Solution for:

Reliability and Emission Control in the Chemical Industry
Increased Reliability

Reduced Down Time
Elastagraph/Dynagraph Technology helps reduce downtime by creating a tighter seal which reduces leaks and increases mean time between failure (MTBF). A tighter seal is achieved due to the corrugated design and soft graphite sealing element. This design improves sealability during thermo-cycling and through vibration.

Decreased Failure at Start-Up
After shutdown and when equipment starts up, vibrations and temperature put increased stress on gaskets. This can cause leaks or even failures. The ElastaGraph/Dynagraph Technology’s flexible material and design is better to withstand these uncontrolled conditions and will help you achieve leak free start-ups.

Increased Production
Due to a reduction in product loss, reduced down time and decreased failures at start-up, you will reduce your maintenance costs while at the same time increase your plant efficiency. This increased production will generate higher revenues as the plant runs longer and more consistent.

Elastagraph/Dynagraph Advantages:
- Corrugated Metal Gaskets Require Less Load to Seal
- Soft Flexible Graphite Creates Tighter Seal
- Reduced Leaks at Start Up
- Increased Life through Thermo-Cycling Applications
- API-607 and API-589 fire resistant

Reduced Emissions

Cost of Emissions
Fugitive emissions are a byproduct of oil refinery, chemical, and petrochemical plant operations. A typical plant has more than 300,000 valves, gauges, pumps, and other connection points at which leaks could occur. These leaks are often difficult to locate and monitor.

Fugitive emissions also impact safety and sustainability efforts by releasing hydrocarbons and other gaseous media into the air. This causes potential health risks to plant workers and the surrounding community. These emissions can also be flammable which could lead to fire or an explosion.

In addition to the safety and sustainability costs, the financial costs of fugitive emissions are substantial for plants. More than $3 million in fuel products are lost each year by US refineries. The EPA also imposes millions of dollars in fugitive emissions-related fines each year. Finding a solution to reduce or eliminate these emissions can save a plant millions of dollars each year.

Fugitive Emission Compliance
Elastagraph/Dynagraph gaskets were developed specifically to solve fugitive emission and compliance problems. They also perform well in flanges that experience thermal cycling or limited initial bolt load. Elastagraph/Dynagraph gaskets are the most economical way of meeting low emission requirements on the market today.
Since 1990, Leader GT®, the manufacturer, has carried out extensive research into the reliability of mechanical flanges. During this time, it developed a proprietary process in the manufacturing of corrugated metallic gaskets called Elastagraph/Dynagraph Technology. The Elastagraph/Dynagraph Technology utilizes a corrugated pattern that provides superior sealability over traditional corrugated.

Elastagraph/Dynagraph flange and heat exchanger gaskets are specifically engineered for low available load applications where reliability and fugitive emissions reductions are a priority.

Through Leader GT®’s research, it was determined that increased pitch and groove depth improves ElastaGraph/Dynagraph’s recovery or “spring back”. This reduces the surface area of the gasket for greater unit load at initial torque as well as lower minimum seating stress. This results in both stability and increased load retention during thermal cycling.

The proprietary productions process infuses a seamless layer of flexible graphite at varying densities and thicknesses over a corrugated metallic core. The inner diameter of the ElastaGraph/Dynagraph gasket is encapsulated by high-density flexible graphite, increasing seal ability many times over traditional designs.

The traditional designs create a leak path and contribute to stress corrosion of the metal insert. This process also eliminates the mylar/polyester film adhesive used in traditional gasket designs which contributes to volume and bolt torque.

Key Features:
- Industry’s only corrugated rib pattern
- Increased gasket recovery
- Lower porosity and stress corrosion
- Greater unit load at initial torque
- Increased load retention
- No mylar/polyester film
ElastaGraph/Dynagraph Gaskets

Technical Specifications

ISO 9001

Leader Elastagraph/Dynagraph Technology

Leader’s Corrugated Design reduces leaks which leads to increased safety, sustainability, and cost savings from emission loss.

MATERIAL CONSIDERATIONS:

Sealing Material — Flexible graphite has been widely recognized as the material of choice in combining excellent thermal stability with corrosion resistance (nuclear grade available).

