

COWEX POWER COMPOSITES

HIGH VOLTAGES

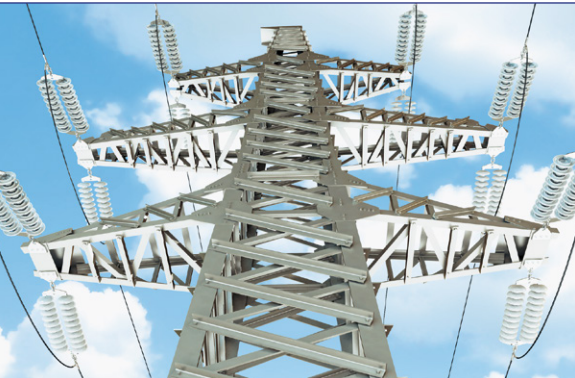
HEAVY CURRENTS

ELECTRICAL ENGINEERING

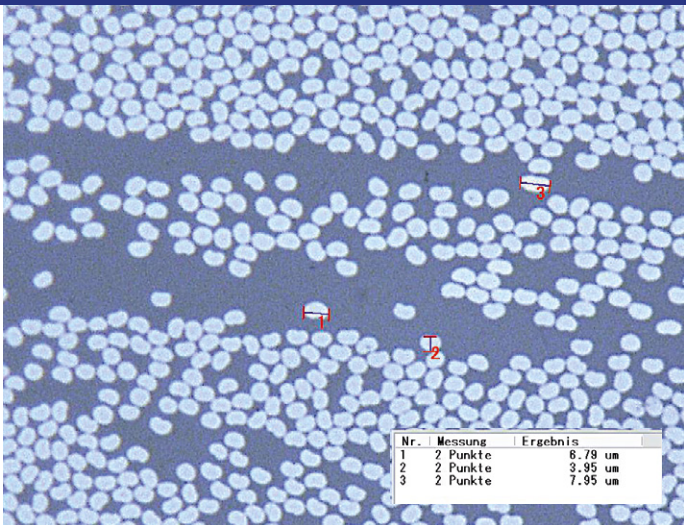
HIGH ENERGY PHYSICS

COMPONENT ASSEMBLIES

POWERFUL SOLUTIONS WITH COMPOSITES



Do you not feel truly at home until the voltages exceed 1000 kV? That's how we feel too! From test probes for work at high voltages to heavy current insulators in the most demanding designs – if your specifications allow no room for compromise, then COWEX is the right address for you. We also produce mechanical components for industry – from small precision parts to complex assemblies – with the same commitment and dependability.



Nr.	Messung	Ergebnis
1	2 Punkte	6.78 um
2	2 Punkte	3.95 um
3	2 Punkte	7.95 um

QUALITY ASSURANCE
Absolute process reliability with high levels of reproducibility is the basis for the premium quality offered by COWEX. Every individual component is numbered with a corresponding inspection report to ensure complete traceability right back to the raw material. Even a component produced in a large series is therefore actually a unique and valuable ‚individual‘ item. We have developed our own well thought-out inspection procedures and measurement techniques for our quality control. COWEX internal quality definitions are even more stringent than some of the provisions of standards such as IEC 601235 and IEC 60855.

ELECTRICAL INSULATION – GREAT POTENTIAL!



COWEX IS A BYWORD FOR INNOVATION AND EXCELLENCE IN MANUFACTURING COMPOSITES FOR THE ELECTRICAL SECTOR AND ENGINEERING COMPONENT ASSEMBLIES

We manufacture large volumes of standard components to the same specified quality as for customized one-off products. Major customers, such as Siemens, ABB and Alstom, particularly appreciate this consistency, for example in the series manufacture of 25,000 phase separators or 15,000 drive rods of uniformly high quality and displaying the same uncompromising precision as the respective prototypes.

