

### CADdoctor SX Basic Packages

- CADdoctor SX / Trans**
  - 3D Data Translation (Geometry Check & Heal)
  - IGES and STEP I/O
- CADdoctor SX / FEM**
  - 3D Data Translation (Geometry Check & Heal)
  - IGES and STEP I/O
  - Geometry Simplification
  - Polygon I/O and Operation
- CADdoctor SX / Mold**
  - 3D Data Translation (Geometry Check & Heal)
  - IGES and STEP I/O
  - Mold Manufacturing Checker
  - Fillet/Chamfer Removal, Faces Merging
- CADdoctor SX / ReverseEngineering**
  - 3D Data Translation (Geometry Check & Heal)
  - IGES and STEP I/O
  - Polygon I/O and Operation
  - Reverse Engineering

### CADdoctor SX Plus2 Bundle Packages

- CADdoctor SX / TransPlus2**
- CADdoctor SX / FEMPlus2**
- CADdoctor SX / MoldPlus2**

Plus2 Bundle Packages are the combinations of a basic product and any two of standard format Input/output add-ons and direct CAD import add-ons.  
Direct CAD Export Add-ons are not available with purchases of Plus2 options.

### Standard Format I / O Add-on

- Parasolid Add-on
- ACIS Add-on
- JT Add-on

### Direct CAD Import Add-on

- CATIA V5 Import Add-on
- CATIA V4 Import Add-on
- NX (UG) Import Add-on
- Pro/E Import Add-on

### Direct CAD Export Add-on

- CATIA V5 Export Add-on
- CATIA V4 Export Add-on

# CADdoctor<sup>®</sup> SX

Translate and Harness the Power of 3D Data

|                     | 3D Data Translation |      | Simplification  |            | Polygon Handling | Reverse Engineering | Quality Check for Molding |
|---------------------|---------------------|------|-----------------|------------|------------------|---------------------|---------------------------|
|                     | Check               | Heal | Feature Removal | ShrinkWrap |                  |                     |                           |
| Trans / TransPlus2  | ●                   | ●    |                 |            |                  |                     |                           |
| FEM / FEMPlus2      | ●                   | ●    | ●               | ●          | ●                |                     |                           |
| Mold / MoldPlus2    | ●                   | ●    | ●               |            |                  |                     | ●                         |
| Reverse Engineering | ●                   | ●    |                 |            | ●                | ●                   |                           |

### CADdoctor SX Supported CAD ※Please refer to [www.elysium-global.com](http://www.elysium-global.com) for the latest information.

| Product                                | Product Name   | Input Format   | Output Format                     | Version                            |
|--|--|--|-----------------------------------|------------------------------------|
| Basic Packages                         | Trans Basic  | IGES   | IGES                              | Input: -V5.3<br>Output: V5.2, V5.3 |
|  |  | STEP   | STEP                              | AP203, AP214                       |
|  | FEM Basic  | IGES, STEP, STL, OBJ, VRML, Nastran Bulk Data, ASCII | IGES, STEP, STL, OBJ, VRML, ASCII | IGES, STEP: the same as above      |
|  | Mold Basic   | IGES   | IGES                              | Input: -V5.3<br>Output: V5.2, V5.3 |
| STEP                                   |  | STEP   | AP203, AP214                      |                                    |
| RE Basic                               | IGES, STEP, STL, OBJ, VRML, Nastran Bulk Data, ASCII | IGES, STEP, STL, OBJ, VRML, ASCII                    | IGES, STEP: the same as above     |                                    |
| Standard Format Input / Output Add-ons | Parasolid Add-on                                     | Parasolid  | Parasolid                         | V7-V22                             |
|  | ACIS Add-on  | ACIS   | ACIS                              | 6-20                               |
|  | JT Add-on  | JT   | JT                                | Input: 6.4-9.1<br>Output: 8.0-9.1  |
| Direct CAD Import Add-ons              | CATIA V5 Import Add-on                               | CATIA V5   |                                   | R7-R20                             |
|  | CATIA V4 Import Add-on                               | CATIA V4   |                                   | V4.2.1-V4.2.5                      |
|  | NX(UG) Import Add-on                                 | NX   |                                   | UG10 - NX7                         |
|  | Pro/E Import Add-on                                  | Pro/E  |                                   | Pro/E 2000 - WF5                   |
| Direct CAD Export Add-ons              | CATIA V5 Export Add-on                               |  | CATIA V5                          | R14                                |
|  | CATIA V4 Export Add-on                               |  | CATIA V4                          | V4.2.1-V4.2.5                      |

