

Pexgol Piping Solutions

Industrial **Applications**

—
2018

PEXGOL
X-LINKED PIPING SOLUTIONS



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Pipes and Pexgol solutions

Pexgol, a division of **Golan Plastic Products**, is a global leader of heavy duty PE-Xa pipes. Pexgol pipes are produced from a special high density polyethylene (HDPE) with a very high molecular weight. During production the raw material is pressed under high temperatures and pressures while the pipe is being extruded the material crosslinks resulting in an unbreakable chemical cross-connection between polyethylene chains.

Pexgol cross-linked polyethylene system with its unique and adaptable design offers an excellent solution for the transport of liquids and other substances that require great chemical and mechanical resistance.

Pexgol presents a wide range of products that respond to different needs and applications of the industry.



Products

PEXGOL TECHNICA:



PEXGOL OPTIMUS:



PEXGOL TERRA:



Industrial Processes

Process fluids are at the core of many industrial companies' operations. Everything from food process fluids and clean water, to chemicals and highly abrasive substances pass through the pipelines, meaning that safety margins are of very high importance. **Pexgol provides industrial process fluid solutions for all kind of industries.**

The pipes and accessories manufactured by Pexgol are specifically designed for the chemical, petrochemical, food, pharmaceutical, textile & alcohol industries and comply with the highest quality and safety standards. Each Pexgol product passes various tests to check efficiency and safety:

- Hydrostatic
- Electrical conductance (Spark test)
- Traction (tensile strength and elongation at break) test
- Density (specific density SG and standard specific density SSG)

Pexgol is recognized as the technical partner and supplier of high added value products for the transportation of corrosive fluids, offering a manufacturing guarantee of high resistance to corrosion and specialized services to the industry that include:

- Customized manufacturing methods.
- Assessment and monitoring through all project phases.
- Policy of quality, component traceability and certified guarantee.
- Total pipe delivery including prefabricated products according to customer needs.



Applications

1.

PULP & PAPER INDUSTRY

In every industry today, manufacturers look for ways to make operations more cost effective. In the **pulp and paper industry**, this includes seeking new piping materials and methods that reduce costs while maintaining piping performance and satisfying processing requirements. The key objective is to find new or improved corrosion resistant materials that reduce overall costs and maintenance, while providing long-term service.

These savings can be recognized from beginning to end, enabling lower:

- Piping costs.
- Installation costs.
- Retrofit costs.
- Overall maintenance costs.

The most important characteristics of Pexgol pipes are:

- **Corrosion resistance** – a known necessity in an industry where harsh and highly corrosive chemicals are routinely used.
- **Hydraulic capability.**
- **Abrasion resistance.**
- **Lower thermal conductivity** that produce both long service life and cost savings.
- Is **lightweight and easy to install.**

STOCK PREPARATION / PAPER MAKING OPERATIONS

Before papermaking or sheet forming, several stock additives are added to the pulp to improve the properties of the paper or to facilitate processing.

- Rosin
- Starches
- Titanium dioxide
- Various waxes

Also, extensive and reliable handling of fresh and white water during the papermaking process makes Pexgol piping systems a favorable alternative to metal pipe.

Pexgol is chemically inert to most stock additives and papermaking chemicals, which includes:

WATER HANDLING AND DISTRIBUTION

In this industry, large amounts of water are required, so it is used to the maximum by recycling it several times.

For recycling, lime is used to increase the pH of the water after usage. Lime is highly encrusting and steel or rubber coated tubes are often embedded. We have made several applications with Pexgol in which we demonstrate that lime scale decreases significantly and the cleaning time of the pipeline is also lower.



BLEACH PLANT OPERATIONS

Bleach plant piping systems are exposed to the most corrosive environment within the pulp and paper process, with chemicals such as chlorine dioxide and hydrogen peroxide used in multiple stages in the bleaching process.

These solutions can affect the service life of carbon steel and stainless steel piping materials. Pexgol piping, however, has demonstrated excellent service in bleach plant process lines and exhibited continued performance when exposed to several corrosive acidic and caustic solutions found in bleach preparation and process operations.

Pexgol piping can be used to handle:

- Sodium Hydroxide
- Sodium Chlorate
- Sodium Chloride
- Hydrochloric Acids
- Chlorine Dioxide
- Sulfuric Acid
- Hydrogen Peroxide

PULP CHEMICAL RECOVERY PROCESS

An integral part of the chemical pulping process is the recovery of chemical cooking liquors. Equally important is the mill's ability to re-use these liquors and other process byproducts.

