ITI

International TechneGroup

*CAD*fix 11

August 2016

CADfix 11 Summary

- Import/Export
  - CAD version updates
  - More robust STL export
- Wizard
  - Improved healing
  - New STL repairing
- Morph
  - Improved mesh->CAD matching stage
    - Automatically handle split lines
    - Support for closed surfaces
  - Higher success rate
- 3D Printing
  - Improved slicing
- Facets
  - New facet/facet splitting tool

- Diagnostics
  - New facet/STL criteria
  - Improved non-tangent face display
  - More accurate folded NURBS test
- Defeature
  - Faster, more robust, fillet removal tool
  - Improved chamfer detection
  - Improved face splitting for CFD
- GUI
  - Various user driven improvements
- Misc.
 - Smaller .fbm size
  - Extended CFI api
  - Bugfixes.

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Rollup of CADfix 10 Service Packs

- ## 10/SP1
  - Extended assembly editting
  - New faceted solid upgrade tool
  - New surface splitting tool
  - Improved Morph tool
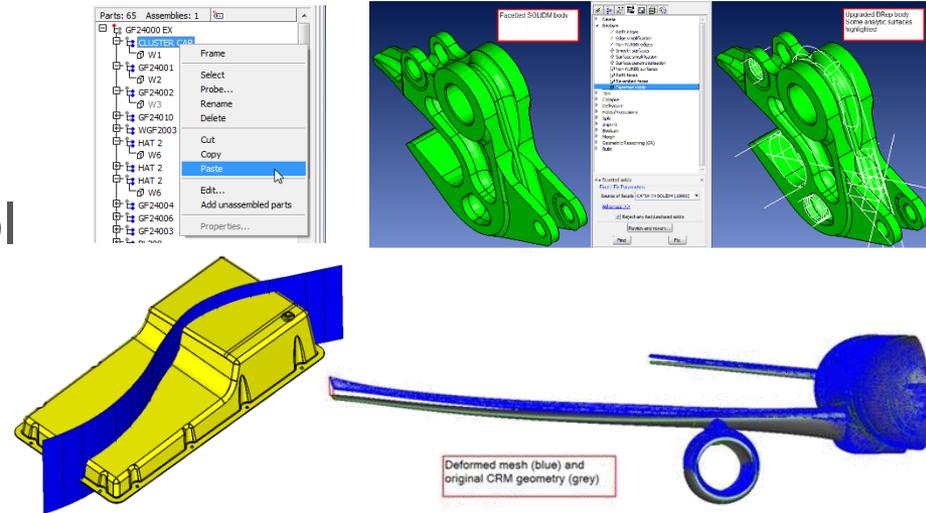
- ## 10/SP2
  - Export of Creo .prt
  - Import of PLMXML
  - Material property import
  - Improved welding tool
 - New hidden display mode
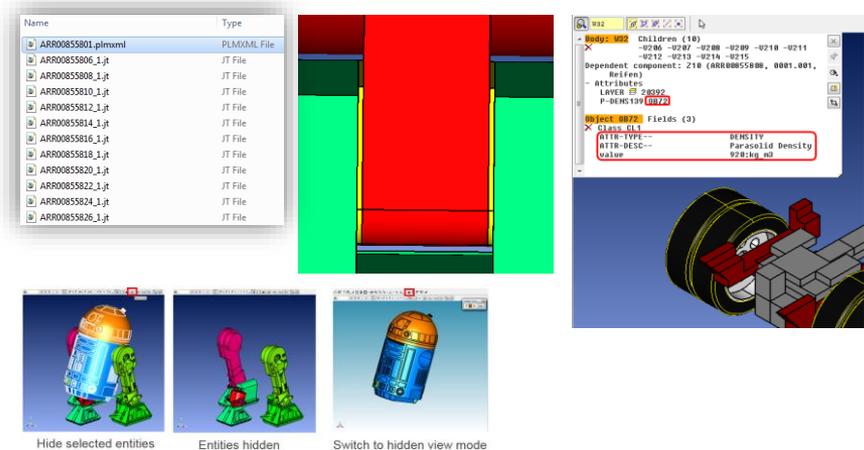
Import/Export

- CAD version support updates
  - CATIA V5 2016 (R26)
  - SolidWorks 2016
  - Inventor 2016
  - ACIS R26 (2016.0.1)
  - Parasolid 28.0

Import/Export

- ## STL export
  - – More robust export with less facetting failures
  - – New option to export non-watertight facets (STL is geometrically watertight but extra non-shared edge nodes may be inserted to make bad faces mesh)
  - – Facet length now available as parameter for minimum number faceting mode. Useful for limiting very high aspect ratio facets, e.g. in long cylindrical faces


☐ Respect zone definitions
☐ Allow non-watertight facets
Preview...

