ENTRY NO. 93

NAME OF MACHINE NEN Cyclotron 2 DATE 30 April 1984
INSTITUTION E. I. DuPont
ADDRESS 331 Treble Cove Road, N. Billerica, MA (USA)
TEL (617) 667-9531 TELEX 947126-NENNMTC
IN CHARGE R. Garniewicz REPORTED BY F. Buck

HISTORY AND STATUS Designed and Built by the Cyclotron Corp.
DESIGN, date Model tests
ENG DESIGN, date
CONSTRUCTION, date August 76
FIRST BEAM, date (or goal) November 76
MAJOR ALTERATIONS None
COST, ACCELERATOR
COST, FACILITY, total
FUNDED BY E. I. DuPont

ACCELERATOR STAFF, OPERATION AND DEVELOPMENT
SCIENTISTS ENGINEERS
TECHNICIANS CRAFTS
GRAD STUDENTS involved during year None
OPERATED BY Research staff or X Operators
OPERATION 100 hr/wk. On target hr/wk
TIME DISTR. in house 100 %, outside %
BUDGET, op & dev
FUNDED BY E.I. DuPont

RESEARCH STAFF, not included above None
USERS, in house outside
GRAD STUDENTS involved during year
RESEARCH BUDGET, in house
FUNDED BY

MAGNET
POLE FACE, diameter (compact) 96.52 cm, R-extraction 41.9 cm
R injection cm
GAP, min 5.08 cm, Field 22.5 kG
max 10.16 cm, Field 14.4 kG } at 26×10⁶ Ampere turns
AVERAGE FIELD at R ext 17.5 kG
B max/<B> 1.28
NUMBER OF SECTORS { compact 3 / separated } Spiral, max deg
SECTOR ANGLE (SSC) deg
TRIMMING COILS Inner and outer harmonic, one per sector
CONDUCTOR, material and type Hollow copper
STORED ENERGY (cryogenic) MJ
POWER: main coils 51 max kW: current stability
trimming coils 1.2 max kW: current stability
WEIGHT: Fe 22.5 tons: coils 2 tons
COOLING system
ION ENERGY (Bending limit) E/A = q^2/A^2 MeV/amu
(Focusing limit) E/A = 26 q/A MeV/amu

ACCELERATION SYSTEM
DEES, number 2 angle 81 deg
BEAM APERTURE 1.9 cm; DC Bias 2.5 kV
TUNED by, coarse shorting bar fine capacitor
RF 26.9 to MHz, stable ±
Orb F 26.9 to MHz
HARMONICS, RF/Orb F, used 1st
DEE–Gnd, max 34 kV, min gap 1 cm
STABILITY, (pk-pk noise)/(pk RF volt)
ENERGY GAIN, max kV/turn
RF PHASE, stable to ± deg
RF POWER input, max. 55 kW
FREQUENCY MODULATION, rate None /s
modulator, type
beam pulse, width

VACUUM SYSTEM
OPERATING PRESSURE 10-20 Micro Torr or mbar
PUMPS, No, Type, Size 1-10". oil diffusion

ION SOURCES
Pig, cold cathode, radial

INJECTION SYSTEM

EXTRACTION SYSTEM

FACILITIES FOR RESEARCH
SHIELDED AREA, fixed m^2; movable m^2
TARGET STATIONS in rooms
STATIONS served at same time, max
MAG SPECTROGRAPH, type
COMPUTER model
OTHER FACILITIES

CHARACTERISTIC BEAMS

PARTICLE	ENERGY (MeV) Goal	Achieved	CURRENT (pμA) Internal	External
p	26	26	200	
SECONDARY			(part/s)	

BEAM PROPERTIES

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

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

REFERENCES/NOTES
1)
2)

PLAN VIEW OF FACILITY, COMMENTS, ETC.