#### 32 bit

Execution Environment Windows 7, Vista, XP Professional capable machine  
CPU Windows 7, Vista, XP Professional capable CPU  
Memory 1GB or more  
OS Windows 7, Vista, XP Professional  
Disk Device Hard Disk (500MB at least), CD-ROM drive  
Display 1280x1024, 65,536 colors, VGA(OpenGL, double buffer)

#### 64 bit

Execution Environment Windows 7 x64, Vista x64, XP Professional x64 capable machine  
CPU Windows 7 x64, Vista x64, XP Professional x64 capable CPU  
Memory 1GB or more  
OS Windows 7 x64, Vista x64, XP Professional x64  
Disk Device Hard Disk (700MB at least), CD-ROM drive  
Display 1280x1024, 65,536 colors, VGA(OpenGL, double buffer)



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# CADdoctor<sup>®</sup> SX

*CADdoctor SX is a high-fidelity translation, verification and geometry optimization tool*

Sophisticated 3D data handling techniques in CADdoctor SX provides highly reliable data translation and advanced 3D processing tools. Adopted and highly praised among world-leading automobile manufacturers, the Elysium's geometry interoperability technology realizes seamless exchange and effective utilization of 3D data in wide range of fields.

The CADdoctor SX family consists of four suites which achieve intended purposes:

1. 3D CAD-to-CAD translation.
2. Translation and geometry simplification for Finite Element Methods (FEM).
3. Preparation of injection molding die design and machining.
4. Reverse Engineering (RE).

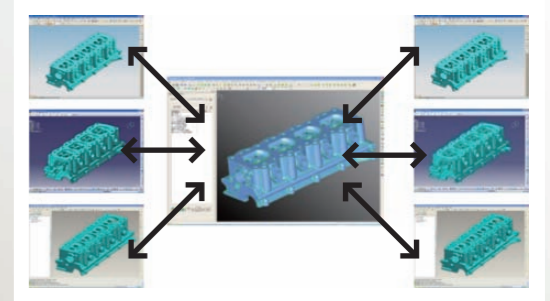


## CADdoctor SX suites

### Trans/Trans Plus2

Prevent Errors and Save Time in 3D Data Exchange

Translation/TranslationPlus2 is the basic package for 3D CAD-to-CAD translation. This suite allows users to translate any source CAD file to another CAD file with the highest level of fidelity. Direct native CAD file access is standard functionality.

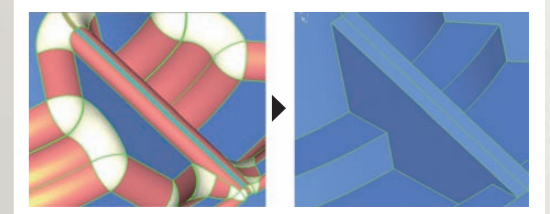


### FEM/FEM Plus2

Create a Smooth Path to FEM analysis

FEM/FEMPlus2 is a general purpose package for CAD/FEM engineers intending to prepare 3D data for downstream FEM analysis and/or Digital Mock Up. This module contains all the functionality of Translation/TranslationPlus2, plus geometry simplification.

An 'Envelope Solid' function to extract the outward most surface of an assembly or part, is also available.