Faceting criteria
  ◉ Minimum number
  ◯ Quality facets

Parameters

Facet sag	0.1575
Facet turn	30
Facet length	
Expansion rate	2.0
Min. facets/edge	1
Min. through	

☑ Smooth
☐ Use source sizing
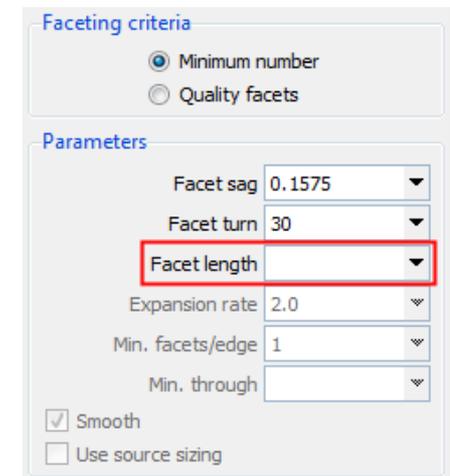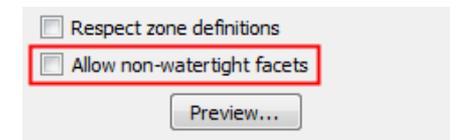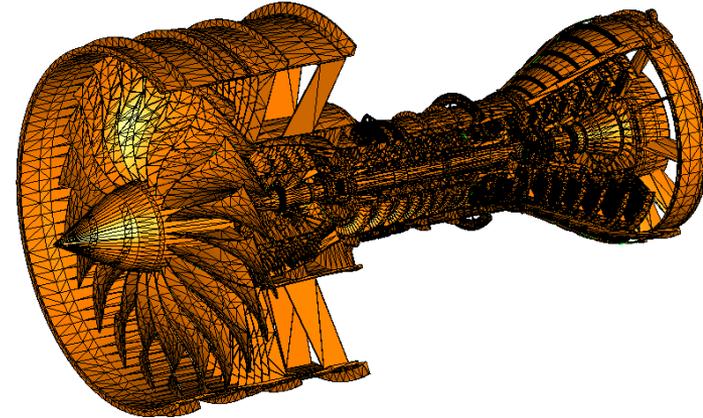
Morph

- Closed surfaces
  - Morphing of closed NURBS surfaces now fully supported
  - Closure is preserved along closed boundary

- Split lines
  - Lines with no deformed mesh at one or both end points now supported, e.g. Split circles

- Mid-side nodes
 - New option to ignore mid-side nodes when matching mesh to CAD


Line end point missing from mesh
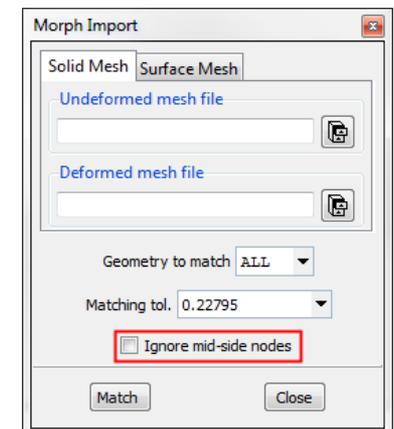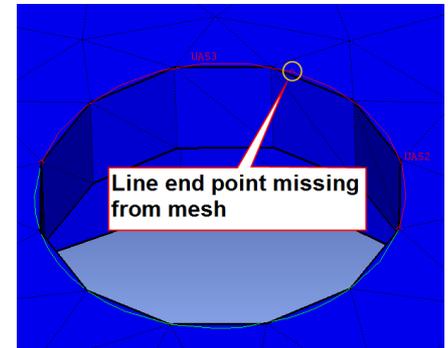
3D Printing

