Ramesh Gupta, 3/29/2010

Rev. 1

Preliminary Parameter List for 6 T, 200 mm Superconducting Solenoid for e-lens

Coil i.d.	200 mm
Coil length	2500 mm
Yoke length	2500 mm
Wire, bare	1.78 mm X 1.14 mm (70 mil X 45 mil)
Wire, insulated	1.91 mm X 1.27 mm (75 mil X 50 mil)
Turn-to-turn spacing (axial, radial)	2.03 mm X 1.42 mm (80 mil X 56 mil)
Number of layers (main, full length)	22 (11 double layers)
Number of layers for trimming end fields	2 (1 double layer)
Length of layers for trimming end fields	175 mm on each end
Coil o.d. (main coil only)	262.58 mm
Coil o.d. Trim coil (in series to the main coil)	268.28 mm
Coil o.d. with trim coil and over-wrap	270.86 mm
Number of turns per layer main coil	~1230
Number of turns per layer trim coil	~86 (on either end)
Total number of turns	~27,404
Current for 6 T	~442 A
Stored energy @ 6 T	~1.4 MJ
Inductance	~14 Henry
Yoke i.d.	~300 mm
Yoke o.d.	~450 mm
Yoke width (radial)	~75 mm
Field on the axis	6 T
Maximum computed error on axis	~3 X 10^{-3} (-1050 to 1050 mm and within 20 mm)
Peak Field on the conductor @ 6T	6.15 T (2.4% peak field enhancement)