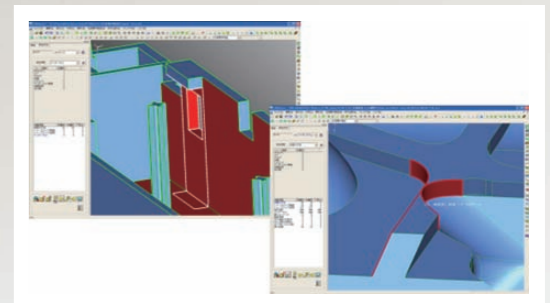


### Mold/Mold Plus2

Minimize Rework during Mold Processing

Mold/MoldPlus2 is a general purpose package for 3D CAD users who design injection molding dies or prepare 3D data for machining.

This module includes all the functionality of Translation/ TranslationPlus2, along with geometry simplification and advanced PDQ validation needed to ensure an injection-molded product's manufacturability and quality.

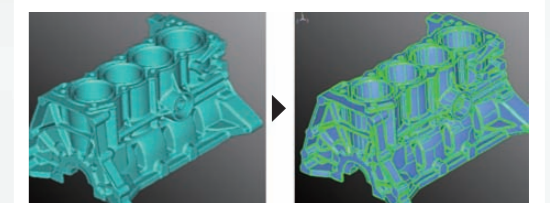


### Reverse Engineering

Effective Use of Point Cloud and Polygon Data

RE is an all-round package for handling polygon files for those who use a 3D measuring machine to execute reverse engineering.

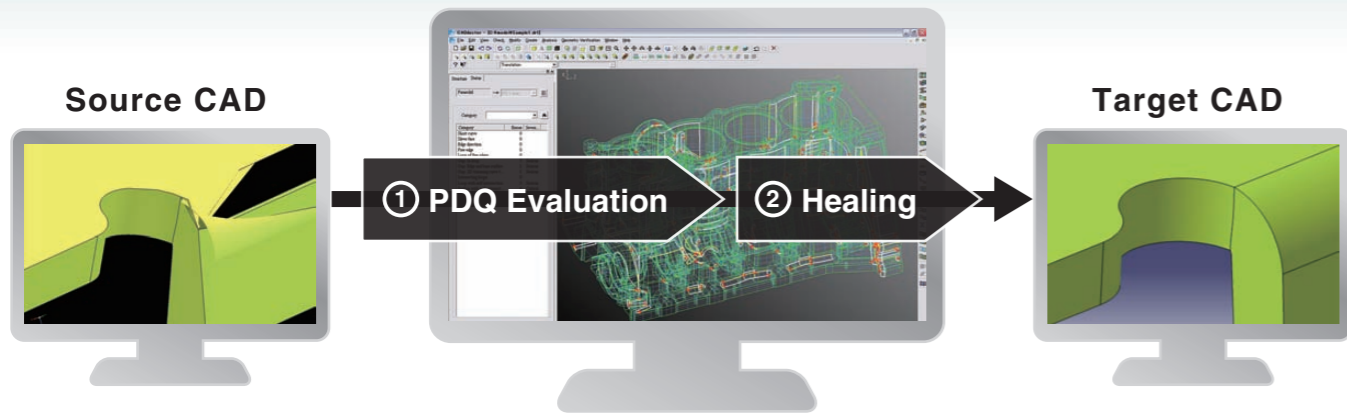
With this module, B-rep CAD models can be generated from polygon files, polygon files can be generated from point cloud files and CAD data can be modified to fit polygon data. The suite is also useful for interchange between FEM results and CAD data.



# Trans/TransPlus2

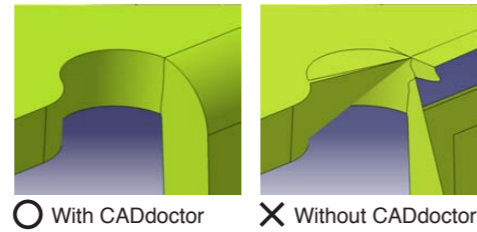
CADdoctor®SX

High-quality and flexible 3D data translation



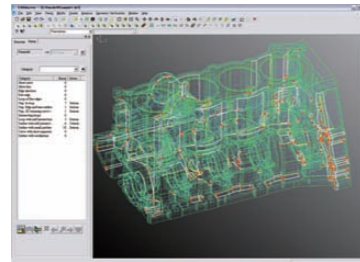
★ To import/export a native CAD file directly, Plus2 option is required.

