

SPECIAL OVERHEAD CONDUCTORS

Solutions for **sensitive environmental areas**
and combined **energy and data transmission**

NOISE-REDUCTION CONDUCTORS
COATED CONDUCTORS
OPGW/OPPC



TAKING THE TECHNOLOGICAL LEAD THROUGH CONSISTENT RESEARCH AND DEVELOPMENT.

Alongside the demand for increased distribution and transmission performance in recent decades, environmental protection and sustainability have become increasingly important. Ever shorter innovation cycles and dynamically changing markets mean we have to remain focused on the markets and the technology at all times.

Through consistent further development of its special conductor designs, **LUMPI-BERNDORF** has succeeded in setting new benchmarks for environmentally-friendly and cost-effective energy transport.

SOLUTIONS FOR SENSITIVE ENVIRONMENTAL AREAS

Frequently, the prerequisites for problem-free energy transport in particularly sensitive environmental areas, such as wooded and residential areas, include avoiding disruptive visual impacts and reducing noise emissions. Various innovative solutions from LUMPI-BERNDORF, including combinations of products, can be used to address complex tasks such as these.

TELECOMMUNICATIONS SOLUTIONS

Intelligent energy networks and the rapidly increasing demand for telecommunications solutions are increasingly placing new demands on the transmission system operators. **LUMPI-BERNDORF** also offers conductors with forward-thinking design for combined energy and data transmission in the area of telecommunications – another example of high-tech products that guarantee a smooth energy and data flow.



INHALT

SPECIAL OVERHEAD CONDUCTORS

Solutions for sensitive environmental areas
and combined energy and data transmission.

1 **SPECIAL CONDUCTOR CONSTRUCTIONS**
HOLLOW CONDUCTORS
LOW WEIGHT CONDUCTORS

4 - 5

2 **SURFACE TREATMENT FOR OVERHEAD CONDUCTORS**
HYDROPHILIC CONDUCTORS
COATED CONDUCTORS

6 - 8

3 **OVERHEAD LINES WITH INTEGRATED OPTICAL FIBRES**
OPGW / OPPC

9 - 11



SPECIAL CONDUCTOR CONSTRUCTIONS

HOLLOW CONDUCTORS

NOISELESS ENERGY TRANSMISSION - HIGH PERFORMANCE

Electric high-voltage overhead lines can lead to disruptive noise emissions under certain circumstances. The use of noise-reducing overhead conductors can be an ideal solution, particularly in residential areas where special environmental measures (e.g. noise emissions) are to be taken into account.

Due to a special conductor construction (hollow area in centre) and the use of aluminium clad steel, aluminium and alloyed aluminium wires it is possible to replace standard conductors with hollow ones. As such the conductor diameter is increased, whilst retaining the mechanical and electrical properties of the overhead lines to be replaced. Thanks to the increase in the conductor diameter and the resulting reduction in marginal field intensity, many different corona noises are significantly reduced.



ADVANTAGES:

- Reduction of marginal field intensity
- Reduction of corona noise
- No tower/foundation adaptations

PERFECTION AND FORWARD-THINKING TECHNOLOGY

LOW WEIGHT CONDUCTOR

GREATER DIAMETER - LOWER WEIGHT

The sophisticated conductor construction is a combination of aluminium or alloyed aluminium wires and special filling elements. Thanks to the conductor's special construction, assembly without special fittings is possible, in contrast to classic hollow cables, which means the same stringing process compared to standard conductors.

Due to the greater diameter combined with a simultaneous reduction in weight, the corona noise level is noticeably reduced. For additional optimisation of noise reduction, the conductor can be provided with a hydrophilic surface.

Alongside the established bead blasted method, there is also another groundbreaking new development from LUMPI BERNDORF available for use: colour-coating with „**SILENT BLACK COLOUR**“ (see chapter ‚Surface treatments for overhead lines‘).



ADVANTAGES:

- Use of standard fittings
- Same stringing process as for standard conductors
- Greater diameter with the same or lower weight



