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APPLICATION GUIDE

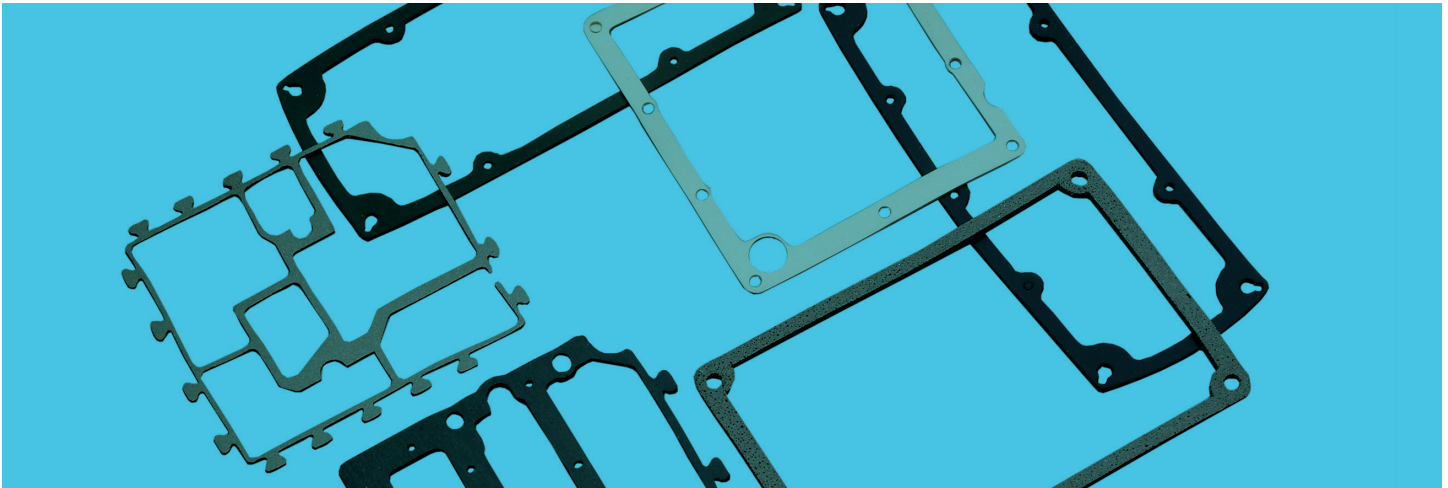
DESIGNING FOR SUCCESS – DIE CUT GASKETS:

5 Frequent Oversights & How to Address Them

By: Modus™ Technical Team

When designing a die cut gasket for a performance application, it's important to start the process by talking to an expert. An expert will help walk you through the specs, gasket design, and application considerations to guarantee your die cut gasket will function as intended. This one-on-one consultation will also ensure you'll receive the right die cut gasket on-time and on-budget so you're not stuck with lengthy delays or working out of scope of budget.

Die cut gaskets are used for a variety of applications, with some of the most common uses being environmental seals and EMI shielding.



While there are many gasket manufacturing methods to choose from based on your application needs, the die cutting process offers a variety of unique benefits:

- Fast gasket production
- Low tooling and labor costs
- A wide selection of material options
- Automated manufacturing techniques
- Suitable for large and small parts
- Easily customizable

But what happens when your die cut gasket isn't designed for success?

The result can be costly and potentially detrimental to the application. Before specifying your next die cut gasket solution, make sure you don't make one of these common mistakes.

OVERSIGHT #1: DESIGN CHALLENGED DIE CUT GASKETS

Common mistakes:

- Forgetting to consider bolt hole position constraints when designing a die cut gasket.

Solution:

- Through one-to-one consultations and a collaborative design/manufacturing process, an expert converter can identify potential manufacturing issues early in the design process. Early supplier involvement in the design process can help reduce manufacturing issues, which would cause costly project delays.
- If holes must be placed at the very edge of the gasket, consider an alternative manufacturing method like waterjet cutting.
- Potentially, specify an open slot instead of a hole.
- Think about using a thinner gasket material to reduce the thickness of the wall between the hole and the edge of the gasket.



The Real World:

- We've seen it many times over the years, gaskets drawn to perfection, with the exception of the one hole placed too close to the edge! Your typical steel rule die needs both punches and steel rule to properly cut a gasket with holes. We run into problems when there's not enough room between the hole punch and the steel rule to eject the gasket material from the die.
- The hole placement issue has been addressed in the past through a variety of solutions including revising the hole location, switching to an alternative manufacturing method such as waterjet, or molding the gasket.

OVERSIGHT #2: NEGLECTING TO AUDIT YOUR GASKET CONVERTER

Common mistake:

- Don't we all have some desire to go with the least expensive supplier? The low cost supplier will always be an attractive option. Just make sure you set your expectations accordingly if you're going to use the lowest cost provider. Neglecting to audit or at least ask some probing questions can lead to disappointment on multiple levels.