In general, CAD-to-CAD translation between different formats can generate unreadable, inoperative or defective data, which requires manual modification in the target CAD. But in contrast, CADdoctor SX corrects this by supporting various data formats, freeing you from tedious work and enabling unlimited data exchange with your business partners.



## ① PDQ Evaluation

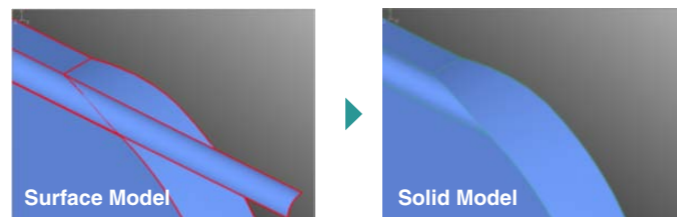
PDQ Evaluation automatically detects and corrects errors that could cause problems in the target CAD system. Although each target system has different validation criteria and tolerances for data accuracy and data representation, CADdoctor SX automatically locates the errors and highlights them for user attention.



## ② Healing

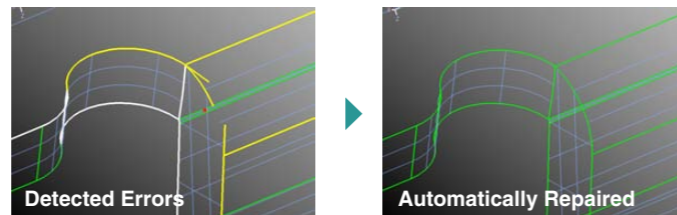
### Automatic Stitch

Automatic Stitch can turn surface models into solid models. It connects free edges which are located within a specified tolerance, and automatically modifies them to merge at the line of intersection to the underlying face. In addition, the Advanced Trimming function can modify an inadequately-trimmed face to an optimally-trimmed face.



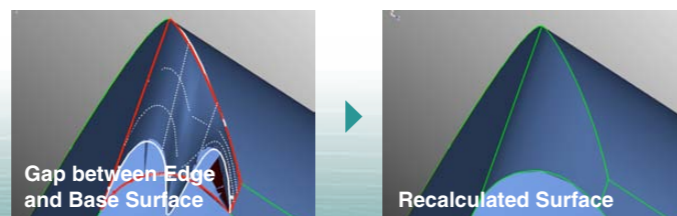
### Automatic Healing

Automatic Healing's sophisticated geometry treatments can correct for slight adjustments of the location or form of a face and edges. The healing never corrects beyond the tolerance value of native CAD data, ensuring the original design.



### Healing Advisor

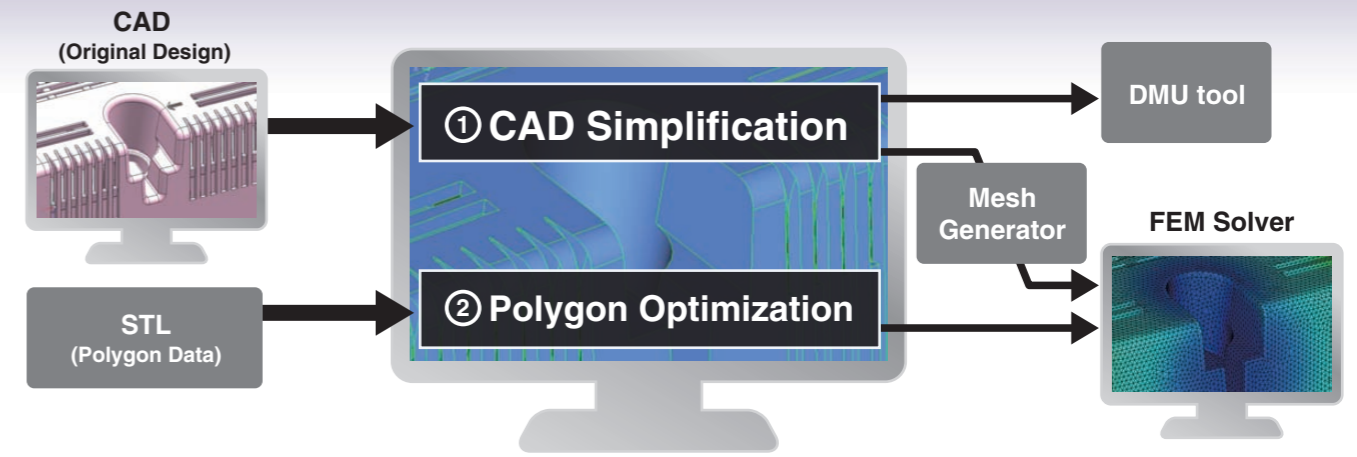
The Interactive healing Advisor supports healing of extreme or composite errors that should be omitted during the Automatic Healing Process. It can be accomplished with very simple operations.



