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A leading market research and consulting firm founded in 1989, TechniCom, Inc., focuses on the forces and dynamics surrounding the mechanical engineering design and manufacturing marketplace. Its principals are recognized authorities who have a solid, fundamental understanding of the marketplace, the leading products, and the vendors producing these products.

MID-RANGE MCAD BENCHMARK REPORT

A description of our mid range benchmark report testing the design functionality of these systems.

ABOUT THE REPORT

Version 6 of TechniCom's 250 page report, published January, 1999, compares the modeling capabilities of mid range mechanical CAD (MCAD) modeling systems. Users can now compare these systems using an actual benchmark consisting of tests that build real models. This report tests the design capabilities of mid-range modelers that provide solid modeling, associative drafting (to the solid), variable driven modeling, and assembly modeling and can be purchased for less than $7,000 US list pricing. Our tests use a variant of TechniCom's previous tests, run in the past to test high end MCAD systems. Variable driven modeling includes parametric, feature based, and variational modeling. The first version of these tests were completed in mid 1996. In each version since then, we have added or updated the tests of the modeling software. The conclusions are presented in this report. *We anticipate that these results will allow users to select systems useful to their environment.*

Why buy this report?

Having us perform the tests instead of, or in addition to you, saves you significant time and money.

Out tests have been proven to carefully review the capability of advanced variable driven design systems.

Our impartial observations can help you organize and run your own tests.

New versions of the report will be available to previous purchasers at a discount.

Our analysts provide you with industry comparisons.

The price includes a trial subscription to *CAD/CAM Watch*, our industry leading MCAD newsletter.

A value that cannot be duplicated at this price!

Systems tested in Version 6:
Artisan Series 3
Mechanical Desktop V3
Solid Edge V5
SolidWorks 98
Helix V4

WHY A BENCHMARK?

Even mid range systems demonstrate enormous complexity. Paper analyses are incomplete, too simplistic and are not useful for comparing systems in terms of design functionality, usability, and performance. Such a determination can only be made by performing similar tests on different systems.

TechniCom's benchmarking experience allowed us to construct and continually revise an excellent series of tests. The resulting 7 tests, consisting of 64 steps, test a wide range of functions, and can be completed in less than one day. To complete the tests within a reasonable time we have purposely excluded large assemblies, tolerance analysis, and part versioning, as well as downstream functions such as analysis and manufacturing.

About the tests

The test scripts are provided to the vendors prior to the testing. The specific techniques we ask the vendors to use are described in these test plans. To insure that operator influence is minimal vendors supply their own operators for the tests and perform the tests at our site. At the conclusion of each test we record the methodology used, and rate the test performance using our predefined expectations. TechniCom observers develop the ratings during testing using a combination of analytic and subjective analyses.

Our tests continue to evolve. We plan to maintain our focus on the modeling aspects. The latest versions of the testing to be included in our report adds Tests 6 and 7 to expand on assembly testing and to add a complex surfacing test.

What about other systems not tested?

We expect other systems to be added. As we add reviews of additional systems, purchasers of earlier reports will be given the first opportunity to upgrade their reports, at a discount.

Test Overview

The seven scripts comprising the tests can be usually completed in two days. The scripts range from simple parametric sketching to modeling with features and feature modifications, to the interplay between 3D and detailing, to assembly management, and the creation of complex surfaced solids.

Script	Steps	Primary Test Function
1	9	Parametric sketching, 2D constraints, creating and altering 3D objects from profiles, shelling, draft angles, rib features and feature patterns
2	4	Associativity of the solid model with drafting, cross sections, offset sections and isometric views
3	5	Alter the features in complex ways, maintain model and drawing integrity
4	5	Build assembly parts and use and alter complex fillets
5	12	Assemble and alter assemblies of parts using engineering and geometric constraints
6	11	Flexible assembly modeling builds assemblies of assemblies and tests positioning of component and assembly parts
7	13	Non-analytical curves create solids, form and retain blended fillets on parametric surfaces, and create thin wall shells on complex surfaced solids

