PHOENIX CONVEYOR BELT SYSTEMS

PROGRAM OF CONVEYOR BELTS

For top performance, endurance and economy
Phoenix has established a respected global market presence based upon innovative product design and cutting edge technology. Our line of conveyor belt products is developed from engineered product designs that have been tested and proven to provide the highest level of product performance in conveying applications worldwide. Dedication to all aspects of the manufacturing process and the highest level of quality control standards ensure that our products provide the best value to our customers. With over 100 years of experience and a multitude of World Records, Phoenix Conveyor Belt Systems GmbH continues to demonstrate its position as a global leader in conveyor belt technology.
From the start of conveyor belt production more than 100 years ago...

**1904**
Manufacture of the first conveyor belt. The belt’s tension carrier initially consisted of fabric made from cotton and rayon staple.

**1956**
Manufacture of the first steel-cord conveyor belt.

**1973**
Introduction of the PHOENOTEC active protection system, consisting of synthetic individual cords.

**1995**
Delivery of the world’s strongest generator-operated conveyor belt; with the highest dynamic splice fatigue strength worldwide. For the El Abra copper mine.

**1998**
Delivery of 5,500 m of type St 4000 conveyor belt for the Pierina gold mine in Peru, situated at 4,200 m above sea level. It is the steepest overland conveyor belt, with an inclination of 18°.
...to the most modern, high-performance, conveyor belts for use above and underground.

1975
Delivery of the world’s first self-extinguishing steel-cord conveyor belt, for use underground.

1979
The first PVG conveyor belt; with a PVC-impregnated carcass and CR covers.

1981
First delivery of the world’s heaviest conveyor belt; with a weight of 52 metric tons.

1986
Delivery of the world’s strongest underground conveyor belt – PHOENCORD St 7500 – for the Prosper Haniel mine.

1975
The first PVG conveyor belt; with a PVC-impregnated carcass and CR covers.

1979
The longest conveyor belt on earth is conveying limestone from a mine located in India across the state border to a cement plant in Bangladesh. The single flight conveyor is 17,000 m long.

2006
The longest pipe conveyor belt worldwide. The latest pathbreaking application is a 16.4 km long belt (8,172 m center distance) for the conveyance of hot clinker from a cement factory to the port on the upper run of the conveyor, and coal and limestone from the port to the factory on the bottom run.

1999
Delivery and assembly of the world’s strongest conveyor belt – the PHOENCORD St 7800, for the Los Pelambres copper mine.

2003
Delivery of the heaviest conveyor belt reels worldwide for the highest elevated copper mine worldwide – Collahuasi. One conveyor belt reel type St 6300 weighs 58 t.

2007
The longest pipe conveyor belt worldwide. The latest pathbreaking application is a 16.4 km long belt (8,172 m center distance) for the conveyance of hot clinker from a cement factory to the port on the upper run of the conveyor, and coal and limestone from the port to the factory on the bottom run.
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Phoenix Conveyor Belt Systems GmbH is the technological leader worldwide for the construction and production of conveyor belts. Phoenix conveyor belts have been operating in many countries around the world for more than 100 years. Enduring and economical.
Special conveyor belts

PHOENOFLEX

PHOENAMID
with PHENOTEC

PHENOPPIPE

MAGMA

PHENOTOP

Protective systems for conveyor belts

PHENOTEC

PHENOCARE SL
Steel-cord conveyor belts

PHOENOCORD®

PHOENOCORD steel-cord conveyor belts:
- Smallest elongation with long conveyor routes.
- High breaking strength with highest capacity.
- Long working life with the lowest need for maintenance.
- Economical use above and below ground.

Phoenix has been developing and fabricating steel-cord conveyor belts for more than 50 years already. A broad palette of steel-cord conveyor belts up to a width of 3,200 m and individual lengths weighing up to 58 metric tons per unit are manufactured on the basis of a huge number of materials. Decades of knowledge and experience are used to develop a large number of new belt constructions to meet the growing requirements. The criteria to be considered are: high dynamic efficiency; resistance to rotting and corrosion; low elongation; meeting the fire-protection and electrostatic safety requirements; thermal stability and chemical resistance.

