

Bekaert solutions in Energy & Mining

Dear Reader,

Welcome to this first edition of Bekaert's Energy and Mining Newsletter!

Energy and mining markets are clearly growing in importance. That is why Bekaert, too, is fully committed to developing innovative technologies and solutions that will enable customers in various energy sectors to extract, transmit, produce, and distribute energy and other resources in an efficient and safe way.

Each issue of this newsletter will cover a selection of products and solutions that Bekaert provides. Consider it an invitation to contact us at any time with any questions you may have.

Powering your performance



High-voltage lines are being increasingly upgraded with new conductors to cope with higher transmission demands over longer distances.

Bekaert wires and coatings ensure greater strength and higher temperature resistance to meet these new demands.

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Renewing your energy

Wind turbines are being built ever higher and farther out to sea. This greatly increases the forces to be transmitted. Bekaert has developed fine cords for timing belts that ensure maintenance-free, high-performance transmission belts for the rotor blades.



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Digging into innovation



Safe working conditions are critically important in the mining industry. That is why many mining companies choose Dramix[®] to reinforce mine shafts.

[read more on page 4](#)

Fueling your business

Increasingly deeper wells and longer distribution pipes have put the oil drilling industry to the test. Bekaert has risen to the challenge and developed ultra-strong and corrosion-resistant rope wires, ropes and cables, plastic strips with embedded advanced cords to reinforce pipes.



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Powering your performance

Electricity market sets new performance requirements for energy transport



While in the past, electricity production has been strongly localized in the area where it is consumed, the current trend to buy electricity where it is cheapest strongly increases transport over large distances.

Therefore, high-voltage lines are being upgraded with new conductors that have a higher current-carrying capacity at equal weight, diameter, and sag.

Keeping cool in an overheated electricity market

One popular method for increasing a conductor's current-carrying capacity is to operate it at a higher temperature. Consequently, the conductor has to cope with temperatures of up to 300°C, which are too high for traditional conductor wire coatings to handle.

Bekaert Bezinal[®] coated steel wires for safe and reliable operating conditions

Bekaert has been working on an alternative solution to protect the conductor's steel core: a new coating called Bezinal[®] that contains about 95% zinc and 5% aluminum. The Bezinal[®] coating has a temperature resistance up to its melting point (385°C) and has better overall corrosion resistance than zinc. Salt spray corrosion tests have shown that with an equal coating thickness, Bezinal[®] takes two to four times longer to rust than pure zinc.

Equally important in ensuring safe and reliable operation is the use of wires with higher tensile strength for reinforcing the conductor's steel core. These wires enable the reduction of the conductor's steel section, thus increasing its aluminum section for a given outer diameter and weight. This lowers the electric resistance and reduces thermal losses. To this end, Bekaert has developed a high tensile wire that is lighter and thereby prevents the cable from sagging.

*"In the USA and Europe, the most successful new generation of conductor is the ACSS conductor. For this type of high-capacity, low-sag conductor, the aluminum wires are heated up to about 350°C, which involves annealing them in our factory. This requires a high-strength steel core to support the strand and one that can withstand high temperatures. Moreover, it needs to have sufficient corrosion resistance. Because of its ability to handle the different steel core requirements, Bekaert, with its high-strength Bezinal[®] coated steel wires, has been the chosen partner for General Cable USA and for General Cable/ECN Spain." **ECN Spain, conductor manufacturer***

Related products & applications in Utilities & Energy on Bekaert.com

- steel wires and strands for overhead power conductors
- cable and hose braiding wire
- landcable armoring wires
- tension wire in subsea telecom cable / subsea energy transmission cable armoring

Renewing your energy

Drawing on its sound expertise in steel cord manufacturing, Bekaert has developed high-performance, durable fine cords specifically designed to reinforce elastomer products such as timing belts. Used in a variety of applications, such as hoisting, these fine cords offer maximum precision



and adhesion and allow manufacturers to introduce a space-saving alternative to the market that is completely maintenance-free. In looking for a solution for Vensys with exactly these features, Gates called on Bekaert to collaborate on a new application: steel cord-reinforced timing belts for wind turbines.

Ever higher and farther

In order to bolster performance capacity, wind turbines are built ever higher and farther out to sea. This greatly increases the forces to be transmitted and the weight of the transmission system of the blades increases disproportionately. Accordingly, a search is on for new transmission systems. These systems provide for optimum energy production: they adjust the position of the rotor blades based on wind direction and speed.

A new wind on alternative energy

Gates, one of the suppliers of Vensys windmills, in cooperation with their partner Walther Flender, has developed an alternative drive system for blades that makes use of synchronous belts. The rubber synchronous belts are traditionally reinforced with glass fiber: a strong material, resistant to the great force exchange. Glass fiber is too elastic, however, causing belts to expand over time and for the blades to be less precisely adjusted. Since wind turbines should use their energy source optimally in the long term and so that the safety of the systems can be guaranteed, Bekaert was asked about the technical possibilities of steel cord.

In order to meet the high requirements of manoeuvrability, tensile strength, length stability and adhesion with the Gates rubber, Bekaert developed a high-quality steel cord comprised of 83 woven wires.

What additional advantages does this steel cord reinforced belt solution offer? It is substantially lighter compared to gearboxes, the traditional system for blade drives, which greatly simplifies their installation at great heights. In addition, the complex architecture of steel cord offers sufficient suppleness to be able to be stretched over the small gears with which newer types of wind turbines are fitted to save space. And what is more: the steel cord-reinforced belts are maintenance-free; in contrast to gearboxes, they do not need to be oiled regularly. Gates can thus offer wind turbine manufacturers a solution that guarantees sustainable, precise rotor blade adjustment.

