**ENTRY NO:** CM12
**Date:** 14 Feb 2005 22:11:16
**Machine Name:** C235
**Institution:** Sumitomo Heavy Industries, Ltd.
**Address:** 5-9-11 Kitashinagawa, Shinagawa-ku Tokyo 141, Japa
**Telephone:** +81-3-5488-8322
**Fax:** +81-3-5488-8321
**Web Address:** www.shi.co.jp/quantum/index.htm1
**Person in Charge of Cyclotron:**
**Person Reporting Information:** T.Tachikawa
**E-mail Address:** Tsk Tachikawa@shi.co.jp

**History**
**Designed by:**
**Construction Dates:** 1997
**First Beam Date:** 1998
**Characteristic Beams**
ions / energy(MeV/N)/current(pps)/power(w)
p 235 300nA
**Transmission Efficiency (source to extracted beam)**
**Typical (%):**
**Best (%):**
**Emittance**
**Emittance Definition:**
**Vertical (pi mm mrad):**
**Horizontal (pi mm mrad):**
**Longitudinal (dE/E[%] x RF[deg.]):**
**USES**
**Basic Research (%):**
**Development (%):**
**Therapy (%):**
**Isotope Production (%):**
**Other Application (%):**
**Maintenance (%):**
**Beam Tuning (%):**
**Total Time (h/year):**

**TECHNICAL DATA**
**(a)Magnet**
**Type:** compact
**Kb (MeV):**
**Kf (MeV):**
**Average Field (min./max. T):** 2.2
**Number of Sectors:** 4
**Hill Angular Width (deg.):** 57
**Spiral (deg.):** 57
**Pole Diameter (m):**
**Injection Radius (m):**
**Extraction Radius (m):** 1.07
**Hill Gap (m):** 0.096-0.009
**Valley Gap (m):** 0.6
**Trim Coils**
**Number:** 0x2
**Maximum Current (A-turns):**
**Harmonic Coils**
**Number:** 1xNsectorsx2
**Maximum Current (A-turns):**
**Main Coils**
**Number:** 1x2
**Total Ampere Turns:** 532000
**Maximum Current (A):** 800
**Stored Energy (MJ):**
**Total Iron Weight (tons):** 190
**Total Coil Weight (tons):** 20
**Power**
**Main Coils (total KW):**
**Trim Coils (total, maximum, KW):**
**Refrigerator (cryogenic, KW):**

**(b)RF**
**Acceleration**
**Frequency Range (MHz):** 106
**Harmonic Modes:** 4
**Number of Dees:** 2
**Number of Cavities:** 2
**Dee Angular Width (deg.):**30
**Voltage**
**At Injection (peak to ground, KV):** 60
**At Extraction (peak to ground, KV):** 140
**Peak (peak to ground, KV):**
**Line Power (max, KW):** 60
**Phase Stability (deg.):**
**Voltage Stability (%):**

**(c)Injection**
**Ion Source:** Livingston
**Source Bias Voltage (kV):**
**External Injection:**
**Buncher Type:**
**Injection Energy (MeV/n):**
**Component:**
**Injection Efficiency (%):**
**Injector:**

**(d)Extraction**
**Elements, Characteristic:** Electrostatic deflector Gradient corrector (passive) Permanent quadrupoles
**Typical Efficiency (%):** 50
**Best Efficiency (%):**

**(e)Vacuum**
**Pumps:** 2 sets of cryogenic pumps
**Achieved Vacuum (Pa):** 9*10-5

**REFERENCES**

**EXPERIMENTAL FACILITIES**

**COMMENTS**