

– Designing for Electronic Device Manufacturing –

Assembly Solutions For Cooler, More Reliable LED Lighting & Electronic Devices

3M Thermal Interface Materials (TIM)

Innovative Solutions for the Electronics Industry

Related Applications



Attaching



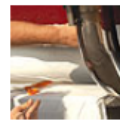
Bonding



Conducting



Damping

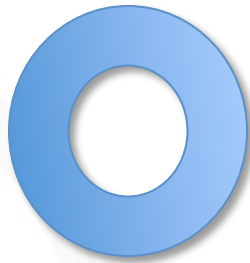


Surface Protection

Gleicher
MANUFACTURING CORPORATION

Gleicher + 3M Electronic Device Solutions

Q: How do you hand cut
a precise shape
from a piece of tape ?



A: You don't :)

When designing new products in the electronics industry, engineers must consider quality, protection, and performance. So you've considered all these issues and now you're ready to make your prototypes.

But Labs have to use production ready samples, just like those used in manufacturing, to get accurate test results. The prototype sample must be of the same standard as those used in your finished assembly processes.

Can you avoid using rough cut samples
that interfere with prototype testing?

This guide will help you to pose your own strategic fastening questions so you can quickly get production-ready fastener samples in hand.

The goal is to help Engineers define the attributes they need to represent production realities. It will help you design an attachment solution, source the adhesive materials and choose the best converting and laminating options for your product's bond lines.

The Good News:

3M technology is used in a broad range of specialized solutions for today's demanding electronics assembly applications both consumer and industrial. The materials can be converted into components, fabricated sub-assemblies and finished goods based on your requirements and specifications.



Enabling Next Generation Electronics

3M continuously solves problems that others cannot to deliver practical, ingenious solutions that help our customers succeed.

3M global experts drive improvements in customer manufacturing processes and product performance by applying our strengths in many of the building blocks of tomorrow's electronic devices.

DESIGN

Let's Take a Step Back:

Before you choose a 3M material, you need to determine where your product will be used and how it will be assembled. Consider environment and usage cycles; they will dictate which materials and assembly processes are best.

Start During R & D:

Ask key questions and speak with a converting expert.

Product Use Questions

Are we Attaching, Conducting, Damping, or interested in Surface Protection?

In what setting(s) will your product be exposed?

3M offers materials that stand up to extreme exposures like high temperatures and drop stress, offer EMI/RFI protection, and are able to withstand cleaning solution. In addition to thinner and lighter weight, 3M offers a de-bondable PSA, as well as anti static and light-tack cling film.

What problem are you trying to solve for your bond line?

Do you need to ground electrical shock, absorb impact to protect from drops, accommodate heat issues, EMI / RFI stray field, weight issues, transmittance - lowest haze (optically clear), or does your sensitive device need a protective film?

What range of Heat will likely occur?

Many 3M materials have thermal management properties. Your converter will need know how important is the durability of the thermal interface material for support efficiency in different environmental conditions, especially in external applications of LEDs. Ask your converter for documentation.

What compliance or regulatory issues are you dealing with?

Ask your converter for material safety data sheets or laboratory research.

Will your product be used repeatedly?

Would you prefer single-use, disposable products? Or is it better to use a durable, multi-use, cleanable material?

Tap Into a “Custom” Team

In the event a solution does not exist, an expert converter with engineering services will guide your project through custom design and fabrication.

Bond-Line Design Questions

Before you can focus on choosing a 3M material for your product, step back and think about your product design. Your converter will want to have a theory discussion and understand the chemistry and geometry behind what you're doing.

These questions will help you and your converter choose a bonding agent.

What type of geometry does your application require? How large is the surface area you need to bond against?

What's your tolerance for chemical resistance in your process?

What are the specs on your bond line?

Will your joint overlap, or will you use a butt joint? The polymer you chose will dictate the joint mechanism.

How will you apply the fastener? Will you press it, peel it, attach it manually, or on an automated line?

**Applications are unique.
Customization is a given.
Costs must be controlled.**

Custom design is critical in the electronics industry, and a good converter will help you lower costs and increase efficiencies.

