



2011: NHMFL successfully tests a superconducting electromagnet to a field of 35.4 Tesla. The new record was achieved with a layer-wound insert magnet constructed with a single piece of SuperPower 2G HTS wire approximately 100 m in length and nested in a 31 T background magnet.

Coil Application

SuperPower® 2G HTS Wire ~ Spec Sheet

SuperPower is producing long lengths of high-performance 2G HTS wire to fabricate coils for devices such as HTS motors, generators, transformers and SMES. Properties uniquely suited for coils include:

- I_c uniformity in long lengths; standard deviation less than 10%
- Long, single piece lengths of robust and high performing 2G HTS wire are available
- Wire is half the thickness of 1G wire and other brands of 2G wire, offering
 - High engineering current density (J_e) – 21 kA/cm² and higher at 77K, self field
 - Superior mechanical properties particularly suited for coil applications
- Wire exhibits excellent performance in magnetic field (data available on request)
- Different configurations are available, including widths down to 3 mm
- Suitable for both pancake and layer wound coils
- Superior wire stability

Specifications	SCS4050 (4 mm wide)	SCS12050 (12 mm wide)	Comments
Total thickness	0.1 mm	0.1 mm	
Copper stabilizer thickness (total)	0.04 mm	0.04 mm	Surround stabilizer with rounded corners
Substrate thickness	0.05 mm	0.05 mm	Hastelloy® C-276
Critical tensile stress	> 550 MPa	> 550 MPa	At 77K
Critical bend diameter in tension	11 mm	11 mm	At room temperature
Critical bend diameter in compression	11 mm	11 mm	At room temperature
Critical axial tensile strain	0.45%	0.45%	At 77K
Substrate resistance	125 micro-ohm cm	125 micro-ohm cm	Higher resistance leads to lower eddy current ac loss
Substrate magnetic properties	Non-magnetic	Non-magnetic	Leads to lower ferro-magnetic ac loss
Joint resistivity	40-50 nΩcm ²		
Critical bend diameter of joint	25 mm		
Minimum critical current	80A and higher	240A and higher	At 77K, self field



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