

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: $\langle B \rangle_{\text{min}}$ T $\langle B \rangle_{\text{max}}$ 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 $E/A = 30$ q²/A² 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: $\langle B \rangle_{\text{min}}$ T $\langle B \rangle_{\text{max}}$ 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 $E/A = 70$ q²/A² 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 $\times 2$

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 ⁺	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)