

Recent Activities in Accelerator Construction and STF Cryomodule

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Hitachi, Ltd.

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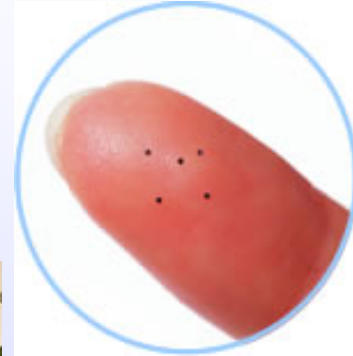
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Introduction of Hitachi

Since its foundation in 1910, Hitachi, Ltd. has contributed to society through technology.

~ Power plant, Railway vehicles, Security systems, Consumer products, etc. ~



(Unconsolidated base) (Consolidated base)

Net sales : 2,785 billionsY / 10,250 billionsY

Employees : 41,000 / 356,000

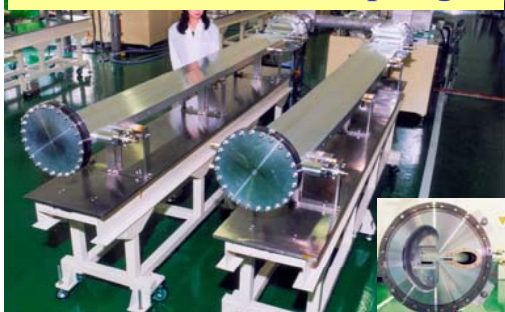
Our Experience on Particle Accelerator Construction

We have been contributing to National Projects of big accelerator construction more than 40 years.

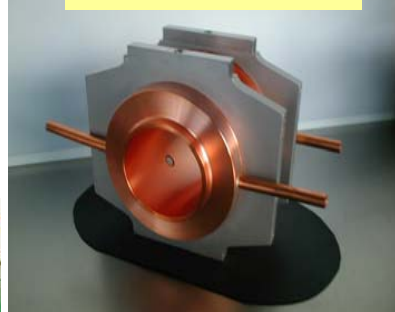
Project(Institute)	1971~	1981~	1991~	2001~	2011~
Proton Synch. (KEK)	■				
Photon Factory (KEK)		■			
TRISTAN (KEK)		■			
HIMAC (NIRS)			■		
Spring-8 (RIKEN)			■		
KEK-B (KEK)				■	
RIBF (RIKEN)				■	
J-PARC (JAEA/KEK)				■	
ERL (KEK)					■
ILC (KEK/International)					■

Two orange arrows point from the 'ERL (KEK)' and 'ILC (KEK/International)' rows to the images below. A speech bubble points to the 'RIBF (RIKEN)' row with the text "We are here." Dashed boxes are present in the 2011~ column for the ERL and ILC rows.

Beam Chamber for Spring-8



BPM for KEKB



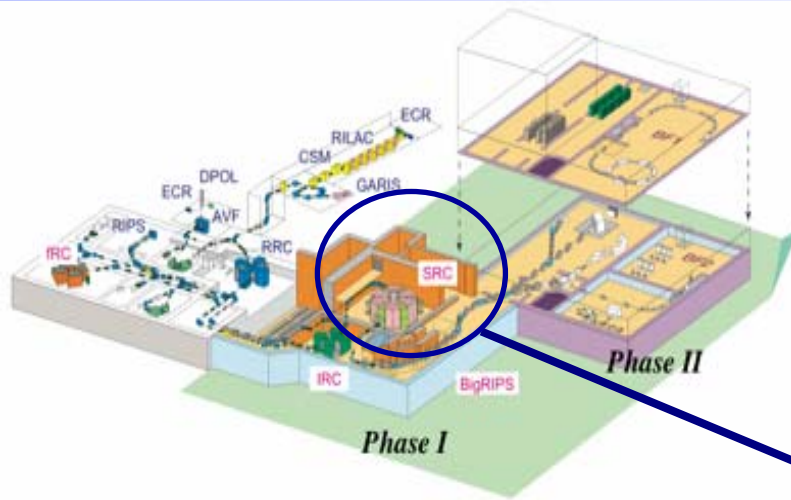
SRC for RIBF



RFQ for J-PARC



**SRC is the heart of RI-Beam Factory of RIKEN.
Hitachi's superconducting technology lives here.**



K-VALUE	2600
MAX. SECTOR FIELD	3.8 T
MAX. STORED ENERGY	240 MJ
RADIO FREQUENCY	18~38 MHz
INJECTION RADIUS	3.56 m
EXTRACTION RADIUS	5.36 m
TOTAL WEIGHT	8300 t



Magnet System for J-PARC 3GeV / 50GeV Synchrotron.