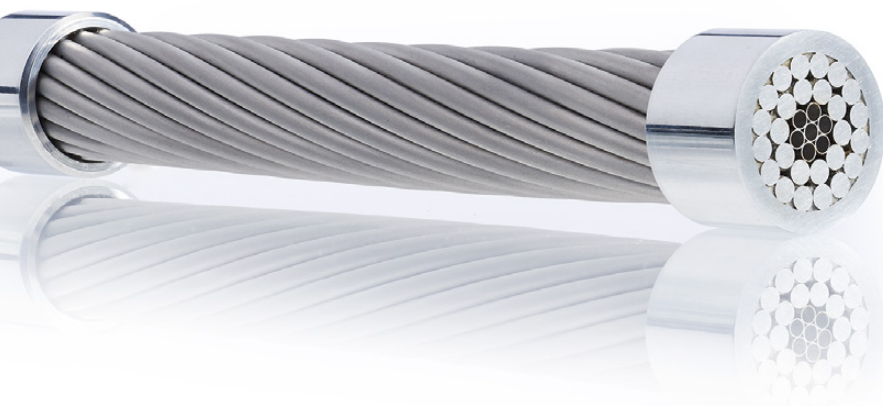
SURFACE TREATMENTS FOR OVERHEAD LINES

HYDROPHILIC CONDUCTORS

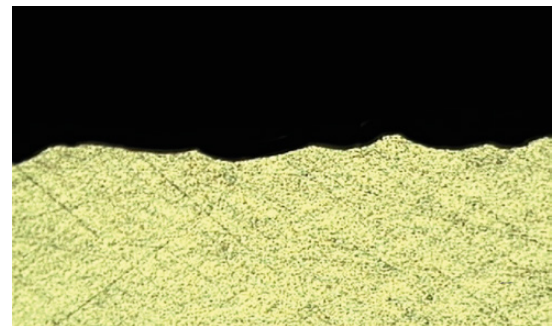
Due to increased marginal field intensity, high operating voltages sometimes lead to high/low frequency noise emissions which can be intensified in damp weather conditions.

BEAD BLASTED CONDUCTORS FOR NOISE REDUCTION

As a measure to effectively combat corona discharge in high-voltage overhead lines, LUMPI-BERNDORF has developed a process that is gentle on the material and provides a hydrophilic surface. Noise development can only be reduced to a minimum by increasing hydrophilicity.



Thanks to their spherical segment-shaped indentations, conductors treated with glass beads are not subject to side effects such as radial cracking or notching effects.



HYDROPHILIC SURFACE

Due to fast dispersal of water and a reduction in the number of water droplets on the hydrophilic surface, the frequency of corona discharge is significantly lowered and the resulting noise level is reduced to a minimum. Another positive aspect is the reduction in transmission losses in overhead lines – another contributing factor to more cost-effective energy transport.

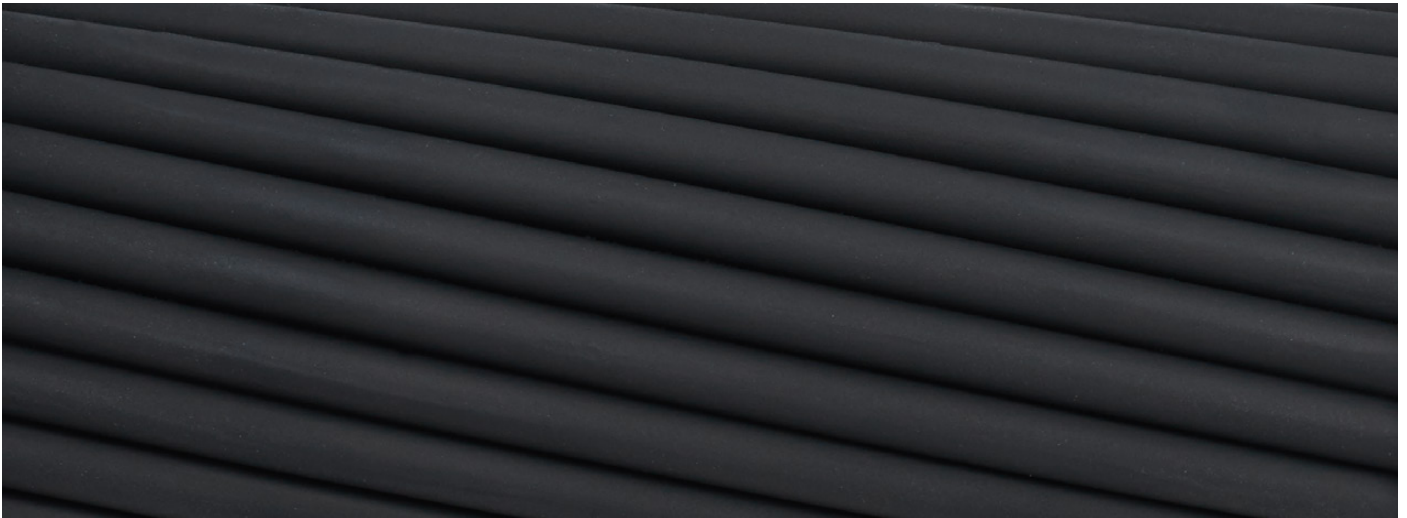
ADVANTAGES:

- Reduced corona noise in damp climate
- Material-friendly process
- Reduction in transmission losses
- Diffuse matt surface for reducing reflections

NEW PATHS TO INNOVATION

COATING WITH SILENT BLACK COLOUR

With the aim of confronting the technological challenges of the future in closer collaboration with the customer, LUMPI-BERNDORF has set another significant milestone with the **revolutionary** new development of **SILENT BLACK COLOUR**.



