

**ENTRY NO:**CU14

**Date:** 7 Feb 2005 11:56:12

**Machine Name:** HM-18

**Institution:** NIRS: National Institute of Radiological Science

**Address:** Anagawa, Inage-ku, Chiba, 263-8555, Japan

**Telephone:** +81-(0)43-206-3173

**Fax:** +81-(0)43-206-6146

**Web Address:**

**Person in Charge of Cyclotron:** S.Yamada

**Person Reporting Information:** T.Honma

**E-mail Address:** honma\_t@nirs.go.jp

#### History

**Designed by:** Sumitomo Heavy Industries

**Construction Dates:** 1994

**First Beam Date:** Mar. 1994

#### Characteristic Beams

p: 18MeV, 2.E+14 (pps)

d: 9MeV, 2.E+14 (pps)

#### Transmission Efficiency (source to extracted beam)

Typical (%): 90

Best (%): 100

#### Emittance

**Emittance Definition:**

**Vertical (pi mm mrad):**

**Horizontal (pi mm mrad):**

**Longitudinal (dE/E[%] x RF[deg.]):**

#### USES

**Basic Research (%):**

**Development (%):**

**Therapy (%):**

**Isotope Production (%):** 90

**Other Application (%):**

**Maintenance (%):** 5

**Beam Tuning (%):** 5

**Total Time (h/year):** 1300

#### TECHNICAL DATA

##### (a)Magnet

**Type:** compact

**Kb (MeV):**

**Kf (MeV):**

**Average Field (min./max. T):** 1.56

**Number of Sectors:** 4

**Hill Angular Width (deg.):**

**Spiral (deg.):**

**Pole Diameter (m):** 1.08

**Injection Radius (m):**

**Extraction Radius (m):** 0.46

**Hill Gap (m):** 0.036

**Valley Gap (m):** 0.154

##### Trim Coils

**Number:** 4x2(Upper and Lower)

**Maximum Current (A-turns):** 1600

##### Harmonic Coils

**Number:**

**Maximum Current (A-turns):**

##### Main Coils

**Number:** 1x2(Upper and Lower)

**Total Ampere Turns:** 9.72E+4

**Maximum Current (A):** 180

##### Stored Energy (MJ):

**Total Iron Weight (tons):** 27

**Total Coil Weight (tons):**

##### Power

**Main Coils (total KW):** 24.3

**Trim Coils (total, maximum, KW):** 2.82

**Refrigerator (cryogenic, KW):**

##### (b)RF

##### Acceleration

**Frequency Range (MHz):** 45

**Harmonic Modes:** 2nd and 4th

**Number of Dees:** 2

**Number of Cavities:** 1

**Dee Angular Width (deg.):** 35

##### Voltage

**At Injection (peak to ground, KV):**

**At Extraction (peak to ground, KV):**

**Peak (peak to ground, KV):** 25

**Line Power (max, KW):**

**Phase Stability (deg.):**

**Voltage Stability (%):** 0.1

##### (c)Injection

**Ion Source:** cold-cathode PIG

**Source Bias Voltage (kV):**

**External Injection:**

**Buncher Type:**

**Injection Energy (MeV/n):**

**Component:**

**Injection Efficiency (%):**

**Injector:**

##### (d)Extraction

**Elements, Characteristic:** carbon-foil, charge-exchange

**Typical Efficiency (%):** 90

**Best Efficiency (%):** 100

##### (e)Vacuum

**Pumps:** TMP 1000l/s x1, CRYO x2

**Achieved Vacuum (Pa):** 3.E-5

#### REFERENCES

#### EXPERIMENTAL FACILITIES

3-port for internal,

2-port for external.

#### COMMENTS