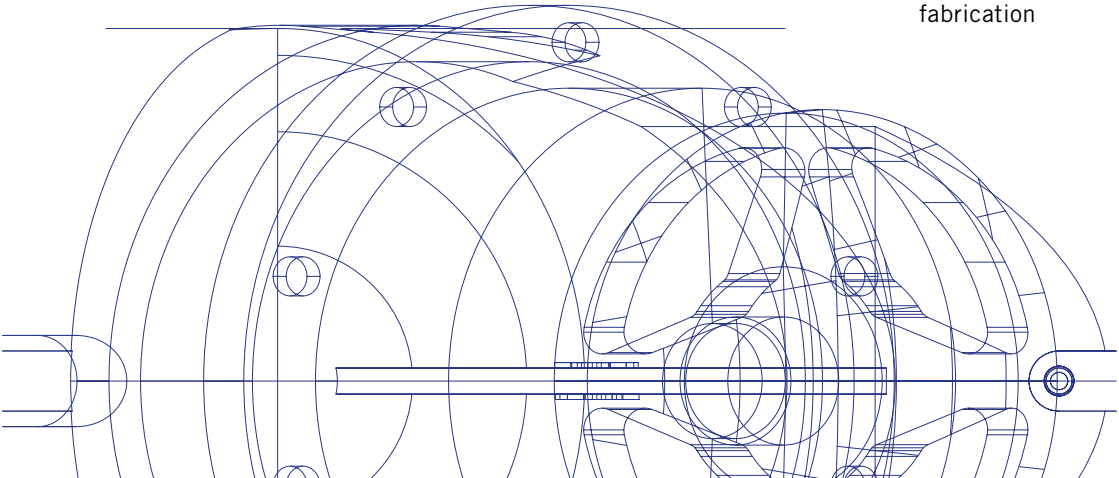
DEVELOPMENT

At COWEX it goes without saying that we continue to develop and improve our existing products. However, you will benefit even more from our expertise if you let us develop your individual applications and solutions. When CERN, the European Organization for Nuclear Research, set out the specifications for a calorimeter calling for the highest possible resistance to pressure while at the same time having maximum longitudinal stiffness, all those involved knew that would not actually be possible. Nevertheless, our engineers developed the desired components – with a dimensional tolerance of ±0.01 mm! Elsewhere in the world, the design parameters of our hollow insulators for the gigantic Three Gorges Dam do full justice to a project defined only by superlatives. COWEX can manufacture 10 m long components of this type up to diameters of 2000 mm. But even with our standard products you also benefit from the wealth of experience that we have accumulated through these extremely demanding orders.

Innovative processes open up undreamt of possibilities for value engineering projects. It is therefore quite possible that we question the design of components that you have used hitherto. However, if this results in your obtaining a better product at less expense, you will surely forgive us...

MANUFACTURE

The market-oriented series production and intelligent stock-holding of individual components or assemblies is one of our particular strengths. Deliberate overcapacity in our manufacturing facilities means that even large quantities of components can be supplied within a few days for job lot orders. Multiple supplier contracts with dependable partners guarantee the ongoing availability and high quality of our raw materials. Whether it is a prototype, a customized component or a large series – COWEX always delivers reliable Swiss quality.



PREMIUM QUALITY

- Thermal expansion taken into account
- Ideal dielectric properties
- High resistance to ultraviolet light
- Calculated, defined mechanical properties
- Surface quality as desired, ground or polished (surface roughness Ra < 0.4)
- Customized, functional surface treatment

PRECISION PROCESSES

- Filament winding
- Pull-pressing
- Pultrusion
- Vacuum impregnation

COMPETENCE IN COMPOSITES

We offer extensive expertise in the following sectors:

- High voltages/heavy currents
- Rail overhead contact lines
- High energy physics
- Machinery building and chemical equipment fabrication

HIGH PERFORMANCE MATERIALS

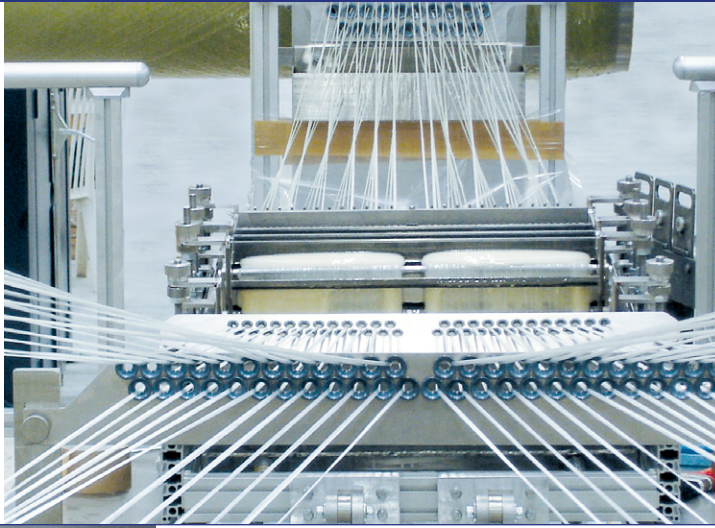
Reinforcing fibres:

- Aramid
- Glass
- Polyester
- Carbon

POWERFUL PARTNERS

- Short decision paths
- Strong innovation skills
- Proactive value engineering with significant cost savings
- Manufacturing overcapacity distributed at several sites
- Swiss reliability

- Profit from clear advantages
- Process reliability from a single source: development – manufacture – quality assurance
 - Products customized to meet your individual needs
 - Flexible manufacture – at short notice if required
 - Consistently high quality from the first to the very last component in a series
 - Short lead times with Swiss punctuality
 - Partner-like cooperation



1000 KILOVOLTS SAFELY INSULATED

COWEX'S WIDE-RANGING EXPERTISE IN ELECTRICAL ENGINEERING COMES TO THE FORE IN THE MANUFACTURE OF COMPACT HIGH VOLTAGE INSULATORS FOR GAS-INSULATED SWITCHGEAR.