Electronics

For cell phones, digital tablets, medical devices, gaming equipment, and similar electronic products, 3M bonds, seals, laminates, labels, protects, and more. Applications, to name only a few, include membrane switch adhesives for top to bottom reliability, cleanly removable clear tape to protect screens during shipping and in-store display, die-cut foam tape to bond and seal lenses and housings, and laminating adhesive to attach nameplates.



Operational Questions when Sourcing:

Inventory Services

This is an agreement between a Manufacturer and the Supplier about stock requirements. At the end of the agreement, the customer could have obligations to purchase residual inventory. Every relationship is unique; negotiate inventory services carefully. Ask suppliers about options.

Scheduled Releases

Synchronize your inventory with your production. This reduces the amount of material on floor, and helps make invoicing seamless. Be sure to verify your supplier's administrative capabilities during your selection process.

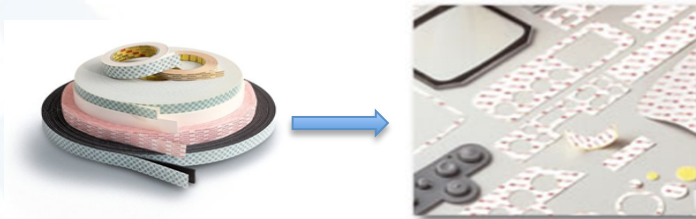
SOURCING



Converting Questions:

Deciding which cutting method is most appropriate for your needs is a critical part of the process. Different techniques change the shape or the yield of your fastener. The attributes of the finished product determine which is best.

Die cutting is a tried-and-true method for converting; it doesn't require the use of heat, so it offers more options. Its shortfalls are in the set-up and lead time to specify, secure and test the dies. The size of the production run can determine if die cutting is cost-effective for your project.



Laser cutting has changed the game because it offers expanded design capabilities. It is a good option for varied patterns and shapes and when extreme precision is required. Laser cutting is great for small batches or when time is a factor. Laser cutting leaves no debris; your components will be untainted by foreign matter.

Why 3M?

3M products are built to last and have proven their worth and reliability over time. 3M technology is also *supported* technology. It's been tested and trusted to be long-lasting.



Consider the following as you choose your conversion method:

Must your product adhere to sterility standards? Compliance issues affect your material's configuration.

How many units will you produce?

Are you using high-speed production methods or manual assembly? Will your product be finished by man or machine?

Would configurations such as rolls, sheets or kiss-cutting make your materials more user-friendly at the assembly line?

Would it be helpful to tailor your material with perforations or slits? A perforated cut ensures conformity and precision for the end user.

The right conversion method can help you cut time and minimize waste. Optimize your resources by working with a converting expert.

Some Converting Options

Processes

- Adhesive or chemical laminating
- Multi-layering
- Mechanical slitting
- Die cutting
- Kiss cutting
- Laser cutting
- Perforating

Format Options

- Slitting
- Sheets
- Strips
- Pieces

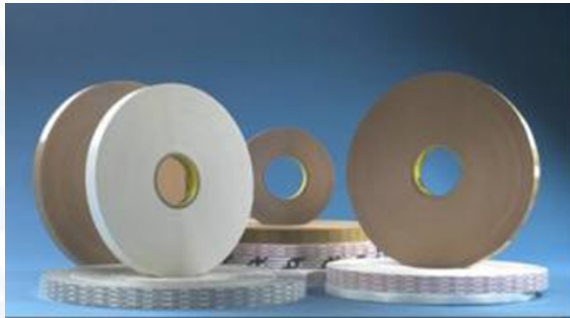
Value-Added Features

- Tabs
- Release Liners

Release Liners

Why use a release liner? They play a *functional* role.

- Clear liners aid *quality control*
- Colored liners aid *assembly sequencing*
- Liners allow adhesive to be *delivered in bulk* for later attachment by downstream assemblers.
- Liners can be used as a tool for *accurate alignment*



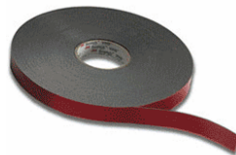
Support Your Product Prototyping

Get help from your converting partner securing the 3M samples and data pages that will be useful to your laboratory.

