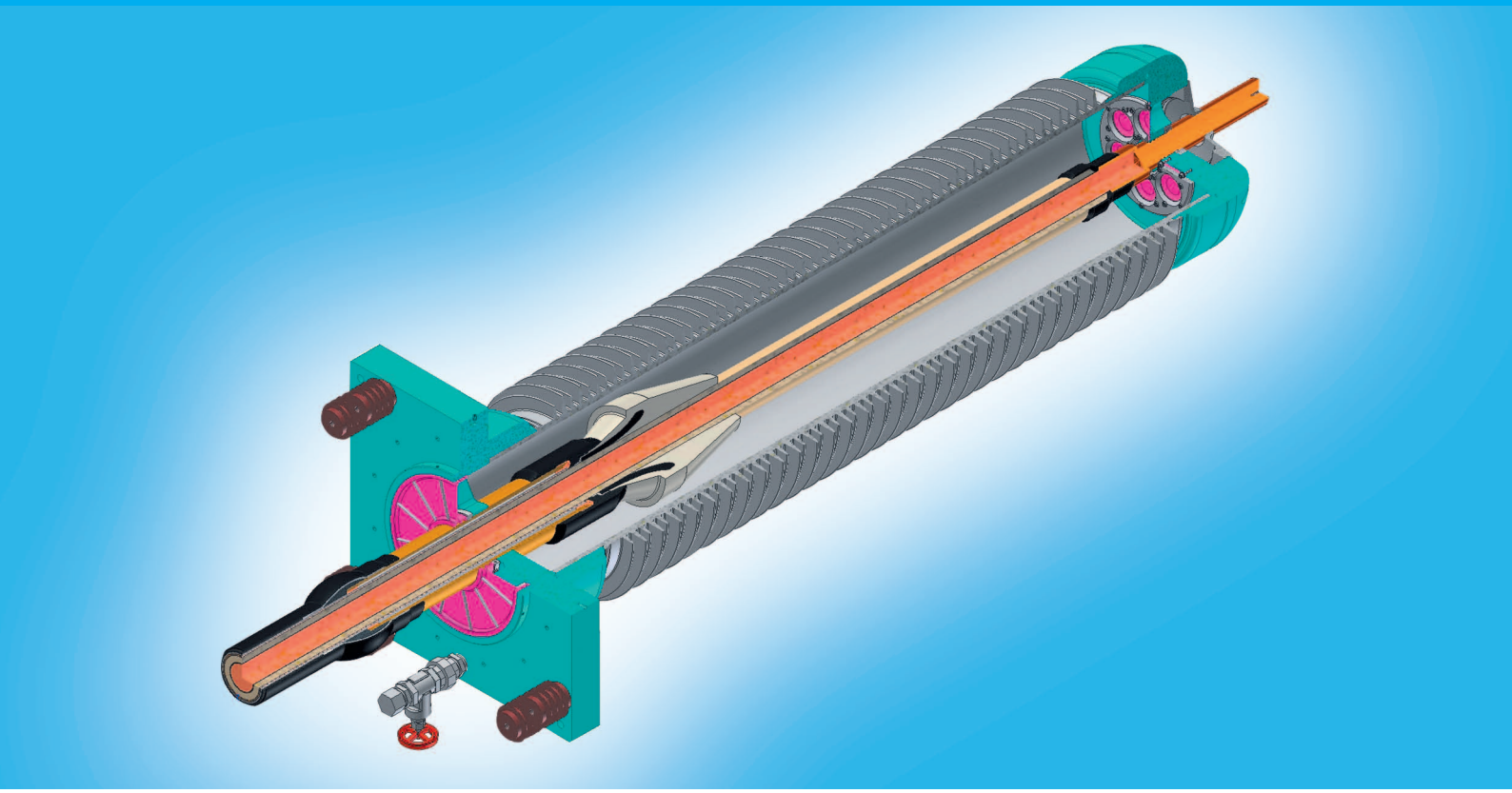
Safety First: Explosion resistant terminations from Brugg Cables



CABLEGRID™ Australia Pty Ltd.

BRUGG CABLES
Well connected.

New generation of safe devices.

The new explosion resistant terminations of Brugg Cables provide your application with the optimum degree of safety – for your personnel and your assets.