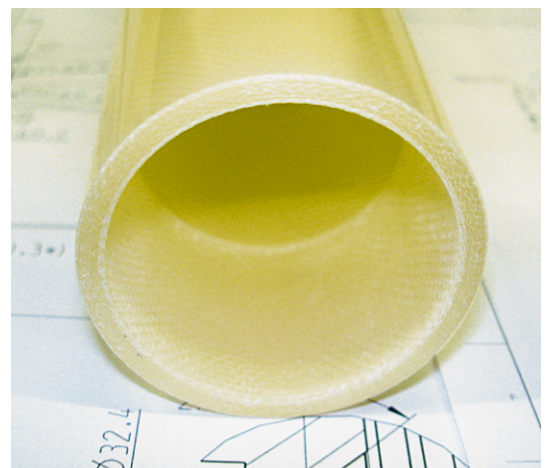
Highly specific processes endow COWEX insulators with impressive dielectric, mechanical and chemical quality characteristics. The functional reliability that this guarantees opens up totally new perspectives for the construction of compact equipment, especially on complex applications. This premium quality is also a positive factor impacting on the total life cycle costs.

When developing and manufacturing insulators made of composites we have a clear objective: the COWEX components are to constitute the heart of the installation and have the longest service life. A critical factor in achieving this is the bond between the composite material of the insulators and the end fittings for transmitting forces and torques. The special dielectric design and the quality of mechanical processing enable these joints between materials to be at least as strong as the composite itself, even under high cyclic loading from switching operations. A dielectric constant double that of SF6 is also achieved. This extremely high dielectric strength enables smaller dimensions to be used, thus setting new standards in the development of innovative compact installations – a tremendous competitive edge for the switchgear manufacturer. The unique surface quality also makes any further treatment unnecessary, thus cutting costs. In addition, the high power insulating materials are extremely resistant to hydrofluoric acid and other chemicals released by the breakdown of insulating media. With correct maintenance the service life of COWEX insulators will be significantly longer than that of the gas-insulated switchgear. In other words: Fit 'em and forget 'em! Mission accomplished ...

A COMPLETE RANGE FOR HIGH VOLTAGES

Regardless of how demanding your specifications are – just have a word with us

- Drive rods for high voltage switchgear
- Interrupting chambers and drive rods for gas-insulated switchgear (GIS) installations
- Earthing sticks for occupational safety
- Long rod designs of post-line insulators
- Hollow-core insulators
- Bushings

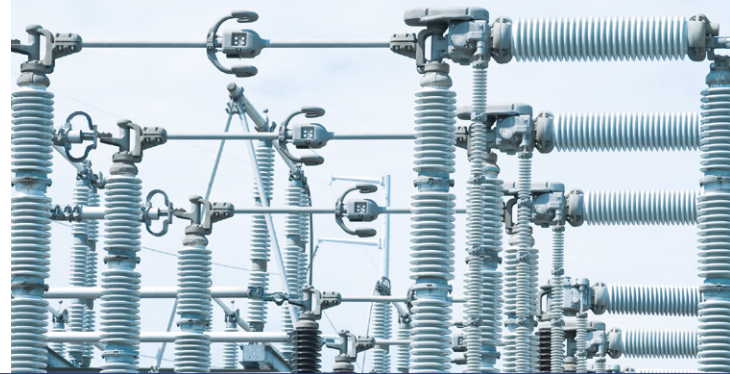


The benefits of COWEX insulators at a glance: long service life thanks to well engineered material interfaces, extremely good surface quality, high dielectric strength for compact designs and low total costs over the complete product life cycle (TCO/LCC).



COWEX components are in use here as well at the Grande Dixence hydro-electric power station, which boasts the tallest gravity dam in the world.

POWER? GIGAWATTS!



HEAVY CURRENT INSULATORS WITH HIGH POWER RATINGS NECESSITATE CONTROL OF THE ELECTRIC FIELD. COWEX 2-IN-1 BUSHINGS ARE MANUFACTURED WITH THE FINEST SWISS PRECISION FOR THE HEAVIEST CURRENTS.

COWEX can handle currents! We know the challenges that arise when very heavy currents are involved, requiring very bulky components. Conventional wisdom in the industry considered the vacuum impregnation of large workpieces with enormous quantities of resin to be an unrealistic proposition. Regardless of this, we developed a specific winding and vacuum process that enables us to manufacture precision components in giga dimensions. Highly precise control of the electric field is fully integrated into the insulator, with positioning accuracy in the order of 0.1 mm, also enabling the assembly to be optimized for economy of space. This 2-in-1 technology represents value engineering at its very best and provides great benefits for the customer.