Solution:

- A quality system certified to an international standard, such as ISO9001, can help you determine if your supplier has [documented processes](#) in place to ensure product quality.
- Is your gasket supplier a cultural fit for your organization? What happens when there's a production or quality issue? A supplier with authentic references and documented values can help determine if they're a good fit.
- Ask about the supplier's commitment to basic manufacturing concepts like 5S and Lean. Do they place value in a clean and well organized manufacturing facility?
- Does the supplier have a process in place to ensure expired adhesives aren't being used to make your gaskets? Be sure to ask about their PSA (adhesive) expiration process!



The Real World:

- Our goal is to exceed your expectations! Haven't heard that one before! What does exceed my expectations even mean when it comes to gaskets? Does your supplier know the kind of experience you're looking for when purchasing a gasket? Maybe one where the supplier delivers perfect quality gaskets, on time and at a reasonable total landed cost? I guess that's a good start.
- We're not in the habit of throwing competitors under the proverbial bus, but do wonder sometimes why mutual customers continue to tolerate delivery, quality and service issues. We had a customer tell us they were looking for a new gasket supplier because their existing supplier was yelling at them! You probably don't want to hear about the gory details, but suffice it to say, it was somewhat easy to transition the customer to [Modus Advanced, Inc.](#)

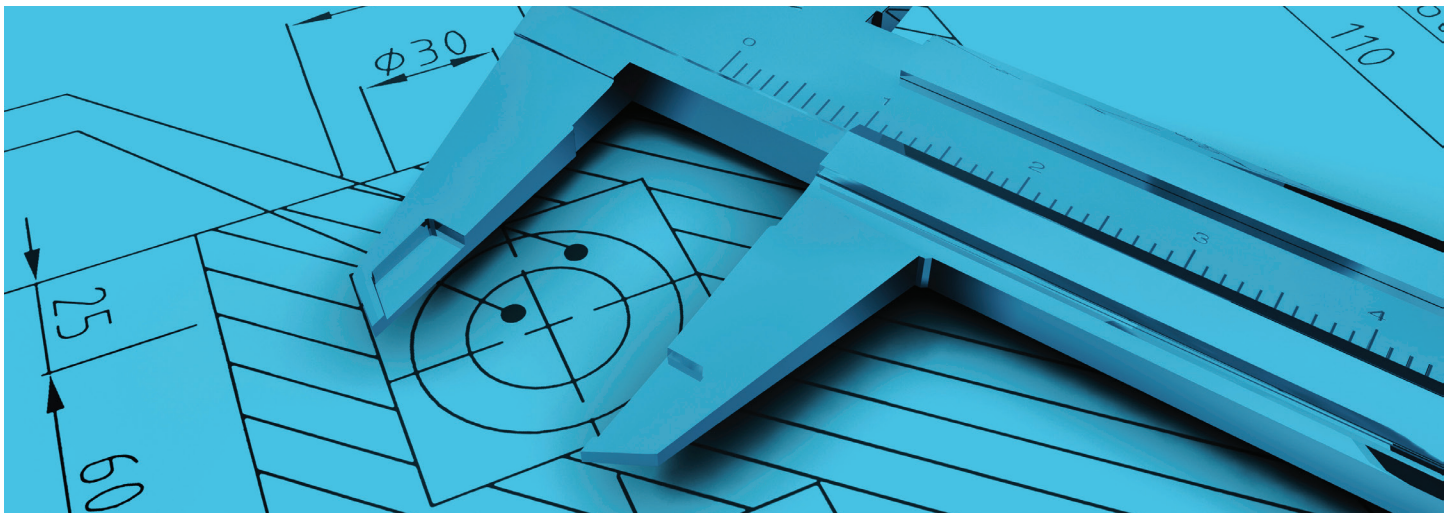
OVERSIGHT #3: SPECIFYING MACHINING TOLERANCES

Common mistake:

- Die cutting tolerances are a function of material type, part features, tool type, and production techniques. The process of manufacturing a die cut gasket is very different than machining a metal part and requires much wider tolerances.

Solution:

- Strive for tight cut tolerances, but understand the cutting process and material limitations. Acceptable tolerance levels can typically be agreed upon by consulting with die cutting experts who understand how to balance gasket fit, form, and function to processing capabilities.
- Ask your converter about alternative gasket manufacturing methods such as waterjet or CNC digital cutting if standard die cut tolerances aren't acceptable. Cut tolerances on a high-quality waterjet can be as tight as .005" in some applications.



The Real World:

- We're super impressed by the tolerances our machine shop cousins can hold on aluminum parts, but we prefer to leave machining tolerances to the metal guys! Rubber by its very nature is pliable and deflects when cut with a steel rule die. It's not uncommon for mechanical engineers designing rubber gaskets to include default CAD system tolerances on their gasket drawings. Past experience tells us correcting drawing tolerances can delay a project anywhere between a few days and a week. Most gasket converters who operate under an ISO9001, or better, quality system will ask their customer to update the tolerances on the drawing before starting production. Our [tolerance tables](#) can help engineers correctly specify tolerances, avoiding exceptions being taken on quotes, or production delays.

