Entry: C 43 **Date**: May 1998

Machine Name: Eindhoven AVF cyclotron **Institution**: Eindhoven University of Technology (TUE)

Address: P.O.Box 513, NL- 5600 MB Eindhoven, The Netherlands

In Charge of the cyclotron: R. Queens

Tel: 31 40 2474048 **Web:** http://www.cycl.phys.tue.nl/

Fax: 31 40 2438060 **E-mail:** j.i.m.botman@cycl.phys.tue.nl

HISTORY

Design by: Philips

Construction time:1962-9163

First beam: April 1963

CHARACTERISTIC BEAMS

ions / energy (MeV/n) **/ current** (μA):

- p 2.5 - 29.5 MeV 100 μA
- d 3 - 15 MeV 100 μA
- ^{4}He 6 - 30 MeV 30 μA
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transmission efficiency (total)

- typical: 70 % **- best**: %

transverse emittance (rms)

- vertical: 4π mmmrad

- horizontal: 6π mmmrad

longitudinal emittance (rms) 0.15 ΔE/E.deg RF

USES

basic research: 40 % **therapy**: %

development: % **isotope production**: 50 %

other applications: % **maintenance**: 10 %

beam tuning: %

total time: 4000 h/year

TECHNICAL DATA

a) magnet

type: room temperature H-magnet

Kb: 30 MeV/A **Kf**: MeV/A

average field (max): 1.55 T

number of magnet sectors: 3

- angle: 70 deg

- spiral (max): 35 deg

pole parameters

- diameter: 1.3 m

- injection radius: 0.02 m

- extraction radius: 52 m

hill gap: 0.15 m **valley gap**: 0.3 m

field trimming

- trim coils

- number: 10

- current (max): 200/100 A

- harmonic coils

- number: 3

- current (max): 30 A

- others

- number:

- current (max): A

main coils:

- number: 2

- Ampere-turns: 300 kA.T.

- current: 300 A

stored energy: MJ

weight : - iron: 80 t - **coils**: 10 t

power

- main coils (total): 60 kW

- trim coils (total max): 16 kW

- refrigerator (cryogenic): kW

b) RF

- acceleration

- frequency range: 5 - 23.3 MHz

- harmonic modes: 1 or 3

- number of dees: 1

- angular aperture: 180 deg

- voltage:- average (min-max): 50 kV

- variation with radius: no

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- power in (max): 100 kW

- stability: - phase: 1 deg- **voltage**: 0.001 %

c) injection

- internal source: Livingston type

- external (radial/axial):

- elements:

- source voltage: kV

- injection energy: MeV/n

- buncher:

- injection efficiency: %

d) ion sources/injector

e) extraction

- elements, characteristics:

- electrostatic deflector 80 deg, 60 kV/4 mm.
- magnetic channel
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-

- efficiency

- typical: % **- best**: %

f) vacuum

- pumps: oil diffusion 8000 l/s

- achieved vacuum: 10^{-6} Torr

REFERENCES

TUE Theses:

Schutte (1973), Van Heusden (1976), Botman (1981)

EXPERIMENTAL FACILITIES

Isotope production

Channeling

Microbeam

PLAN VIEW OF FACILITY