Metal Carrier — 316L SS is the standard carrier. Other higher alloys available upon request. Available in ring, full face, and full pipe sizes.

Specifications:

- Available for 150lb, 300lb, and 600lb flanges
- Standard stock items are 316L metal core for 1/2” through 24”
- Other special sizes and higher alloys available upon request
- Thickness: 1/16” and 1/8”

Operating Limits & Specifications

<table>
<thead>
<tr>
<th></th>
<th>Elastagraph</th>
<th>Dynagraph</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Operating Temperature</td>
<td>1200°F Steam - 850°F Oxidizing</td>
<td>1200°F Steam - 850°F Oxidizing</td>
</tr>
<tr>
<td>PH Rating</td>
<td>0-14</td>
<td>0-14</td>
</tr>
<tr>
<td>Composition</td>
<td>High Purity Inhibited Grade Flexible Graphite molded over a corrugated metal core</td>
<td>High Purity Inhibited Grade Flexible Graphite molded over a corrugated metal core</td>
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<tr>
<td>Metal Substrate</td>
<td>316L (standard), 304SS, Monel, Zirconium, Hast B276 etc. (other metals available upon request)</td>
<td>316L or carbon steel</td>
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<tr>
<td>M Value</td>
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<td>3</td>
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<tr>
<td>Y Value</td>
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<td>5000</td>
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<tr>
<td>DIN Sizes</td>
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<tr>
<td>Pressure Ratings</td>
<td>150, 300 and 600 Class Flanges</td>
<td>Vacuum to 4500 psi</td>
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</table>

Test data available upon request. Check Leader Global Technologies for oxidizing applications.

The physical or chemical properties of Leader Global Technologies seals represent typical average values obtained in accordance with accepted test methods and are subject to normal manufacturing variations. They are supplied as a technical service and are subject to change without notice. Check with Leader Global Technologies to assure current information.

For a full description of Leader Global Technologies Liabilities and Warranties, please contact our Customer Service Department at (281) 542-0600 or contact your local Lewis-Goetz division.
Case Study
Dynagraph HE Gaskets
Savings: $1 Million

Challenge:
A large chemical manufacturer required a better gasket solution for their large reactor vessels. These reactor gaskets are the most frequent source of spills and releases in the entire plant. The plant was currently using the gasket design supplied by the vessel manufacture. This gasket consisted of 3 rings of braided graphite packing wrapped with stainless steel foil and finished with a graphite laminate, resulting in a very low-density seal with high compressibility.

Due to this poorly designed seal and radial movement, the plant was losing 13.6 million pounds of production a year, at a cost exceeding $1 million. They also incurred $91,000 in maintenance costs due to gasket replacement and the bolt tensioning involved.

Solution:
In place of the current gasket, a Dynagraph HE gasket was installed. This gasket has a high crush resistance and is known for its superior performance in applications with excessive radial shear. The Dynagraph HE gasket consists of a heavy corrugated stainless steel substrate covered by a molded layer of flexible graphite. This gasket design reduces volume and weight loss at elevated temperatures and allows the gasket to establish an initial seal and stabilize quickly while maintaining that load over the life of the joint.

Result:
The installation of the Dynagraph HE gasket allowed the craftsmen to properly elongate the bolts to 45-50% of yield and achieve a gasket stress of over 4500 PSI. This was sufficient load to create an effective seal and maintain load through thermal and temperature cycling. Even after the second pass of loading, the gasket had minimal reduction of bolt torque.

Once the reactor was heated to 850°F, the unit was started and inspected for emissions. The flange was considered leak free and was again checked for tightness. Once again, the flange had lost a minimal amount of torque.

Since installation, the vessel has experienced a significant amount of thermal cycling and no leaks have been reported. Due to this success, the plant is replacing the gaskets on all its reactors with the Dynagraph HE. This change will save the plant a significant amount of money while contributing to sustainability.

The customer eliminated production loss, saving them a yearly cost of over $1 million while also reducing maintenance costs in the amount of $91,000.
Lewis-Goetz Offers a Complete Line of Products Including:

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- Fasteners
- Packing
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