

## DFA Software - Product Simplification

Boothroyd Dewhurst, Inc.'s Design for Assembly (DFA) Product Simplification (DFA) software offers engineers the capability to analyse design concepts and create innovative products with fewer parts and higher quality.

### Lean from the start

DFA Product Simplification software utilises an intuitive question-and-answer interface that identifies opportunities for substantial cost reduction in a product. By applying industry-tested minimum part count criteria, the software finds parts that can be consolidated/eliminated while maintaining 100% functionality. The outcome of a DFA-based design is a more elegant product that is both functionally efficient and easy to assemble. DFA re-designs also have the added impact of increased quality and reliability, faster development time, and require fewer suppliers.

The screenshot displays the DFA Software interface for analyzing a part. The main window is titled 'Motor original' and 'Motor redesign'. On the left, a tree view shows the 'Motor assembly' structure, with 'end plate screw' selected. The central panel shows the 'Item' details for part number 9584, including a 3D model, repeat count (2), and cost of special assembly tools (\$0.00). The 'Item weight' section offers three options: 'Less than 5 lb (2.27kg)', 'From 5 lb (2.27kg) to 30 lb (13.6kg)', and 'More than 30 lb (13.6kg)'. The 'Envelope dimensions, in' section shows a cylindrical part with dimensions 0.200 and 0.500. The 'Item function' section has three radio buttons: 'Fasten or secure other items' (selected), 'Connect other items', and 'Item has other function'. The right panel contains several sections: 'Symmetry' (No axes, One axis, Two axes), 'Handling requirements' (One hand without grasping tool, One hand using grasping tool, Two hands due to flexibility, Two hands - severe nest or tangle), 'Handling difficulties' (Nest or tangle, Stick together, Slips from fingers, Requires careful handling), 'Securing process' (Added not secured, Added and held down, Snap/push fitting, Threaded fastening, Pop Rivetting, Self-stick securing), 'Operation characteristics' (Power tool, Nut/screw driver, Ratchet wrench, Open end wrench, Box end wrench), 'Insertion difficulties' (Not self-locating, Holes require alignment with tool, Access to mating location obstructed, Sight of mating location restricted), and 'Manufacturing data' (Piece part cost, \$0.03; Item cost, \$0.03; Tooling investment, \$0.00). A 'Notes' section states: 'These are separate fasteners and do not meet the criteria for minimum parts.' A 'Thumbnail picture' section has a 'Load file' button. At the bottom, a status bar shows: 'Results per entry for: end plate screw | Process time = 18.12s | Process cost = \$0.15 | Assembly tool or fixture cost = \$0.00 | Item cost = \$0.06 | Total cost = \$0.21 | DFMA'.

### Benefits of DFA for Product Designers

Product engineers know that 85% of manufacturing costs are determined in the early stages of design. They also know that making informed design decisions during the concept stages avoids costly corrections later on. You can use the DFA software to:

- **Estimate assembly difficulty.** DFA establishes a rating for your product design in terms of its difficulty of assembly. The software rates each part according to how it is grasped, oriented and moved for



insertion and to how it is inserted and/or fastened onto the product. As a general rule, products that are easy to assemble tend to cost less than assemblies that are difficult.

- *Support decision-making.* DFA software provides you with objective, consensus-building information so your team can examine all the potential design solutions and select the most effective approach. You can easily incorporate product input from other groups, such as field service and marketing.
- *Benchmark existing products.* The DFA index -a measure of assembly efficiency, serves as a basis for quantitatively comparing design alternatives internally or against competing products. The software yields an objective measure that is independent of product size or complexity.
- *Add focus to design reviews.* DFA analysis can guide the progress of a design, verifying improvement as it evolves. As you eliminate redundant parts or operations and remove assembly, the assembly efficiency scores noticeably improve.
- *Sharpens design skills.* The software helps designers establish the theoretical minimum number of parts for a product. In the process, engineers identify design concepts that reduce unnecessary complexity and cost.
- *Integrate design and manufacturing.* The DFA approach gives you an overall structure for making design changes in light of related material and manufacturing costs. Used together, DFA and DFM enable engineers to select appropriate and cost-effective shape-forming processes for components.

### [The link to Design for Manufacture](#)

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DFA complements Design for Manufacture (DFM). Engineers use DFA software to reduce the assembly cost of a product by consolidating parts into elegant and multifunctional designs. DFM software then allows the design engineer to quickly judge the cost of producing the new design and to compare it with the cost of producing the original assembly. Used together, DFM and DFA software gives engineers an early cost profile of product designs, providing a basis for planning and decision making. Such analyses, when performed at the earliest stages of concept design, have the potential to greatly influence manufacturing and other life-cycle costs before the costs are locked in.

### [DFA software requirements](#)

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DFA Product Simplification (current version 10.5.3.366)

Windows 7, 8, 10, 11 (64bit recommended) .Net 6, Dual core Processor (Quad core recommended), 2GB (4GB or more recommended), Hard disk space: 1GB for installation (2GB or more recommended), and graphics should be Direct3D 11 or higher (For CAD functionality).

