

**ENTRY NO:**CM04  
**Date:** 8 Feb 2005 14:30:02  
**Machine Name:** Cyclone 10/5  
**Institution:** Ion Beam Applications (IBA)  
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#### History

**Designed by:** IBA  
**Construction Dates:** 1989  
**First Beam Date:** 1990  
**Characteristic Beams**  
10 MeV proton 100 microA external  
5 MeV deuteron 50 microA  
**Transmission Efficiency (source to extracted beam)**  
**Typical (%)**: 55  
**Best (%)**: 60  
**Emittance**  
**Emittance Definition:** -  
**Vertical (pi mm mrad):**  
**Horizontal (pi mm mrad):**  
**Longitudinal (dE/E[%] x RF[deg.]):**  
**USES**  
**Basic Research (%)**:  
**Development (%)**:  
**Therapy (%)**:  
**Isotope Production (%)**: 100  
**Other Application (%)**:  
**Maintenance (%)**:  
**Beam Tuning (%)**:  
**Total Time (h/year)**:

#### TECHNICAL DATA

**(a)Magnet**  
**Type:** compact  
**Kb (MeV):** 10  
**Kf (MeV/A):** 10  
**Average Field (min./max. T):** 1.3 (0.4/1.9)  
**Number of Sectors:** 4  
**Hill Angular Width (deg.):** 54  
**Spiral (deg.):** 0  
**Pole Diameter (m):** 0.76  
**Injection Radius (m):** 0.02  
**Extraction Radius (m):** 0.35  
**Hill Gap (m):** 0.03  
**Valley Gap (m):** 0.80  
**Trim Coils**  
**Number:** 0  
**Maximum Current (A-turns):** N/A  
**Harmonic Coils**  
**Number:** 0  
**Maximum Current (A-turns):**N/A  
**Main Coils**  
**Number:** 2  
**Total Ampere Turns:** 112000  
**Maximum Current (A):** 200  
**Stored Energy (MJ):**  
**Total Iron Weight (tons):** 12  
**Total Coil Weight (tons):** 1.25  
**Power**  
**Main Coils (total KW):** 17  
**Trim Coils (total, maximum, KW):** -  
**Refrigerator (cryogenic, KW):** -

#### (b)RF

**Acceleration**  
**Frequency Range (MHz):** 40  
**Harmonic Modes:** 2 p/ 4 d

**Number of Dees:** 2  
**Number of Cavities:** 2  
**Dee Angular Width (deg.):** 30  
**Voltage**  
**At Injection (peak to ground, KV):** 32  
**At Extraction (peak to ground, KV):** 32  
**Peak (peak to ground, KV):** 32  
**Line Power (max, KW):** 10  
**Phase Stability (deg.):**0.1  
**Voltage Stability (%)**: 0.1

#### (c)Injection

**Ion Source:** 2 internal PIG  
**Source Bias Voltage (kV):** N/A  
**External Injection:** N/A  
**Buncher Type:** N/A  
**Injection Energy (MeV/n):** N/A  
**Component:**  
**Injection Efficiency (%)**:  
**Injector:**

#### (d)Extraction

**Elements, Characteristic:** carbon stripper  
**Typical Efficiency (%)**: 100  
**Best Efficiency (%)**:

#### (e)Vacuum

**Pumps:** oil diffusion pump  
**Achieved Vacuum (Pa):** 1 e-5

**REFERENCES** EPAC 1990, Y Jongen et al., Nice 1990

#### EXPERIMENTAL FACILITIES

#### COMMENTS

20 units sold, self-shielded version available