# FEM/FEMPlus2

CADdoctor®SX

Automate FEM model preparation

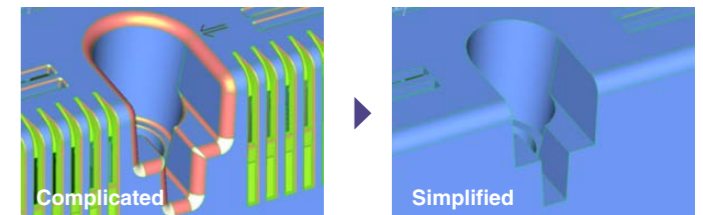


A complex CAD model can cause considerable damage to Finite Element Methods analysis, such as generation of irregular mesh, longer calculation time and analysis errors. FEM/FEM Plus2 is an excellent tool for downsizing CAD files to produce high quality mesh data for FEM by automatically removing unnecessary features. Upon removing features, users can select either eliminating features with no trace to make simple faces, or maintaining the line of features to keep faces segmented, depending on the purpose of the analysis. FEM/FEM Plus2 also allows a user to directly modify a stereolithography (STL; Polygon) model, and a function to handle Nastran bulk data is also available.

## ① CAD Simplification

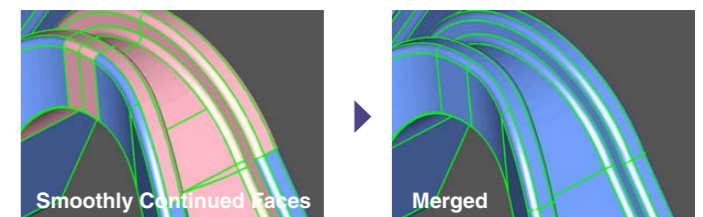
### Feature Removal

CADdoctor SX FEM suite provides several functions to remove unnecessary features such as fillets, chamfers, and holes. The Fillet Removal function automatically detects a fillet by defining its radius as a threshold, whereby removing the fillet results in an intersection of the underlying surfaces. In the Hole Removal function, there are two automatic options to detect and remove holes: Round Hole Auto-Detect and Removal, and Generic Hole Auto-Detect and Removal. There is also one manual option, Manual Hole Detect and Removal for detecting and removing any opening on a specified face.



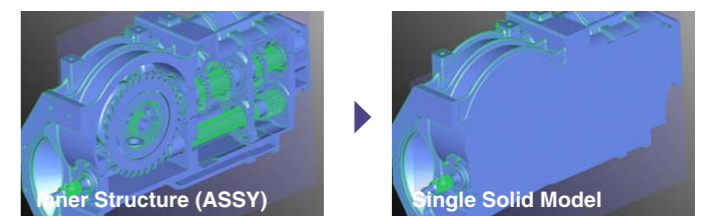
### Merging Faces

The Merge Face function combines smoothly continued multi-faceted faces to one face, without changing the original shape. The reduction in the number of surfaces decreases data size significantly and allows 3D data to be used more effectively in post-process.



