Pro/ENGINEER Mechanica Lite
Don’t just design a good product....
...engineer a great one!
Designing Better Products – Right from the Start

“… fewer than 15% of quality problems can be traced to shoddy workmanship or other factory errors… The real problem, he says, is at the front end of the development process.”

“Besides turning to simulation for root cause analysis when a design problem occurs and using it to check product performance pre-release, many manufacturers are using simulation to drive design.”

“… one can see that the best in class performers place the highest emphasis on performing simulation upfront in the design phase… this early use enables those leading manufacturers to reduce the number of prototypes necessary to pass quality tests as well as to avoid unnecessary change orders after design release.

“Warranty tends to be a reactive response, not a predictive [one]”

The pressure to engineer great products is not letting up…
Simulation in product design

Product design is the interplay between the often conflicting requirements of...

- Form
- Fit
- Function

Pro/E and ISDX address form and fit...

- But what about Function?
  - How will my design perform?
  - What can I do to reduce warranty liability?
  - Can I optimize my design to differentiate it?
  - Is weight reduction a possibility?

How will you understand the performance of your design?
Pro/ENGINEER Mechanica Lite

Pro/ENGINEER Mechanica for every Foundation license!
- From model to results in minutes…

Capabilities include*…
- Guiding interface walks users through model setup
  - Static Structural Analysis
  - Parts and Assemblies
  - Loads
    - Force/Moment, Pressure, Gravity
  - Constraints
    - Displacement, Pin, Ball, Planar
  - Full results functionality
    - F Probing, Animation, etc…
- Mechanica Solution Technology
- Complete upward model compatibility to full Mechanica!

Stop designing, start engineering!

*Model size limited to 100 surfaces
Pro/ENGINEER Mechanica Lite

Proven, unparalleled accuracy

Not just any answer; the right answer

- Unique MECHANICA solution technology
  - Capturing model geometry
  - Accurately and automatically finding high stresses
- No more need to be an FEA specialist
  - Focus on being a good engineer
- Competitors rely on dated technology
  - They claim accuracy, but it fails when put to the test...

Do you value a pretty picture…

…or the right answer?

Mechanica max stress 26.7 ksi!

COSMOSXpress max stress 18 ksi!
Pro/ENGINEER Mechanica Lite – FAQ

What Are The Pre-Requisites to Access Mechanica Lite?

- Wildfire 4.0 M060 – Scheduled Release Date December 30th 2008
- Maintenance Paying Customers with Pro/ENGINEER Foundation XE
- Mechanica needs to be installed (346 Mb)
What Model Types can Mechanica Lite accept?

- Solid Models only – no shells, no beams
- Parts or Assemblies – limited to 100 surfaces
- Assemblies have bonded connections only

- 100 surfaces limit applies to total surfaces in assembly
- A cylinder has 4 surfaces – 2 ends, 2 cylindrical
- Mated identical surfaces in an assembly still counts as 2 surfaces
- No Surface or Volume Region capability
What happens when you hit the 100 Surface Limit?

Error Message

This model contains more than 100 surfaces.
It cannot be opened in Mechanica Lite.
How can you check the number of surfaces in a model?

- **Edit > Find > Surface / Surface History / All**
What Are The Process Guide Steps in Mechanica Lite?

- Materials
- Constraints
- Loads
- Analysis
- Results

Note: To move to the next step, click “Next”, or use config.pro option: simulation_process_auto_advance yes
What Type of Materials can you use in Mechanica Lite?

- Linear Isotropic only
- Existing Isotropic Materials in Material Directory
- Pro/ENGINEER Assigned Material (Isotropic)
- Error Message if Isotropic is not selected
Pro/ENGINEER Mechanica Lite – FAQ

What Type of Constraints can you use in Mechanica Lite?

- Single Constraint Set
- Standard Displacement Constraint (not Rotations)
- Wildfire 5.0 Planar, Pin & Ball Constraints
- No Symmetry Constraint (can be manually created)
What Type of Loads can you use in Mechanica Lite?

- Single Loadset
- Multiple Loads
- References – Surfaces, Edges/Curves, Points
- Properties – World or Selected CSYS
- Force Components, Dir Vector & Mag, Dir Points & Mag
- Pressure Load
- Gravity Load
- No Advanced Loads i.e. Total Load At Point
- No Bearing Loads
- No Moment Loads
- No Temperature Loads
Can you Edit / Delete Constraints, Loads etc. in Mechanica Lite?

➢ Yes – From the Process Guide, Model or Model Tree
Can you access any functions outside the Process Advisor?

- No, except the following:
  - Edit > Current CSYS
  - View > Simulation Display
  - Info > Simulation Model
  - Info > Tolerance Report
  - Info > Review Total Load
What Analysis Types can you set up in Mechanica Lite?

- Linear Static Only
- No Access to Analysis Types, Settings etc.
- Only Option is “Run”
- Single Pass Adaptive Solver
- Diagnostic Window shows Status
- Study Name “MyAnalysis” cannot be changed – danger of overwriting
- No Direct Access to Summary File
- Result Directory is Standard – i.e. Contains Summary File, Models etc.
- Plotting Grid 4
What Result Windows can you set up in Mechanica Lite?

- All – Full access to all Standard Mechanica Result Window Controls
- Process Guide automatically creates animated Von Mises Fringe Stress Window, Displacement Window, and Vector plot of Max Principal Stress
- Windows can be Edited, Deleted or New Windows can be created with full controls
Can you take a Model from Mechanica Lite to Full Mechanica?

- Yes
  - see message
Can you take a Model from Full Mechanica to Mechanica Lite?

- Yes, but all Mechanica Entities will be Deleted – see message