- Improved quality and robustness
  - Slicing of curved facets generates high precision slice boundaries
 - Increased robustess of near in-plane slicing
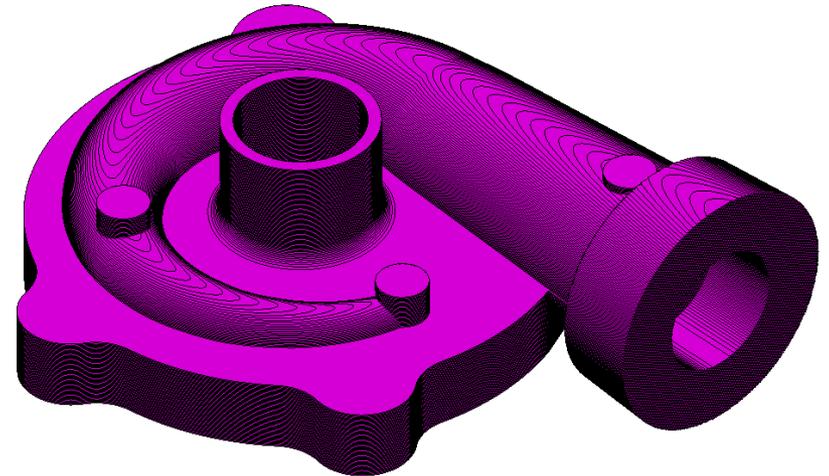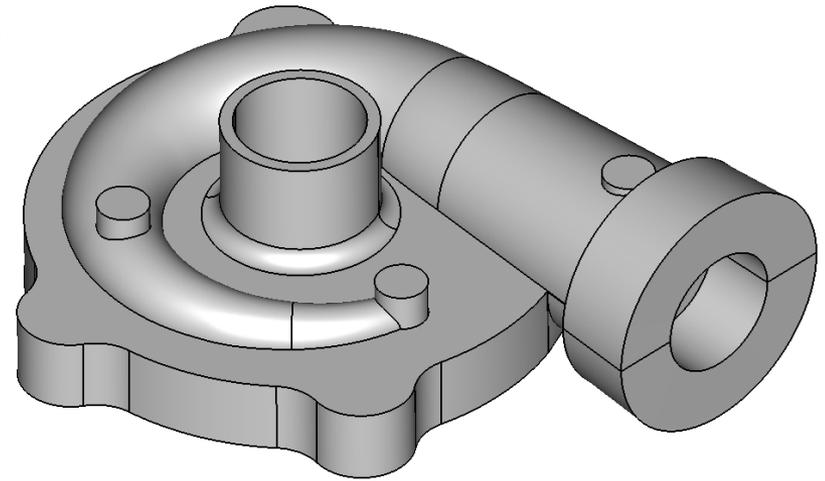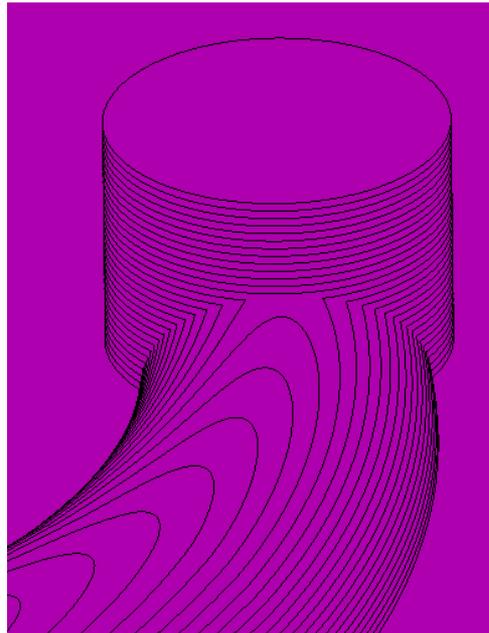
Facets

- ## Wizard Repair for STL
  - Wizard repair detects and removes/deletes voids
  - Interactive or batch (configured via .cwc file)

- ## New Diagnostic criteria for facets
 - Tools for finding and fixing common issues
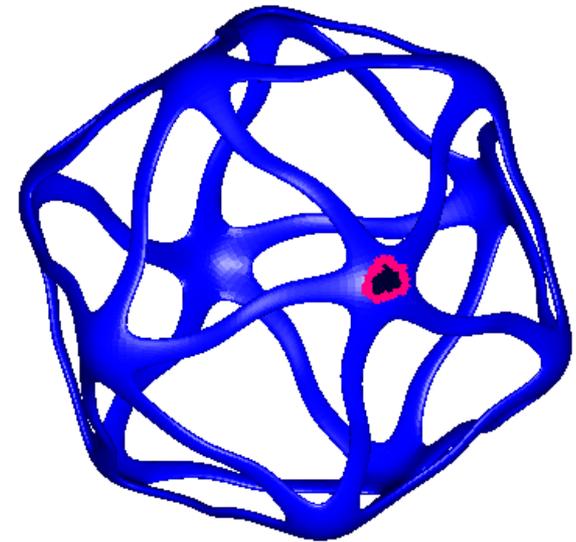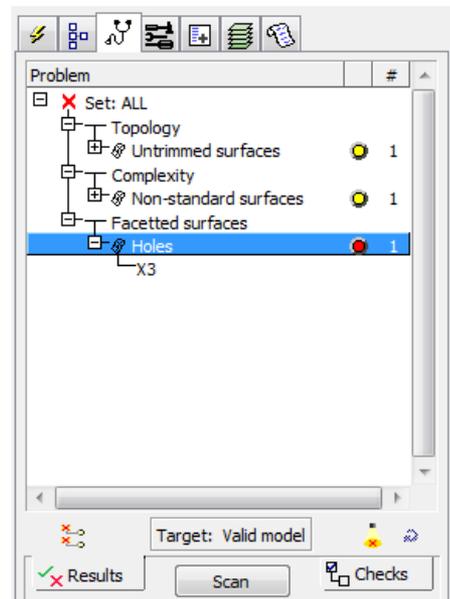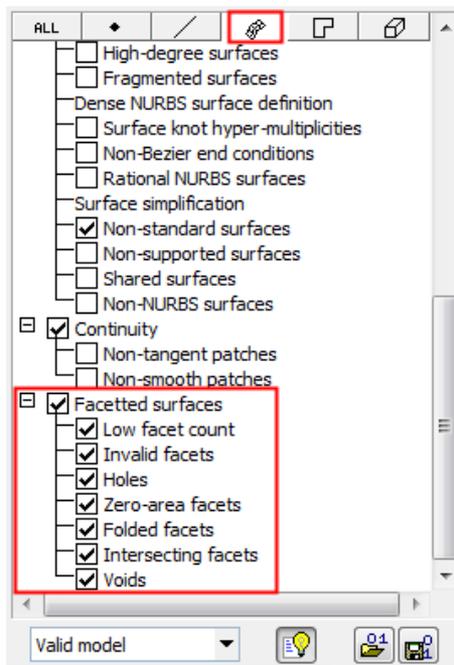
Facets

