

ENTRY NO. CB3 Date 5. October, 1995
 Name of Machine CELSIUS
 Institution The Svedberg Laboratory
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 In Charge: DAG REISTAD Reported by: DAG REISTAD

HISTORY
MILESTONE DATES:
 Design 1984 - 1988 Model Tests
 Construction 1984 - 1988 First Beam 1988
DESIGN/CONSTRUCTION BY:
 in house yes other
COST: Accelerator 45 MSEK Facility
FUNDED BY: Swedish Government

STATUS
STAFF: Machine
 Scientists 4 Engineers 4
 Technicians 1 Students -
 Research (in house/external)
 Scientists / Engineers /
 Technicians / Students /
BUDGET: Machine 400 kSEK Funded by Swedish Government
 Research Funded by

TIME DISTRIBUTION:
 Basic Research (in house/external) % / %
 Applied Program (in house/external) % / %
 Maintenance % Development %

MAIN PARAMETERS
MACHINE TYPE: Storage ring
ION TYPES: Up to argon ENERGY: MeV/u
RING: Geometry square Circumference 82 m

INJECTED BEAM CHARACTERISTICS
PARAMETERS: Injected Ions From Gustaf Werner Cyclotron
 Energy 12 - 180 MeV/u Ions/bunch
EMITTANCE: h 2,5 π mm mrad v 2,5 π mm mrad
 $\Delta E/E$ 0,3 % Bunch length nsec
TIMING: Bunch freq MHz Filling Time sec
INJECTION METHOD: stripping and multiturn

MAGNET SYSTEM
LATTICE: Focusing Type combined function & separate quads
 Focusing Order FDDDFDDDFD - QF - QD
 Betatron Freq: v_h 1,627 v_v 1,836
 No. Short Straight Sections 2 Length 9,3 m
 No. Long Straight Sections 2 Length 9,6 m
BENDING MAGNETS: No. 40 Length (ea) 1,1 m
 Field: max 1,0 T
QUADRUPOLES: No. 4 Length (ea) 0,44 m
 Gradient: max 12,25 T/m
OTHER MAGNETS:

RF SYSTEM
CAVITIES: No. 1 Type Ferrite tuned
 RF FREQ 0,4 - 3,3 MHz HARMONIC f_{rf}/f_{ion} 1
 PEAK VOLTS/CAV 0,0015 MV
 PEAK POWER/CAV 0,0015 MW

VACUUM SYSTEM
VACUUM CHAMBER: Material Stainless steel
 Aperture x cm²
PUMPS: (No., Type, Speed) 36 sputter-ion, 5300 l/s
 36 titanium sublimation 24000 l/s
PRESSURE: presently 2 x 10⁻¹⁰ Torr

EXTRACTION SYSTEM
TYPE: (a) The ring is intended for physics with very thin internal targets. No beam extraction is foreseen.
 (b) very thin internal targets. No beam extraction is foreseen.
 (c) extraction is foreseen.
LENGTH OF SPILL: (a) sec
 (b) sec
 (c) sec

CHARACTERISTIC BEAMS

Ion	E/A (MeV/u)	Ions/pulse	$\Delta E/E$ (%)
(a) protons	48 - 1360	5E11	0,01 - 0,1
(b) deuterons	12 - 470	5E10	0,01 - 0,1
(c) alphas	12 - 470	2E10	0,01 - 0,1
(d) oxygen	12 - 470	5E9	0,01 - 0,1

EXTRACTED BEAM PROPERTIES:
 Rep. Rate (pulse/sec)
 $\epsilon_n = \beta \gamma \epsilon$ h π mm mrad for μ A of MeV/u ions
 v π mm mrad for μ A of MeV/u ions

FACILITIES FOR RESEARCH
SHIELDED AREA: Fixed 900 m² Moveable m²
 Target Stations: 2 No. Served At Same Time: 1
MAGNETIC SPECTROMETERS:
OTHER FACILITIES:

REFERENCES/NOTES
 (a) Reistad et al., 13th Int Cycl. Conf., 1992, 266
 (b) Reistad et al., these proceedings

OTHER RELEVANT PARAMETERS, RECENT IMPROVEMENTS, ETC.

PLAN VIEW OF FACILITY, COMMENTS