EVERYTHING FOR HIGH CURRENT INSULATION

Whatever your requirements for insulators are, COWEX can offer the right solution – whether ex stock or developed specially for you.

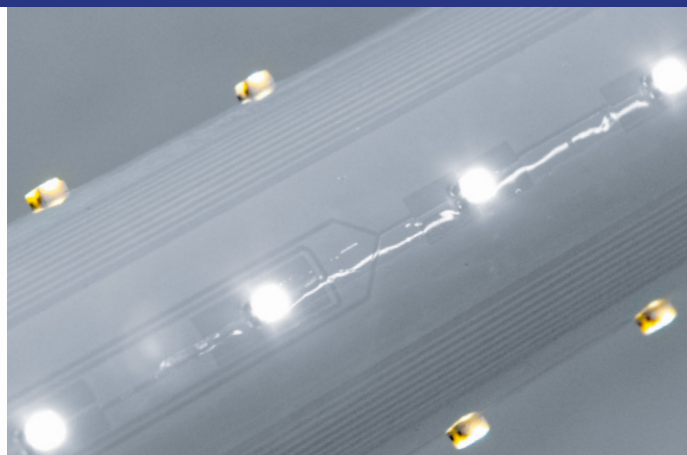
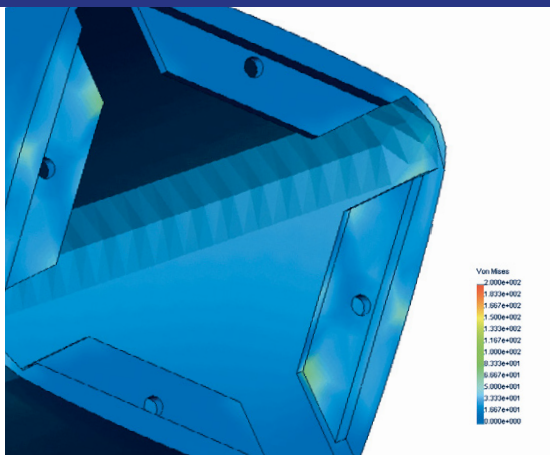
- Drive shafts for generator circuit breaker mechanisms
- Interrupting chambers and pressure cylinders
- Insulators for pump starting switches
- Earthing sticks for occupational safety
- High voltage capacitors and resistors



SWISS MADE AND WORLDPROOF

High quality composite components and assemblies from COWEX can be found in many prestigious projects worldwide. At the Three Gorges Dam in China hollow-core insulators of impressive dimensions have been installed, together with drive shafts for the generator switchgear that can cope reliably with the extremely high torques involved. Our products are also in use under extraordinary climatic conditions, such as in the Gulf states and in the tropics, where heat, humidity and aggressive salts prohibit the use of conventional insulators. Under the English Channel COWEX phase separators help to ensure that the power supply in the Eurotunnel is available at all times, even at 100 m below sea level. But we also feel equally at home at 4000 m above sea level and under icy conditions: the power cables for the Jungfrau Mountain Railway are suspended from COWEX insulators. And since the makers of satellites also placed their faith in COWEX, our products are even being used in space...

Certificates in all relevant areas demonstrate our compliance with the most stringent standards: ISO 9001, SVTI (Swiss Association for Technical Inspections) pressure vessel certificate.



YOU CAN RELY ON COWEX!

COWEX – ALWAYS AHEAD OF ITS TIME

WE HAVE BEEN WRITING THE HISTORY OF COMPOSITES FOR OVER 70 YEARS

When COWEX AG was formed within the Welker Group in 1994, the fledgling subsidiary could already fall back on more than 50 years of valuable expertise from the parent company. Since then, with its typically Swiss pioneer spirit and an inexhaustible capacity for innovation, the company has always set new standards in the development and manufacture of high quality components in fibre composites.

MOTIVATED TO PEAK PERFORMANCE BY OUR CUSTOMERS

Even tried-and-tested processes can still be optimized further. We have committed ourselves to this basic principle and in this way, working closely with our customers, we strive for continuous improvement in the quality of our products and services, and use our technological lead for their benefit. Regardless of whether we are manufacturing particularly complex individual items or extremely large job lots, state-of-the-art technology and concepts ensure that the limits of our scalability are defined solely by customer needs. You too can profit from our expertise.

REACH FOR THE STARS WITH US

With COWEX you have found a reliable business partner that understands your needs, from high quality standard components right through to customized composite designs for individual customers. Both feet remain firmly on the ground, however, even though Ruag Space has decided to launch a fair number of satellites equipped with COWEX components into orbit ...

LOCATIONS

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