

ENTRY NO. .... CB3 ..... Date ..... 16 JULY, 1992 .....  
 Name of Machine ..... CELSIUS .....  
 Institution ..... The Svedberg Laboratory .....  
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 In Charge: A. Johansson ..... Reported by: D. Reistad .....

**HISTORY**

**MILESTONE DATES:**  
 Design 1984-1988 ..... Model Tests .....  
 Construction 1984-1988 ..... First Beam ..... 1988 .....

**DESIGN/CONSTRUCTION BY:**  
 in house YES ..... other .....  
 COST: Accelerator .. SEK 45E6 ..... Facility .....  
 FUNDED BY: ..... Swedish Government .....

**STATUS**

**STAFF:** Machine  
 Scientists ..... 2 ..... Engineers ..... 6 .....  
 Technicians ..... 1 ..... Students ..... 2 .....  
 Research (in house/external)  
 Scientists ..... / ..... Engineers ..... / .....  
 Technicians ..... / ..... Students ..... / .....  
**BUDGET:** Machine 300,000 SEK ..... Funded by Swedish Govt. ....  
 Research ..... Funded by .....

**TIME DISTRIBUTION:**  
 Basic Research (in house/external) ..... % / ..... 25 ..... %  
 Applied Program (in house/external) ..... % / ..... %  
 Maintenance ..... 18 ..... % Development ..... 7 ..... %

**MAIN PARAMETERS**

**MACHINE TYPE:** Storage Ring .....  
**ION TYPES:** Light/Heavy Ion ENERGY: ..... MeV/u .....  
**RING:** Geometry ..... Circumference 82 ..... m

**INJECTED BEAM CHARACTERISTICS**

**PARAMETERS:** Injected Ions From Gustav Werner Cyclotron .....  
 Energy 12-180 ..... MeV/u Ions/bunch .....  
**EMITTANCE:**  $h$  .....  $\pi$ mm mrad  $v$  .....  $\pi$ mm mrad  
 $\Delta E/E$  ..... % 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 EDDFEDDDFD .....  $Q_p$  .....  $Q_d$  .....  
 Betatron Freq:  $\nu_h$  ..... 1.63 .....  $\nu_v$  ..... 1.83 .....  
 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. .... 8 ..... 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 .....  
**VOLTS/CAV(max)** ..... 0.0015 ..... MV  
**POWER/CAV(max)** ..... 0.0015 ..... MW

**VACUUM SYSTEM**

**VACUUM CHAMBER:** Material Stainless steel AISI316LN .....  
 Aperture ..... X ..... cm<sup>2</sup>  
**PUMPS:**(No., Type, Speed) 36 Sputter-ion, 5300 l/s .....  
 36 Titanium sublimation, 24,000 l/s .....  
**PRESSURE:** Presently 2 x 10<sup>-9</sup> ..... Torr

**EXTRACTION SYSTEM**

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

**CHARACTERISTIC BEAMS**

Ion	E/A (MeV/u)	Ions/pulse	$\Delta E/E$ (%)
(a) protons	48-1300	10e11	0.01-0.1
(b) deuterons	12-480	2x10e10	0.01-0.1
(c) $\alpha$ -particles	12-480	10e10	0.01-0.1
(d) $^{60}\text{Fe}$ ions	12-480	10e8	0.01-0.1

**EXTRACTED BEAM PROPERTIES:**

Rep. Rate (pulse/sec) .....  
 $\epsilon_n = \beta\gamma\epsilon$   $h$  .....  $\pi$ mm mrad for .....  $\mu$ A of ..... MeV/u ..... ions  
 $v$  .....  $\pi$ mm mrad for .....  $\mu$ A of ..... MeV/u ..... ions

**FACILITIES FOR RESEARCH**

**SHIELDED AREA:** Fixed 900 ..... m<sup>2</sup> Moveable ..... m<sup>2</sup>  
 Target Stations: ..... No. Served At Same Time: .....  
**MAGNETIC SPECTROMETERS:** .....  
**OTHER FACILITIES:** .....

**REFERENCES/NOTES**

- (a) Reistad et al, these proceedings .....
- (b) .....

**OTHER RELEVANT PARAMETERS, RECENT IMPROVEMENTS, ETC.**

**PLAN VIEW OF FACILITY, COMMENTS**

