

PHOENIX

INTERNATIONAL A/S

PHOENIX INTERNATIONAL A/S
Industrivej Vest 11
6600 Vejen, DENMARK

Tel: +45 7696 3400
Fax: +45 7696 3401



www.phoenixint.dk

Civil Products
and
High Performance Specialty Materials



A Phoenix International Company

Introduction

PHOENIX INTERNATIONAL A/S was founded in 1907 in Denmark and has more than 100 years of research and study experience covering arrays of bitumen and polymer-based products. The Company offers a vast range of products to the global market.

Phoenix has been actively engaged in many international projects alongside international partners worldwide. One such cooperation is a joint-venture company with Shell South Africa called Bituguard Pty. This joint-venture operates a plant in Bethlehem South Africa which offers advanced bitumen products to the African market.

Another Phoenix International joint venture is Frontier Co, which has its plant and office located in Sulaymaniyah in the Kurdistan region of Iraq. Frontier offers many different products all manufactured under the license and auspices of Phoenix International A/S.

»» Civil Products and High Performance Specialty Materials

Products Diversity

PHOENIX INTERNATIONAL A/S offers one of the most extensive and diverse product lines for different industries.

The building and civil construction products of the company can be categorised into five major groups, which are as follows:

- ▶ Products for Road Construction
- ▶ Specialty Products for Niche Applications
- ▶ Oxidised Bitumen
- ▶ Products for Building Construction
- ▶ Products for Water Tanks, Tunnels and Canals

Based on customer demand, the company is also capable of formulating and producing materials according to specific customer requirements and technical specifications.

▀ Products for Road Construction

In the road construction industry, Phoenix International A/S supplies a variety of products through the technology provided jointly by Shell and Phoenix International A/S. These products can be used for durable asphalt pavements and also for repairing and protecting existing pavings.

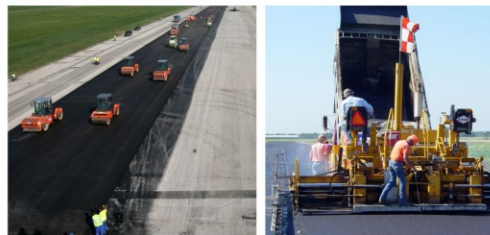


Products for Road Construction

Phoenix Binder®

Phoenix Binder® is the wide-ranging name for various types of resilient polymeric bitumen, specifically used for asphalt mixtures. These products are offered according to PG (Performance Grade) grading system.

Modifying polymer based bitumen makes the production of hot asphalt mixtures possible. These mixtures consist of durable asphalt, porous asphalt, mastic asphalt, and other kinds of asphalt possessing special properties. Using polymeric bitumen in an asphalt mixture, in addition to increasing bitumen's thermal performance range, increases the resistance to heavy traffic on roads and pavements and ultimately reduces the chances of problematic occurrences such as cracks, rutting, grooves and other surface complications.



The Performance Grading (PG) System is a method of measuring asphalt binder performance. This system was introduced in the USA and originally developed.

Penetration Grade Bitumen

The majority of Penetration Grade Bitumen are used in road construction. The overall trend is towards adopting harder bitumen that produce asphalts which have superior properties to those manufactured using softer grades.

- ▶ 20 - 30
- ▶ 30 - 45
- ▶ 35 - 50
- ▶ 40 - 50
- ▶ 40 - 60
- ▶ 50 - 70
- ▶ 60 - 70
- ▶ 70 - 100
- ▶ 85 - 100
- ▶ 100 - 150
- ▶ 160 - 220
- ▶ 330 - 430



Phoenixfluide®

Phoenixfluide® is the specified name for all types of bitumen emulsion products of Phoenix International A/S. These Products are used in road construction and other industries.



Due to their environmental, technical, economical, and application advantages; bitumen emulsions are extremely suitable substances for all kinds of applications. Phoenix International A/S produces all kinds of cationic, anionic, and polymeric bitumen emulsions for different purposes. Special emulsions such as: Tack Coat, Prime Coat, Fog Seal Chip Seal, Slurry Seal, Micro Surfacing, Road Mix and Cold Mix.

Phoenixseal®

Phoenixseal® SH15 and **Phoenixseal® SH30** are two kinds of fine polymeric hot applied asphalt crack sealants and are designed especially for different weather and climate conditions.

One of the most effective and advanced methods to prevent severe damages to roads and pavements is to stem the water leakage by sealing cracks on the asphalt with hot applied polymeric mastics.



Phoenixseal® SH10 is another type of fine polymeric hot applied mastic that is especially designed for expansion joints on bridges. This mastic with its high elasticity and strong adhesion to concrete surfaces is a very suitable option for filling in such cracks.

Phoenixtape®

Phoenixtape® is the wide-ranging name for various types of "double-sided polymeric bitumen tape". These tapes are used for asphalt patchwork and they are offered in rolls that can be produced according to the application usage.

Ease of application, no need for preheating and strong adhesion to asphalt and building materials are among the characteristics that have made this product usable for a vast spectrum of purposes.



► Specialty Products for Niche Applications

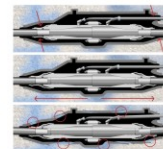
Specialty Products for Niche Applications

PHOENIX 2K

PHOENIX 2K Resin is an outer cable joint seal that forms a water-tight seal by curing around cable joints like a single molecule, whilst bonding perfectly with a variety of cable materials. This unique two compound, polyurethane modified resin actively repels moisture and water giving total corrosion protection for decades.

