

HERA Superconducting Dipoles Cold Masses

In 1988 ASG (acting as Ansaldo Magnet Division) manufactured 242 superconducting dipoles in NbTi for the HERA storage ring. The scope of supply included the manufacturing of the coils, complete with the iron yoke and clamping structure. These magnets belong to a set of 700+700 electromagnets, forming 2 rings for positron and electron storage, assembled one on top of the other, in a 6.3 Km long underground tunnel at the outskirts of Hamburg, where are still working. The observance of stringent geometric tolerances and field uniformity values was mandatory in order to avoid the loss of energy of the beam circulating in the ring. Each of the two poles composing the individual magnet, measured 9 m in length, was prepreg insulated with kapton tape, pressed and cured. The yoke was composed of two iron half-shells, measuring 5 mm in thickness, welded along the whole length. The superconductor consists of 24 twisted 0.8 mm wires, properly formed to obtain a full trapezoidal section and a final cylindrical coil shape. After their assembly and ground insulation, the two coils were clamped together by two aluminium collar halves.



MAGNETS FOR FUSION



MAGNETS FOR HIGH ENERGY PHYSICS



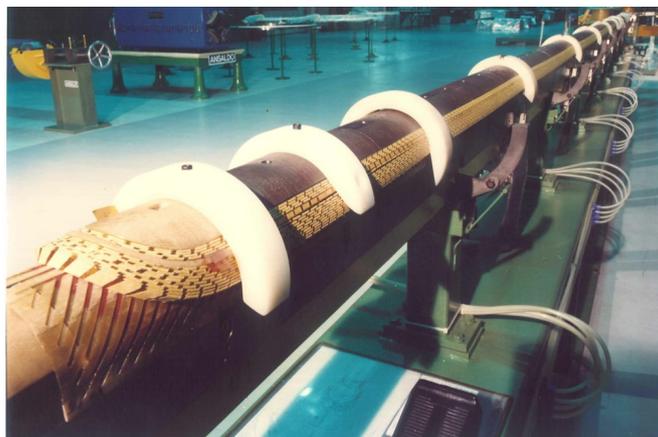
MAGNETS FOR MEDICAL APPLICATIONS



SYSTEMS FOR ENERGY



SERVICES & REPAIRS



Type of winding	2 dipole coils, cold iron yoke
Field on axis	6.05 T
Stored energy	1,275 KJ
Nominal current	6,540 A
Cable insulation	1 overlapped (58%) taping of kapton tape (0.025 mm thickness) + glass fiber tape (0.13 mm thickness) impregnated with B-stage epoxy resing wrapped around the cable with 3 mm gap between adjacent turns
Conductor	Rutherford type s.c. cable built up of 24 individual twisted wires of ϕ 0.84 mm, total dimension 10 x (1.28; 1.67) mm trapezoidal shape
Type of cooling	supercritical helium system
Coil bore	75 mm
Magnet length	9 m



HERA Dipoles Workshop



Cold mass after welding