With this new method for noise reduction in overhead lines, the **silent black colour** is applied to the surface of the finished conductor.

The effect achieved represents a further benefit of hydrophilicity in comparison to bead blasting. At the same time, the coating also has a positive contribution to make to the landscape thanks to the reduced visual impact.

A noise reduction of up to 10 dB has been proven in laboratory tests.

ADVANTAGES:

- Extreme reduction of corona noise level
- Combination of colour-coated and hydrophilic surfaces



COATED OVERHEAD LINES

DEVELOPED FOR USE AS CAMOUFLAGE CONDUCTORS AND FOR THE OPTIMISATION OF CONTINUOUS CURRENT CARRYING CAPACITY

GREEN

LUMPI-BERNDORF takes environmental protection requirements into account and, with the development of camouflage conductors for use in sensitive environmental areas, has taken another step towards sustainability.

Colour-coated conductors are almost invisible in areas with a wooded background. This means that the potentially disruptive visual impact of an overhead line is almost entirely avoided.



BLACK

Overhead conductors with a black surface have been developed in order to optimise the operating temperature and/or the continuous current carrying capacity.

The black conductor surface brings about an improvement in the heat emission, meaning that the conductor stays significantly cooler for a given transfer performance or, conversely, more energy can be transferred at a given conductor temperature (up to 25% more continuous current capacity).



Surface-treated overhead conductors



CONNECTING THE WORLD - ELECTRCITY FOR LIFE
Unimpeded energy and data flow via forward-looking design.



OVERHEAD LINES WITH INTEGRATED OPTICAL FIBRES

OPGW / OPPC - ANOTHER HIGH-TECH PRODUCT FROM LUMPI-BERNDORF FOR UNIMPEDED DATA AND ENERGY TRANSMISSION

OPGW/OPPC conductors for combined energy and data transmission in the field of telecommunications are among the high-tech products available from LUMPI-BERNDORF. The fibre-optic conductors may be used either as earth wires or as phase conductors.

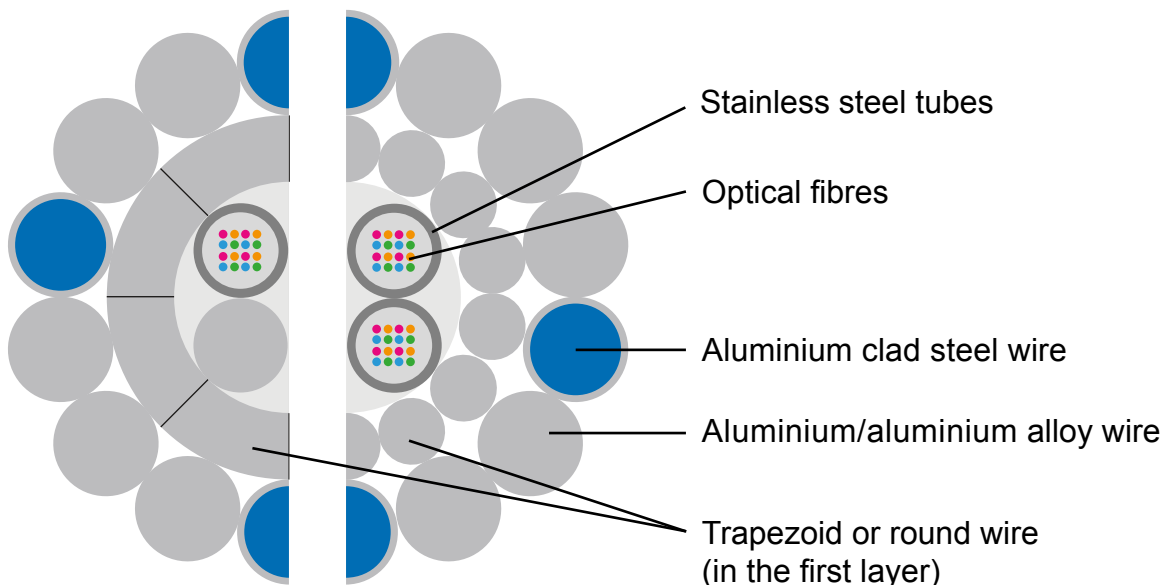


The targeted material combination of aluminium, AlMgSi and aluminium clad steel ensures that the electrical and mechanical requirements are met.

Aluminium coated stainless steel tubes can also be used for specific applications.