OVERSIGHT #4: ASSUMING A DIE CUT GASKET IS ALWAYS THE OPTIMAL SOLUTION

Common mistake:

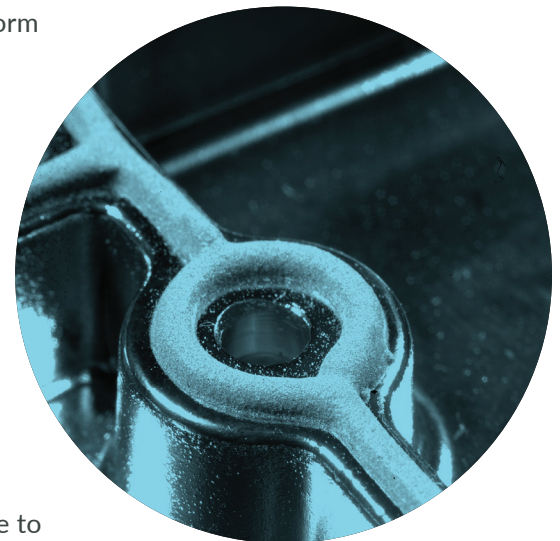
- Do you know you could be paying your gasket converter to throw away up to 75 percent of the material used to make your gasket? Don't make the mistake of assuming a die cut gasket is the optimal solution!

Solution:

- Consider a [custom molded rubber gasket](#) if your gasket design will result in substantial material waste. A custom molded gasket can lead to substantially lower costs, especially if it's a nickel graphite or silver filled EMI shielding gasket.
- Would an extruded and spliced gasket be a better solution for large, irregular shaped sealing surfaces? Extrusion profiles can be optimized for lower compression force, potentially resulting in a better seal and reduction in the number of fasteners.
- [Form in place gaskets](#) can not only provide cost reduction opportunities, but also performance advantages as well. A dispensed FIP gasket can also lead to fewer assembly issues when dealing with thin gasket walls.

The Real World:

- We were lucky enough to have one of our customers introduce us to form in place gaskets years ago. Seven gasket dispensing machines later, we're well on our way to being the largest contract FIP gasket manufacturer on our street. The customer could clearly see the raw material savings advantages to dispensing an FIP gasket on their housing. We were able to cut the cost of their die cut EMI shielding gasket in half by using an alternative gasket manufacturing method.
- A different customer asked us to manufacture a large EMI shielding frame gasket, with PSA on one side. In order to meet their price target, we knew we couldn't simply die cut the gaskets from sheet material. We decided the best alternative was to first mold a picture frame, second apply an electrically conductive PSA and finally die cut the gasket from the PSA backed frame. When working with expensive materials like electrically conductive silicones, it makes sense to consider alternative manufacturing methods. This solution is still saving the customer over \$10,000 per year in gasket costs.



OVERSIGHT #5: THE CHEAP ADHESIVE (PSA) TRAP

Common mistake:

- Not all adhesives are created equal. When the wrong adhesive is used, the gasket assembly could perform poorly, or even result in product failure. Take the time to specify which PSA (pressure sensitive adhesive) your gasket converter uses in your unique application.

Solution:

- Choosing the right adhesive is one of the most important decisions you can make when detailing the specifications for your gasket. Make sure you (or an expert) take temperatures, adhesion strength, life expectancy and more into account when specifying an adhesive system.
- Ask your converter for transparency when they recommend a private label PSA. What makes the converter think their private label product will work in your application? Companies like [3M](#) and [Avery](#) have spent millions of dollars on research and development over the years. Should you consider leveraging their R&D in your application?
- Remember to consider both adhesive surfaces when trying to specify a PSA. The adhesive will need to stick to the seal as well as the mounting surface.
- Many name brand adhesive manufacturers, like 3M for example, have lower cost alternatives. Point being, you might be able to use a high-quality 3M PSA and still meet your cost target!



The Real World:

- The cheap PSA trap! A tricky subject to address given cost and budget goals. If I had to guess, I would say at least 1/4 of gasket drawings we see on a daily basis don't bother to specify an adhesive system. Not specifying the correct PSA can result in premature product failure or worse. Even the best intentioned gasket converter can make a mistake if they don't have a full understanding of the PSA performance requirements.
- We've seen situations where gaskets meant to completely seal an outdoor enclosure from water ingress have failed because the PSA used in the application didn't create a sustainable bond to the seal. The PSA to seal the bond degraded to a point where it failed because the sealing material leached plastizers into the PSA. An inferior PSA / seal system was apparently used to meet cost reduction targets. In the end, the solution ended up not only eating the cost savings, but actually costing the customer a lot more due to the replacement cost of the defective seals.
- We strongly urge engineers to make sure they not only ask their converter for a PSA recommendation, but also run the materials combination by the PSA manufacturer. It really comes down to the age old question, "What's the cost of quality?"

Talking to an expert at the beginning of the process will help ensure you have the right die cut gasket for your application. Your gasket converter should be able to help walk you through the necessary steps to meet your environmental, regulatory, and EMI shielding requirements while providing peace of mind.

Get the Modus Advanced expert opinion at the start of a project to ensure your solution is right for the application and will be delivered on-time and on-budget.

[Request A Quote Today!](#)