

IEC 61788-27 20 K MgB₂ DC link cable

MgB₂ Superconducting Link Cable

18–25 K forced-flow helium Magnesium Diboride (MgB₂) 3–120 kA DC superconducting link

IEC 61788-27 MgB₂ (T_c = 39 K)

18–25 K Gaseous Helium Cooled

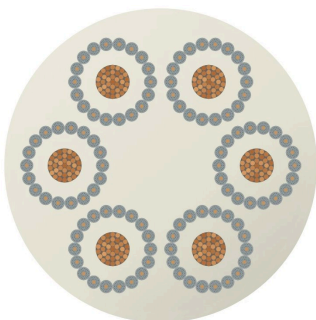
3 kA to 120 kA DC Transfer Link

Application

High-current DC superconducting transfer line cable (MgB₂ Superconducting Link Cable) built to IEC 61788-27 and CERN HiLumi LHC specifications using ex-situ Powder-in-Tube (PIT) multifilamentary Magnesium Diboride (MgB₂, T_c = 39 K) round wires in a.

Typical uses: Particle Accelerator Cold-Powering Links (HiLumi LHC), Fusion Reactor Remote Power Supply Bus Lines, LH₂ Cooled Cryogenic Aircraft & Shipboard DC Links, Green Aluminium Smelter & Electrolyser High-Current DC Buses

Construction



Cross-section, not to scale

- 1 Helical layer of ex-situ PIT MgB₂ round strands
- 2 Central OFHC copper stabilizer core
- 3 Outer OFHC copper wire braid & polyimide dielectric
- 4 Flexible corrugated AISI 316L vacuum-insulated cryostat

Technical data

Typical values

Single-strand critical current (I _c @	≥ 500 to 650 A per Ø 1.0 mm multifilamentary MgB ₂ strand	Total transfer line DC current capacity	3 kA to 18 kA (single circuit) · up to 120 kA total (multi-circuit bundle)
Dielectric withstand in 20 K gaseous	3.0 to 5.0 kV DC (accelerator link) · up to 20–50 kV DC (HVDC link)	Superconducting transition & operating	T _c = 39 K · Operating window 18 K to 25 K (max. current-sharing T _{cs} ≥ 26
Coolant medium	Forced-flow Gaseous Helium (GHe, 2–5 g/s at 0.2–0.4 MPa) or Liquid	Irreversible axial tensile strain limit	ε _{irr} ≥ 0.35 % to 0.45 % (pre-reacted Monel-sheathed MgB ₂ wire)
Minimum bending radius (pre-reacted)	120–400 mm (sub-cable) · 1.2 to 1.8 m (complete multi-circuit cryostat)	Quench hotspot protection	Calculated adiabatic hotspot < 200 K during energy extraction decay
Environmental & chemical durability	Resistant to moisture, industrial fluids and service ageing	Standards	IEC 61788-27 (Twist pitch & critical current of MgB ₂ wires) & CERN WP6a

Sizes

6 standard constructions

Tick the sizes you need and send this page to info@tebaoflex.com or WhatsApp +86 185 9591 3361.

Order designation	MgB ₂ strand layout	Form factor	Bundle Ø mm	Rated DC I kA	T _{op} K	Min. bend R mm
Pre-Reacted 20 K MgB ₂ Unit Sub-Cables (3 kA to 18 kA DC) 3 sizes						
☐ MgB2-Sub-3kA-20K	6×Ø1.0 mm MgB ₂ around Cu core	Ø 4.1 mm Sub-cable	4.1	3.2	20.0	120
☐ MgB2-Coax-10kA-20K	2×12 MgB ₂ concentric (±10 kA)	Ø 16.5 mm Coaxial	16.5	10.0	20.0	350
☐ MgB2-Monopole-18kA-20K	18×Ø1.0 mm MgB ₂ + Cu braid	Ø 19.2 mm Cable	19.2	18.0	20.0	400
Complete Multi-Circuit & Bi-Pole 20 K MgB ₂ Superconducting Transfer Links 3 sizes						
☐ MgB2-Link-60kA-Cryo	2×18kA + 4×3kA + 12×0.6kA bundle	Ø 65 mm Cable / Ø 160 Cryo	65.0	60.0	20.0	1,200
☐ MgB2-Link-120kA-HiLumi	19-circuit multi-pole DC bundle	Ø 90 mm Cable / Ø 220 Cryo	90.0	120.0	20.0	1,800
☐ MgB2-HVDC-20kV-50kA	2×25 kA ±20 kV DC bi-pole	Ø 78 mm Cable / Ø 190 Cryo	78.0	50.0	20.0	1,500

– All MgB₂ strands are reacted prior to cabling and insulated so the finished link requires no site heat treatment.

Standards and approvals

- ✓ IEC 61788-27 MgB₂ Superconductor Compliant
- ✓ 20 K Gaseous Helium Dielectric & Quench Verified
- ✓ ISO 21013 Cryogenic Vessel & Vacuum Certified

Certifications



Management systems: ISO 9001, ISO 14001, ISO 45001

Request a quotation

Send the size, length and destination. An application engineer replies within 2 business hours.

WhatsApp / phone

+86 185 9591 3361

Email

info@tebaoflex.com

Web

tebaoflex.com/cables/magnesium-diboride-mgb2-high-current-dc-superconducting-transfer-line-cable



Typical values for this cable type, based on IEC 61788-27 / CERN HiLumi LHC WP6a / Cryogenic DC Link Std. Values for your order are confirmed in the quotation. Subject to change without notice. Jiangsu Tebaoflex Special Cable Co., Ltd., Taicang, Jiangsu, China.