Piping in this operation must have the ability to withstand a range of acids and bases at elevated temperatures. Pexgol offers:

- Excellent chemical resistance to caustic soda, calcium carbonate and lime, which are used in the chemical recovery of kraft cooking liquors.
- Chemical recovery systems for sulfite pulp also utilize sodium base systems, which demonstrate good chemical compatibility with Pexgol.
- Additionally, the pipe's abrasion-resistant properties can provide selected use for effluent handling and slurry lines.



2.

FOOD INDUSTRY: DAIRY PRODUCTS, SLAUGHTERHOUSES & EDIBLE OILS.

The food and beverage industry depends on processing materials that will not contaminate the supply. Generally, reactors are used **to raise the temperature of the fluids** to complement the processes. In these cases, thanks to its high resistance to temperature and corrosion, the PE-X pipe allows a greater lifespan of the pipeline without any risk of rusted pipe pieces being mixed with the fluid to be transported.



Pexgol can be use in two specific processes:

WATER RECYCLE TREATMENT

In all processes of the food industry, manufacturers are required to have **hot water in permanent circulation** (between 70° and 85° C) **with certain chlorine concentrate** for the cleaning of tools and work equipment. Stainless steel is generally used for this type of application, but besides being very expensive, it can have serious corrosion problems due to the bacteria developing from the combination of chlorine and calcium at high temperature. Pexgol offers an economical solution for this matter, being easy and efficient to install and to maintain.

RESIDUES TREATMENT

Pexgol is an unbeatable solution when residues need to be transported. In the Food Industry it's very common to encounter slurries and abrasive fluids that need to be transported for waste. Pexgol's **resistance to wear is 3 to 5 times superior** to a conventional steel pipe.

One the most common processes is the **transportation of oil slurry** that usually has sedimentation problems running between 70° and 80°C. Thanks to its capabilities, Pexgol is the ideal solution for this.



Among other benefits, the advantages of Pexgol pipes for the Food Processing Industry are:

- **Nearly Eliminates Production Down Time:** In addition, the longer service lifespan and ease of maintenance nearly eliminates production down time due to piping issues.
- **Longer pipe coils:** Pexgol pipes can be coiled up to 1000 meters, saving connection costs, installation time and increasing safety during installation.
- **Superior resistance to incrustation:** Associated with low roughness coefficient of the internal surface of the pipe. Hazen Williams Coefficient: Pexgol → 155, Steel → 100.
- **Resistant to sulfuric acid and other chemicals.**



3.

CHEMICAL INDUSTRY

Chemical processing plants create some of the most challenging environments for industrial piping systems. The combination of aggressive chemicals and high temperatures can compromise the long-term integrity of most piping materials, causing corrosion, process leaks and premature failures that lead to costly replacements. Even the more expensive alloys, lined carbon

steel, and non-metallic alternatives, such as HDPE and FRP, are challenged to provide a cost-effective, reliable solution. Highly durable Pexgol piping solutions stand up to the immense **challenges of chemical processing plants over the long-term** better than any other piping material, metallic or non-metallic. **Pexgol is three times more resistant than HDPE**, and twice more than steel.



THE PEXGOL ADVANTAGE

Made of special, high-performance material, Pexgol pipe and fittings are easy to be installed and offer the necessary mechanical strength and corrosion resistance creating the following advantages for chemical processing operations:

- **Eliminate internal and external corrosion.**
- **Reduce installation time** and promote safety.
- Lower life-cycle costs, maintenance and corrosion monitoring.

- Minimize total **system costs** with stable material prices.
- Provide **excellent hydraulic capabilities.**
- **Wide range chemical resistance:** check the full list of chemical compatibility in our Engineering Guide.
- Can be supplied in long length coils, reducing the number of joints, installation time and risk.

STANDS UP TO THE MOST AGGRESSIVE CHEMICALS

Pexgol's vast range of experience in processing water piping systems during the past 40 years, includes acid waste plants, corrosive and toxic materials, slurry, industrial waste, high temperature fluids, and many types of abrasive materials. Pexgol pipe and fittings **reliably handle aggressive chemicals** such as:

- Sodium hypochlorite
- Hydrochloric acid
- Sulfuric acid
- Phosphoric acid
- Sodium chloride
- Caustic soda
- Bromine acid

Pexgol inherently offers superior resistance to corrosive chemicals, high temperatures, and even the harshest conditions. In fact, **Pexgol pipe and fittings are inert to most acids, bases and salts, and aliphatic hydrocarbons.**

Pexgol provides an excellent balance of properties to improve reliability and user confidence while reducing capital and life-cycle costs, avoiding costly downtime and, most importantly, allowing chemical processing plants to stay operational and more productive.

