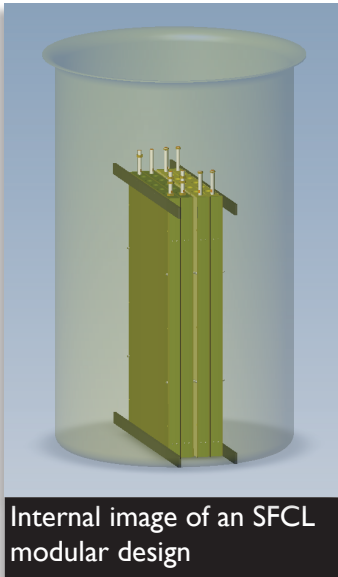
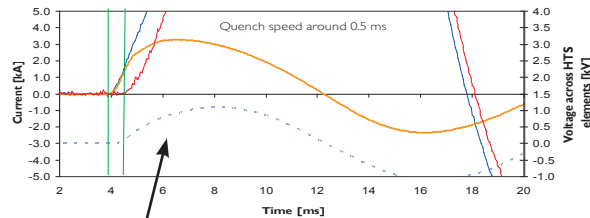


FCL Application

SuperPower® 2G HTS Wire ~ Spec Sheet



SuperPower produces long lengths of high-performance 2G HTS wire designed specifically for HTS Fault Current Limiter (FCL) applications in 12 mm width utilizing a 50 or 100 micron thickness highly resistive substrate. This material is typically provided with several microns thickness silver as a cap layer. If required, an additional copper stabilizing thickness can be added that will vary from 1 to 100 microns. First peak limitation has been demonstrated with fast response time (< 1 ms), low quench current, and rapid recovery.



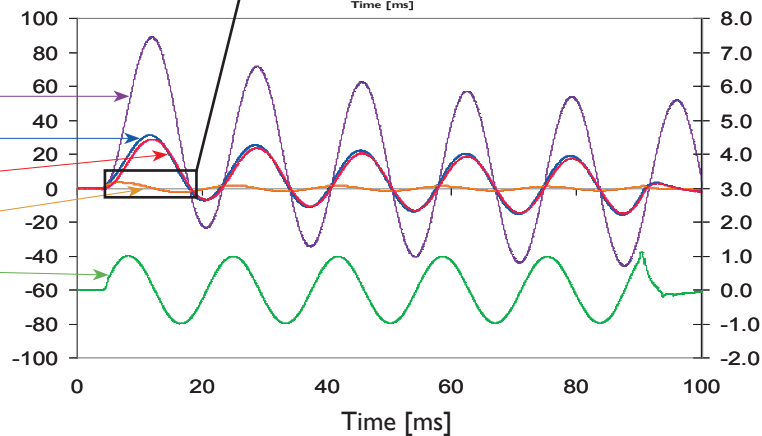
Prospective current (purple) w/o SFCL

Total current (blue) w/ SFCL

Shunt current (red) w/ SFCL

2G HTS current (orange) w/ SFCL

SFCL voltage (green)



Current limiting performance

- Quench response time around 0.5 ms
- 2G wires fully quenched at currents around $2-3 \times I_c$
- Lower energy deposited in HTS material equals better reliable performance

Specifications	SF12050 (12 mm wide)	SF12100 (12 mm wide)	Comments
Total thickness	0.055 mm	0.105 mm	
Stabilizer thickness	0.001 – 0.1 mm	0.001 – 0.1 mm	Tailored to customer requirements
Substrate thickness	0.05 mm	0.1 mm	Hastelloy® C-276
Critical bend diameter in tension	11 mm	25 mm	At room temperature
Critical bend diameter in compression	11 mm	25 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
Typical FCL response time	< 1 ms	< 1 ms	
Voltage drop	Nominal 1.6 V_{peak}/cm	Nominal 1.6 V_{peak}/cm	
Minimum critical current	240A and higher	200A and higher	At 77K self-field
I_c uniformity	$< 10\%$	$< 10\%$	STDEV over length

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