Just a sample of what we test

Sketching
- Create sketch profiles
- Attach parameters
- Attach geometric constraints
- Breaking of constraints
- Connectivity with 3D model
- Test of full versus partial constraints

Modeling
- Create 3D objects from profiles using extrude
- Alter 3D objects from profiles
- Alter 3D objects from profiles in complex manner
- Shelling
- Shelling with draft angles
- Shelling with walls of differing draft angels
- Adding features (ribs, holes, fillets) to part
- Creation of feature patterns
- Complex feature changes to model
- Filleting
- Complex filleting using cliff edges and disappearing faces
- Driving versus driven dimensions appearance
- Calculation of mass properties and accuracy
- Parametric changes to model and feature update
- Large feature changes
- Retention of model sanity when features relocate

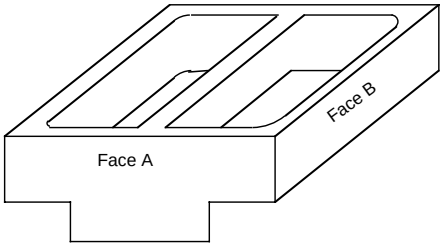
Drafting
- Creating drafting views of the solid
- Bring dimensions from the model into drafting
- Adding dimensions
- Appearance of the dimensions
- Changing the drawing from the model
- Auxiliary views
- Isometric views
- Drafting of assemblies

Assemblies
- Build assembly parts
- Build an assembly of parts
- Place parts based on placement constraints
- Place parts using just touching
- Drive assembly using engineering and geometric constraints
- Assembly mass properties
- Creation of exploded views
- Creation of bills of material
- Creating parts from assembly values
- Flexible placement of parts in an assembly
- Interference detection among parts in an assembly

Surfacing
- Build complex curves based on parametric points
- Use spline curves to generate swept solids
- Placing features on complex shaped solid surfaces
- Filleting on complex shaped solid surfaces
- Altering complex solid surfaces from underlying curves

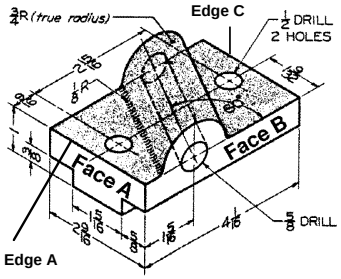
Test Summaries

Test 1 - Profiling the Tee and building the Tee Block



This test sequence evaluates the overall ease of use of the system in constructing and altering a 2D parametric model. The test then evaluates the ability to create 3D objects from profiles, shelling of solids, creating draft angles, filleting and chamfering pockets, and creating and altering rib features and feature patterns.

Test 2- Changing the Tee Block and creating drafting views

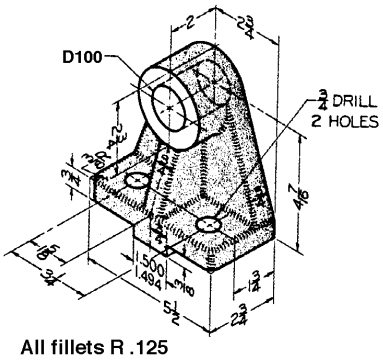


Tests for the associativity of the solid model with drafting, including two way associativity, cross sections, offset sections and isometric views.

Test 3 - Altering the Tee Block

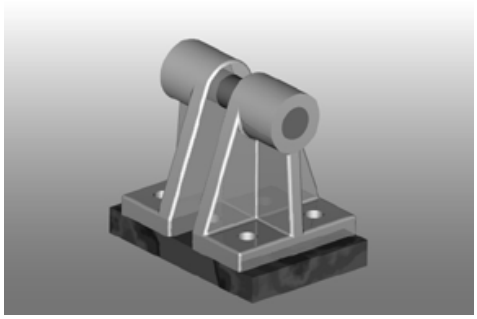
Tests the ability to alter the features of the solid model in rather complex ways and correctly update the model and the associated drawings. Make the changes in this step and the others in this script from the drawings and the model as indicated in the appropriate step.