- New robust facet intersection split tool
 - Split facet surfaces with facet surfaces or a planar surface
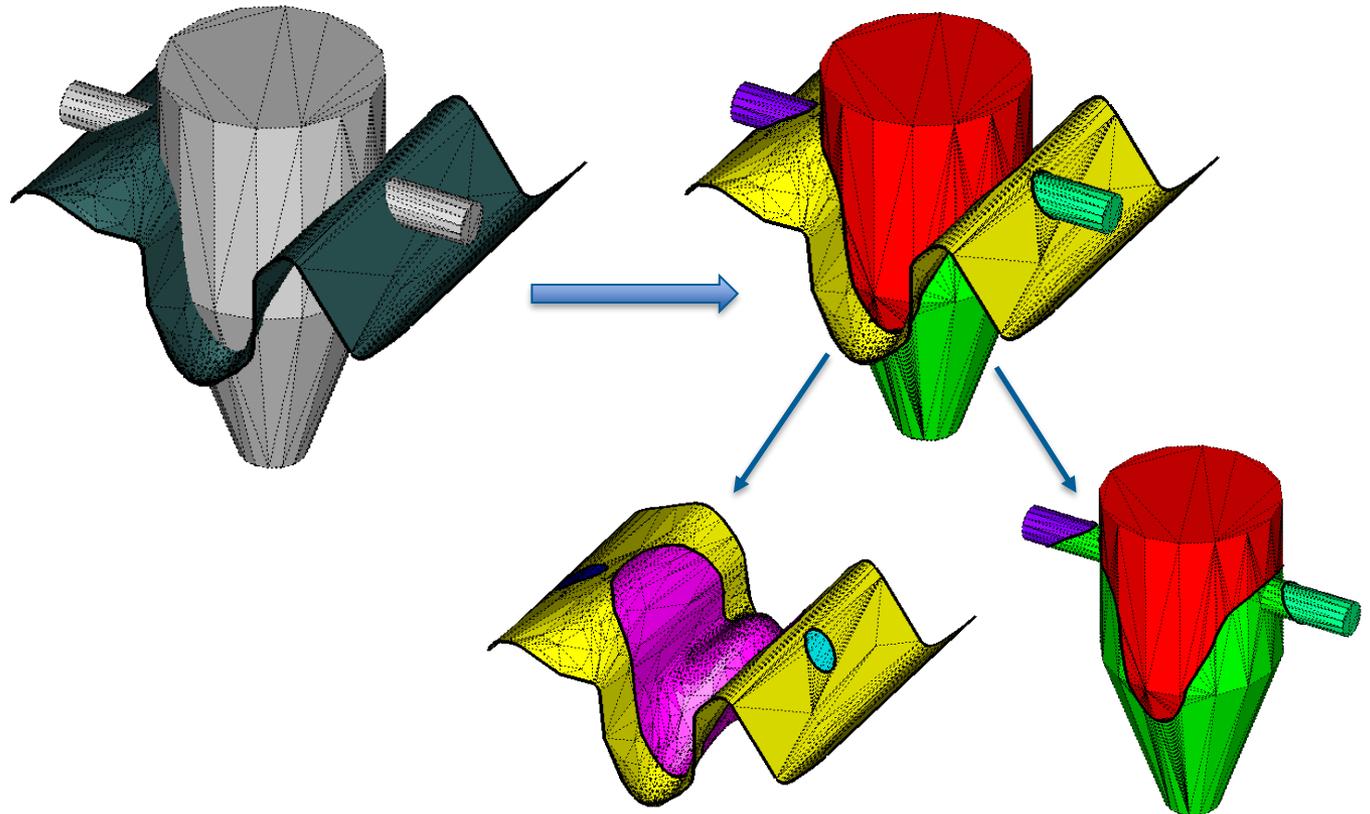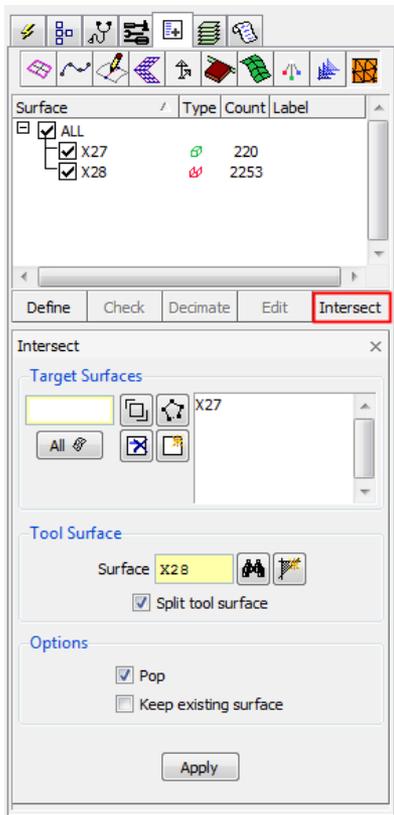
Diagnostics