RFQ



3GeV



Quadrupole Magnet

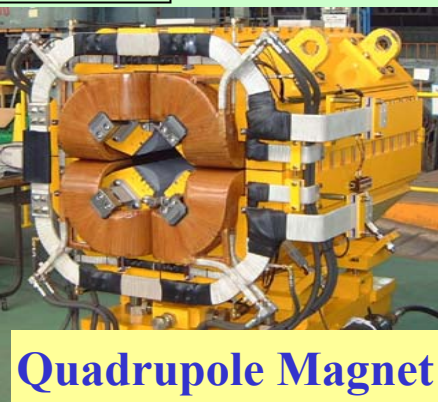


Bending Magnet

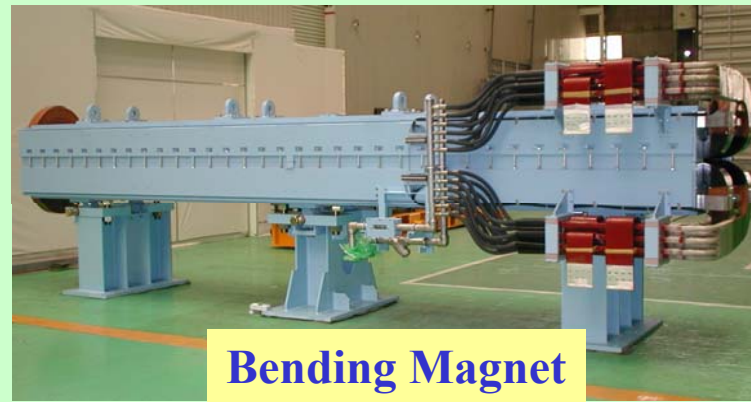
Specifications of Magnets

Synch.	Type	Qty.	Weight	Magnetic field
3GeV	B	25	38t	1.2T
	Q	60	11t	18T/ m
50GeV	B	97	33t	19T
	Q	216	12t	18T/ m

50GeV



Quadrupole Magnet



Bending Magnet

Synchrotron system

New Application for Medical, Industrial Field.

WERC W-MAST



Tsukuba Univ. Proton Beam Therapy



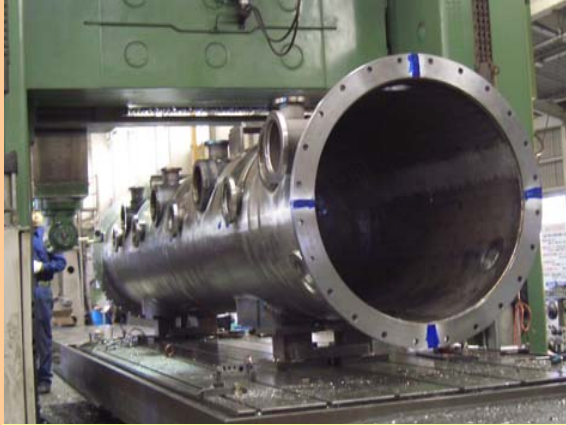
**Multi-Purpose Accelerator
With Synchrotron and Tandem**

**M.D. Anderson Cancer
Center :**

**New PBT facility is
almost completed.**



Parts manufacturing



Vacuum Vessel



GHe return pipes



Radiation shields

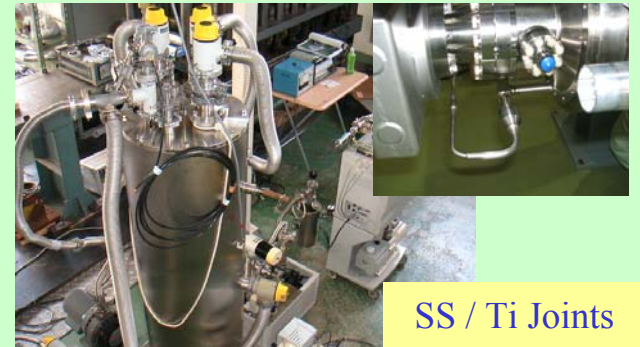


Cryogenic piping/Bellows

Performance tests



Support posts



SS / Ti Joints



Cavity sliding fixtures

All the components underwent final assembly at KEK.



Cold Mass
Assembly



Vacuum vessel
Assembly



Hitachi takes part in KEK's R&D for future Accelerators.

Connecting two cryostats :

A: baseline (35MV/m) cavities

B: LL-type (45MV/m) cavities



KEK/Hitachi

Tuner for 45MV/m RF Cavity



Two-6m Cryomodules for
RF Superconducting Test Facility (STF)

By constructing a variety of accelerator equipment, Hitachi has thus far been developing and establishing the technologies for manufacturing the related components. We were able to share valuable knowledge and expertise particularly well through the manufacturing and assembly of the STF cryomodule as part of R&D currently in progress.

We intend to extend this valuable knowledge and expertise to large accelerator projects to be launched in the future, and help promote the implementation of such projects as the first step toward future ILC constructions.

For the Future.

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