

# Research Report W2C-005

Topic: Weldment-to-Casting Conversions  
**Can W2C lower part and top level costs?**

**Intended Audience:** Design Engineers, Production Managers, Quality Personnel, Field Service managers, Buyers

**Type Report:** Advisory

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## Summary

Many manufacturers use weldments. Software such as AutoDesk® or Solidworks® can design these components or parts used to produce the final product.

Once designed, the actual part production requires a high level of welding expertise, parts inventory, and other costs. Converting this piece into a casting has significant advantages and significant costs savings, possible risk reductions, and production simplifications.

This Overview Research Report outlines the opportunities and risks of converting existing weldments to long term castings.



### ***When Conversion to Casting should be considered***

Weldments are excellent for prototyping, one-off, and proof-of-concept exploratory design. Once the design has been formalized, converting these weldments to castings has multiple benefits.

There are also other times when weldments should be considered for conversion to high ROI castings:

**-Customer dissatisfaction.** If weldments are identified as a weak link by customers, they need immediate attention. The solution is usually conversion to a casting which provides better reliability, inter-changeability, and looks (so is perceived) by the customer as a more professional part as opposed to ‘something they welded together.’

**-High field part replacement.** While this may appear to only be a part failure, there is usually a high rate of replacement because the parts are not completely interchangeable. If you observe a high usage rate of

weldments, determine how many parts had to be ordered against a specific customer issue to solve the issue. Multiple orders of the same weldment indicates possible fitment issues between parts.

**-Warranty claims.** Do you have a warranty program for your product? Consult warranty parts and costs to determine if weldments play a role in these claims. This is another indication that a casting could be the smarter choice for the application.

**-Field failures.** Failure analysis is an excellent opportunity to determine if and how a weldment played a role.

**-Cost savings are needed to be competitive.** The saving will vary from casting to casting depending on the geometry, complexity, alloy, and many other factors. Most casting save at least 15% and many 40% or more compared to the weldment. And, of course, this is in addition to other benefits to your company and customers.



### ***When Weldment-to-Casting may not be the best choice***

Conversion of a weldment to a casting should have several benefits. The primary benefits are interchangeability, increased reliability (if a metallurgist is part of the conversion), higher end-user satisfaction, and significantly lower costs and risks.

#### ***When would these benefits not be immediately seen?***

**-Prototyping.** While 3D printing has revolutionized prototyping, casting prototype parts intended for redesign is not efficient. Weldments have more flexibility, real-time change-ability, and quicker turnaround.

**-One-off production.** Single use makes weldments the choice over a casting. The exception is large and complex weldments that play a critical role, such as military application or unique pieces of large equipment. In those instances, weldments are used to validate the component and the casting produced for the final deliverable.

**-Low value/low usage weldments.** If the weldments are easily made and have extremely low usage in a non-critical area, converting to a casting is probably not an economical idea.

**-Component is 'near term' scheduled for elimination.** The investment in the initial run of castings, and higher savings from subsequent orders, are eliminated if the component or end-item is scheduled for elimination. However, if the item is scheduled for upgrade, a weldment-to-casting conversion would be a logical consideration.

**-Simplicity of the weldment.** Just two parts welded together? Just a simple weld? While other benefits exist, they are usually overcome by the cost of casting simple parts. If reliability, durability, fitment, interchangeability, or customer satisfaction are the drivers, the casting is the better option.

The next page is a simple and easy to understand comparison of weldments versus casting which summarizes cost, design, and quality considerations plus guarantees and risks.

<b>Casting or Weldment?</b>	<b>CASTING</b>	<b>weldment</b>
<b><i>Cost Considerations</i></b>		
Cost (overall actual)	20-40%+ savings	hidden costs (see white paper)
Labor intensive	NO	YES
Labor market dependent	NO	YES
Pre-production costs	molds	Fixture design/construction
Personal Protective Equip costs	part of price	YES
Fixture creation/construction	NO	YES
inventory of parts	reduced to 1 PART	high
Warranty Cost	almost nil	part dependent
<b><i>Design Considerations</i></b>		
Interchangeability	every time	varies by welder/fixture
Company name/part number	easy	difficult
Complex or shaped parts	YES	varies by welder/shop experience
Off-standard material required	metallurgist on staff	varies by shop
exact alloy for application	YES	NO
Finish appearance (branding)	smoother, cleaner	
lower weight	usually	
high field reliability	YES	varies by welder skill
Repeatable structural integrity	YES	varies by welder/parts
Post weld pressing	NO	design dependent
Very low part usage rate?	weight, complexity-maybe	definitely
One-off application	not recommended	recommended
Material yield	very high	lots of plate drop
Unique features	cast in	high skill to create
Post weld stress relief required	NO	likely
<b><i>Quality Considerations</i></b>		
Fixture maintenance and testing	NO	YES
Individual skill dependent	NO	YES
Variable stress weakness points	NO	YES, due to variable welding
design simplicity	single casting	multiple pieces
rejection rate by user	NONE	varies by welder/fixture/part
Dimensional stability	STABLE	varies by welder/parts
<b><i>Guarantees</i></b>		
on-time delivery	GUARANTEED	in-house variables
Finished Parts defect guarantee	YES	in-house
Quality Guarantee	YES	?
48 quote turnaround guarantee	YES	?
<b><i>Risks</i></b>		
OSHA violation risk to company	NONE	high
Labor market dependent	NO	YES
on-time delivery	GUARANTEED	in-house variables



## *Why consider converting a weldment to a casting?*

### *Short term*

**Labor is only getting higher.** Part cost increases will be hidden as labor costs continue to climb.

**Skilled welders are getting harder to find and keep.** As the labor market moves to more office support, qualified skilled labor is becoming scarce.

