



Helping You Turn Prints into Parts

5-TIPS THAT WILL HELP MISTAKE-PROOF ALUMINUM EXTRUDED PRODUCT

DESIGN AND ASSEMBLY

Products have been designed that could not be produced. Products have been released for production that could only be made to work in prototype stages by highly skilled technicians. Products are conceptualized to provide a particular capability and meet particular performance objectives and specifications. It falls on the designer to optimize the product design with the production system, and to design a functioning product within the given economic and schedule constraints.

Here are a few guidelines to help achieve higher quality, lower cost, and improve application of automation:

Tolerances are a significant component of the pricing of a machine part. Have as few tight tolerance features as possible (broadly speaking, tight mill: $<+/- .005"$, tight lathe: $<+/- .002$). Loosen tight flatness, make per inch, and /or to be measured in a restrained state. Loosen tight "true position" tolerances (guideline: $<.014"$ is tight).

Even with today's advanced production process capabilities, avoidance of tight tolerance on multiple connected parts is necessary. Tolerances on connected parts will "stack-Up" making maintenance of overall product tolerance difficult.

Mistake-proof the assembly process by designing in features so components can only be assembled one way, and cannot be reversed. Designing verifiability into the part and its components can be achieved with simple go/no-go tools in the form of notches or natural stopping points. Products should be designed to avoid or simplify adjustments.

Parts intended for human or automated handling should be designed with surfaces that can easily be grasped, placed, and fixtured. Ideally, this means flat, parallel surfaces that would allow a part to be picked-up by a person or a gripper with a pick and place robot, then easily fixtured.

Avoid designs with sharp edges, burrs or points. These parts can injure workers or customers, they require more careful handling, they can damage product finishes, and they may be more susceptible to damage themselves if the sharp edge is an intended feature.

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