- Improved non-tangent face display
 - Find for non-tangent faces now displays the size of the non-tangency
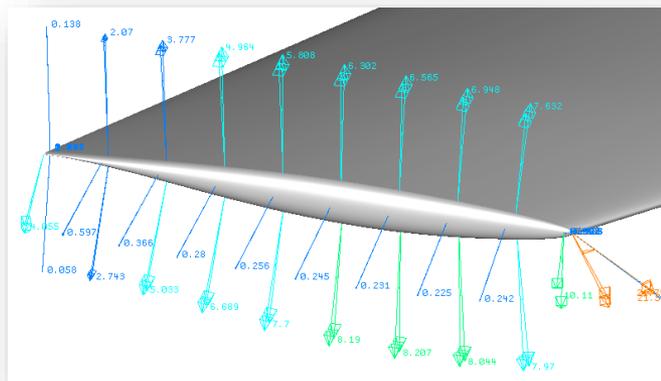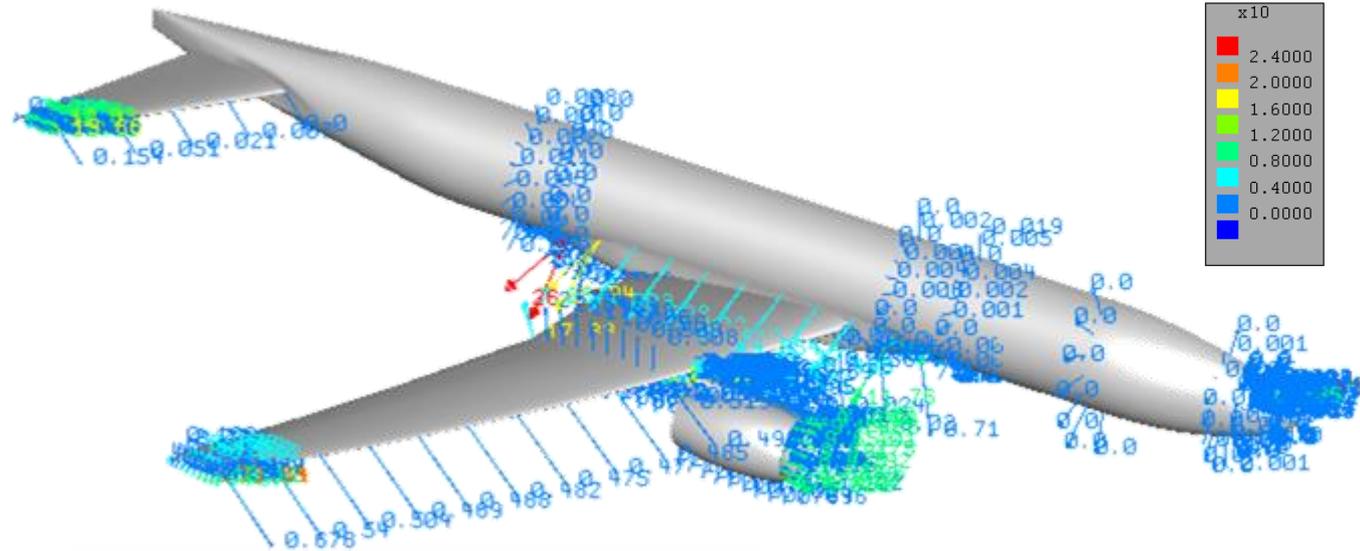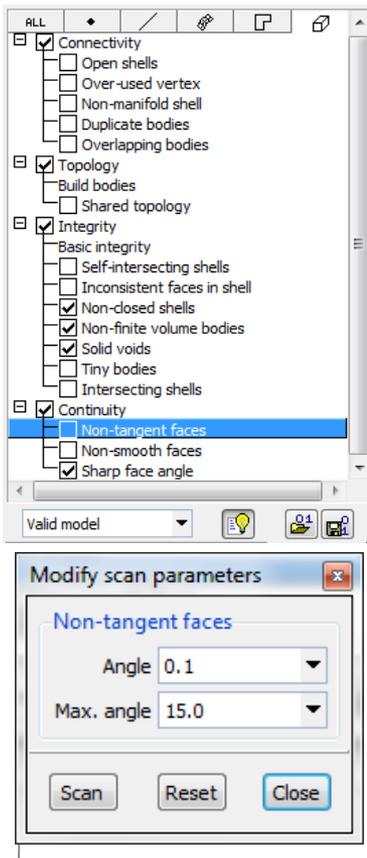
Defeature