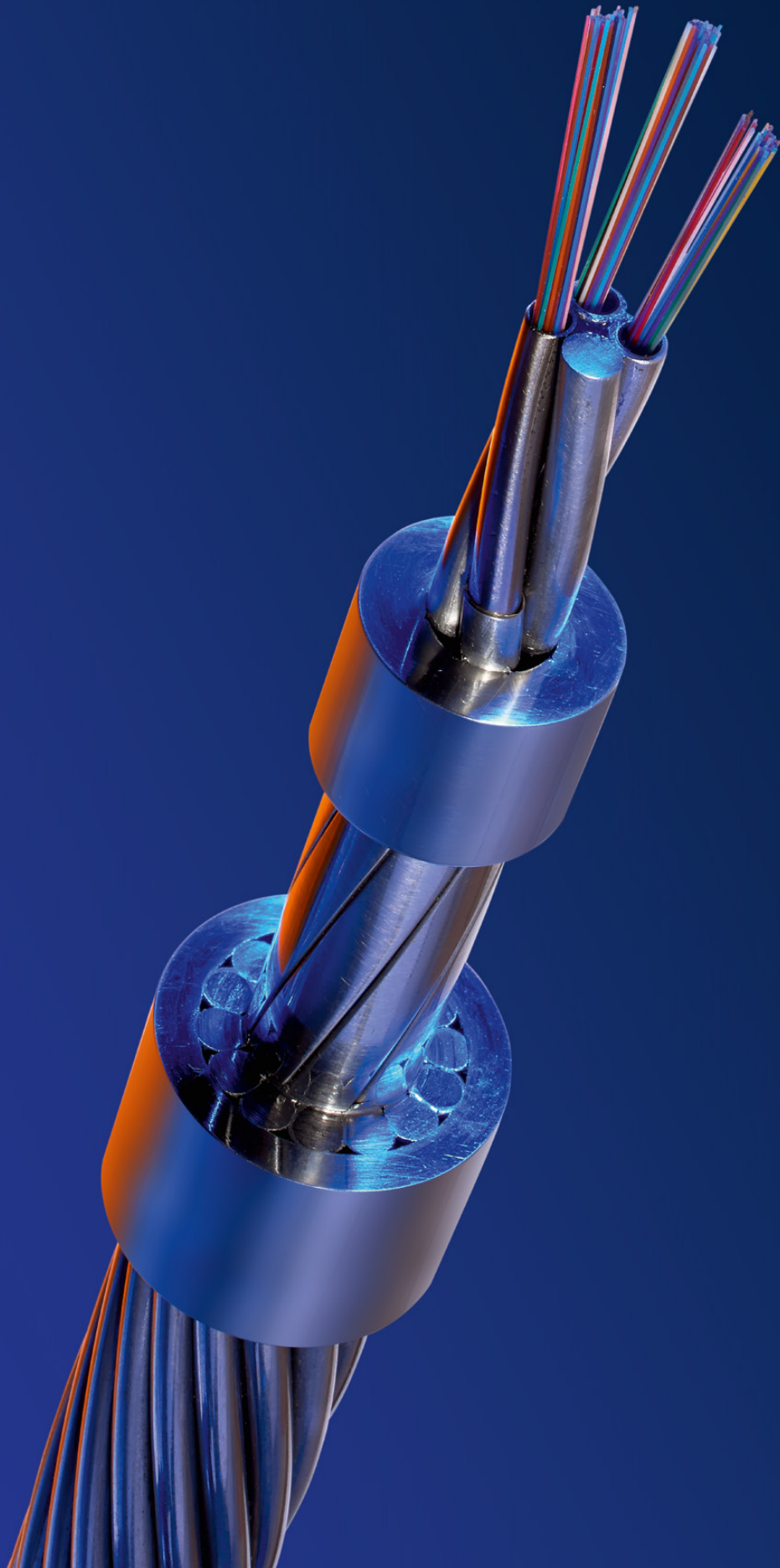
QUALITY MAKES THE DIFFERENCE

The actual communication elements, the optical fibres, are arranged in small stainless steel tubes. In conjunction with a moisture-repellent gel, the hermetically-sealed small steel tubes provide optimal protection against mechanical stresses and humidity. In order to make it possible to distinguish between the small stainless steel tubes, they may also be equipped with a surface marking if required.



Example construction of an OPGW/OPPC

We develop the ideal solution for the required parameters in close cooperation with our customers.



LUMPI-BERNDORF Draht- und Seilwerk GmbH

Head office and plant Linz
Binderlandweg 7
A-4030 Linz

Plant Berndorf
Leobersdorfer Straße 26
A-2560 Berndorf



Tel. +43 732 / 383 848 - 0
Fax: +43 732 / 37 03 78

Tel.: +43 2672 / 83595-0
Fax: +43 2672 / 81245