



10 Ways to Lower Manufacturing Costs

Do you have a good sense of the overall value in your suppliers? Are they working to make a difference in your product development and speed to market? If the answer is no, you should find a new supplier.

Alexandria Industries will always look at different ways to help customers adapt their product designs to the manufacturing process used to make them, while identifying and discussing the associated cost drivers. Check out these considerations and why they matter, as you make decisions with your suppliers to develop your products.

1. Early Involvement of Your Suppliers		
Considerations	Why it Matters	Customer Example
<ul style="list-style-type: none"> ✓ Understand your design to development processes to determine how you quickly get to a successful design that's manufacturable ✓ Ways to save effort and frustrations of your team ✓ Supplier experiences/ histories and values, and if they align with your needs ✓ Develop strong partnerships with suppliers willing to work together to produce great components 	<p>Your supplier should bring value during the product development stage, providing guidance on materials, processes, design, and such. This can save money, time, and frustrations.</p>	<p>Initial Product Request: In 1966, a customer came to us looking for a partner to produce products needed for a new business in the marine market.</p> <p>Produced component: Boat gunnels for some of the most sought-after fishing boats today.</p> <p>Results: A strong partnership remains over 50 years later.</p>
2. Manufacturability		
Considerations	Why it Matters	Customer Example
<ul style="list-style-type: none"> ✓ Keep in mind all manufacturing processes during design stage ✓ Understand how one process can affect others ✓ Understand what features are possible with different processes (extruding or machining sharp corners) ✓ Be open to alternative product development processes (plastic molding, aluminum extrusion, casting or machining) 	<p>Your team is very smart. But do they have in-depth knowledge of the many manufacturing processes available for the component they are attempting to manufacture? It's nearly impossible to be experts in all areas. Select suppliers with broad expertise who are willing to take the journey with you.</p>	<p>Initial Product Request: A small customer's medical component machined from steel was breaking. This drove interest in converting it to an aluminum extrusion.</p> <p>Produced component: Design improvements were made and the component converted to an aluminum extrusion.</p> <p>Results: The extruded component completely outperformed the original steel component, with no breakage.</p>

✓ Consider incorporating features, such as threads, that add value to your profile		
3. Material Selection		
<i>Considerations</i>	<i>Why it Matters</i>	<i>Customer Example</i>
<ul style="list-style-type: none"> ✓ Be open to alternative material (alloys, ferrous, plastic, brands) ✓ Think through surface finish and wall thickness needs that will support a product's functional requirements ✓ Understand material aging, heat treating, and tempers 	<p>Many design engineers believe they choose the right alloy for their extrusions, or the best injection molding material, etc. They may not know there are comparable materials that will produce similar or better results. Keeping an open mind could save you money and produce even better results.</p>	<p>Initial Product Request: A heat sink produced from a die cast was porous and did not generate the thermal dissipation needed within the enclosed electronic unit.</p> <p>Produced component: A redesigned aluminum extruded heat sink.</p> <p>Results: Consistent aluminum extruded heatsink (thin walls/fins); eliminated surface porosity to achieve the desired thermal dissipation; reduced component weight by two-thirds, saving material costs.</p>
4. Near Net Shape/Reduced Operations		
<i>Considerations</i>	<i>Why it Matters</i>	<i>Customer Example</i>
<ul style="list-style-type: none"> ✓ Incorporate screw boss / screw chase features (reduce machining) ✓ Incorporate assembly features; hinge, circuit board groove (reduce machining) ✓ Incorporate mating features (reduce welding and assembly) ✓ Chemical finishing (reduce mechanical finishing) 	<p>Secondary processes take time, and add costs. Many times, aluminum extrusions can be designed to reduce the need for secondary operations. When selecting suppliers, understand the importance of their questions about mating parts, end use and finishing requirements.</p>	<p>Initial Product Request: Three different extruded profile shapes to create an enclosure in an electrical component.</p> <p>Produced component: Two shapes with an extruded hinge feature/functionality removed additional processes (e.g., welding).</p> <p>Results: Purchased one less profile; easier assembly; less ordering, stocking, product damage, or likelihood of being outdated.</p>
5. Multiple Services/One Supplier		
<i>Considerations</i>	<i>Why it Matters</i>	<i>Customer Example</i>
<ul style="list-style-type: none"> ✓ Think through ways to lower administrative costs/time ✓ Think about how to reduce lead-times ✓ Consider ways to resolve design challenges quickly ✓ Think about using one supplier to simplify freight logistics, reduce POs, reduce trips, save time, reduce possible freight 	<p>Price usually drives many decisions. But there should be a dollar value assigned to peace of mind and ease of work. Think about the value (saving time, money, hassle, etc.) it can bring you in selecting a supplier that provides many services.</p>	<p>Initial Product Request: An aluminum extrusion for a pickup truck accessory.</p> <p>Produced component: Extrusion and plastic end caps</p> <p>Results: Purchasing components from one source easily reduced headaches and costs. Our assembly services saved the</p>

<p>damage, lower shipping costs and reduce (re)packaging</p> <ul style="list-style-type: none"> ✓ Consider ways to reduce inventory and WIP 	<p>When using multiple suppliers, consider the time it takes to determine where, when and how a product defect happened. Now think about having one supplier doing many services and getting your work done right, or making it easier to identify and correct errors that may occur.</p>	<p>customer shipping costs and reduced risk from freight damage.</p>
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6. Tolerances

