

ENTRY NO. CM15 Date October 5, 1995
 Machine Name 480 AVF 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 First Machine June '85
 SALES: No. Sold/Operational 1 / 1. Currently Available Yes
 COST: Accelerator Facility

MAGNET

POLE PARAMETERS:

Diameter 115 cm $R_{extract}$ 48 cm R_{inject} cm
 HILL PARAMETERS: Gap (min) cm B_{max} 2.0 T
 (@ 171,200 AT) Gap (max) 8.6 cm B_{min} 1.57 T
 VALLEY PARAMETERS: Gap (min) cm B_{max} T
 (@ 171,200 AT) Gap (max) 14.1 cm B_{min} T
 AVERAGE FIELD: $\langle B \rangle_{min}$ T $\langle B \rangle_{max}$ 1.66 T
 NUMBER OF SECTORS: compact/separated 4 /
 sector angle deg. spiral (max) deg.
 FIELD TRIMMING: Trim Coils 6 pairs
 Harmonic Coils 4 pairs
 Other
 CURRENT: Main Coils Amps Stability $\pm 2 \times 10^{-5}$
 Trim Coils Amps Stability $\pm 5 \times 10^{-4}$
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 28 tons Conductor 1 tons
 ION ENERGY: Bending Limit E/A = 30 q^2/A^2 MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 90° 2 dees with $\lambda/4$ cavities
 No. of Gaps/turn $dE/dn(max)$ 0.099 MeV/q
 Voltage (max) 0.040 MV Harmonic f_r/f_{ion} 1
 Freq 24.5 MHz Power in(max) 0.065 MW
 Stability: Phase $\pm 1 \times 10^{-7}$ Voltage $\pm 1 \times 10^{-3}$

VACUUM SYSTEM

OPERATING PRESSURE: 2×10^{-5} Torr
 PUMPS: (No. and type) 20001/s DP

ION SOURCE(S)

Type	Intensity (mA)	@	$\epsilon_n = \beta\gamma\epsilon$ (π mm mrad)	Ion Species
(a) Livingston				H ⁺
(b)				

INJECTION SYSTEM

Efficiency %

EXTRACTION SYSTEM

Electrostatic + Magnetic Efficiency 75 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part. μ A)	
		Internal	External
(a) H ⁺	30	200	80
(b)			

EXTRACTED BEAM PROPERTIES:

For μ A of MeV/u ions
 $\Delta E/E$ % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x π mm mrad z π mm mrad

REFERENCES/NOTES

(a)
 (b)

ENTRY NO. CM16 Date October 5, 1995
 Machine Name 750 AVF 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 First Machine Feb. '85
 SALES: No. Sold/Operational 2 / 2. Currently Available Yes
 COST: Accelerator Facility

MAGNET

POLE PARAMETERS:

Diameter 180 cm $R_{extract}$ 75 cm R_{inject} cm
 HILL PARAMETERS: Gap (min) cm B_{max} 2.0 T
 (@ 263,000 AT) Gap (max) 13.3 cm B_{min} 1.57 T
 VALLEY PARAMETERS: Gap (min) cm B_{max} T
 (@ 263,000 AT) Gap (max) 31.5 cm B_{min} T
 AVERAGE FIELD: $\langle B \rangle_{min}$ T $\langle B \rangle_{max}$ 1.64 T
 NUMBER OF SECTORS: compact/separated 4 /
 sector angle deg. spiral (max) deg.
 FIELD TRIMMING: Trim Coils 10 pairs
 Harmonic Coils 4 pairs
 Other
 CURRENT: Main Coils Amps Stability $\pm 2 \times 10^{-5}$
 Trim Coils Amps Stability $\pm 5 \times 10^{-4}$
 Stored Energy (cryogenic) MJ
 WEIGHT: Iron 120 tons Conductor 6 tons
 ION ENERGY: Bending Limit E/A = 70 q^2/A^2 MeV/u
 Focusing Limit E/A = q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: 90° 2 dees with $\lambda/4$ cavities
 No. of Gaps/turn $dE/dn(max)$ 0.127 MeV/q
 Voltage (max) 0.050 MV Harmonic f_r/f_{ion} 1
 Freq 13.25 MHz Power in(max) 0.08 MW
 Stability: Phase $\pm 1 \times 10^{-7}$ Voltage $\pm 1 \times 10^{-3}$

VACUUM SYSTEM

OPERATING PRESSURE: 2×10^{-5} Torr
 PUMPS: (No. and type) 20001/s DP x 2

ION SOURCE(S)

Type	Intensity (mA)	@	$\epsilon_n = \beta\gamma\epsilon$ (π mm mrad)	Ion Species
(a) Livingston				H ⁺
(b)				

INJECTION SYSTEM

Efficiency %

EXTRACTION SYSTEM

Electrostatic + Magnetic Efficiency 80 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part. μ A)	
		Internal	External
(a) H ⁺	70	200	55
(b) H ²⁺	25	200	100

EXTRACTED BEAM PROPERTIES:

For μ A of MeV/u ions
 $\Delta E/E$ % $\Delta\phi$ °rf
 $\epsilon_n = \beta\gamma\epsilon$ x π mm mrad z π mm mrad

REFERENCES/NOTES

(a)
 (b)