



TE-MSC
Magnets, Superconductors and Cryostats

Isotope Separator Magnet Refurbishment

Roberto Lopez TE-MSC-MNC
02-03.03.2016

March 2015 (visit report EDMS 1492883):

- General aspect of the magnet is good but most part of it is hidden inside the concrete blocks



Normal entrance side



35.5 ° exit side



Magnet parameters

| <u>Magnet parameters for Lisol</u> | Values | Units |
|--|--------------------------|---------|
| Magnet name | PXMDSDBHCC | |
| Aperture width | 200 | mm |
| Aperture height | 55 | mm |
| Iron length | 1385 | mm |
| Total length | 1500 | mm |
| Weight | 1200 | Kg |
| Cooling system | Combined (air and water) | |
| Deflexion | 55 | degrees |
| Curvature radius | 1500 | mm |
| Air coil turns/pole | 90 | |
| Water coil turns/pole | 10 | |
| Coils powering | Parallel | |
| Magnet resistance (at 20°C) | 0.093 | Ω |
| Magnet inductance | ~272 | mH |
| RMS Current | 266 | A |
| Voltage | 25 | V |
| Power | 6.6 | kW |
| | | |
| <u>Magnet modification for MEDICIS</u> | Values | Units |
| Coils powering | Series | |
| Magnet resistance (at 20°C) | 0.372 | Ω |
| RMS Current | 120 | A |
| Voltage | 40 | V |
| Power | 5 | kW |



Actual status / remaining work

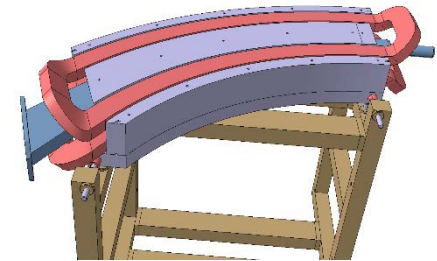
Magnet:

- Removed from the concrete blocks
- Shipment to Meyrin NormaLam workshop (bldg. 181)
- Dismantling, refurbishment, modifications and assembly
- Magnetic measurements
- Installation and commissioning



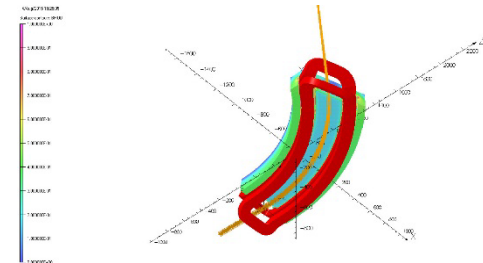
Magnet drawings

- Magnet and support drawings without the laser window
- Magnet drawings with the laser window
- New or modified vacuum chamber



Magnetic simulations

- 3D model without the laser window
- 3D model with the laser window yoke modification





Refurbishment

Work to be performed: (Bldg. 181 or 290)

- Reception radio protection inspection
- Reception electrical and hydraulic tests (3 days)
- Dismantling (1 day)
- Cleaning and shimming of the coils (2-3 days)
- Return yoke modification (2-5 days depending the RP status)
- **Adjustment of the magnetic field quality following the yoke modification**
- Assembly (1-2 days)
- Water manifold (1-5 days depending of its availability)
- Final certification (1-2 days)
- Commissioning (1-2 days)

Cost:

- Material : Small furniture 5kCHF
- FSUs : 2 technicians for 3 weeks 15kCHF
- FTEy Staff : 0.15 (2015-2016)



Planning

Reception at CERN: Middle of March

Reception tests: End of March

Opening and refurbishment: End of April

Following points depend of the vacuum chamber

Simulations and drawings: 1 month

Modifications: 2 weeks

Certification tests: 2 days

Magnetic measurements: 1 week



Remarks

As we don't know the available free space between the coils, the drawings for the laser pipe integration cannot be finalized until the magnet is opened.

The re-assembly after the magnetic modification can only start after the delivery of the vacuum chamber.

We have to finalize which type of alignment is needed.

In terms of resources the required modification of the magnet are feasible within the summer depending of the availability of the different items.