Necessity

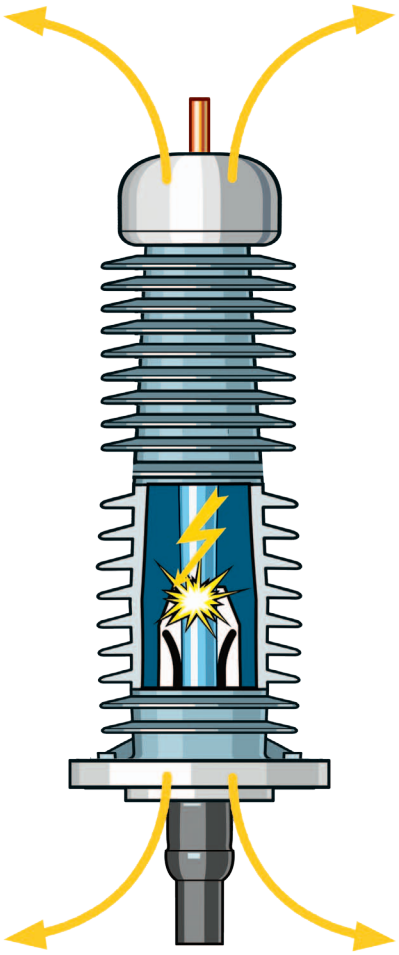
Although high voltage cable systems are extremely reliable and safe, the risk of breakdowns can never be totally excluded. Failures are usually extremely harmful to the surrounding area. At worst, explosions or breakdowns in cable systems, such as those occurring at a termination, can result in harm to life. Termination breakdowns may also result in the destruction of equipment surrounding the termination, leading to additional costs or outages of the system.

Explosion resistant design

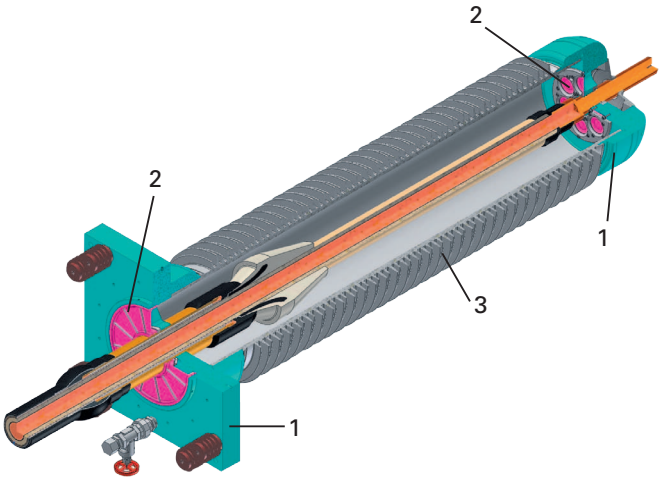
An explosion of a termination during worst case failures cannot be totally avoided. These are caused by maximum short-circuit currents, which are too high. However, the impact of such failures can be reduced.

Explosion resistant terminations are designed to prevent major parts of the termination from flying into the surrounding area (> 3 metres) when an internal arc at the field grading stress cone at max. short-circuit currents of 31.5 kA for 170 kV, 50 kA for 245 kV, and 63 kA for 420 kV (all at max. 0.5 s) occurs.

The design is constructed so that overpressure occurring during the internal arc exhausts at the overpressure devices at the top and bottom of the termination. In addition, the design and material of the base plate, and the insulator termination top is made to withstand any greater forces occurring during a short-circuit current. This ensures maximum protection of the surrounding area.



Principle of exhaust of inner pressure in the termination at an internal arc.



Design of the explosion resistant termination.

1 Base plate and termination head of reinforced strength
2 Overpressure devices
3 Composite insulator of reinforced strength

Products for your safety.

Several of our products are designed to protect your property and power system network from effects of explosions that may arise during internal arc of the termination.