<i>Considerations</i>	<i>Why it Matters</i>	<i>Customer Example</i>
<ul style="list-style-type: none"> ✓ Determine critical-to-function (CTF) tolerances ✓ Determine capability requirements – PPAP ✓ Evaluate Geometric Dimensioning & Tolerancing ✓ Define inspection methods 	<p>You want the best component possible. Does it require many or all of your tolerances to be CTF? Your supplier should work to assure that your CTF tolerances are consistently attainable. Having more CTF tolerances than you need or can be achieved consistently, can increase your costs. Be certain that the tolerances you declare as CTF are CRITICAL to FUNCTION.</p>	<p>Initial Product Request: Component machined from casting for the firearms industry. Produced component: Component tolerances met our inspection methods but failed inspection at the customer. Results: After reviewing the chosen inspection method, we learned the customer changed its method. Once our inspection methods aligned, the customer received acceptable products.</p>

7. Surface Requirements

<i>Considerations</i>	<i>Why it Matters</i>	<i>Customer Example</i>
<ul style="list-style-type: none"> ✓ Consider expectations on exposed or visible surface needs ✓ Think about type of protective finish to apply (paint, anodize) ✓ Understand differences between surface roughness vs. surface defects ✓ Understand unavoidable process conditions (extrusion run-out surface, injection pin, and racking marks) exist ✓ Understand handling and packing requirements, methods 	<p>Some surface requirements require special handling, packing, more scrap, etc. Is your component put inside another component or device? If so, how important is a shiny, blemish-free surface? If your component is used to build a jewelry display cabinet, surface finish is clearly important. Consider the level of surface requirements your components truly need.</p>	<p>Initial Product Request: A defect-free extruded component for the industrial fan market. Produced component: A defect-free surface finish on raw aluminum extruded components with no chemical or mechanical finishing. Results: We developed realistic surface finish criteria, established special product handling, and created new packaging to avoid defects during downstream processes. There have been no rejects for 21 weeks.</p>

8. Finishing

<i>Considerations</i>	<i>Why it Matters</i>	<i>Customer Example</i>
<ul style="list-style-type: none"> ✓ Think through finishing requirements for end product use needs ✓ Consider the impact on dimensions after finishing 	<p>Adding a finish to your component can extend its life and enhance appearance. Understanding your component's end use and needs, are key to successfully selecting the best finish for your product.</p>	<p>Initial Product Request: An extruded component with a bright blue (distinct color) anodized finish for the hand tool market. Produced component:</p>

<ul style="list-style-type: none"> ✓ Determine racking requirements ✓ Understand why plugging threaded holes is necessary ✓ Determine masking requirements 	<p>Sometimes there are different ways to accomplish the same end result. Do you know what they are?</p>	<p>Produced an ideal colored component that met customer specification.</p> <p>Results: Because anodizing requires racking that can leave marks, we discussed this before producing the component. Everyone agreed on one location – where the racking held the component for anodizing – will show a mark.</p>
9. Packaging Requirements		
<i>Considerations</i>	<i>Why it Matters</i>	<i>Customer Example</i>
<ul style="list-style-type: none"> ✓ Think through shipping location and unloading constraints ✓ Understand packing material constraints ✓ Determine method of shipment (common carrier or supplier truck) ✓ Understand the impact on surface requirements 	<p>The best components are only as good as they are when they are unpacked at your location. Finding packaging that works for your product without going overboard is a challenge. The right packaging may require flexibility and adjustment.</p>	<p>Initial Product Request: An aluminum solar racking system.</p> <p>Produced component: A U-shaped, fully assembled racking system.</p> <p>Results: A custom packaging system maximized freight capacity and minimized potential product damage. We reduced the number of shipments, while ensuring the components arrived at the job site in good condition.</p>
10. Lot Sizes/Ship Quantities		
<i>Considerations</i>	<i>Why it Matters</i>	<i>Customer Example</i>
<ul style="list-style-type: none"> ✓ Think about optimal lot sizes and packing quantities ✓ Understand extrusion batch sizes, machine build sizes, chemical finishing racking sizes ✓ Understand fluctuations in lot sizes and +/- ship quantities (higher +/- quantities = lower cost driver) ✓ Think about inventory costs 	<p>Manufacturing the best components requires us to scrap/recycle product along the way that does not meet our quality expectations. We allow for this in our production. This means there is a possibility of over-producing, or under producing your order. Also, each manufacturing process has its own optimum build lot size. The goal is to get as close to zero as possible to help lower inventory costs. Be open to +/- ship quantities.</p>	<p>Initial Product Request: Aluminum extrusions for office/home furniture and structures.</p> <p>Produced component: Varying components – extruded and machined – for office/home furniture and movable wall structures.</p> <p>Results: Customer agreed to +/- 10% ship quantities due to the natural occurrence of component defects that happen during extrusion, handling and fabricating processes.</p>

If you consider at least one thing from this list of 10 ways to lower your manufacturing costs, we believe you will be happy with the results. Then we hope you will make time to consider the other nine ways. We wish you the best success with your product development. Remember, Alexandria Industries is here to take the journey with you.