Design for Assembly (DFA)

At Polyhistor we design a wide range of products in many areas, utilizing Design for Manufacturing and Design for Assembly methodologies. We specialize in Injection Molding, Machining, Sheet Metal, and Casting Design using Solidworks 3D CAD.

Here are some interesting points you might not have known.

Did you know that Ford determined about 80% of mechanical warranty repairs were due to fasteners?

Did you also know that the two departments that can most influence price, quality and cycle time are: Manufacturing (about 20 to 30%), and Engineering Design (about 70 to 80%). ***Yes, that's correct! The majority of product cost comes from the early stages of the design process.***

That being said, here are 24 points to consider when Designing For Assembly (DFA):

1. Minimize part count (one part, no assembly required)
2. Minimize handling during assembly
3. Maximize ease of assembly
4. Minimize the number of operations
5. Utilize self-locating features
6. Utilize self-fastening features (think snap together)
7. Minimize reorientation needs, (think screws from several directions)
8. Design parts for ease of handling and insertion
9. Top-down assembly
10. Maximize use of standard parts
11. Minimize the number of fasteners
12. Utilize modular assemblies (sub-assemblies)

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Design for Assembly (DFA) (cont'd)

13. Develop base part with locating features
14. Design part symmetry to minimize assembly error
15. Minimize the potential for incorrect insertion, (mistake proofing)
16. Utilize simplest fastening method (snap-fit, plastic bend, rivet, screw)
17. Consider handling during design (size, thickness, weight, fragility, flexibility, sharpness, slippery, sticky, needing one hand, two hands, etc.)
18. Consider part behavior (tangling, nesting, locking)
19. Consider fastening method needed (mechanical, thermal, glue)
20. Consider forces needed during assembly
21. Minimize restricted access during the design, (think no room for tool)
22. Minimize "no see" assembly points
23. Minimize secondary operations
24. Always consider automation during the design. A product design for robotic assembly can always be assembled by hand, but not the other way around.