

ENTRY No. 83

NAME OF MACHINE AMERSHAM INTERNATIONAL CYCL. DATE NO. 3
INSTITUTION AMERSHAM INTERNATIONAL
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HISTORY AND STATUS

DESIGN, date Model tests
ENG DESIGN, date SCANDITRONIX (MC40, Mk2)
CONSTRUCTION, date 1985
FIRST BEAM, date (or goal) June 1986
MAJOR ALTERATIONS
COST, ACCELERATOR approx. £ 1.5 M. (1986)
COST, FACILITY, total
FUNDED BY AMERSHAM INTERNATIONAL
ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS 1 ENGINEERS 1
TECHNICIANS 3 CRAFTS

GRAD STUDENTS involved during year
OPERATED BY Research staff or Operators
OPERATION hr/wk, On target hr/wk
TIME DISTR. in house %, Outside %
BUDGET, op & dev
FUNDED BY AMERSHAM INTERNATIONAL PHARMACEUTICALS DIVISION

RESEARCH STAFF, not included above
USERS, in house outside
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house
FUNDED BY

MAGNET
POLE FACE, diameter (compact) 135 cm, R extraction 51 cm
R injection cm
GAP, min 10 cm, Field 20.9 kG }
max 18 cm, Field 13.3 kG } at 227800 35MeV
AVERAGE FIELD at R ext 17.7 kG } Ampere turns
B max/ < B > 1.18

NUMBER OF SECTORS { compact 3 } Spiral, max 50 deg
separated
SECTOR ANGLE (SSC) deg
TRIMMING COILS 7 concentric coils
4 x 3 sets of harmonic coils

CONDUCTOR, material and type Cu cooled
STORED ENERGY (cryogenic) MJ
POWER: main coils .82 max, kW; current stability 10⁻⁵
trimming coils .5 max, kW; current stability 10⁻⁴
WEIGHT: Fe .65 tons; coils 3 tons
COOLING system recirculating chilled deionised water
ION ENERGY (bending limit) E/A = 40 q²/a² MeV/amu
(focusing limit) E/A = q²/a² MeV/amu

ACCELERATION SYSTEM
DEES, number 2; angle 90 deg
BEAM APERTURE 2 cm; DC Bias kV
TUNED by, coarse shorting panel fine capacitive panel
RF 13 to 27 MHz, stable ± 10⁻⁶
Orb F to MHz
HARMONICS, RF/Orb F, used
DEE - Gnd, max 42 kV, min gap 2
STABILITY, (pk-pk noise)/(pk RF volt) 10⁻³
ENERGY GAIN, max 169 kV/turn
RF PHASE, stable to ± 1 deg
RF POWER input, max 40 kW
FREQUENCY MODULATION, rate /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE approx 4 x 10⁻⁶ Torr or mbar
PUMPS, No, Type, Size Two Balzers D1P 400
(diameter 400mm)

ION SOURCES
Hot filament

INJECTION SYSTEM

EXTRACTION SYSTEM

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed m²; movable m²
TARGET STATIONS in rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

| PARTICLE | ENERGY (MeV) | | CURRENT (pA) | |
|----------|--------------|----------|--------------|----------|
| | Goal | Achieved | Internal | External |
| p | 11-35.5 | 11-35.5 | | |
| | | 33.5 | 250 | |

SECONDARY (part/s)

BEAM PROPERTIES

| MEASURED | | CONDITIONS | |
|----------------|----------------------|------------|----------|
| PULSE WIDTH | RF deg | pA of | MeV ions |
| PHASE EXC, max | RF deg | pA of | MeV ions |
| EXTRACT eff | % | pA of | MeV ions |
| RESOL ΔE/E | % | pA of | MeV ions |
| EMITTANCE | | | |
| (π mm. mrad) | { axial } { rad } | pA of | MeV ions |

OPERATING PROGRAMS, time distribution
BASIC NUCLEAR PHYSICS .. SOLID STATES PHYSICS ..
BIOMEDICAL APPLICAT. ISOTOPE PRODUCTIONS 100%

REFERENCES/NOTES

PLAN VIEW OF FACILITY, NOTEWORTHY FEATURES, COMMENTS

ISOTOPE PRODUCTION MACHINE (commercial)

- modified magnet MC40 cyclotron
- computer control PDP 11/73
- Fully automated remote target handling facilities using PDP 11/73 computer system