

The Engineers' Guide to Assembly Solutions

Chapter 1

Design and
Functionality for
Today's Engineer

Leading in design & functionality

Expanding design possibilities for engineers

The Canadian manufacturing landscape is changing: Industries are evolving, products are becoming more innovative, and design engineers are continuously challenged to meet the demands of this evolving landscape.

Differentiating products by introducing a new design is one of the ways engineers are able to stay ahead of the competition. But a change in design could mean an unavoidable change in process. It could also mean introduction of new materials in the manufacturing process. In fact, emerging trends such as light weighting are making the use of multi-material designs and those involving composite materials more common.

So, how do engineers ensure the products they design look aesthetically pleasing, without compromising strength and durability? And how do they accomplish this, keeping in mind process limitations and cost efficiencies as two key factors?

In this chapter, I hope to answer some of these questions and provide bonding solutions, keeping design and aesthetics at the centre of our discussion.



Kejian Zhang

As an application development specialist, Kejian Zhang strives to solve even the toughest manufacturing challenges. He is passionate about enabling manufacturers across Canada to incorporate new technology into designs, optimize assembly processes, and improve productivity. Kejian is dedicated to inspiring future engineers, and is a regular presenter at universities and professional associations.



Challenges: Stuck on the bonding problem

Here are some common challenges Canadian engineers face when designing products for their customers.

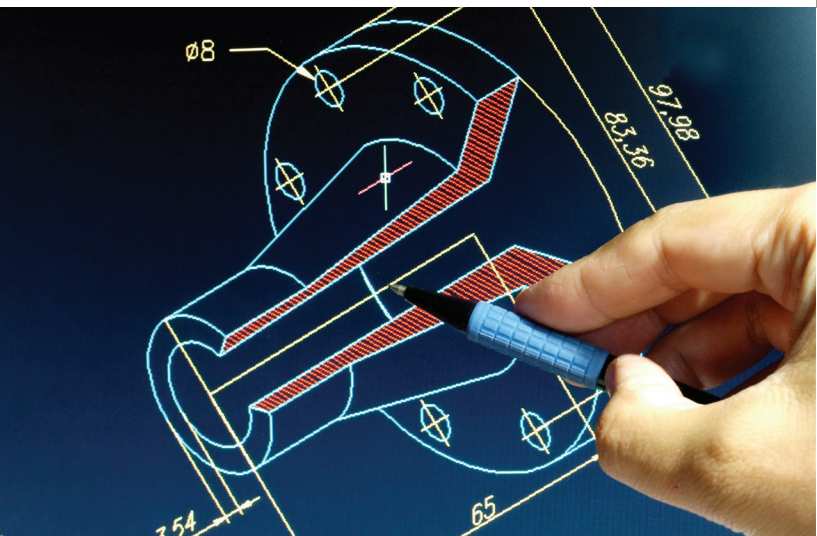


Design demands

Industry needs and those of your customers could play a huge factor in the way products are designed. Sometimes request for new designs cannot be fulfilled using traditional methods due to curved surfaces, multi-material usage, cost considerations, end use of the product, and other reasons.

Functionality

In many industries, functionality is just as important as design. Additionally, bonding dissimilar materials, which is becoming popular in manufacturing, is difficult since assembling these lightweight materials with mechanical fasteners is generally not an option.



Cost

Balancing cost with design possibilities can be a challenge engineers, manufacturers, and production managers face.

Solutions: **How Canadian engineers are achieving the freedom to design**

Here are examples of how some Canadian manufacturers are delivering high-quality products that are not only durable, but also excel in design quality and aesthetics.

Trailer tarps: The freedom to design with tape



When Verduyn Tarps needed to deliver on speed, quality, and aesthetics for their truck tarps, they had to think beyond traditional fasteners.

[Learn why they switched to tape](#) ▷



[WATCH: Freedom to design with 3M™ VHB™ Tape](#) ▷

3M™ VHB™ Tape 4941

The 3M™ VHB™ Tape 4941 family utilizes multi-purpose acrylic adhesives on both sides of a conformable adhesive foam core. The adhesive provides excellent adhesion to a broad range of high and medium surface energy substrates including metals, glass and a wide variety of plastics, as well as plasticized vinyl. The conformable adhesive foam core provides good contact, even with mismatched substrates. The combination of foam strength, conformability, and adhesion makes this family one of the most capable all-around 3M™ VHB™ Tapes.

[Product details](#) ▷



More Resources

VHB™ Tapes
Technical Data Sheet

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How to bond lightweight materials with high strength?

When PDG Mobility needed an assembly solution for bonding lightweight materials to build wheelchairs, they turned to epoxy adhesives.

[Learn why they switched to epoxy](#) ▷



3M™ Scotch-Weld™ DP420 Black

3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black is a toughened, two-part epoxy structural adhesive that provides outstanding shear and peel adhesion, and very high levels of durability to meet demanding bonding challenges. 3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black can replace mechanical fasteners, screws, rivets and spot welds in many applications.

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DP420 Black
Safety Data Sheet

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Explore solving your design challenges with adhesives and tapes



Interested in finding out if 3M adhesives and tapes can help you achieve design flexibility, and find alternatives to mechanical fasteners?

Here are a few ways of exploring 3M Assembly Solutions. →

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