

**ENTRY NO:** C-26  
**Machine Name:** Eindhoven AVF cyclotron  
**Date:** 5/31/01 4:31:56 AM  
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#### HISTORY

**Designed By:** Philips  
**Construction Dates:** 1962 - 1963  
**First Beam Date:** April 1963

#### CHARACTERISTIC BEAMS

ions	/ energy(MeV/N)	/current(pps)	/power(w)
p	2.5 - 29.5	100 microA	
d	3 - 15	100 microA	
He	6 - 30	30 microA	

#### transmission efficiency(source to extract beam)

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

#### tranverse emittance

##### emittance definition:

**vertical:**  $4\pi$  mm mrad

**horizontal:**  $6\pi$  mm mrad

**longitudinal:**  $0.3 \times 40(\Delta) E/E$  %xdeg RF

#### USES

<b>basic research:</b> 40%	<b>therapy:</b> %
<b>development:</b> %	<b>isotope production:</b> 50%
<b>other:</b> %	<b>maintenance:</b> 10%
<b>beam tuning:</b> %	<b>Total Time:</b> 4000h/year

#### TECHNICAL DATA

**a)magnet:** **type:** room temp. H-magnet

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

**average field (min/max):** 1.55 T

**number of magnet sectors:** 3

**hill angular width:** 70hill angular width

**spiral (max):** 35 deg

#### pole parameters

**diameter:** 1.3 m

**injection radius:** 0.02 m

**extraction radius:** 0.52 m

**hill gap:** 0.1m **valley gap:** 0.3m

#### trim coils

-number: 10x2

-current(max): 200/100 A-turns

#### harmonic coils

-number: 3xNsectorsx2

-current(max): 30 A-turns

#### main coils

**number:** 1x2

**total ampere-turns:** 300k A-turns

**current:** 300 A

**stored energy:** MJ

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

#### power

**main coils (total):** 60 kW

**trim coils (total max):** 16 kW

**refrigerator (cryogenic):** kW

#### b)RF

##### acceleration

**frequency range:** 5 - 23.3MHz

**harmonic modes:** 1, 3

**number of dees:** 1

**number of cavities:**

**dee angular width:** 180degrees

##### voltage

at injection: 50kV(peak to ground, max)

at extraction: 50kV(peak to ground, max)

peak: kV(peak to ground, max)

**line power(max):** 100kW

##### stability

**phase:** 1 deg

**voltage:** 0.001%

##### injection

**c)ion source:** Livingston type

##### external injection:

##### components:

**source bias voltage:** kV

**injection energy:** MeV/N

##### buncher:

**injection efficiency:** %

##### d)injector:

##### e)extraction

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

##### efficiency

**typical:** 70%

**best:** %

##### f)vacuum

**pumps:** oil diffusion, 8000l/s

**achieved vacuum:** 10-6Pa

#### REFERENCES

N.F. Verster, et. al., The Philips AVF prototype cyclotron, CERN 63-19, (1963), 43-47.

#### EXPERIMENTAL FACILITIES

Isotope production Positron emission profiling for catalysis

#### COMMENTS