


Valve solutions for a constantly changing world.



EGC
ENGINEERED SOLUTIONS
A CDI Products Company



For a valve rebuilder,
it just doesn't get
any better than this.

EGC Enterprises knows more about flexible graphite than most other companies in the world because we engineer and manufacture high-tech, high-temperature, high pressure fluid sealing products. Founded in 1978, EGC has a long history of innovation and customer-based solutions. EGC engineers are recognized worldwide as problem solvers where high-quality is our measure of excellence.

It's about **saving time.**

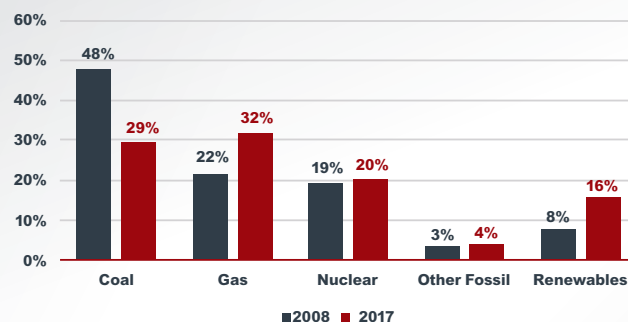
Valve maintenance professionals live in a world that's constantly changing. A decade ago, it could take weeks or months to finish an outage. Now, it's two weeks or less. There are cases when the plant adds a last-minute valve to the outage scope or an emergency shutdown occurs where there is only a day or two to complete the job.

EGC began making graphite pressure seals for the US Navy about 25 years ago. In fact, EGC seals are still the only graphite pressure seals approved for use in Standard Navy Valve designs aboard nuclear propulsion vessels. But, because of tooling, pressure seals initially required six weeks

or more to make – a timeline that worked for the US Navy, but wasn't nearly good enough for application in the valve repair aftermarket, where time is of the essence.

But EGC engineers are as persistent as they are inventive. They found ways to reduce the engineering and production time on their seals. And in doing so, they changed the entire valve maintenance landscape to

2008 to 2017 **Power Sector Change**



The VSG: A faster solution.

In 2008, EGC engineers made a remarkable breakthrough. They engineered a proprietary process to eliminate die-formed tooling from the manufacturing of graphite pressure seals. It was the first VSG pressure seal with caps. For the first time, the graphite pressure seal could be made without tooling, while still delivering the same performance as the US Navy graphite seal and sealing 100% of the time. Standard delivery dropped from six weeks to ten days, with the potential to drop to less than a week. Now, there was a flexible graphite pressure seal ideal for the outage schedules of the power industry.

| | |
|----------------------------|---|
| Standard Leadtime | 2 weeks |
| Expedited Delivery | Inquire about Fast-Track options |
| Material | High density graphite with oxidation inhibitor with 300 series Stainless Steel caps |
| Applications | Pressure seal bonnet valves in Natural Gas, Coal, Steam Generation Solar and Nuclear PowerPlants. Petrochemical and Chemical refineries |
| Available Sizes | 3" to 27" in diameter |
| Pressure Limit | Up to 4,500 lbs. class valves |
| Temperature Limit | 1,200 F |
| Chemical Resistance | pH 0 – 14 except in strong oxidizers |



The VSG Pro: Same performance, same-day service.

With the natural gas boom, outage scopes were often reduced to less than seven days. This led EGC engineers to pioneer another breakthrough in 2010: a high-density, high-temperature graphite pressure seal with no tooling AND no caps. It was called the VSG Pro Pressure Seal. It focused on a revolutionary anti-extrusion design. With no production tooling or caps, standard delivery fell to 48 hours, or even sameday. Now outage managers and rebuilders could get a custom engineered, flexible graphite seal that could be completed the same day the order arrived, then shipped immediately. The result: the fastest graphite seals on the planet. That's why today, 95% of all EGC pressure seals are VSG Pros.

| | |
|---------------------|--|
| Standard Leadtime | 48 hours |
| Expedited Delivery | Inquire about Fast-Track options |
| Material | High density graphite with oxidation inhibitor with 300 series Stainless Steel Edges |
| Applications | Pressure seal bonnet valves in Natural Gas, Coal, Steam Generation Solar and Nuclear Power Plants. Petrochemical and Chemical refineries |
| Available Sizes | 3" to 40" in diameter |
| Pressure Limit | Up to 4,500 lbs. class valves |
| Temperature Limit | 1200 F |
| Chemical Resistance | pH 0 – 14 except in strong oxidizers |



VSG Pro Pack:

A better stem packing idea

EGC Engineers have applied the same proprietary manufacturing technology to packing sets, eliminating die-formed tools from the manufacturing process. This development enables every valve to have custom engineered packing sets that are specifically designed for a perfect fit in 48 hours or less. The VSG Pro Pack is a rising stem packing composed of two, Inconel-jacketed end rings and 1 to 5 pure graphite center rings.

| | |
|----------------------------|---|
| Standard Leadtime | 48 hours |
| Expedited Delivery | Inquire about Fast-Track options |
| Material | Inconel reinforced braided end rings—flexible graphite with oxidation inhibitor center rings |
| Applications | Rising stem valves in Natural Gas, Coal, Steam Generation Solar and Nuclear Power Plants. Petrochemical and Chemical refineries |
| Available Sizes | 1/2" to 10" in diameter |
| Pressure Limit | 10,000 psi |
| Temperature Limit | 1,200 F in steam service |
| Chemical Resistance | pH 0 – 14 except in strong oxidizers |



The ultimate in engineering that virtually eliminates fugitive emissions.

