Recent Activities in Accelerator Construction and STF Cryomodule

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Hitachi, Ltd.
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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. ～

(Consolidated base) (Unconsolidated base)

Net sales : 2,785 billions¥ / 10,250 billions¥
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.

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<tbody>
<tr>
<td>Proton Synch. (KEK)</td>
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<td>Photon Factory (KEK)</td>
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<td>TRISTAN (KEK)</td>
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<td>HIMAC (NIRS)</td>
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<td>Spring-8 (RIKEN)</td>
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<td>KEK-B (KEK)</td>
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<td>RIBF (RIKEN)</td>
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<td>J-PARC (JAEA/KEK)</td>
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<td>ERL (KEK)</td>
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<td>ILC (KEK/International)</td>
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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.

** SRC (Superconducting Ring Cyclotron)**

- **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

Specifications of Magnets

<table>
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<tr>
<th>Synch.</th>
<th>Type</th>
<th>Qty.</th>
<th>Weight</th>
<th>Magnetic field</th>
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<td>3GeV</td>
<td>B</td>
<td>25</td>
<td>38t</td>
<td>1.2T</td>
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<td></td>
<td>Q</td>
<td>60</td>
<td>11t</td>
<td>18T/ m</td>
</tr>
<tr>
<td>50GeV</td>
<td>B</td>
<td>97</td>
<td>33t</td>
<td>19T</td>
</tr>
<tr>
<td></td>
<td>Q</td>
<td>216</td>
<td>12t</td>
<td>18T/ m</td>
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Synchrotron system

New Application for Medical, Industrial Field.

M.D. Anderson Cancer Center:
New PBT facility is almost completed.
6 - 1 STF / KEK (1) Parts Manufacturing

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.
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

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.

HITACHI