- Fillet Removal
  - Re-designed algorithm resulting in significantly faster processing
  - Able to handle more complex networks of fillets
  - New partial result returned where can't remove all
  - Removal of individual selected fillets
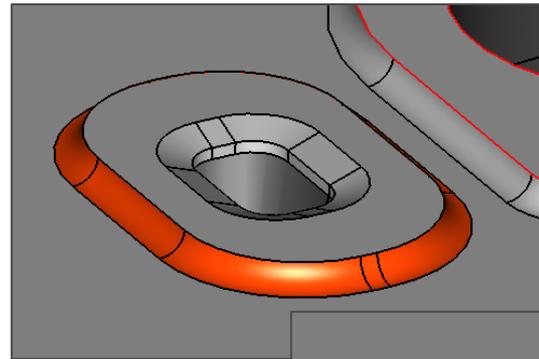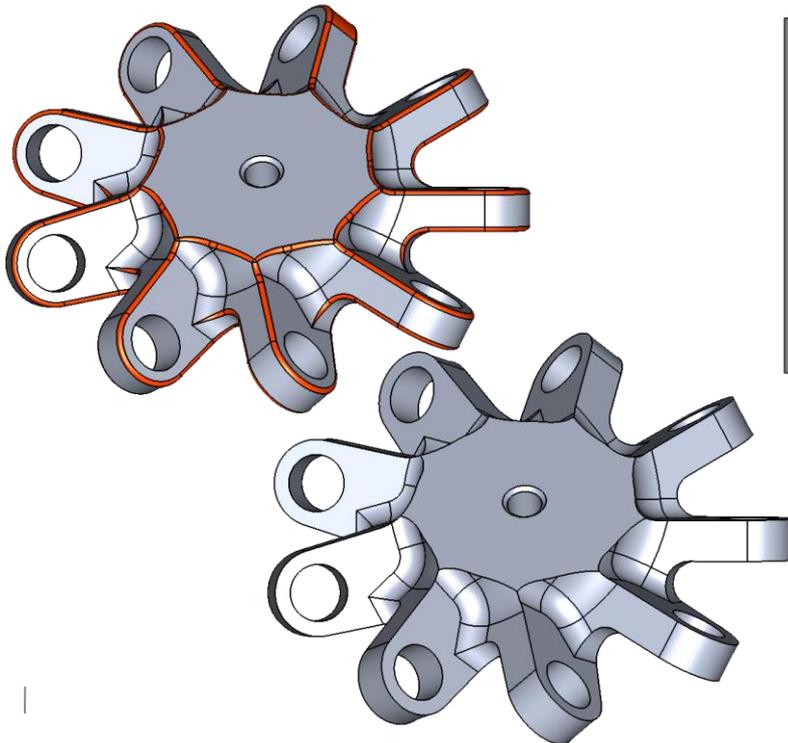
Now removes fillets between parallel faces
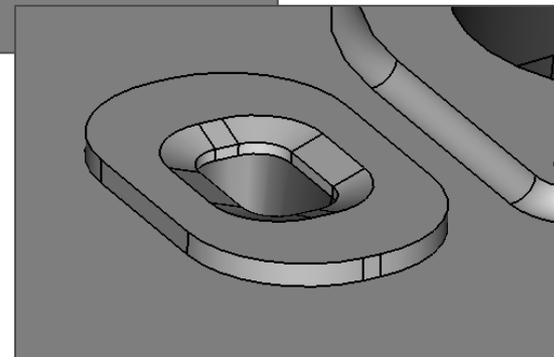
Defeature

- ## Chamfer Removal

  – Find improved to cope with chamfers with split sides. Commonly found with counter-sunk holes

