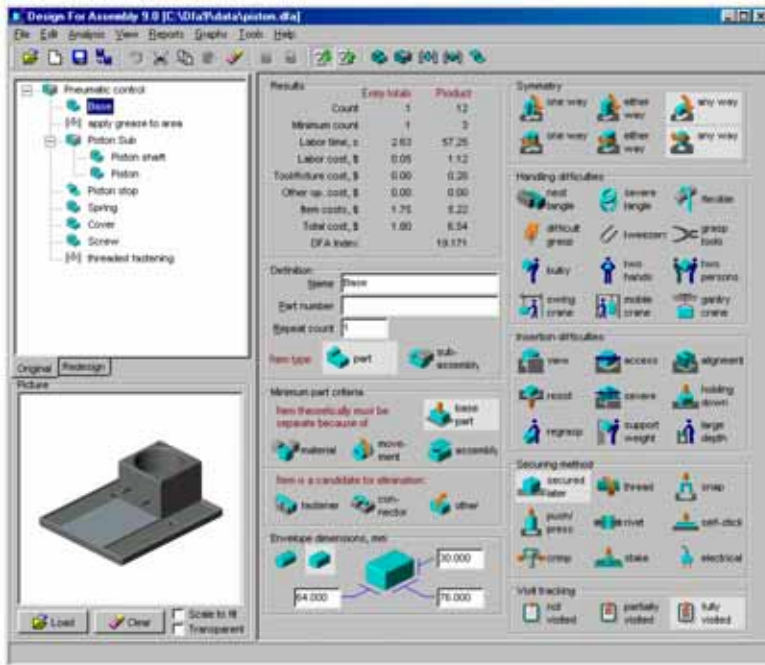


Boothroyd Dewhurst, Inc.

Manufacturers today must deliver quality products to customers faster and at less cost. To hit this mark, designers in every industry – from automotive, aerospace and telecommunications to medical devices and consumer goods – rely on Design for Assembly (DFA) software from Boothroyd Dewhurst, Inc. New DFA software offers engineers more tools for analyzing design concepts and creating innovative products with fewer parts.



- Design

- For

- Assembly

- DFA

- Software

DESIGN FOR ASSEMBLY – SIMPLICITY PAYS OFF

Design for Assembly is a methodology for evaluating part designs and the overall design of an assembly. It is a quantifiable way to identify unnecessary parts in an assembly and to determine assembly times and costs. Using DFA software, product engineers assess the cost contribution of each part and then simplify the product concept through part reduction strategies. These strategies involve incorporating as many features into one part as is economically feasible. The outcome of a DFA-based design is a more elegant product with fewer parts that is both functionally efficient and easy to assemble. The larger benefits of a DFA-based design are reduced part costs, improved quality and reliability, and shorter development cycles.

THE LINK TO DESIGN FOR MANUFACTURE

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 quickly to 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.

BENEFITS OF DFA FOR PRODUCT DESIGNERS

Product engineers know that 85 percent of manufacturing costs are determined in the early stages of design. When you make informed design decisions during the concept stage, you avoid costly corrections later on. Use DFA software to

Estimate difficulty of assembly. You can establish 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.

Support decision making. The 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 difficulties, assembly efficiency scores noticeably improve.

Sharpen 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.

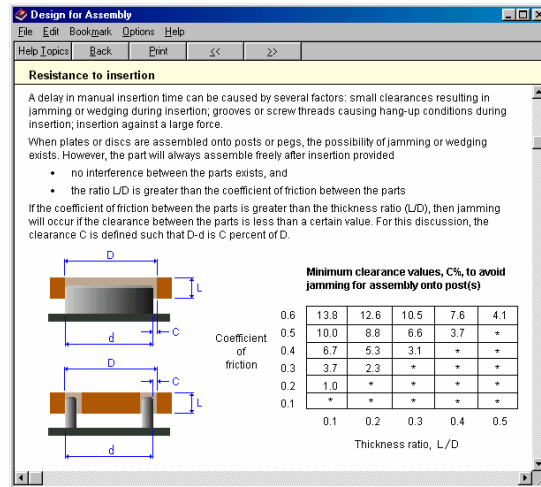
Integrate design and manufacturing. The DFA approach gives you an overall structure for making design changes in light of related material and manufacturing costs. Used together, DFA and DFM enable engineers to select appropriate and cost-effective shape-forming processes for components.

SEE FAST RESULTS FROM THE START

DFA software prompts you to think systematically about every part in your assembly. After you enter the name and part number for the product, the first step is to identify all the components in your design, together with any special handling operations required. You do this by creating a Structure Chart.

Typically, you itemize your Structure Chart by manually choosing from menu options such as “add part” and “add operation.” However, to save time, the software also allows you to cut and paste items from DFA analyses you have already completed. You can import an existing bill of materials in order to create your Structure Chart, and you can easily import appropriate part dimensions from existing CAD models. Part manufacturing costs estimated with DFM Concurrent Costing software are also simple to add.

For each item in the design, you then answer a series of DFA questions. To determine the theoretical minimum number of parts for the product, for example, you decide whether each item in the chart must be separate from all others in the assembly. You also specify securing methods, part envelope dimensions, and any handling, insertion or fetching difficulties for each part. The answers to these questions establish the assembly time and cost for each item in your design.



As you answer the DFA questions, a Results Box will update, showing how each part contributes to overall assembly time and cost. To compare results for competing designs, you can add multiple Structure Charts to the main window. Clicking on the tab for each chart will show you the results and DFA questions for every assembly alternative you have analyzed. Separate picture and memo fields allow you to display an image of each part along with comments.

Once you have completed DFA analysis for all the designs you wish to compare, reports and graphs help you summarize the results. At this point, you can select the most efficient design from the set you have developed or continue refining your ideas with another round of DFA.

Systematic use of DFA opens new doors to innovation and creativity and fosters overall improvement in product design practices.



Boothroyd Dewhurst, Inc.
138 Main Street
Wakefield, RI 02879
tel: 401-783-5840
Fax: 401-783-6872
Email: info@dfma.com
Website: www.dfma.com