

Amperium[®] Stainless Steel Laminated Wire

Type 8602

Second generation HTS wire for current limiter and current lead applications. Available in 12 mm width.

AMSC's Amperium stainless steel laminated wire conducts more than 100 times the electrical current of copper wire having similar dimensions. It is designed for use in current limiting superconductor coils or rods where robustness and current limiting capacity are critical. The use of stainless steel lamination provides a high normal state resistance for current limiter applications as well as a low thermal conductivity package for low heat leak current leads.

Ideal Characteristics for FCL Applications

Type 8602 Amperium wire provides high I_c , superior I_c uniformity, and increased normal state resistivity in a robust, manufacturing process tolerant stainless steel package. Type 8602 stainless steel laminated wire consists of one HTS/substrate insert structure placed between two layers of 75 μm thick 316L stainless steel laminate, completing the wire.

Ideal for current lead applications

Amperium stainless steel laminated wire is uniquely suited for current lead applications. The combination of low thermal conductivity and high ampacity makes it an ideal wire for low heat leak current leads operating between large temperature differences. The heat leak of Amperium stainless steel wire from 77 K to 4 K is typically $\frac{1}{2}$ or less that of other HTS wires.

High strength with excellent mechanical properties

The stainless steel laminated design with solder fillets at the edges encloses the HTS core in a high strength hermetic package. The unique architecture produces excellent mechanical properties in both axial and through-thickness directions.

Wide width design

Manufactured using a high-volume and proprietary process, AMSC's stainless steel laminated wire is available in 12 mm width. The wider, higher current wire is designed for high power distribution and transmission level current limiters.

- High strength: robust and reliable with excellent mechanical properties
- Well suited for rapid thermal cycle applications like fault current limiters and high stress coils
- High normal state axial resistance
- Pre-tinned to enable easy terminations and joining



FCL Coil with AMSC's Amperium Stainless Steel



Second generation HTS wire for fault current limiter and current lead applications Type 8602

MECHANICAL PROPERTIES

12 mm

Average thickness:	0.22 mm - 0.28 mm
Minimum width:	11.9 mm
Maximum width:	12.3 mm
Minimum double bend diameter (RT):	70 mm ⁱ
Maximum rated tensile stress (RT):	200 MPa ⁱ
Maximum rated wire tension (RT):	48 kg ⁱ
Maximum rated tensile strain (77K):	0.3% ⁱ

ELECTRICAL PROPERTIES

12 mm

Minimum amperage (I _c) ⁱⁱ	Average Engineering current density - J _e (A/cm ²) ⁱⁱⁱ
200 A	6,600 A/cm ²
225 A	7,400 A/cm ²
250 A	8,200 A/cm ²
≥250 A	Contact factory

Insulation options: Contact factory

Certificate of Conformance provided.

Certificate of Analysis optionally available. Contact factory.

Leaders and trailers optionally available. Contact factory.

ⁱ Greater than 95% I_c retention

ⁱⁱ 77K, self-field, 1 μV/cm, 1 m resolution

ⁱⁱⁱ J_e is based on average thickness and width