4. TEXTILE INDUSTRY

Textile industries demand a smart choice of pipes. Pexgol pipes provide an ideal solution for transporting **compressed air** throughout the factories. Piping selection directly affects the three key elements of every compressed air system: flow, pressure and air quality. Poor choices in pipe materials, diameter and layout cause flow restrictions, often resulting in significant pressure drop. Pressure drop is a main cause of increased energy consumption and under-performing tools and equipment.

Advantages of Pexgol pipes for Textile Industry:

- **Low friction coefficient**, providing the best possible laminar flow.
- Effective fittings that minimize pressure drop for optimum flow and energy efficiency.
- Fast & easy installation without supports.
- Simple and easy to install mechanical connections.
- Pexgol has flexibility and high strain resistance, makes it resistant to failure due to water hammer (x2.5 times the nominal pressure).

Pexgol provides the perfect system for air lines in textiles: spinning, weaving, garments, knitting, processing, embroidery, engineering & commercial buildings.

Acid fluids are also a challenge in this industry: water with low pH, caprolactam acid, and other acid fluids are no problem for Pexgol systems. Over the last 40 years, Pexgol pipes have undergone tests and lab researches proving to be highly resistant to acidic conditions and even chemical attacks.



5.

ALCOHOL REFINERIES & SUGAR MILLS

Pexgol solutions are perfectly tailored for applications in the sugar, ethanol & refinery industries. Renowned sugar mills and refineries all over the world rely on Pexgol pipe systems. The vast amount of systems that are successfully in operation are the best reference for the reliability and good quality of our products.

In the distillation processes the temperature hovers between 60 and 80°C, therefore usually steel pipes are used. Thanks to the fact that PE-X has a **superior resistance to high temperatures**, it is an excellent solution since it does not suffer from corrosion.

Besides transporting distillation liquids, Pexgol can also **support molasses transportation**. Molasses usually require to be transported at a specific temperature. It usually sticks to the pipe walls. Pexgol is an ideal solution for this kind of operation, since it can be provided with insulation, helping to contain the heat. In addition, the pipes **internal smooth walls help to avoid build-up**.

Likewise Pexgol pipes can be used as bores for water supply in the factories. **Pexgol does not suffer from corrosion.**

Pexgol has over 20 years of experience in **transporting spirits and fluids with an 86% alcohol concentrate.**

Corrosion resistance is one of the most important advantages of Pexgol pipes. **Pexgol's excellent corrosion resistance** is a result of the unique structure of crosslinked polyethylene, making the pipe material especially tough and resilient, and generally able to resist corrosion better than metal pipes. Pexgol solution reduces both capital and maintenance costs while maintaining the highest of regulatory standards for both operators and owners.



Fittings & Connections

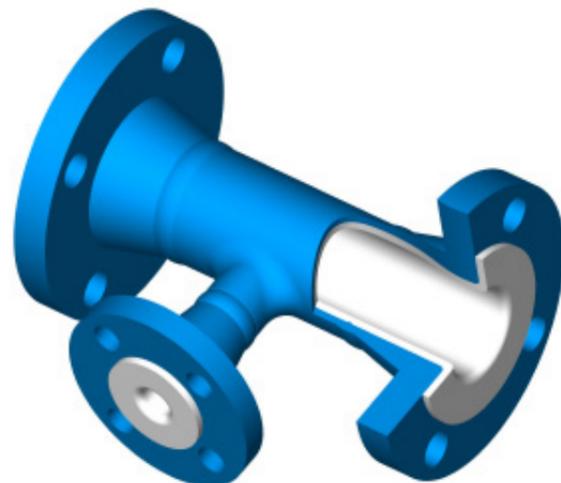
We offer a full piping solution that includes all kinds of fittings and accessories to provide an easy, cost-efficient and quick installation.



PE-X LINED FITTINGS

PE-X lined steel fittings consist of a **steel flanged fitting lined with thick black PE-X coating** which extends over the full face of the flanges.

This type of fitting can be used as a **standard fitting such as a Tee, an elbow, or a reducer**. The fittings are supplied with an external epoxy coating. Standard fittings are supplied with wall thickness of PE-X layer: 3–5 mm for corrosion resistance and up to 10 mm for abrasion resistance.



PREFABRICATED ELBOWS

Prefabricated elbows are produced from **Pexgol** pipes of all classes according to a proprietary process. **Prefabricated elbows** with flared-ends are available in any diameter between 50 mm and 710 mm. Each leg can be ordered with plain ends or with flared ends with or without flanges.