  – More robust at identifying ambiguous groups of connected chamfers
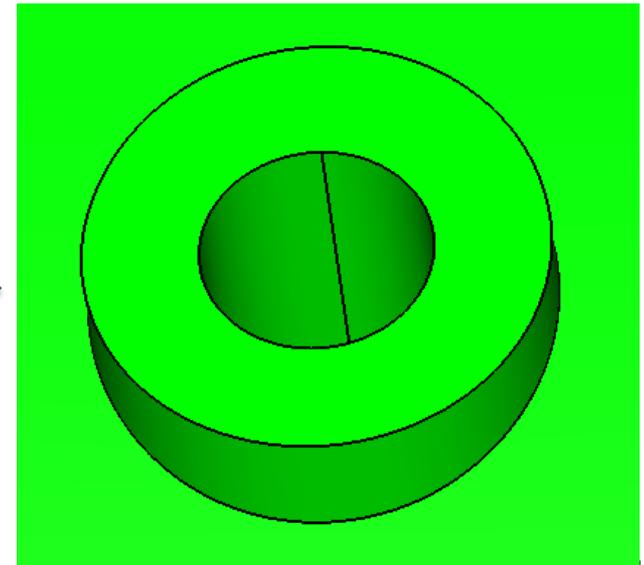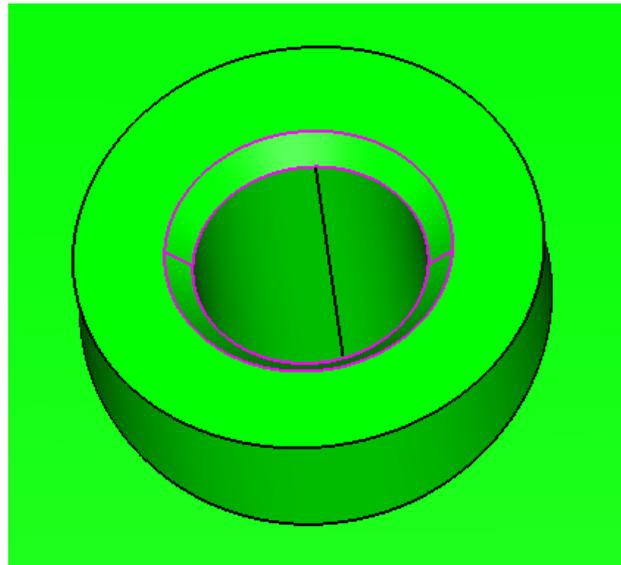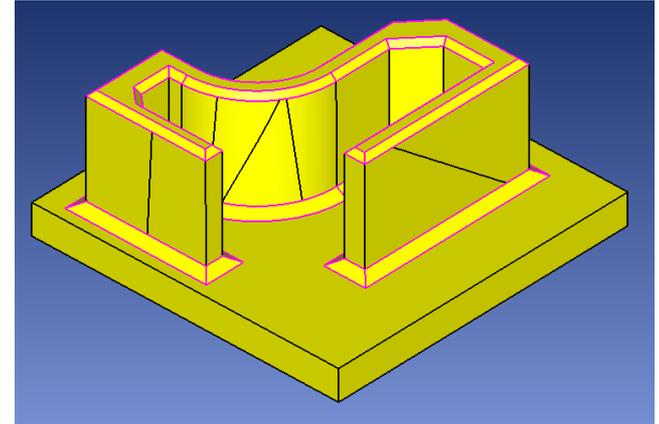
Defeature