LDAR programs have shown that valve stems are a major source of FE leaks. Product loss is just a small part of the potential cost. EPA fines, environmental risks, health hazards, legal liability and plant shutdowns can make the total costs of vapor leaks significant. Thermafoil 2236 CLE packing can help prevent fugitive emissions from escaping through the stem of the valve. It has passed API 622 and does NOT degrade up to 850F. It averages just 2ppmv, without the adjustment of the gland, during testing performed at the Yarmouth Research and Technology Center.

| | |
|----------------------------|--|
| Standard Leadtime | 48 for spool stock |
| Expedited Delivery | Inquire about Fast-Track options |
| Material | Inconel reinforced packing with proprietary blocking agent |
| Applications | Rising and rotating stem valves in Petrochemical and Chemical refineries |
| Available Sizes | 1/8" to 1" cross section |
| Pressure Limit | 6,526 psi |
| Temperature Limit | 850 F |
| Chemical Resistance | pH 0 – 14 except in strong oxidizers |



When consistent load is critical consider **EGC live-loaded packing sets.**

When thermal cycling, pressure surges, packing relaxation or wear cause gland force to diminish, EGC has a solution. It's called live-loaded packing and it's done with Belleville spring washers. The washers are inserted on the stem or on the fasteners. They press against the check-nuts and the flange to maintain constant pressure on the gland packing. Belleville spring washers have a high spring rate, can resolve thermal expansion and produce extremely high loads in a small area. They can absorb shock, provide dampening and support extreme forces in bolted areas.

| | |
|----------------------------|--|
| Standard Leadtime | 48 hours |
| Expedited Delivery | Inquire about Fast-Track options |
| Material | Inconel reinforced braided end rings—flexible graphite with oxidation inhibitor center rings—Belleville spring materials vary by application |
| Applications | Rising and rotating stem valves in Natural Gas, Coal, Steam Generation Solar and Nuclear Power Plants, Petrochemical and Chemical refineries |
| Available Sizes | 1/2" to 10" in diameter |
| Pressure Limit | 10,000 psi |
| Temperature Limit | 1,200 F in steam service |
| Chemical Resistance | pH 0 – 14 except in strong oxidizers |



Alta-P. Tough under pressure!

Thermafoil Laminated Alta-P (TF-LAP), consists of two parts – graphite and stainless steel with no adhesive binders. Layers of stainless provide extra strength, giving the composite material the ultimate in toughness in very high-pressure situations. Alta-P can handle gasket pressures of up to 40,000 psi unit load and systyem pressures of up to 3,500 psi in non-contained applications. Alta-P also handles system pressures of up to 14,000 psi if the cavity is contained on the OD and ID.

| | |
|---------------------|--|
| Standard Leadtime | 48 hours |
| Expedited Delivery | Inquire about Fast-Track options |
| Material | High density graphite with oxidation inhibitor and 316 series Stainless layers |
| Applications | Flange and valve applications in Natural Gas, Coal, Steam Generation Solar and Nuclear Power Plants, Petrochemical and Chemical refineries |
| Available Sizes | 1/16", 1/8", and 3/16" thick and up to 24" in diameter |
| Pressure Limit | 3,500 psi in non-contained flanges and 14,000 psi when OD and ID are contained |
| Temperature Limit | 1,200 F in Steam service |
| Chemical Resistance | pH 0 – 14 except in strong oxidizers |

