

# Giga Casting and What Can it Do

*Find out how the “Giga Press” and “Giga Casting” can replace thousands of manufacturing processes with single giant castings.*

AUSTIN, TEXAS, UNITED STATES,  
September 22, 2022 /  
EINPresswire.com/ -- Value Engineering  
Versus Breakthrough Engineering

Structural engineers and product designers are constantly looking for ways to make their designs stronger while reducing weight and material costs, a process known as value engineering.



Often the success of these changes is measured in ounces of lost weight or cents on the dollar in cost savings.

“

Creative engineers and designers can create breakthrough structural designs so revolutionary that they make everything that came before seem obsolete.”

*Formaspace*

But on occasion, creative engineers and designers can create breakthrough structural designs so revolutionary that they make everything that came before seem obsolete.

Here are a couple of examples to illustrate our point.

In architecture, the American construction industry was transformed by the introduction of balloon frame houses

in the early 1800s, the fast, stick-built construction method that replaced earlier heavy post and beam designs. Then, in 1885, the first skyscraper appeared, Chicago’s 10-story tall Home Insurance Building, which pioneered the use of a structural steel frame construction, allowing architects to design our first modern multi-story buildings. In 1951 Mies van der Rohe moved this steel structure inward – away from the exterior walls – to create better views and more usable space in his design for Chicago’s Lake Shore Drive Apartments, the prototype of today’s modern glass office towers.

Vehicle design has also seen a series of structural engineering breakthroughs. Throughout the 1920s and well into the 1930s, most volume car production was “body on frame” – bodies were built of stamped sheet metal nailed to wooden supports, then later mounted onto a strong metal frame containing the engine and running gear. This approach was essentially an incremental update to the longstanding construction practices dating back to the horse-driven carriage era.

But there was another way. Budd [Manufacturing](#) Company, later famous for its streamlined railroad cars, such as the Pioneer Zephyr, sought to change things. In the early 1930s, they licensed their revolutionary all-metal unibody vehicle designs (known as a monocoque in French) to the French car maker Citroën (for use in the beloved Traction Avant) and Chrysler (for their art deco-styled Airflow sedan series). Budd’s unibody design coalesced the entire vehicle structure into a super strong body shell, eliminating the need for wood panel supports and a separate frame.

While “body on frame” structures remain in use to this day (primarily for trucks and heavy SUVs), the majority of today’s modern vehicles use a unibody structure, thanks to its relatively lower weight, higher strength, increased torsional rigidity, reduced vibration, and (usually) lower cost.

Introducing Sandy Munro, YouTube’s Breakout Star Advocating For Better Design For Manufacturing

When talking about manufacturing optimization, we’ve often brought up the name of Sandy Munro, founder of the eponymous Munro Associates, a Michigan-based consulting company famous for its no-nonsense automotive teardowns and manufacturing/material costing analysis.

It’s hard to pull the wool over Munro’s eyes. He’s seen it all during his decades-long career that started as an automotive toolmaker, to cost-analysis project manager at Ford, to his current

 FORMASPACE



No matter your requirements, Formaspace can build the right industrial furniture for your exact needs. Shown above is a heavy-duty workbench with anti-vibration levelers, mounted with a 2.5” black onyx epoxy top for extremely long life.

fame as an oft-quoted YouTube channel sensation where he has a cultivated devoted following his highly detailed videos evaluating engineering design choices and manufacturing methods.

Munro is an outspoken advocate of tried-and-true principles of manufacturing design optimization, including:

- Promoting the practice of “top-down” construction, in which components are assembled from the bottom layer upwards (without the need to flip or turn the in-process work upside down). This not only speeds up assembly and increases quality, it generally makes product repair and maintenance easier as well.

- Reducing or ideally eliminating the use of fasteners to increase quality and reduce manufacturing and warranty costs. (Munro says that a study at Ford

showed that fasteners are a root cause of a majority of warranty failures – “If you want poor quality, add more screws.”). Useful approaches for achieving this include using part designs that can be snapped or glued into place.

- Reduce manufacturing costs by combining multiple part sub-assemblies into one larger component. For example, it may be possible to replace a part made up of various brackets and sheet metal stampings with a single, larger molded part – to achieve lower costs and better quality.

- Create multi-purpose components that perform multiple functions, which can reduce costs across multiple systems. (Munro points to the Tesla “Super Bottle” as a prime example; this single water reservoir replaces multiple tanks used in the battery heat management and interior heating systems.)

material handling operations custom workstation with chutes

- Improving the efficiency of your material handling operations will have a positive impact on your bottom line. The custom workstation above features multiple chutes allowing the operator to process, assemble, or pack items quickly.

- As an industry insider, Munro has direct experience with how difficult it can be to create breakthrough engineering programs, like the Tesla Super Bottle.



Improving the efficiency of your material handling operations will have a positive impact on your bottom line. The custom workstation above features multiple chutes allowing the operator to process, assemble, or pack items quickly.

In an interview on Autoline Network, Munro went on one of his famous 'rants' about what stands in the way of manufacturing innovation at big established companies:

"This bottle is called the Super Bottle; this bottle does all the cooling – for everything! You've got a heat exchanger here for your AC system, a heat exchanger here for the battery module – everything goes through this little bottle here. We were really thrilled with this.

You were asking before, 'why don't we see the guys in Detroit do things (like this)?'

Do you know how many different fiefdoms you have to have (onboard) in order to make this happen?

The engine cooling guys (say) 'uh uh no no, I will not – those are my hoses, this my hose, you can't have that, this space is mine.'

The arguing and bickering that goes on about cooling is just out of this world. And they (Tesla) took this (which) crosses powertrain, HVAC, and on and on and on, and here they have created something – this isn't the first time we have ever talked about doing something like this – we've talked about it a lot, but because of the Detroit infrastructure – the way that cars are designed you have this 'you stay out of my territory' — (which means) you can't have something like this because it crosses too many lines (of management)."

Case Study: High Cost Of Stamping And Assembling Sheet Metal Panels In Unibody Structures

Let's turn the conversation back to unibody car manufacturing.

Unibodies have the potential to be cheaper and lighter weight than their 'body on frame' brethren.

That said, the conventional manufacturing processes of welding up potentially hundreds of individual sheet metal stampings to create an entire vehicle body can be expensive – and in one famous instance, deceptively so, as in the case of the famous original Alec Issigonis-designed Mini.

In the early 1960s, Ford manufacturing experts tore down a new Mini to try to discover how BMC could sell it for such an astonishingly low price – only to discover that BMC was likely losing around 30 pounds on each Mini sold (equivalent to about 6% of the sales price). Ford was right, BMC's hit car was losing them money on each sale, which later helped drive BMC into a series of unwanted mergers and ultimately bankruptcy.

[Read more...](#)

Julia Solodovnikova

Formaspace

+1 800-251-1505

[email us here](#)

Visit us on social media:

[Facebook](#)

[Twitter](#)

[LinkedIn](#)

---

This press release can be viewed online at: <https://www.einpresswire.com/article/589440367>

EIN Presswire's priority is source transparency. We do not allow opaque clients, and our editors try to be careful about weeding out false and misleading content. As a user, if you see something we have missed, please do bring it to our attention. Your help is welcome. EIN Presswire, Everyone's Internet News Presswire™, tries to define some of the boundaries that are reasonable in today's world. Please see our Editorial Guidelines for more information.

© 1995-2022 Newsmatics Inc. All Right Reserved.