The length of each leg can be different. The elbows are produced with a tolerance of up to +5 degrees and +/- 10 mm in length.



FLANGED COUPLERS

Available sizes from diameters 63 mm to 710 mm. **The flange has oval holes designed to fit most international standards**. The couplers can be used for the full range of temperatures and pressures, the same as Pexgol

Pexgol flanged couplers consist of either two halves or four quarters, depending on the pipe size.



FLARED END CONNECTORS

The ends of the **Pexgol** pipe are heated and flared by a proprietary process. The final pipe end is similar to a stub end.

The loose flange is usually mounted over the pipe during the flaring process. Alter-

natively, split flanges can be supplied to be mounted later.

Pexgol prepares flanges conforming to different standards.



ELECTROFUSION FITTINGS

Electrofusion fittings are used to connect Pexgol cross-linked polyethylene pipes (for example, ISO 14531). The pipes and fitting are joined by electrofusion welding, creating a leak-proof seal. During the electrofusion process, a current is transported through a heating wire.

The surrounding material (around the wire)

is melted, welding the pipe to the fitting. Service temperature for the PE 100 electrofusion fittings is limited to 40°C. For higher temperatures Pex2Pex electrofusion couplers can be used.

Pexgol approves and supplies the following fittings systems and installation tools: Plas-son, Friatec, GF/Wavin.



Available Diameters

An outstanding feature of the Pexgol pipe is its flexibility, due to the **cross-linked structure**. This structure enables the pipe to return to its original diameter after de-coiling. As a result, Pexgol is able to supply longer lengths of pipe, compared to other suppliers and types

of pipes. Pexgol pipes can be shipped in coils, coils with cores and straight sections.

Pexgol pipes for industrial applications are available in diameters **from 63 mm (2") to 450 mm (18")**.

Pipe		Maximum Length per coil (m)
Outside diameter (mm)	Class	
63 (2")	12	4500
63 (2")	15	4500
63 (2")	19	4500
63 (2")	24	4500
63 (2")	30	4500
75 (2,5")	10	N/A
75 (2,5")	12	3300
75 (2,5")	15	3300
75 (2,5")	19	3300
75 (2,5")	24	3300
75 (2,5")	30	3300
90 (3")	10	N/A
90 (3")	12	2000

Pipe		Maximum Length per coil (m)
Outside diameter (mm)	Class	
90 (3")	15	2000
90 (3")	19	2000
90 (3")	24	2000
90 (3")	30	2000
110 (4")	12	1300
110 (4")	15	1300
110 (4")	19	1300
110 (4")	24	1300
110 (4")	30	1300
125 (4")	12	1000
125 (4")	15	1150
125 (4")	19	1150
125 (4")	24	1150
125 (4")	30	1150
140 (6")	12	760
140 (6")	15	800
140 (6")	19	870
140 (6")	24	870
140 (6")	30	870
160 (6")	12	500
160 (6")	15	600
160 (6")	19	600
160 (6")	24	600
160 (6")	30	600
180 (6")	12	380
180 (6")	15	450
180 (6")	19	500
180 (6")	24	500
180 (6")	30	500

Pipe		Maximum Length per coil (m)
Outside diameter (mm)	Class	
200 (8")	12	270
200 (8")	15	300
200 (8")	24	300
200 (8")	30	300
225 (8")	12	142
225 (8")	15	230
225 (8")	19	280
225 (8")	24	280
225 (8")	30	280
250 (10")	15	135
250 (10")	19	230
250 (10")	24	230
250 (10")	30	230
280 (10")	15	108
280 (10")	19	150
280 (10")	24	160
280 (10")	30	185
315 (12")	15	55
315 (12")	19	90
315 (12")	24	90
315 (12")	30	90
355 (14")	19	50
355 (14")	24	50
355 (14")	30	50
400 (16")	19	40
400 (16")	24	40
400 (16")	30	40
450 (18")	24	34
450 (18")	30	34



About Pexgol:

Pexgol, a division of Golan Plastic Products, is the only worldwide manufacturer that specializes in large diameter, cross-linked polyethylene pipe systems, providing them to industrial, infrastructure, aquaculture and mining sectors throughout the world.

Pexgol Material: PE-Xa

Is a chemically unbreakable cross-connection between polyethylene chains. The result of this chemical reaction is the creation of a material which has extremely high structural integrity, combined with resistance to a wide variety of corrosive and weather conditions.



GOLAN PLASTIC PRODUCTS

Kibbutz Shaar Hagolan 15145, Israel

+972 77 902 1000

contact@pexgol.com

Pexgol.com