Midwest Metal Products

Research Report W2C-001

Topic: Weldment to Casting Conversion

11 Signs to convert a weldment to a casting

Type Report: Background/Analysis
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Summary. Weldments were initially created in your company for expediency. They answered the need to get a product to market. Using an in-house capability, and close interaction with a design engineer or team, parts were quickly adapted as needed. But when does that necessity transform into longer term stable production?

This question is key. And Midwest Metal Products researched within our client group to discover answers. This Research Report provides guidance you will find useful as your company examines ways to increase reliability, save money, or reduce risk and inventory using a high ROI casting in place of a weldment.

A very short story

Although I rarely tell stories, this one seemed appropriate to this discussion. Its accuracy can be questioned, the points cannot:

Conrad Hilton, the founder of the hotel chain bearing his name, was surveying the Bahamas in the 1930s. He came across an artist carving local scenery and people in relief, a type of wood carving in which figures are cut in a flat panel of wood. An artist himself, Hilton asked the price of the large artwork. The carver told him $100. So Hilton asked him how much for 20 of the relief carvings, noting that he intended to put one near the elevator of every floor of a new hotel he was building.

The artist thought for a minute and replied "The first is $100, the second $500 and the rest $1000 each." Assuming ignorance, Hilton informed the artist that he might be confused: When you buy more you usually get a discount per piece.

The artist replied "You are the one confused. I am an artist. The first one I create is fun. The second one is boring. From then on out it is just plain hard work!"

In their hearts, all welders are artists.

Background

Whenever a new product or updated part is considered by design engineers, time to market and the ability to make rapid prototyping changes are key. Without weldments, and the flexibility and speed they offer, the lead time for new parts and products would be substantially longer. The close working relationship between design engineers and the fabrication team are essential in this phase.

As the production level design freezes, it may be time to look at other methods to replace the weldment method of parts fabrication. While critical in the design, evaluation and early adopter phase, weldments are labor intensive and introduce many variables into the end product that impact customer use and satisfaction.

Casting the part is one alternative that shows significant saving, durability, and other features when properly supervised by a metallurgist. But when should a weldment be considered for conversion to a casting? The rest of this paper outlines tripwires for engineers, buyers, and management to consider.

11 Tripwires

Observing any of these 11 events is an indication that substantial costs or other significant benefits, now and in the future, are available by converting a weldment to a casting:

Full production of the part or assembly

When production shifts from the frenetic design and initial beta stage to production, this should be a signal to consider alternative methods for long term parts production and associated costs reductions.

Field Reports

Your field engineering team will be a rich source of identifying problems or issues with new equipment and parts. Their expertise is invaluable in identifying failure, fitment, and customer satisfaction concerns. The advantage of discovery by this group is the ability to intervene before it becomes a true customer service issue which threatens future sales and brand perception.

Quality Assurance discoveries

Reviewing in-house QA reports of weldments should reveal concerns that need correcting

Design team

Engineering design teams always get feedback and wish lists from various sources, especially field teams, sales and marketing, and production personnel. Each of these should be viewed with an eye toward understanding the role of a weldment in the issue. Reducing parts count, improving inter-changeability, reliability and overall functionality by converting a weldment to a high ROI casting can solve many other ‘side’ issues.

Production Management Team

Production management, floor operators and assembly teams are a rich source of information. They are working every day with weldments and can identify those that have possible assembly issues, delays while weldments are created, or even finishing flaws which may cause injuries.

Assembly team members

While production personnel may be a step or two away from hands on experience, these are the people who are closest to the use of the weldment in production. These people will be the first to complain. But they will also do whatever they can to make the weldment work and keep production flowing. Observation of their interaction with weldments is a particularly easy way to spot a problem that could be solved by using a more standardized piece, such as a casting, in place of the hand-assembled assortment of welded parts.

Customer complaints

A quick indicator of issues with a weldment will come in the form of customer complaints. It may be a reliability or other issue. And the issue will not immediately point to the weldment, but to an impact on production, their own customer service, or other non-specific complaint.

Warranty payments

Do you warrant your products? Look for payments that revolve around a certain part or function. Parts usage rates can identify problems very readily. If a weldment has a high usage rate, look closer. The issue may not be failure, but how well the handmade part fits when replaced. This is where additional research may be needed to identify failure versus other weaknesses.

Competitive cost pressure

Reducing costs or increasing the value of a part or product is always forefront in the minds of companies in competition. Their reputation can rise or fall on the value their product provides. Being able to lower the cost can mean more customers and/or higher margins. And when converting a weldment to a casting, there are many opportunities to increase reliability which move the value and company reputation up compared to the competition.

Production interruptions

Production lines are parts dependent. With the advent of just-in-time parts delivery, the production line can continuously run without large parts inventories. If a weldment's build-up is interrupting the production schedule, due to vacations, sick time, and safety/OSHA training or personal time off, the time for conversion is near.

Labor availability

Trained, qualified, and competent labor is becoming scarcer. Welding is a specific skill that few seek, choosing instead the 'cleaner' trades. There is little 'glory' associated with welding. It is perceived as a dirty, hot, limited use skill. Young people are choosing computers and related opportunities that allow sitting on comfortable, air conditioned offices. If your company is seeing this labor shortage, consider reducing the dependency by converting to castings when appropriate.

Conclusion

Weldments serve a very important purpose in the initial design. Once finalized, the economic and other benefits of castings should be evaluated. Following these guidelines will allow any company buyer or engineer to select initial candidates for evaluation.

While anyone can take out your appendix, only a trained and qualified surgeon will give the results you really want. And while any foundry can melt metal, it takes a metallurgist's oversight to ensure it is done with the proper alloy, to your exact specifications, in an economical environment.

While some foundries will convert a weldment, only Midwest Metal Products gives you and your company the expertise of a metallurgist at every step of design and production.

Midwest Metal Products (MMP) offers a free certificate which covers all costs of evaluation by a metallurgist eliminating any and all risk to your company.