

 **BEKAERT**

better together

Armofor[®] steel cord reinforced thermoplastic strip



The reliable solution for high pressure resistance



Bekaert Armofor®

Steel cord reinforced composites developed for the oil and gas industry

Steel cords have a long history as reinforcement in rubber. Now Bekaert has developed a proprietary production process to position steel cords with high precision side-by-side in a thermoplastic matrix thus forming composite strips with superior strength.

Bekaert Armofor® composites offer steel cord performance

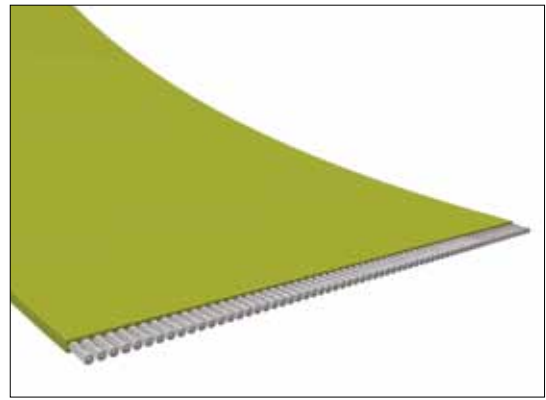
- High strength to weight ratio
- Flexibility
- Zero creep
- Ductile behavior
- Excellent corrosion protection

Both polymer matrix and cord properties can be tailored for strength, flexibility and temperature resistance.

Bekaert Armofor® is delivered as an easy to wind composite strip.

Bekaert Armofor®

allows you to design flexible high-pressure pipes.



Value elements



Bekaert Armofor® is the reinforcement of choice when you design thermoplastic pipes that must offer the combination of HIGH PRESSURE RESISTANCE with one or all of these value elements.

- **LIGHT WEIGHT**
compared to steel pipe alternatives
- **FLEXIBILITY**
for spoolable pipes
- **TEMPERATURE RESISTANCE**
to handle the pressure in ultra low, normal or high temperature operating conditions
- **CORROSION RESISTANCE**
for long-term sustained performance

Positioning

	Bekaert Armofor® reinforced thermoplastic pipes	Compared to		
		Aramid reinforced thermoplastic pipes	High performance rigid steel pipes	Glass reinforced epoxy pipes
Spoolability	✓	✓	✗	✗
Low weight	✓	✓	✗	✓
Resistance to high temperature	✓	✗	✓	✓
Corrosion resistance	✓	✓	✗	✓
High pressure performance	✓	✗	✓	✓
Impact resistance	✓	✓	✗	✗
Resistance against abrasion and wear	✓	✓	✗	✗
Fluid sensitivity	Hydrocarbons	Hydrocarbons	Acid, base and H ₂ S	Water, base

Global presence to support your business

Being part of your solution means being part of your business. Backed by our global presence and technological leadership, we can respond quickly to your needs, wherever you are located.

Where shall we meet?

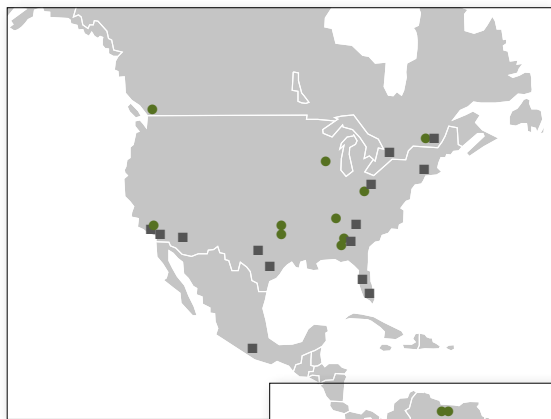
When you choose Bekaert, you will benefit from our commitment to local service, supported by our global presence. We aim to excel as a dependable, ever-advancing supplier.

