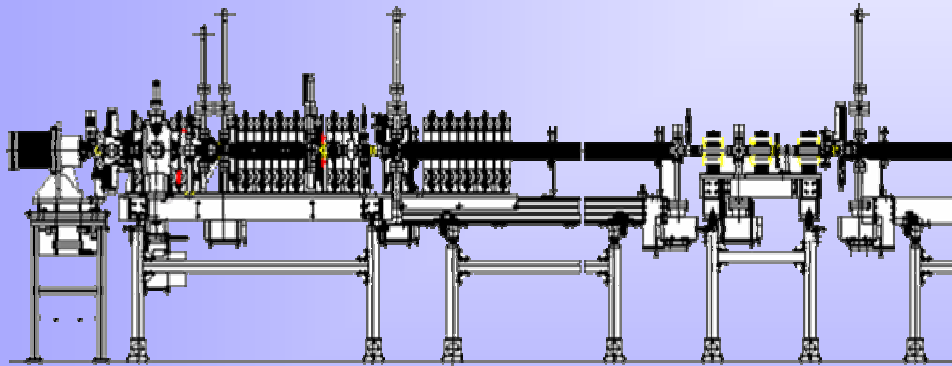


Technology Transfer to industry

Examples of successful technology transfer to industry

- Cavity manufacturing (Nb/Cu LEP 200)
- Linear Collider Technology
- SRF Modules (CORNELL, Rossendorf)

S-Band Technology, developed at DESY for the linear collider, was adopted to realize 100 MeV Electron linacs



Our tasks:

- Design taken from DESY
- Design reviewed and applied for injection linacs
- Reviewed manufacturing technology in some key fields
- Developed new design for the turn-key accelerator

Up to now 4 linacs delivered or under fabrication

Technology Transfer to industry

Examples of successful technology transfer to industry

- Cavity manufacturing (Nb/Cu LEP 200)
- Linear Collider Technology
- SRF Modules (CORNELL, Rossendorf)



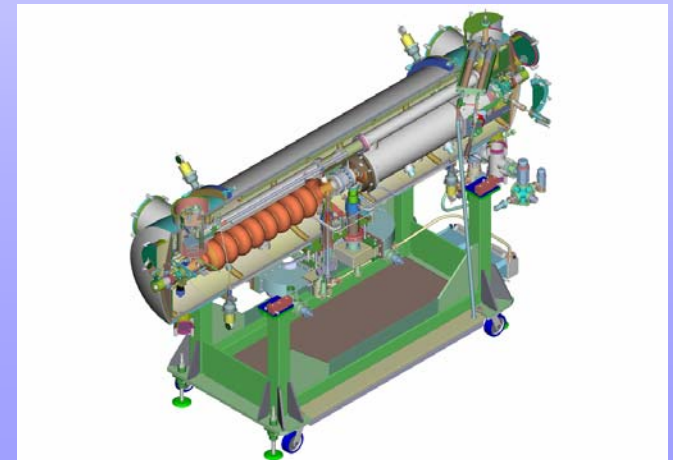
ACCEL



Existing/operating accelerator modules are taken and „industrialized“, produced, and delivered with guarantee

Our Tasks:

- Review design and manufacturing drawings (more or less effort)
- Use these revised drawings for production.
- Review manufacturing procedures and apply them for industrial standards
- Find “weak points” in design and improve those
 - Mechanical weakness of waveguide
 - Heating of pick up at HOM Coupler





Technology Transfer to Industry

- 1. Take established procedures and designs and apply those for the same institute who has developed those and asks for the accelerator (CERN LEP200)**
 - 2. Take key technologies from one institute, develop own designs (example: e-Linac, a kind of “product”) and provide to third parties/customers**
 - 3. Take existing designs (CORNELL, Rossendorf), improve these designs and provide modules of the same design for others within the SRF community**
-
- 1. Proving of procedures and technologies needs high level of Know How in the industry**
 - 2. Safety margins to cover risk are on industries side and the judgment on these do also require a high degree of Know How in accelerator technology**
 - 3. Risk of weak design points needs to be managed by continuous cooperation with all partners**



ACCEL

Technology Transfer to Industry

Another way to work with industry is to use industry as job-shops or service supplier:

- Use network of specialized companies for module production (**cavity manuf., BCP or EP treatment, coupler manuf. , integrator ...**)
- Project management by institute
- Works for prototypes and small quantities
- The know how in industry built up will remain distributed
- The task of delivering performance remains with the institute

The choice is either to work with the “job shop” or to ask for turn-key modules

Of course: any intermediate solution is possible



ACCEL

Current Industrial SRF Capabilities

Design Engineering Manufacturing Preparation Testing **Assembly** Taking into Operation

Assembly of SRF cavities/modules is performed in industry on a routine basis

There are more Resources existing from recent projects with similar requirements for series production of high quality Components, like the sc magnets for LHC.



Manufacturing and assembly space for the LHC Quadripoles