PHOENOCORD 1800 / St 7800- 19T/10 X

19 mm carrying side
bonding plate
PHOENOTEC transverse reinforcement
steel-cord tension carrier
10 mm running side
Phoenix has been the leading manufacturer of high-strength conveyor belts to meet demanding conditions of use, for decades.

1975 Phoenix supplied the world’s first self-extinguishing conveyor belt, type PHOENOCORD St 4000.

1986 The world’s strongest conveyor belt – with a breaking strength of 8,200 N/mm – was installed in the Prosper-Haniel mine by Phoenix. This 1,400 mm wide, PHOENOCORD St 7500 could hold the weight of 3 Boeing 747s (jumbo jets) without tearing.

1995 Phoenix supplied a 20 km long steel-cord conveyor belt for the El Abra copper mine. The delivery and commissioning of this 1,600 mm wide PHOENOCORD St 6800 presented a challenge for man and material. A total of 56 splices were made under extreme climatic conditions in order to commission and endless splice the belt.

1999 Phoenix was again able to demonstrate its outstanding performance worldwide, for the highest strength conveyor belts. The 24 km long and 1,800 mm wide PHOENOCORD St 7800 with PHOENOTEC transverse reinforcement runs in two tunnel systems of the Los Pelambres copper mine. Up to 25 MW of energy is generated by the downhill conveyance of the ore.

Los Pelambres, Chile

Feeding station at 3,200 m above sea level

Height difference 1,310 m
Phoenix conveyor belts are designed for the respective application. Our application engineers are already advising the customer during the planning of conveyor belt systems, in order to find an optimum solution.

Phoenix manufactures a huge number of standard conveyor belts besides steel tension carriers and special conveyor belts. The covers consist of an abrasion-resistant rubber quality, with high values for strength and elongation. Phoenix conveyor belts usually have solid rubber edges. Phoenix offers PHOENOTEC synthetic cord transverse reinforcement to the user as an active protection system against extreme impacts. The belts are endless jointed by means of well-known splicing systems. Splicing materials of acclaimed, specialized companies can be used as well. We would be glad to inform you about special solutions.
Phoenix is the major specialist for constructing and producing conveyor belts of all types. Phoenix conveyor belts are supplied in various grades of covers, which are adapted to special requirements and conditions of use such as: • fire-protection safety, • resistance to aggressive transported materials like chemical mediums, fats and oils, • extreme abrasion resistance with highly abrasive bulk materials.
Textile conveyor belts for underground

UNIFLEX®

A generation of conveyor belts for high-performance conveyance in underground coal mines. With high fire-protection safety.

Phoenix had already begun to develop self-extinguishing textile conveyor belts with solid woven tension carriers and rubber covers for a wide range of strengths during the 1970s. The PVC plastomer and the CR elastomer were used as basic materials. A new generation of belts was created, which are distinguished by the following features.

- Durability by means of high abrasion resistance.
- Dynamically efficient fatigue-resistant splices by means of vulcanization or mechanical fastening.
- High static and dynamic tear-off resistance of the tension carrier.
- Resistance to ageing and moisture.
- High fire-protection safety and low surface resistance.

UNIFLEX PVC

Phoenix achieved the first official approval worldwide for this type of belt in the year 1979. The palette of conveyor belts was up to a belt breaking strength of 3,500 N/mm.