- plants
- offices and distribution centers

North America

1 800 personnel
Combined sales:
€ 469 million

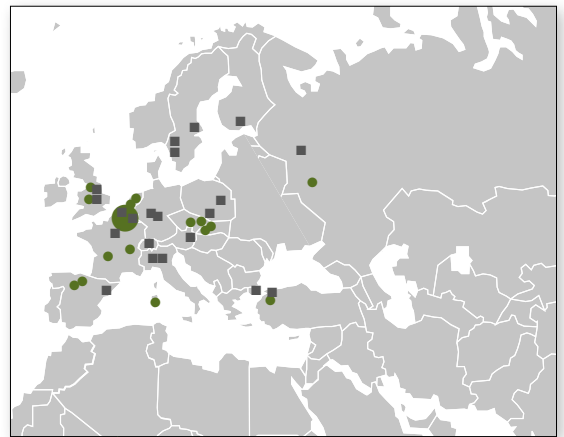
14%



EMEA

6 500 personnel
Combined sales:
€ 823 million

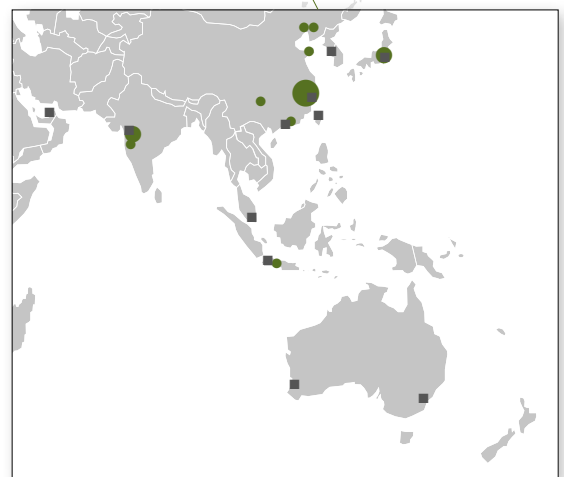
25%



Asia-Pacific

10 000 personnel
Combined sales:
€ 814 million

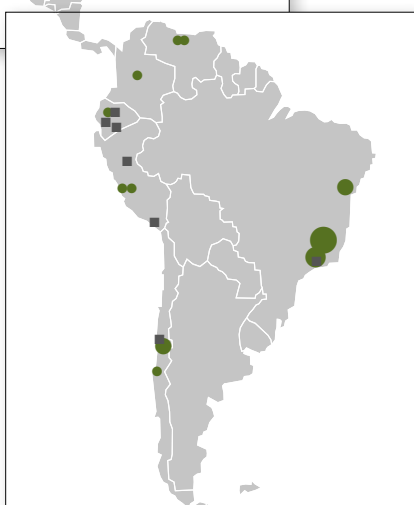
24%



Latin America

7 200 personnel
Combined sales:
€ 1 237 million

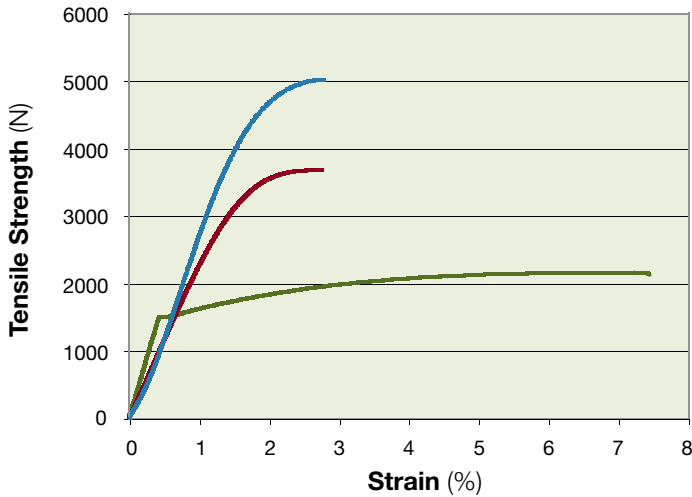
37%



Financial figures based on year results 2009
Personnel as per mid 2010

Performance

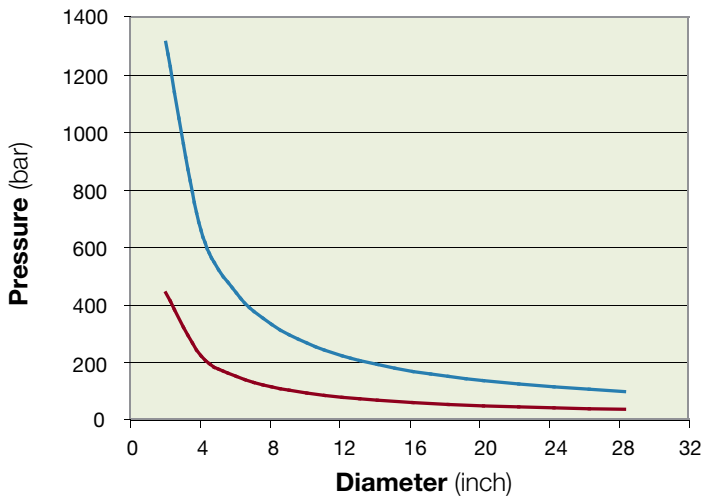
The design flexibility of Bekaert steel cord allows the development of cost efficient high performance solutions compared to traditional fibers.



- Typical strength/strain curves for steel wire and steel cord.
- At the same diameter the steel wire shows a lower tensile strength than steel cord A.
 - The same is true when comparing the steel wire and steel cord B having similar linear densities.
 - The steel wire has an important plastic elongation before failure while steel cord behaves elastic in the entire test range.

- HT Steel Wire - 1.5mm
13.5g/m
- HT Steel Cord A - 1.5mm
9.8g/m
- HT Steel Cord B - 1.7mm
13.5g/m

Steel cord is characterized by a higher strength-to-weight-ratio and higher flexibility when compared to steel wire.



A typical curve is shown of the burst pressure versus the diameter of the pipe for 2 layers of Bekaert Armofo[®] with a steel cord with a diameter of 1.85mm. As safety factor for this application a factor 3 is chosen. Higher burst pressures can be achieved with more layers of Bekaert Armofo[®].

- Burst pressure
- Working pressure (safety factor 3)

Bekaert Armofo[®] can be designed to meet your specific requirements for burst pressure and working pressure at a given pipe diameter.



Packaging

Our packaging allows for an easy transfer onto your strip winding line.



Approvals



Imagine what we can achieve together ...

If you want to expand your capabilities while reducing your risk to do business, don't hesitate to get in touch. We would be delighted to talk about how we can work together.

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