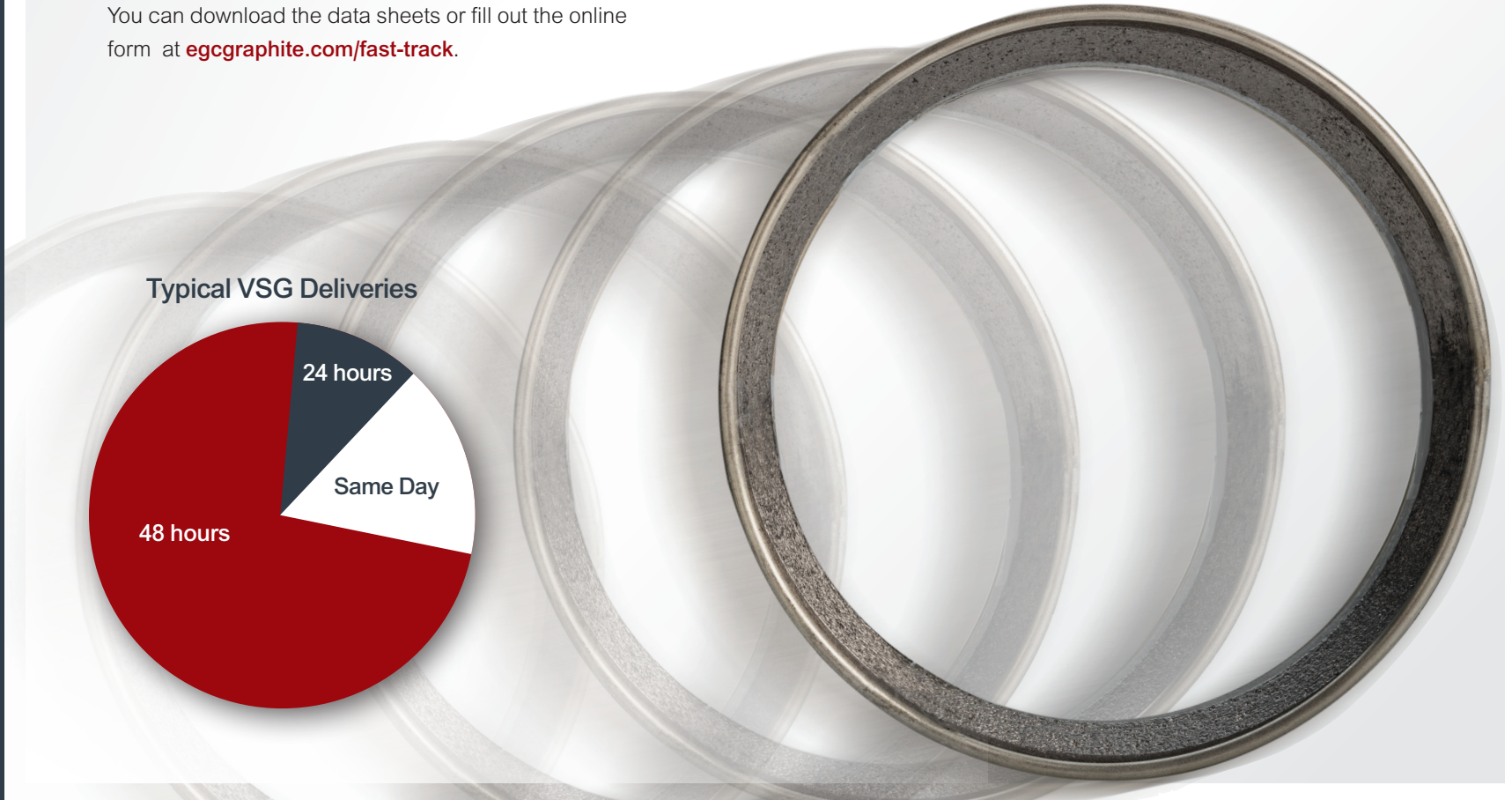
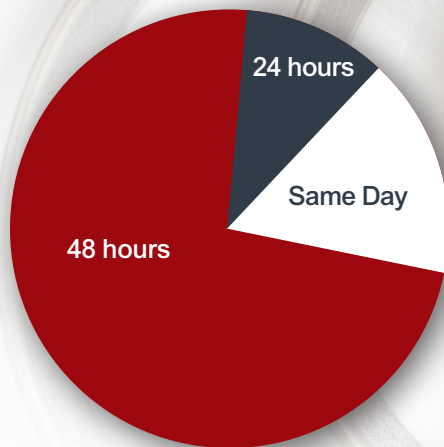


Fast-Track™. Another reason EGC is the fastest on the planet!

Fast-Track is EGC's expedite program. Valve repair personnel can use Fast-Track to maintain an outage schedule or for emergency shut-downs. Fast-Track can ship the same day, which should not be surprising given EGC's track record for driving down delivery times. Just fill out the VSG, VSG ProPack or Live Loaded data sheet, specify where and when you need it and we'll handle the rest. Our high-performance team of associates are eager to make your delivery the fastest possible. Just order today and install tomorrow.

You can download the data sheets or fill out the online form at egcgraphite.com/fast-track.

Typical VSG Deliveries



Let EGC engineer your next seal.

EGC's flagship products set the standard for valve sealing.
Every seal is custom engineered and manufactured to your exact need.

Unlike metal pressure seals EGC's VSG graphite pressure seals can handle multiple thermal cycles a day, seals every time and rebounds after every pressure cycle. They are compressible and conformable and works in over-size, out-of-round, steam-cut and pitted bonnet valves. They are removed as easily as they are installed. Maintenance studies show that you can save 75% on valve repair labor time by using graphite pressure seals vs metal.

EGC has continually raised the bar with an impressive range of engineered solutions like VSG Pro and Pro Pack, Thermafoil 2236 CLE Packing, Live-Loaded Packing, Alta-P and Fast-Track.

For a valve rebuilder, it just doesn't get any better than this.
Let EGC be your fluid sealing solutions provider.



a 100% Employee-Owned Company

EGC Enterprises, Inc.
140 Parker Court, Chardon, OH 44024
440-285-5835



EGC Enterprises, Inc.

140 Parker Court • Chardon, OH 44024

egcgraphite.com • outageseason.com

p 440-285-5835 • f 440.285.8337