Application

Application of PHOENIX 2K Resin is quick and safe.



PHOENIX 2K Resin absorbs all cable and joint movement and expansion while still protecting the joint. All mechanical pressures are transferred to the protective PHOENIX 2K Resin.

Benefits

- Fast & easy handling: a cold application which cures in just a few hours
- Lifetime flexibility: absorbs cable stresses throughout service life with no cracking
- Excellent protection: bitumen modified PU for complete corrosion protection
- Long lasting: 40+ year service life
- Easy to apply: twin compound applicators ensure precise 1:1 ratio mix
- Excellent adhesion: to steel, copper, aluminium, fiberglass, wire sheaths, XLPE, PU & PE's
- Cost - effective application - rapid filling and curing saves on labour and cable downtime.

PHOENIX 2K is one of a few materials in the world approved for cable joints ranging from 0 - 500 kv.

PHOENIX 2K Resin is tested and approved to ISO EN IEC 840 - a guarantee of quality.

▸ Oxidised Bitumen

Oxidised Bitumen

Oxidised Bitumen

Phoenix International A/S can produce all kinds of bitumen tailored to meet the needs of asphalt manufacturers, road builders, construction, government, communities, asset owners, designers and architects giving usable and effective solutions for all markets.



▸ Oxidised Bitumen product range includes:

- 85 / 25
- 85 / 40
- 95 / 25
- 105 / 35
- 115 / 15

▾ Products for Building Construction

▾ Prefabricated Waterproofing Membranes

Prefabricated Waterproofing Products are made with high - quality raw materials in a fully equipped and modern plant. These Products are tailored to different environments and climates according to international standards. They are usable in industrial, residential, and public structures.

Products for Building Construction

Phoenixflex®

Phoenixflex® is a prefabricated waterproofing membrane which is made using modified bitumen with an SBS polymer and a polyester layer in rolls of 1 m wide and 4 mm thick.

The combination of modified bitumen with an SBS polymeric base and a puncture-resistant polyester layer has added unique properties to **Phoenixflex®** that distinguishes it completely from similar products. Among these properties, high tolerance and flexibility in the cold, considerable mechanical and strain resistance, excellent adhesion to building materials and most importantly its self-repairing nature can be noted in **Phoenixflex®**.



Phoenixplast®

Phoenixplast® is a prefabricated waterproofing membrane made by using modified bitumen with an APP polymer and a polyester layer in rolls of 1 m wide and 4 mm thick. Adhesion to building materials and strain-resistance are among its specifications.



Phoenixroof®

Phoenixroof® is a prefabricated waterproofing membrane made by using oxidised bitumen and a polyester layer in rolls of 1 m wide and 4 mm thick. This product is suitable for insulating the foundation and the interior of structures and can also be used for roofs in warm climates.

Phoenix® waterproofing products are also available by order in other forms and grades, such as silica powder, mineral aggregation, aluminium foil, and polyethylene film.

Phoenixfluide® WA2

Phoenixfluide® WA2 is one of many bitumen emulsions that is used as an insulation primer for waterproofing products and also as a protective bitumen layer for concrete surfaces.

It can be offered in tanks of several tons, and 20 to 220 Kg containers.



- Products for Water Tanks, Tunnels and Transfer Canals
- **Phoenix® PBGM** (Prefabricated Bituminous Geo Membrane)
- Mastics for Water Tanks and Tunnels
- Mastics for Water Transfer Canals

Phoenix® PBGM

There are all sorts of Prefabricated Bituminous Geo Membrane (PBGM) products that are used in water tanks, dams, tunnels, water canals, and water transfer systems. Different types of PBGM can be offered by Phoenix International A/S according to the durability of the structure and adaptation to both potable and farming water.



Phoenixseal®

Phoenixseal® SH20 is a fine polymeric hot applied mastic, produced by Phoenix International A/S for water canals. In addition to extending the life of the canal and reducing the amount of water waste, these products can also greatly lower the price of dredging due to their prevention of growth of shrubs and fungi inside concrete joints.



High elasticity, excellent adhesion to concrete surfaces and tolerance for different atmospheric conditions and thermal changes are among the characteristics of **Phoenixseal® SH20**. Furthermore, this product is perfectly stable in the slopes of trapezoidal canals and would not slide down as time goes by.

Phoenixseal® SH18 and **Phoenixseal® SH60** are two kinds of fine polymeric warm mastics produced by Phoenix that are formulated especially for filling in the expansion joints in potable water tanks and tunnels.



Phoenixseal® SH18 is used for cracks in horizontal surfaces and **Phoenixseal® SH60** for those in vertical surfaces. These products meet health and safety requirements for use in potable water tanks.





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info@phoenixint.dk



Our Goal

Is to develop protective solutions for the utility arteries of a modern world while meeting all market requirements for performance, flexibility, durability, and ensuring respect for the environment.

We will provide our customers with worldwide services complementary to our products which will ensure maximum benefit from the use of our solutions.

We will fulfill our goal of becoming world leader, within our industry, through innovation, integrity and excellent service.

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