Sourcing the right Release Liner:

Choose a liner material carefully. Knowing function and features will make for a more predictable and cost-efficient assembly.

- **What thickness do you need?** Thicker liners are stronger, discourage buckling and wrinkles, and help avoid breakage during removal.
- **Does your adhesion process call for a high or low release value?**
- **How accurate is the alignment? Consider:**
 - Control over contact area
 - Ease of handling
 - Perforations
- **What kind of quality control do you need at the contact area?**
- **Do you need to control contamination?**
- **Do you need a “lay-flat” liner?**



Specialty Die Cutter

Die cut various materials such as foils, foams, films, laminating adhesives, etc. for creating die cut pieces to be used in OEM manufacturing and assembly. They can also slit various materials to produce custom roll widths for manufacturing.



Converting the Liner:

Edge finish and assembly methods will drive the liner material selection and the cutting method.

- **Are you using a tractor feed or friction feed on your assembly line?**
- **Would perforations or slits be helpful?**

Capabilities of a Good Converting Partner

- Statistical Process Control
- CAD Systems
- Stocking Programs
- Sampling and Prototyping
- Private Labeling and Bar Coding

Design For Manufacturing Checklist

As you think about what you need for your application, remember these major considerations in a three-step framework:

Design It:

- ✓ Environment
- ✓ Usage
- ✓ Non-allergenic
- ✓ Compliance
- ✓ Assembly

Source It:

- ✓ Lot Tracking
- ✓ Inventory management
- ✓ Component materials
- ✓ How thin or thick
- ✓ Permanent vs. re-positionable

Convert It:

- ✓ Production volume
- ✓ Die cutting
- ✓ Laser cutting
- ✓ Perforations
- ✓ Slitting

Connect with a converting team that offers a broad range of technologies, solutions and laboratory capabilities to help with your design and manufacturing challenges. They will be helpful as you move from concept to production by developing a proof of concept and identifying design and manufacturing options.

Additional Resources

[3M Products for Electronics](#) OR

[3M Industrial Adhesives and Tapes for Electronics](#)

- [3M Solutions: Electronic Assembly Tapes](#)
- [3M Solutions: Cushioning Materials](#)
- [3M Solutions: Thermal Management Materials](#)
- [3M Solutions: EMI/EMC Materials](#)

[3M Solutions: Electronic Device Assembly](#)

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SAMPLES: stock – or – die-cut parts

Tapes, adhesives, fasteners, tabbed liners, transparent or colored liners, tacked liners, and more. *Let us know what you need!*

Let's Connect:

Call Us: (877) 629-0738 and ask for Engineering

Email Us: engineering@gleicher.com

Visit Us: www.gleicher.com

Gleicher Manufacturing Corp. is a family-owned business with 64 years of experience in converting. We're unique in that we serve as a bridge between customers' development, manufacturing and purchasing departments.

We are proud of the fact that we're a "3M Preferred Converter" one of only a handful in the country. We earned this kind of status by meeting high quality standards and through our ability to handle diverse converting methods. We can make sure you feel the swell of pride as well.

Our goal is to make sure you solve your assembly problems while you're still in the research and development phase, not when the assembly line has started to roll. We make sure that the production line will not come to a halt, costing you time and money, by helping you think through how best to convert our materials to meet your needs.

Located in Scotch Plains, New Jersey, we were founded in 1949 as a supplier to the U.S. Navy. Since then, we've established ourselves not only as a dependable, knowledgeable provider of product solutions but also as an innovator for whom "good enough" is never enough. We want your product to exceed expectations. After all, we are putting our name behind it, too.

We're Gleicher. Your partner in innovation.

Chick Gleicher,
President



Key Takeaway: The bond-line design, materials choices and converting decisions will affect final assembly.

Source the materials and adhesives components from a supplier who understands your assembly environment. Partnering early with a Converter allow engineers to specify the dimensions and attachment challenges, and the Converter will shape the attachment solution using cutting-edge techniques.

Experts familiar with 3M products make your job easier by offering production quality samples, providing access to research and documentation, and aiding in assembly planning.

Gleicher
MANUFACTURING CORPORATION

3M Preferred
Converter
Preferred