Standards and tests

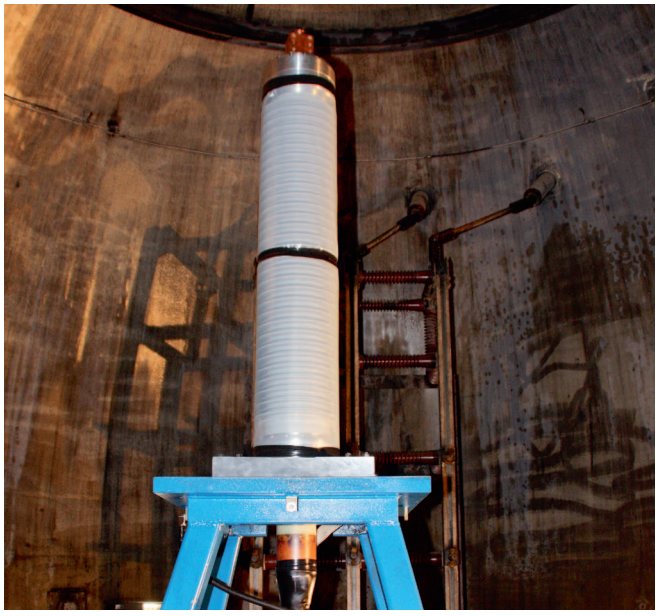
All terminations are designed and tested according to international standards, such as IEC 60840 (≤170 kV), IEC 62067 (≥170 kV) or IEC 60071-1 (insulation coordination).
The tests of the explosion resistant terminations are conducted according to the Italian utility TERNA standards. These are certified by PEHLA laboratories.

Additional measures

In many cases, the explosion resistant termination is not a standard model. To achieve a greater degree of safety, parts of the termination, such as the base plate, are thicker and of increased strength. Consequently, the termination is heavier. This weight, together with the high forces occurring during the short-circuit current, means that the mounting of the termination and the steel structure must be able to withstand considerable loads. Because of this, the steel structure and basement of the termination need to be reinforced.

References

Terminations have been successfully installed in many different applications, such as for the Italian utility TERNA.



Explosion resistant termination during the test in a PEHLA Laboratory.

Installed explosion resistant termination at 245 kV level.

Technical data of explosion resistant terminations for polymer cables

Max. operating voltage kV	Ø over insulation mm	Max. conductor cross-section (Cu/Al) mm²	Max. Ø over outer sheath mm	Type	Min. creepage distance mm
170	57 – 110	2500	150	FR 1.170-01 ep	5950
245	76 – 115	2500	150	FR 1.245-01 ep	7870, 9800
420	90 – 130	2500	160	FR 1.420-01 ep	14100

Switzerland (Head office)
Brugg Kabel AG
Klosterzelgstrasse 28
CH-5201Brugg
Phone +41 56 460 33 33
info@brugg.com

China
Brugg Cables (Shanghai) Co., Ltd.
Building No. 7 Sai Te Industrial Park
No. 1300 Jun Gong Road
Shanghai, 200433
P.R. China
Phone +86 21 5506 2530
info@brugg-cables.com.cn

Brugg Cables (Shanghai) Co. Ltd.
Suzhou Branch
No. 2 East Mechanic Premise
No. 88 Jin Ling East Road
Wei Ting Town
Suzhou Industrial Park
Suzhou, 215121
P.R. China
Phone +86 512 6262 2943
info@brugg-cables.com.cn

Germany
Brugg Kabel GmbH
Daimlerstrasse 8
DE-71701 Schwieberdingen
Phone +49 7150 9 1635 0
info.de@brugg.com

Italy
Brugg Cables Italia Srl
Via Palermo, 20
Sesto San Giovanni
IT-20099 Milano
Phone +39 02 22 47 00 48
info.it@brugg.com

USA
Brugg Cables, LLC
25 Anderson Road
P.O. Box 5231
US-Rome, GA 30162-5231
Phone +1 706 235 8755
info.usa@brugg.com

Kuwait
Brugg Cables
Salwa, Block 12
Street No 7, House No 76
Floor No 1, Flat No 1
P.O. Box 2191
22022 Salmiya/Kuwait
Phone +965 2566 32 71
info.kw@brugg.com

Poland
Brugg Cables Sp. z. o.o.
Ul. Poznanska 106
PL-66-300 Miedzyrzecz
Phone +48 95 74 20 800
Fax +48 95 74 20 802

Czech Republic
Brugg Kabel CZ, s.r.o
VGP Park, hala VI
Vlastiborská 2840/1
CZ-193 00 Praha 9 - Horní Pocernice
Phone +420 226 203 300
Fax +420 226 203 333

United Arab Emirates
Brugg Kabel AG - Abu Dhabi
P.O. Box 51769
Saiid Omran Power Building 93
Hamdan Street, Tourist Club Area
4th Floor, 041
Abu Dhabi / UAE
Phone +971 2 671 73 02
info.ea@brugg.com

Brugg Cable LLC Dubai
P.O. Box 28896
Dubai
United Arab Emirates
Phone +971 4 334 55 40
Fax +971 4 334 41 18
brugg@emirates.net.ae

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