UNIFLEX PVC

Uniflex PVC conveyor belts consist of a PVC-impregnated solid woven traction carrier and PVC covers. Uniflex PVC conveyor belts are ideally suited for rough usage below ground, and they meet the strictest safety regulations for fire-protection.
The UNIFLEX PVG conveyor belt is constructed from unconventional materials and it represents one of the most interesting developments of conveyor belts. In this respect UNIFLEX conveyor belts have passed their test of suitability and they are now given priority in fields of application which were formerly reserved for steel-cord conveyor belts only.
Phoenix Conveyor Belt Systems GmbH has developed highly effective and high-performance special conveyor belts for special duties in systems engineering and conveyor technology.

**PHOENOFLEX**

Unlike conveyor belts which use individual steel cords as the tension carrier, PHOENOFLEX conveyor belts have a tension carrier that is made from steel cords which are additionally interconnected with textile or steel threads. PHOENOFLEX is typically used for high temperatures such as when conveying hot bitumen.

**PHOENAMID**

The PHOENAMID conveyor belt is available for special applications which demand a combination of low elongation, low weight and high strength, e.g. on machine booms. Its tension carriers consist of aramid cords. Special prerequisites of systems engineering have to be met when using aramid conveyor belts.
MAGMA®
High-temperature conveyor belts

The MAGMA generation of conveyor belts was created in order to meet the growing requirements for heat-resistant conveyor belts. It is based on many years of experience with conveying hot bulk materials and practically oriented testing procedures. Phoenix used the latest technology in the field of polymeric materials when developing the program of MAGMA conveyor belts.

MAGMA conveyor belts are used for a large number of conveyed materials like cement, slag, ash, moulding sand, etc.

MAGMA ensures unproblematic transport at continuous temperatures of up to 200°C with short-term peaks that are considerably higher. MAGMA conveyor belts can be supplied as single-ply, two-ply and multi-ply belts. MAGMA can also be used as a steel-cord belt for conveyance over great distances. The belt splices for MAGMA can be made with Phoenix splicing materials or with commercial quality materials that are sufficiently resistant to high temperatures.
Closed conveyor belts are gaining increasing importance because they meet the growing requirements for a clean environment. The ability to maneuver through more narrow curves possibly leads to a shorter conveyor route since transfer stations can be avoided.

PHOENOPIPE®
The closed conveyor belt

PHOENOPIPE conveyor belts are primarily used where bulk materials must be conveyed along horizontal and vertical curves in confined spaces. PHOENOPIPE’s special capability of adapting to topography allows material to be conveyed through difficult terrain and over long distances. PHOENOPIPE’s important advantages are protection of the conveyed material from environmental influences like rain and wind as well protection of the environment by avoiding discharge of the conveyed material such as ash from power stations and gypsum. Inclined angles of up to 35° can be overcome by using PHOENOPIPE. Cost reductions are possible by shortening the conveyor route and avoiding transfer stations.

Upper run

Lower run

PHOENOPIPE conveyor belt
conveyed material
carrying idler
frame
The conveyor belt is deformed when running over the carrying rollers, which consumes energy. Bulges form in front of the carrying rollers.

The cover's EOB quality with special visco-elastic properties reduces this deformation and it helps to reduce the drive energy.

The finite element graphic shows part of a belt with loads being applied by indentation, while it runs over the carrying idler.

PHOENOCORD EOB conveyor belts can dramatically reduce energy consumption by means of visco-elastic properties of the covers. This is an important contribution to increasing the economic efficiency of long conveyor routes.

PHOENOCORD® EOB
The energy-optimized conveyor belt

The advantages of the energy-saving PHOENOCORD EOB conveyor belt result from the special visco-elastic properties of the running side cover. Phoenix scientists have simulated the deformation of conveyor belts on idlers in elaborate FEM simulations. It was established while doing so, that the greatest deformation occurs directly above the layer that runs over the carrying idler. External influential factors like weather and the system's condition must be considered when ascertaining the energy requirement. Transverse reinforcement on the running side enables further energy savings to be achieved.
MVF-A conveyor belts
Acid protected conveyor belts
The MVF-A quality was specially developed for conveying copper ore. Copper ore is sharp-edged and highly abrasive. In addition, the ore is frequently sprayed with sulphuric acid in order to leach out the metal from the ore. The MVF-A quality copes with these aggressive mechanical and chemical stresses, thanks to its high abrasion resistant and acid protected properties.
PHENOTOP® COVER BELT