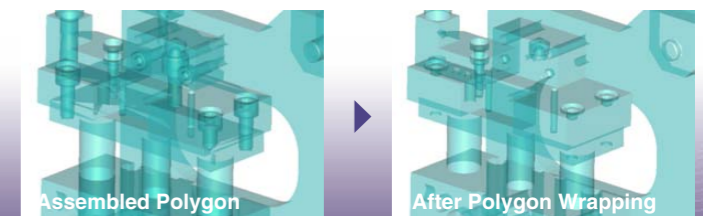
### Solid Envelope

Solid Envelope integrates all parts together to form an envelope. It determines whether a part is inner or outer, and removes inner parts, as necessary. This automatic binding function enables gaps between elements to be filled completely, in addition to processing Boolean.

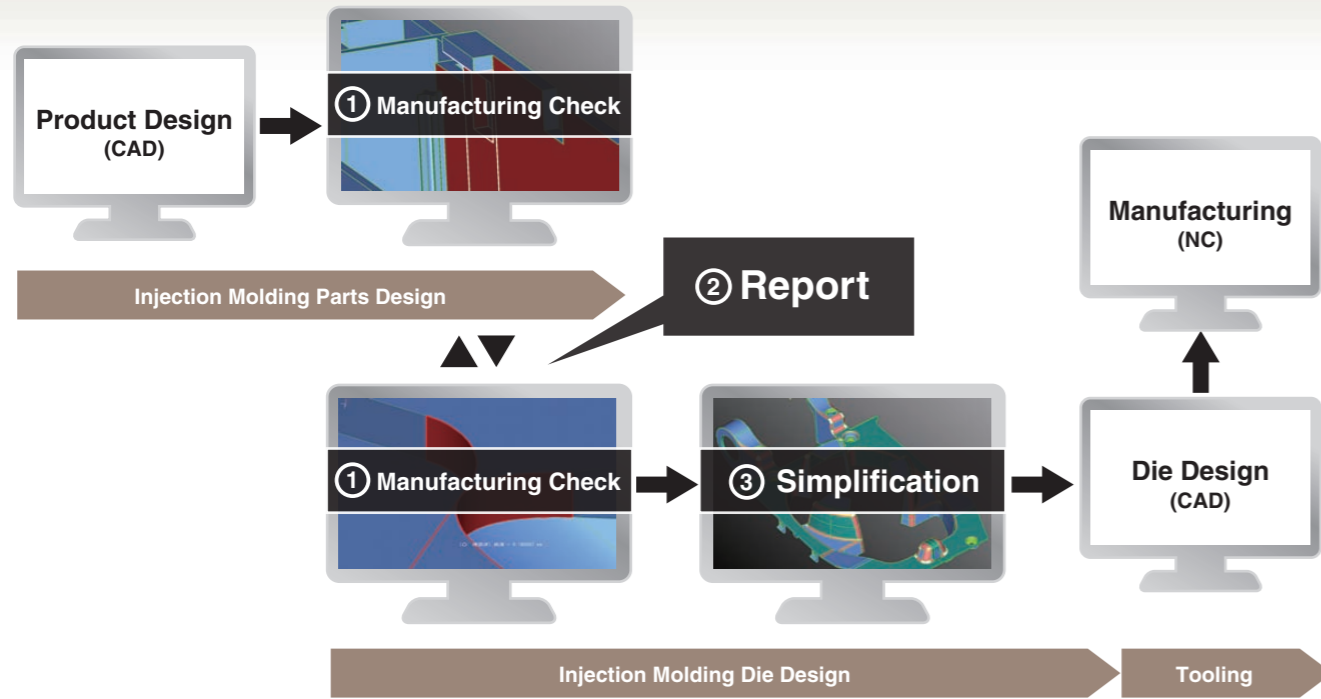


## ② Polygon Optimization

In addition to geometry simplification functions, FEM/FEMPlus2 can optimize polygon models with remeshing or other functions and minimizes the risk of errors in FEM analysis. The FEM suite supports the following formats: STL, VRML, OBJ and Nastran bulk data.



