

ENTRY NO. CM9 Date
 Machine Name BC168
 Manufacturer The Japan Steel Works, LTD.
 Address 4 Chatsu-machi Nurooran, 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 1981-1982 First Machine 1982
 SALES: No. Sold/Operational 4 / 4 Currently Available yes
 COST: Accelerator Facility

MAGNET
 POLE PARAMETERS:
 Diameter 91 cm R_{extract} 38 cm R_{inject} cm
 HILL PARAMETERS: Gap (min) 7 cm B_{max} T
 (@ 1.2x10⁵ AT) Gap (max) 7 cm B_{min} T
 VALLEY PARAMETERS: Gap (min) 13 cm B_{max} T
 (@ 1.2x10⁵ AT) Gap (max) 13 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) none deg
 FIELD TRIMMING: Trim Coils 2
 Harmonic Coils 2
 Other
 CURRENT: Main Coils 310 Amps Stability ± 2x10⁻⁵
 Trim Coils 50 Amps Stability ± 1x10⁻⁴
 Stored Energy (cryogenic) 1 ton MJ
 WEIGHT: Iron 20 ton Conductor 1 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) 0.02 MW
 Stability: Phase 1 Voltage 1x10⁻³ MW

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

ION SOURCE(S)

Type	Intensity (mA)	@ (π mm mrad)	ε _n = βγε	Ion Species
(a) Hot Cathode PIG	1			H ⁺
(b) Hot Cathode PIG	1			D ⁺

INJECTION SYSTEM
 Efficiency %

EXTRACTION SYSTEM
 Electrostatic deflector Efficiency 80 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part. μA)	
		Internal	External
(a) H ⁺	16	150	70
(b) D ⁺	8	150	70

EXTRACTED BEAM PROPERTIES:
 For 50 μA of 16 MeV/u H⁺ ions
 ΔE/E 30 % Δφ 10 °rf
 ε_n = βγε x 30 π mm mrad z 10 π mm mrad

REFERENCES/NOTES
 (a)
 (b)

ENTRY NO. CM10 Date
 Machine Name BC1710
 Manufacturer The Japan Steel Works, LTD.
 Address 4 Chatsu-machi Nurooran, 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 1980-1981 First Machine 1981
 SALES: No. Sold/Operational 8 / 8 Currently Available yes
 COST: Accelerator Facility

MAGNET
 POLE PARAMETERS:
 Diameter 101 cm R_{extract} 42 cm R_{inject} cm
 HILL PARAMETERS: Gap (min) 7 cm B_{max} T
 (@ 1.2x10⁵ AT) Gap (max) 7 cm B_{min} T
 VALLEY PARAMETERS: Gap (min) 13 cm B_{max} T
 (@ 1.2x10⁵ AT) Gap (max) 13 cm B_{min} T
 AVERAGE FIELD: _{min} 1.43 T _{max} 1.54 T
 NUMBER OF SECTORS: compact/separated 4 /
 sector angle 45 deg. spiral (max) none deg
 FIELD TRIMMING: Trim Coils 3
 Harmonic Coils 2
 Other
 CURRENT: Main Coils 380 Amps Stability ± 2x10⁻⁵
 Trim Coils 50 Amps Stability ± 1x10⁻⁴
 Stored Energy (cryogenic) 1 ton MJ
 WEIGHT: Iron 30 ton Conductor 1 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 43.5, 47 MHz Power in(max) 0.02 MW
 Stability: Phase 1 Voltage 1x10⁻³ MW

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

ION SOURCE(S)

Type	Intensity (mA)	@ (π mm mrad)	ε _n = βγε	Ion Species
(a) Hot Cathode PIG	1			H ⁺
(b) Hot Cathode PIG	1			D ⁺

INJECTION SYSTEM
 Efficiency %

EXTRACTION SYSTEM
 Electrostatic deflector Efficiency 80 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part. μA)	
		Internal	External
(a) H ⁺	17	150	70
(b) D ⁺	10	150	70

EXTRACTED BEAM PROPERTIES:
 For 50 μA of 17 MeV/u H⁺ ions
 ΔE/E 30 % Δφ 10 °rf
 ε_n = βγε x 30 π mm mrad z 10 π mm mrad

REFERENCES/NOTES
 (a)
 (b)