PHENOTOP cover belts are used in systems where the conveyed material has to be protected. Special transversely rigid belts are used in this case. PHENOTOP cover belts are flexible in the longitudinal direction so that they can be partially lifted off from the steel construction when loading and unloading. The conveyed material thus remains protected as much as possible when loading and unloading.
The working life and functional capability of steel-cord conveyor belts depends more on the impact stresses than abrasion. The PHOENOTEC reinforcement system offers active protection against damage that is caused by high impact energies and slitting by foreign bodies. The PHOENOTEC system consists of highly elastic, high-tensile polyamide cords which are aligned at right angles to the conveyor belt’s longitudinal axis.

PHOENOTEC is vulcanized into the conveyor belt’s covers (carrying or running side, or both). The pitch and diameter of the cords are established according to the respective requirements. It is particularly recommended to equip conveyor belts with PHOENOTEC when the danger of injuries exists from great discharge heights or foreign bodies.

A damaged conveyor belt can cause long and expensive downtimes. PHOENOCARE SL helps to minimize the damage that results from the belt being slit longitudinally. The system is preferred in critical areas like loading points with high impact energies. PHOENOCARE SL consists of electroinductive conductor loops which are vulcanized into the carrying or running side and spaced according to requirements.

Monitoring sensors are fitted in front of a critical area and behind it. The integrated conductor loops serve as electromagnetic transmitters, which are scanned by the monitoring sensors. The conveyor belt is immediately halted when it is slit by a foreign body, and the electrical circuit is interrupted as a result in order to prevent greater damage. The belt damage can thus be reduced to a few metres. In addition, the conveyor belt can be equipped with a transponder as the data carrier.
Conveyor belt splices

Making the splice

As a rule, conveyor belts are spliced on the conveyor belt system on site, in order to form an endless belt. Belt splices represent a weak point in the conveyor belt regarding strength. Making belt splices therefore demands special know-how, experience and cleanest conditions. Phoenix Conveyor Belt Systems not only has a team of qualified engineers who can precisely plan and execute this work but also a great number of different, highly modern vulcanizing presses for applications above and underground. This service is available to our customers worldwide.

One proof of performance are the world’s strongest belt splices which Phoenix fabricated in Chile in 1999.
Phoenix Conveyor Belt Systems has the most modern testing centre worldwide for developing conveyor belts. Extensive quality tests ensure the technological lead of Phoenix conveyor belts.

All of the Phoenix Group’s production locations and subsidiaries meet the ISO 9001 quality standard. The certification according to ISO 9001 comprises quality assurance during development, production, assembly and distribution. It therefore completely covers all of the areas which lead to higher standards of products and services.

Phoenix Conveyor Belt Systems GmbH fabricates according to all the nationally relevant quality standards like DIN, SABS, MSHA, RMA, BS, AS, CSA, etc.
A horizontally arranged tension-testing machine for conveyor belt samples up to 10 m long. The maximum force amounts to 2,500 kN and the maximum test frequency is 2 Hz.

Drum friction test rig for analysing the fire-protection behaviour of conveyor belts during drum slippage. The drum temperature, drive performance and belt tension are continuously registered during the test.

Impact and rip testing rigs (Phoenix system)
Phoenix experts are advising about detailed matters during the planning of conveyor belt systems. They thus contribute to ensuring that the belt complies with the operating conditions, that the belt's technological aspects are considered, and that a customized belt construction is achieved for use. It is obvious that advice for our customers does not cease when the conveyor belt is delivered. Our assembly engineers coordinate the pulling-in procedure and the assembly sequence based on our extensive know-how.

Even after this stage our service continues through inspections of the systems that could be carried out by our specialists on request.
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