Improve the efficiency of injection molding part design and manufacturing

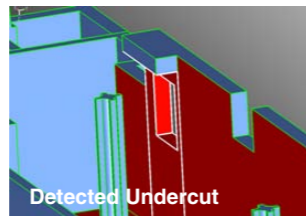


Introducing Mold/MoldPlus2 during the mold design phase includes thorough manufacturing checks which eliminates rework on the designing and manufacturing of a mold and die. This Mold suite also contains geometry simplification functions, like a fillet removal operation, which improves the efficiency of the preparation process for injection molded die manufacturing in mold-design.

## ① Manufacturing Check

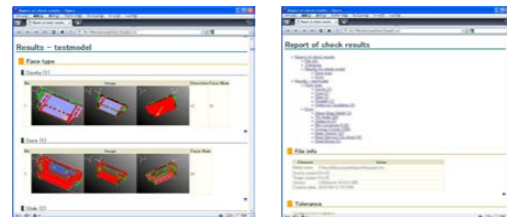
Manufacturing Check verifies the following potential problems that may have an effect on mold design and manufacturing, simply by defining the pull direction of mold.

- A part that cannot be molded, such as sharp edges.
- A part that may cause failure in product manufacturing, such as draft angle violation.
- A part that may affect on product quality, such as thin wall.
- An intricate part that could increase cost for mold manufacturing, such as undercut and slide.



## ② Report

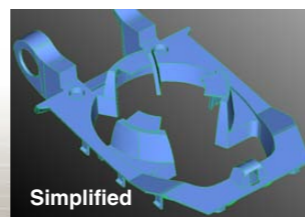
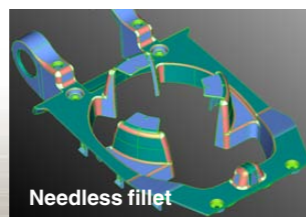
A check report is automatically created in XML format, including the settings for validation, the number of errors detected and images of each error. It also shows draft side attributes, such as cavity, core, slide and undercut, in different colors, which can be output to CAD files.



