

ENTRY NO. CM13 Date
 Machine Name BC3015
 Manufacturer The Japan Steel Works, LTD.
 Address 4 Chatsu-machi Muroran, Hokkaido, Japan
 Tel (0143) 22-9211 Telex 0987601
 Fax (0143) 23-8161 E-MAIL
 In Charge: Y. Toda Reported by: Y. Toda

HISTORY AND STATUS
 DATES: Design 1983-1985 First Machine 1985
 SALES: No. Sold/Operational 1/1 Currently Available yes
 COST: Accelerator Facility

MAGNET
 POLE PARAMETERS:
 Diameter 129 cm R_{extract} 52 cm R_{inject} cm
 HILL PARAMETERS: Gap (min) 10.7 cm B_{max} T
 (@ 2.6x10⁵ AT) Gap (max) 10.7 cm B_{min} T
 VALLEY PARAMETERS: Gap (min) 19.8 cm B_{max} T
 (@ 2.6x10⁵ AT) Gap (max) 19.8 cm B_{min} T
 AVERAGE FIELD: _{min} 1.54 T _{max} 1.54 T
 NUMBER OF SECTORS: compact/separated 4 /
 sector angle 45 deg spiral (max) 40 deg
 FIELD TRIMMING: Trim Coils 6
 Harmonic Coils 4
 Other
 CURRENT: Main Coils 450 Amps Stability ± 2x10⁻⁵
 Trim Coils 50 Amps Stability ± 1x10⁻⁴
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 60 tons Conductor 2 ton
 ION ENERGY: Bending Limit E/A = q²/A² MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM
 FUNDAMENTAL ACCELERATION:
 Description: 2 sets of pie/4 shape dee with lambda/4 stems
 No. of Gaps/turn 4 dE/dn(max) 0.16 MeV/q
 Voltage (max) 0.04 MV Harmonic f_r/f_{ion} 2/4
 Freq 47 MHz Power in(max) 0.025 MW
 Stability: Phase 1 Voltage 1x10⁻³

VACUUM SYSTEM
 OPERATING PRESSURE: 1x10⁻⁶ Torr
 PUMPS: (No. and type) 2 diffusion pump

ION SOURCE(S)
 Type Intensity @ ε_n = βγϵ Ion Species
 (a) Hot Cathode PIG 1 (π mm mrad) H⁺
 (b) Hot Cathode PIG 1 D⁺

INJECTION SYSTEM Efficiency %

EXTRACTION SYSTEM
 Electrostatic deflector Efficiency 150 70 %

CHARACTERISTIC BEAMS
 Accelerated Ions E/A (MeV/u) Current (part. μA)
 Internal External
 (a) H⁺ 30 150 70
 (b) D⁺ 15 150 70

EXTRACTED BEAM PROPERTIES:
 For 50 μA of 30 MeV/u H⁺ ions
 ΔE/E 1 % Δφ °rf
 ε_n = βγϵ x 30 π mm mrad z 10 π mm mrad

REFERENCES/NOTES
 (a)
 (b)

ENTRY NO. CM14 Date October 5, 1995
 Machine Name HM-18 CYCLOTRON
 Manufacturer Sumitomo Heavy Industries, Ltd.
 Address 5-9-11, Kitashinagawa, Shinagawa-ku, Tokyo 141, Japan
 Tel (03)5488-8322 Telex
 Fax (03)5488-8321 E-MAIL
 In Charge: Reported by: T. Tachikawa

HISTORY AND STATUS
 DATES: Design 1989 First Machine 1991
 SALES: No. Sold/Operational 6 / 6 Currently Available Yes
 COST: Accelerator Facility

MAGNET
 POLE PARAMETERS:
 Diameter 104 cm R_{extract} 43.46 cm R_{inject} cm
 HILL PARAMETERS: Gap (min) cm B_{max} 2.1 T
 (@ 97,000 AT) Gap (max) 3.6 cm B_{min} 0.72 T
 VALLEY PARAMETERS: Gap (min) cm B_{max} T
 (@ 97,000 AT) Gap (max) 15.4 cm B_{min} T
 AVERAGE FIELD: _{min} 1.51 T _{max} 1.56 T
 NUMBER OF SECTORS: compact/separated 4 /
 sector angle 50 deg spiral (max) no deg
 FIELD TRIMMING: Trim Coils 4 pairs
 Harmonic Coils
 Other
 CURRENT: Main Coils 180 Amps Stability ± 1x10⁻⁴
 Trim Coils 30-80 Amps Stability ± 1x10⁻³
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 26 tons Conductor 0.7 tons
 ION ENERGY: Bending Limit E/A = q²/A² MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM
 FUNDAMENTAL ACCELERATION:
 Description: 45° - 2 dees with λ/4 cavities
 No. of Gaps/turn 4 dE/dn(max) 0.12 MeV/q
 Voltage (max) 0.035 MV Harmonic f_r/f_{ion} 2(H⁺), 4(D⁺)
 Freq 45 MHz Power in(max) 0.015 MW
 Stability: Phase ± 0.5deg Voltage ± 1x10⁻³

VACUUM SYSTEM
 OPERATING PRESSURE: 7x10⁻⁶ Torr
 PUMPS: (No. and type) DP x 2

ION SOURCE(S)
 Type Intensity @ ε_n = βγϵ Ion Species
 (a) PIG H⁺, D⁺
 (b)

INJECTION SYSTEM Efficiency %

EXTRACTION SYSTEM
 Stripping (carbon foil) Efficiency 100 %

CHARACTERISTIC BEAMS
 Accelerated Ions E/A (MeV/u) Current (part. μA)
 Internal External
 (a) H⁺ 18 70
 (b) D⁺ 10 50

EXTRACTED BEAM PROPERTIES:
 For μA of MeV/u ions
 ΔE/E % Δφ °rf
 ε_n = βγϵ x π mm mrad z π mm mrad

REFERENCES/NOTES
 (a)
 (b)