Test 4 - Generating the bearing bracket



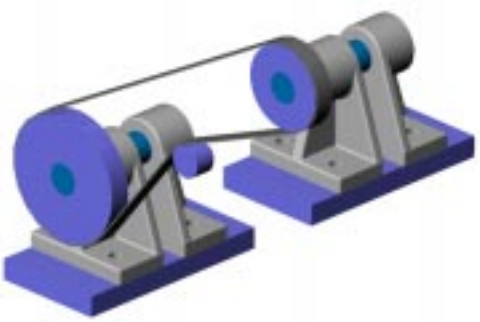
This script builds the parts for the assembly test of Test #5. While building the part we also test the ability to do complex blends. The Bearing Bracket has a front rib that exactly intersects the face of the bearing bottom. Blind changes to the filleting of the model further test the robustness of software's solid modeling.

Test 5 - Assembling the pulley brackets, plate and shaft

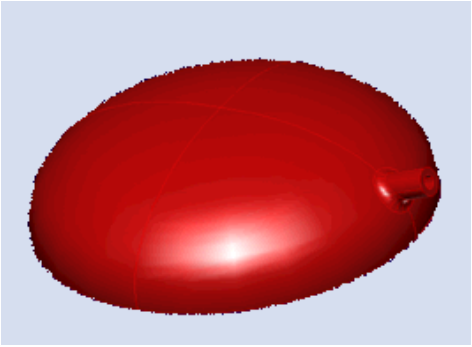


This script assembles parts into an assembly, controlling how they are placed, building and altering parametric relationships between parts in the assembly, and interpart relations that drive the assembly from internal (to the) part parameters.

Test 6 - Advanced Assembly Test



Flexible assembly modeling tests whether the system allows the freedom to easily move, drag, and place components within an assembly. We use the bearing bracket assembly from the previous test, duplicate it, extend both shafts to mount pulleys, design and mount two pulleys of different sizes on the shafts and related to the shaft sizes, add a belt extending around the pulleys, test for interference among the parts, add a roller related to the pulleys, add sheet metal part to support roller, and add bolts to one of the pulleys.



Test 7 - Spline based solidic modeling test

This script evaluates the ability to use non-analytical curves in sweep profiles; the ability to relate curve and surface control points to parameters and alter the control points through these relationships; the ability to form and retain blended fillets on these parametric surfaces; and, the ability to create thin wall shells on complex surfaces.

We build a spline curve using a series of parametric data points, then create a solid by sweeping the profile. Next we add a cylinder, perform measurements, add a fillet at the intersection of the cylinder and the surface, drill a hole in the cylinder, shell the new solid, develop drafting views with cross sections, and change the parameters of the data points resulting in changes to the surface and solid.

About TechniCom

TechniCom, founded in 1989, specializes in market research, analysis and consulting for the mechanical CAD/CAM Industry. We publish *CAD/CAM Watch* and offer custom programs for in-depth analysis of specific areas.

TechniCom has extensive experience in developing, producing, and documenting the results of the highest quality benchmarks for the mechanical CAD/CAM industry. Our landmark study, completed in 1992 was entitled *Parametric, Variational, and Feature Based Modeling Benchmark Report*. The 400 page report depicted the results of a 27 man-month effort, and was widely hailed industry-wide, as shedding new light on formerly ill understood technologies and software systems. This program supplements our highly successful CAD/CAM Industry Program, which offers reports focused on the mechanical marketplace.

Test Expectations

Test expectations provide the basis for evaluating test performance. After each test script is completed, the raters fill in rating tables with individual ratings for each of the steps in that test script. The ratings describe how well each step meets our expectations.

Our objectives are to test the functionality and performance of mid-range mechanical modeling systems, while eliminating the influence of hardware and operator skill levels.

Report Outline

Order Form

Please send me _____ copies of TechniCom's Mid-Range MCAD Benchmark Report.

Name: _____

Company: _____

Title: _____

Address: _____

City, State Zip: _____

Telephone _____

Price of the report: **$595.00** Include payment or credit card information

Name on credit card (if different than above) _____ Card Number _____

Expiration date _____ Authorized signature _____

Contact us for special pricing if you have purchased a previous copy of the report and want to upgrade your Version.