**Expensive to train new welders.** Lead times and training costs for new employee/welders will only increase.

### *Long term*

**Customer satisfaction.** Your sales teams knows selling is easier when current customers are happy. They can become sources for referrals, repeat customers, and life-long clients. Meanwhile you save money (see below).

**Professional looking parts.** Your parts have a finished look, improving perception of your product and company. Many castings can also include a logo- not possible with a weldment.

**Fixed and accurate costing.** You get the parts delivered to your receiving area completely finished. You know the full cost ahead of time, instead of complicated cost analysis needed for weldment true cost computations.

**20-45% part cost reduction** (variable by part) compared to weldments. And that savings is computed before you order, not a 'hoped for' figure on paper. Once you have computed the real cost of your weldment (see the Research Paper with the checklist), it's easy to compare to the quote by Midwest Metal Products. No more guessing about price.

### *How important is a Metallurgist to the process?*

While many foundries can 'melt metal', the benefits of a weldment to casting conversion are directly linked to the expertise of an on-staff Metallurgist. Foundries who specialize in W2C have immediate and direct access to a Metallurgist. A trained, certified, and experienced Metallurgist will validate your teams design against specific alloys, and other part specific technical requirements your team needs. Any bricklayer can build a wall, but it takes a trained professional to ensure the load is correct.

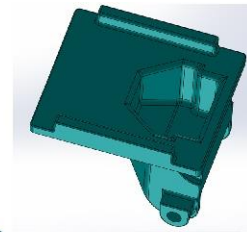


For more information, visit Midwest Metal Products website specifically for researching weldments to casting conversions at [www.Weldments2Castings.com](http://www.Weldments2Castings.com).

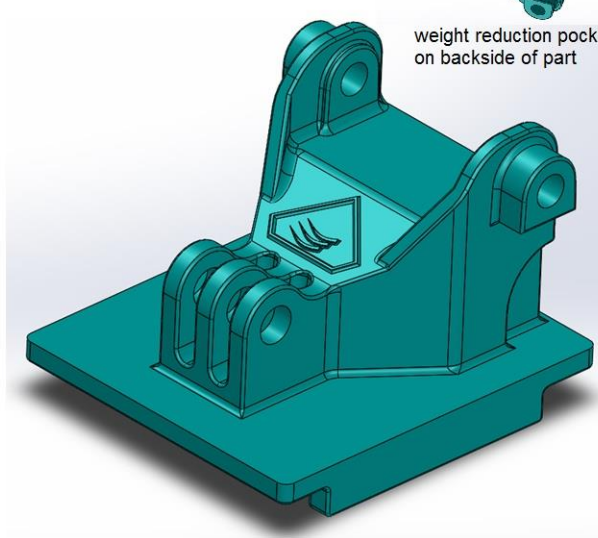
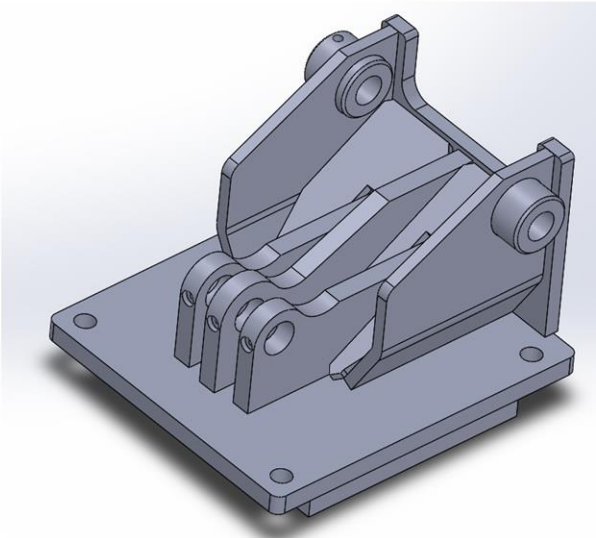
There you will find other Research Papers covering how to properly identify the cost of a weldment, the Top 5 reasons companies decide to convert, and many other topics.

MMP's casting conversion in action with a current client - 13 pc weldment to a single piece casting - including logo.

Part is the mount for a boom which carries their primary product on it - 175 lbs



weight reduction pocket on backside of part



Want to get started lowering costs while also improving customer satisfaction with your product? Midwest Metal Products is the ONLY foundry *owned and operated by a Metallurgist*. We are specialists in weldment to casting conversions. Use this certificate or just tell us you saw it to begin the process. It's risk free and cost free!

***Midwest Metal Products is so sure we can reduce your parts cost and solve other challenges by converting your weldment to a casting that are willing to take ALL the risk.***

***Use this certificate on the next page to get all the research, planning, estimating, and design for your conversion at no cost or risk to you.***

\$1500 value Certificate



Zero Risk

*"Are you an Engineer with a challenging welded part problem?"*

Join our

## **"BEFORE and AFTER" Weldment-to-Casting Club**

You'll love partnering with the only foundry owned and operated by a Metallurgist! Join the 'Club' of other engineers who rely on MMP for their company's reputation.

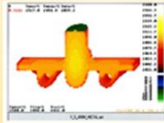
**We'll waive our \$1500 fee with this certificate**, provide top-of-the-charts service from our metalcasting experts, and help you become the hero!

*stronger \* higher precision \* repeatability \* fewer parts \* lower cost \* faster turnaround*



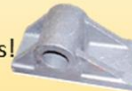
We'll consult with you to produce a 3D model

Our engineering staff produces a casting/pattern model



Specialized computer software ensures the soundness

Stronger, More Precise, and Faster Turnaround Times!



Join the Club by sending this Certificate along with your requirements. If we can't help you engineer a casting that solves your quality, strength, and precision needs, we'll send you a \$25 Starbucks card!

