

ENTRY NO. CU26 Date October, 10, 1995
 Name of Machine Rossendorf PET Cyclotron "CYCLONE 18/9"
 Institution Forschungszentrum Rossendorf, Institut für Bioanorganische und Radiopharm. Chemie
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 In Charge: St. Preusche, Dr. J. Steinbach Reported by: St. Preusche

HISTORY

MILESTONE DATES:

Design IBA/Belgium Model Tests
 Construction First Beam 1995

DESIGN/CONSTRUCTION BY:

in house other

COST: Accelerator Facility

FUNDED BY:

STATUS

STAFF: Machine

Scientists 1 Engineers
 Technicians 2 Students

Research (in house/external)

Scientists / Engineers /
 Technicians / Students /

BUDGET: Machine Funded by
 Research Funded by

TIME DISTRIBUTION:

Basic Research (in house/external) 50.00 % / %
 Applied Program (in house/external) 20.00 % / %
 Maintenance 10.00 % Development 10.00 %

MAGNET

POLE PARAMETERS:

Diameter 108.00 cm R_{extract} 45.49 cm R_{inject} cm

HILL PARAMETERS: Gap (min) 3.00 cm B_{max} 1.90 T
 (@ AT) Gap (max) 3.00 cm B_{min} 1.60 T

VALLEY PARAMETERS: Gap (min) 35.00 cm B_{max} 0.90 T
 (@ AT) Gap (max) 35.00 cm B_{min} 0.30 T

AVERAGE FIELD: $\langle B \rangle_{\text{min}}$ 1.34 T $\langle B \rangle_{\text{max}}$ 1.39 T

NUMBER OF SECTORS: compact/separated 4 /
 sector angle 5.6 deg. spiral (max) deg.

FIELD TRIMMING: Trim Coils

Harmonic Coils

Other Movable Inserts

CURRENT: Main Coils 190.00 Amps Stability
 Trim Coils Amps Stability

Stored Energy (cryogenic) MJ

WEIGHT: Iron Conductor

ION ENERGY: Bending Limit $E/A = 18.6$ q²/A² MeV/u

Focusing Limit $E/A = 18.4$ q/A MeV/u

ACCELERATION SYSTEM

FUNDAMENTAL ACCELERATION:

Description: RF Cavities in opposite valleys

No. of Gaps/turn 4 dE/dn(max) 0.1 MeV/q

Voltage (max) 0.03 MV Harmonic f_H/f_{ion} 2 or 4

Freq 41.8 MHz Power in(max) 0.01 MW

Stability: Phase Voltage

OTHER CAVITIES (Flattopping or otherwise):

Description:

Region of Influence: R_{min} cm R_{max} cm

No. of Gaps/turn dE/dn(max) MeV/q

Voltage (max) MV Harmonic f_H/f_{ion} MW

Freq MHz Power in(max) MW

Stability: Phase Voltage

VACUUM SYSTEM

OPERATING PRESSURE: 10⁻⁵ mbar with beam

PUMPS: (No. and type) 4x Edwards 160/700 diffstack

1x Edwards 100/300 diffstack for beamline

ION SOURCE(S)

	Type	Intensity (mA)	@ $\epsilon_n = \beta\gamma\epsilon$ (mm mrad)	Ion Species
(a)	PIG			H ⁺
(b)	PIG			D ⁺
(c)				
(d)				

INJECTION SYSTEM

Efficiency %

EXTRACTION SYSTEM

Stripping Efficiency 100 %

CHARACTERISTIC BEAMS

Accelerated Ions	E/A (MeV/u)	Current (part μ A)	
		Internal	External
(a) H ⁺	18		
(b) D ⁺	9, 5		
(c)			
(d)			

Secondary Particles	E (MeV)	part/sec
(a)		
(b)		
(c)		

EXTRACTED BEAM PROPERTIES:

For μ A of MeV/u ions

$\Delta E/E$ % $\Delta \phi$ °

$\epsilon_n = \beta\gamma\epsilon$ x mm mrad z mm mrad

FACILITIES FOR RESEARCH

SHIELDED AREA: Fixed: m² Moveable m²

Target Stations: No. Served At Same Time:

MAGNETIC SPECTROMETERS:

OTHER FACILITIES:

REFERENCES/NOTES

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PLAN VIEW OF FACILITY, COMMENTS

- 8 exit ports for targets: 6 are used
- External beam transport line
- Dual beam at ports 3/7 and 4/8 possible