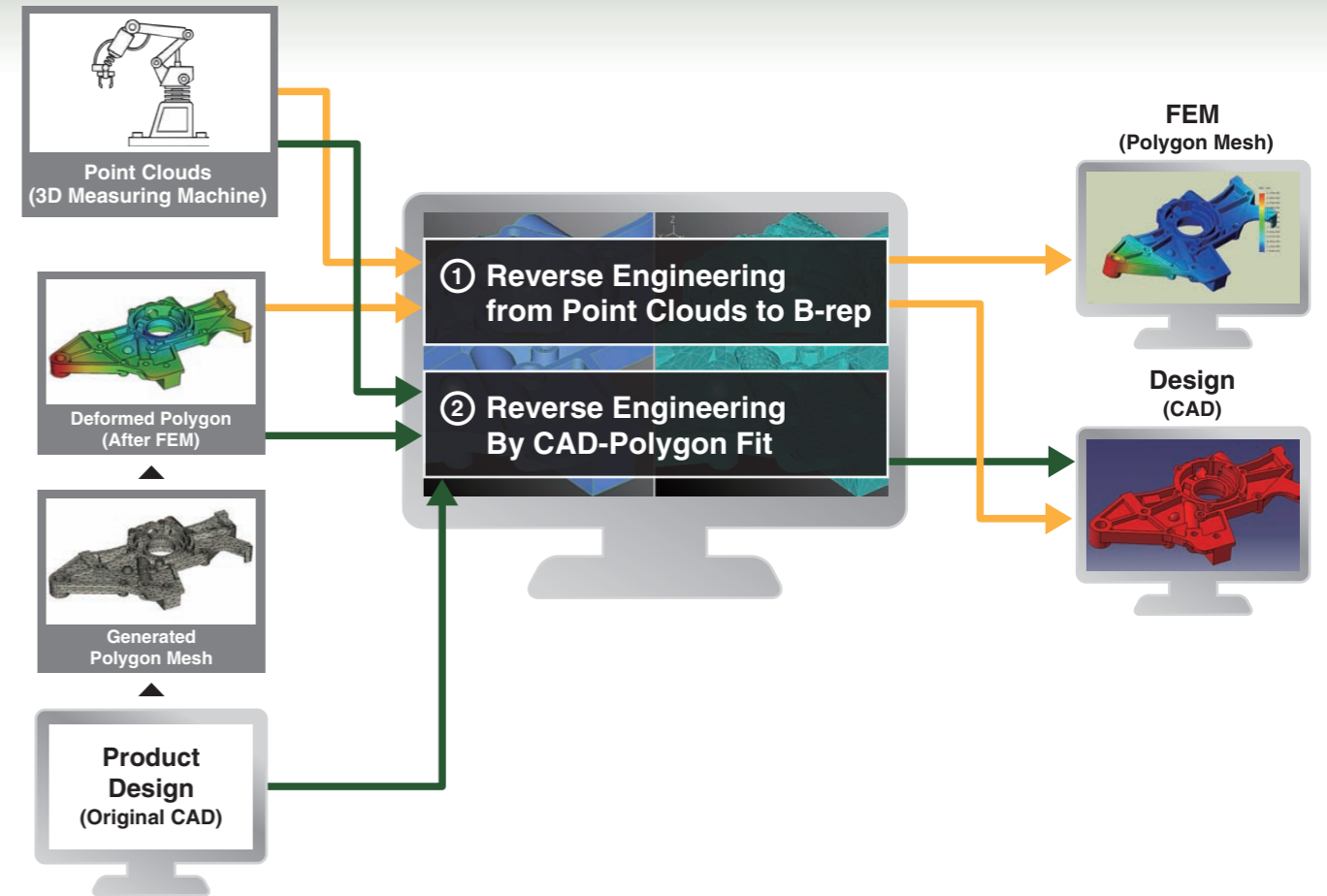
Report on web Browser

## ③ Geometry Simplification

Some of the geometry simplification functions that FEM suite provides are available in the Mold suite. These include feature recognition and removal options such as removal of fillets, chamfer, holes, boss and rib and merging faces. This function, for instance, will be helpful when users need to remove fillets from CAD geometry, prior to tapering and fillet-adding process in a CAD system.

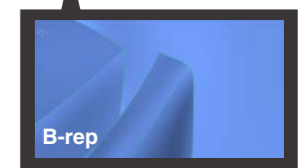
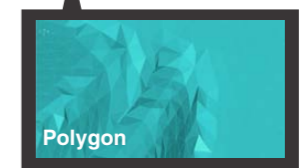
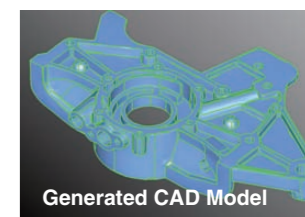


Achieve synergistic use among 3D CAD, Polygon and Point Clouds



## ① Reverse Engineering from Point Clouds to B-rep

An original CAD model is not always available when trying to generate product data for other purposes. Our Reverse Engineering technology supports the generation of B-rep models from point clouds created by a 3D measuring machine and polygons created from the point clouds, while optimum segmentation of the polygon is essential to produce a desired B-rep model. CADdoctor SX automatically examines geometric features of polygon data, assumes how the surfaces would be designed in a CAD and determines the optimal area to segment. It can also identify polygon surfaces automatically based on the representation of curved surfaces such as planar, cylindrical and conic, then subsequently segment those surfaces. Once the segmentation is closed, a face is generated on each segment with simple operations, and then a perfect B-rep model is completed. CADdoctor SX can also generate trimmed surfaces automatically, leading to smoother complex edges. This segmentation process contributes to creating adequate CAD data with simple surface formation.



## ② Reverse Engineering with CAD model and Polygon Data ( from point cloud/ from FEM )

Reverse Engineering also provides sophisticated deformation functions of CAD surface models using an FEM result of polygon data. On the deformation, the curvature of both CAD data and polygon is considered, allowing deformation of a surface without altering the shape of the original CAD model. As shown in the right figures, the gap between B-rep surface and polygon highlighted in colors will disappear after CAD-Polygon Fit.