- Face auto-splitting for structured meshing
 - Much improved robustness and speed
  - More layers of splits now possible, and thinner
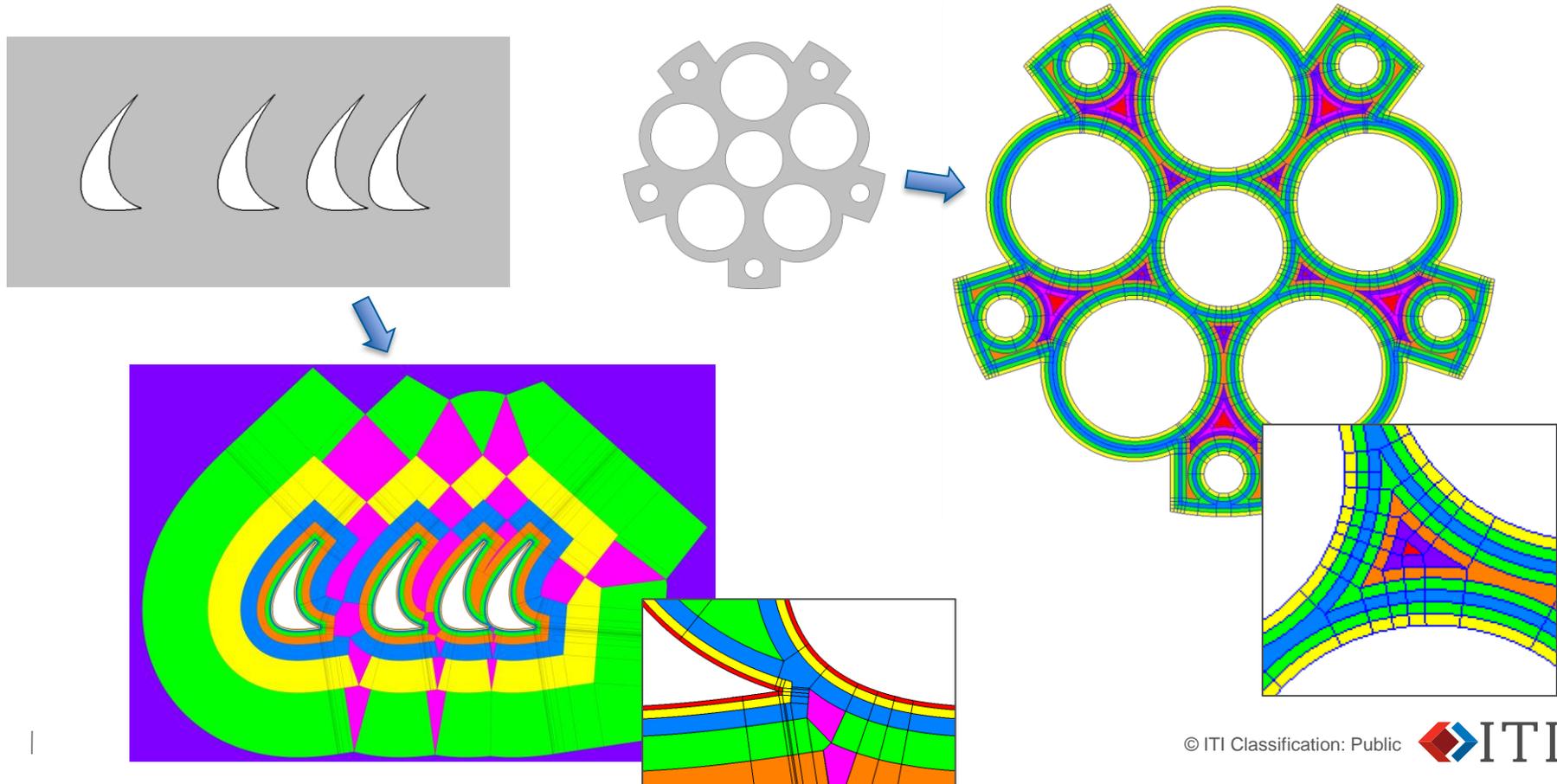
Miscellaneous

- ## Smaller .fbm file size
  - CADfix database files are now saved in a new compressed format
  - Specially developed compression algortihm that makes saving and loading large models faster than old uncompressed format.

- ## .fbm files now platform independant
  - CADfix model files (.fbm) created on Windows can now be opened on Linux and vice versa.

CAE Mesh Generation

- ## Single or Double precision node storage
  - New option to control the precision of node coordinates

    ```
    PROC NSTORE DOUBLE/SINGLE CONVERT/DELETE
    ```

  - Default is to store as single precision (current behaviour)

- ## Incremental meshing
  - New support for converting mesh to manual mesh. Not automatically deleted on next MESH command
  - New mesh will connect to existing manual mesh where available
  - Enables meshes of complex multi-body models to be created incrementally. See:

    ```
    MESH ALL MANUAL ADD/REMOVE
    PROC MGEN MANUAL ON
    ```

Coming in Service Pack 1 (end 2016)

- ## Shrink-wrap
  - Innovative new algorithm designed to capture difficult CAD features such as thin regions and junctions.
  - Greater precision, higher quality and less user interaction required
  - Original CAD parency preserved
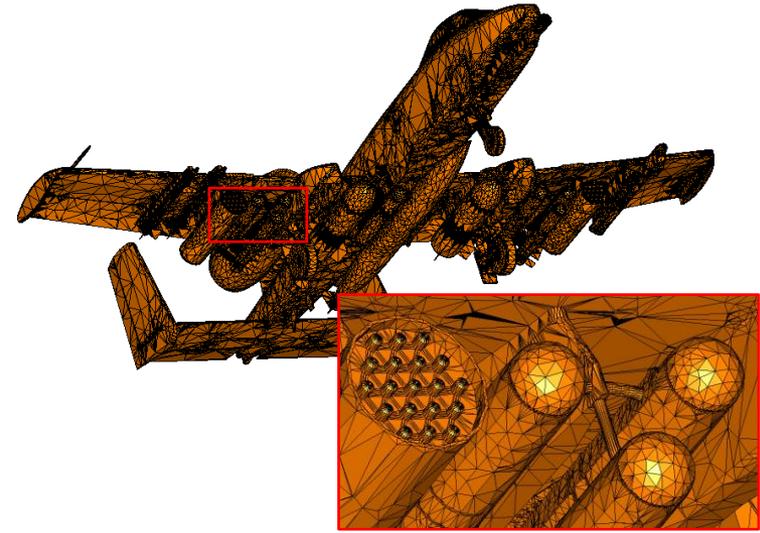
- ## Mid-surface
  - *Prototype* release of new tool for automatic mid-surface generation
  - Fully automatic with user controls
  - Precise thickness distribution
  - Export as facets or CAD geometry