Related products & applications in renewables and cleantech on Bekaert.com

- fine cord for timing belts for wind mill turbines
- sawing wire for cutting silicon into PV wafers
- clean enclosed burners for waste gas combustion

Digging into innovation

Going safely underground



Safety is critically important in the mining industry. That is why many mining companies choose Dramix® to reinforce mine tunnels and shafts. Our high-quality fibers, which can be mixed with concrete without clumping, have an outstanding reputation for safety.

Delving deeper into Swedish mines

For more than a decade already, we have enjoyed preferred supplier status for Dramix® with the Swedish mining companies LKAB and Boliden. Both are located in the extreme north of Sweden and account for the production of millions of metric tons of quality ore per year.

“We don’t have a constant pattern of demand: one week we need more Dramix® than we do another, also because the quality of the rocks varies greatly. But the worst thing that can happen to us is when the mining has to stop because we’re short on rock reinforcement,” says Patrik Johansson, manager of concrete factory in Malmberget and responsible for rock reinforcement at LKAB. *“That is why Bekaert keeps local stock in Göteborg. Even when we recently found out on a Friday evening that our stock was running low, Bekaert ensured next-day transport over 1,800 km.”*

“Bekaert’s glued Dramix® fibers have proven their quality throughout the years: for mining companies it is crucial that there is no clotting of the concrete which can cause obstructions of the shotcrete equipment with production losses as a result. Dramix® never let us down in this respect. In the years to come, we will invest heavily in mines; after all, the demand for mining products is on the rise around the world. Our need for rock support will therefore increase. Bekaert always succeeds in meeting our needs at the agreed time. In the future, we will probably be using their services even more frequently.”

Thomas Larsson, purchaser at LKAB

Related products & applications in mining on Bekaert.com

- Dramix® steel fibres for securing mine shafts
- Mesh Track/Bitufor ensuring security in mines
- deep shaft mining ropes
- conveyor belt cord for transportation belts
- tire cord for reinforcing off-the-road tires

Fueling your business

In today's economy, natural resources like oil play an important role. Since oil resources are becoming scarce, there is an increasing need to extract oil from deeper wells that are sometimes harder to reach. Likewise, oil companies are looking for ways to at least sustain the output of their existing oil wells. Bekaert supports companies in this technologically challenging environment with its extensive knowledge of mechanical strengths, coatings, specific wire forms, and applications.



Going with you all the way

Our contribution begins right at the prospecting phase. We provide wire to reinforce tow leader cables – cables to attach the streamers prospecting for oil in the sea – and to protect them from external pressure. Once oil is found, our wires are used as mooring ropes – usually 6-strand ropes – to anchor the drilling unit, drilling lines, or well-logging cables so that measuring instruments can be lowered into the pit. Once the oil platform has been built and all relevant equipment installed, our products play a major role. Our wires reinforce Abandonment & Recovery (A & R) winch ropes, which are used to install the pipes that will transport the oil. The flexible pipes that do the actual transport contain several layers of heavy-duty profiled wires. These wires reinforce production or communication umbilicals transferring different functions like electrical, pneumatic, hydraulic, or optical signals to remote operated vehicles (ROVs), for example, which are performing undersea exploration.

Bekaert wires also make up offloading buoy mooring rope. Other oil platform-related functions also rely on Bekaert products; for example, pressure vessels supply the crew with desalinated water and our cables make sure the sprinkler hoses can withstand extreme temperatures. Bekaert's solutions are also used in onshore oil and gas extraction.

Second life for existing oil wells

Water injection is now a major oil extraction method worldwide. Water is injected into the reservoir for two reasons: firstly, to maintain pressure in the reservoir; secondly, to sweep or displace the oil from the reservoir and push it towards an oil production well.

In the category of 200+ bar, the pipes used for water injection are traditionally made of steel. Steel pipes require a lot of maintenance, as steel typically corrodes easily. That is why oil companies are looking at alternatives such as plastic piping.

The steel cord-reinforced thermoplastic strips for water injection pipes, a solution developed by Bekaert, cater to the need to prolong the service life of these alternative pipes while guaranteeing optimal performance. These pipes can withstand pressures of up to 500 bar and have several advantages over mainstream steel and GRE (glass fiber-reinforced epoxy) pipes.

The special coating developed by Bekaert for the steel cord-reinforced thermoplastic strips has an over 20-year corrosion protection guarantee under the most severe operating conditions, thus ensuring a much longer service life than steel. In addition, the installation costs for the customer are reduced and their efficient processability enables the oil company to generate more output.

Related products & applications in Petroleum & Gas on Bekaert.com

- armoring wires for umbilicals
- flat and shaped armoring wires for offshore oil and gas extraction pipes
- steel wire for marine cables
- steel reinforced thermoplastic strips for well stimulation by high pressure conduits
- mooring lines strands and rope wires for oil platforms and drilling ships
- hose wire and cord and profiled coupling wires for high pressure and sprinkler hoses

Come and see us at the fairs

Renewable Energy: photovoltaic industry

- European Photovoltaic Solar Energy Conference and Exhibition (Hamburg, Germany, Sept 09)
- Solar Power (Anaheim, USA, Oct 09)

Bekaert (www.bekaert.com) is a global technological leader in its two core competences: advanced metal transformation and advanced materials and coatings, and a market leader in drawn wire products and applications. Bekaert (Euronext Brussels: BEKB) is a global company with headquarters in Belgium, employing 23 000 people worldwide. Serving customers in 120 countries, Bekaert pursues sustainable profitable growth in all its activities and generates annual combined sales of € 4 billion.

This newsletter is equally available on the Utilities industry section on Bekaert.com

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