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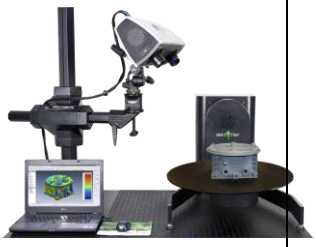
3D PRINTING ▪ 3D SCANNING ▪ PRODUCT DESIGN

EMS - 3D Scanning Hardware, Software and CAD Output Options

Creaform GoScan & HandySCAN	Creaform MetraSCAN	Creaform HandyProbe	Steinbichler Comet L3D
			
Creaform 3D scanners are hand held, very portable and easy to setup and use. They are great for tight locations and on-site scanning where no other scanners can go.	The MetraSCAN uses an optical tracker to 3D Scan objects. Great for shop floor scanning and metrology even under conditions where the part is moving.	The HandyProbe uses an optical tracker to probe objects. Great for shop floor inspection and metrology even under conditions where the part is moving.	The Comet L3D offer structured light 3D Scanning to offer unmatched resolution and accuracy. Great for very small parts up to a complete automobile with photogrammetry
Konica-Minolta Range 7	**CreaForm MaxShot Photogrammetry**	**Steinbichler Photogrammetry**	**Surphaser 100HSX**
			
The Range 7 offers very high accuracy and detail and is great for small to medium size parts where accuracy and detail is critical. The Range 7 is also a very good inspection tool.	The Maxshot Photogrammetry system integrates with all Creaform 3D Scanners allowing you to 3D scan large scale objects with a very high accuracy.	Photogrammetry combined with a 3D Scanner offers the highest accuracy for medium to large parts by combining high resolution photo images, coded targets, scale bars and 3D scan data.	The Surphaser is the highest accuracy, and resolution medium to long range 3D Scanner. If offers unmatched resolution and detail on large objects such as vehicles, aircraft, buildings, etc.

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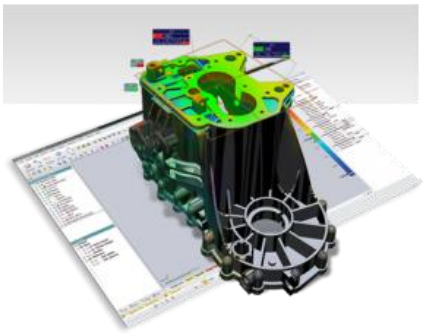
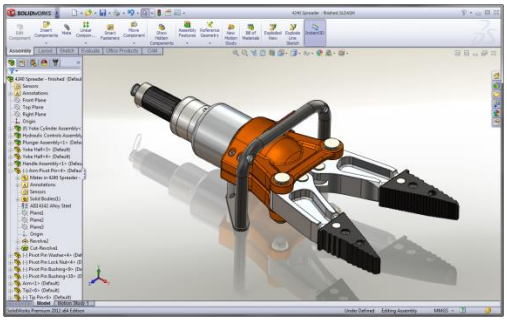
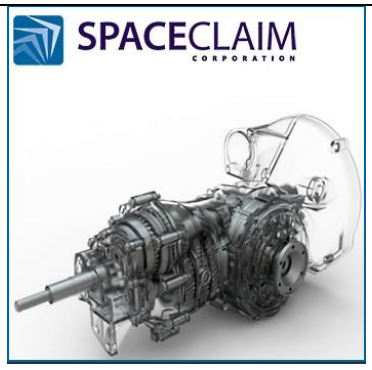
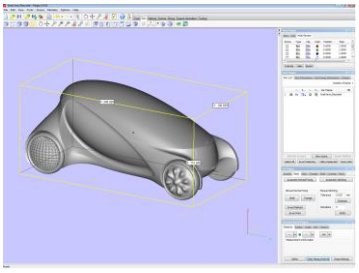
EMS – CAD, 3D Scanning & Inspection Software

GeoMagic – Design X	Geomagic Control	Geomagic FreeForm
		
GeoMagic Design X is powerful tool for polygon editing and advanced surface and solid model creation. It's the only product on the market capable of building feature based solids models that can be "Live Transferred" to CAD products such as SolidWorks, Inventor, Siemens NX, AutoCAD and more…	GeoMagic Control allows for complete 2D and 3D inspection of parts and assemblies. Dimensional tolerances and GD&T are full supported along with inspection reports output in PDF, Excel and Powerpoint formats.	A virtual clay sculpting tool that allows the user to import scan data and sculpt it to any shape using a feedback haptic hand held device. Great for sculpture, fossils and artwork.
Solidworks	**Spaceclaim**	**Magics RP**
		
Solidworks is the defacto 3D CAD standard for many companies today. Ease of use and powerful features make it attractive to small, medium and large companies.	Spaceclaim is the next generation of 3D CAD as it doesn't require a history tree perform solid modeling. By graphically driving all design Spaceclaim makes it fast and easy to do product design and engineering.	Magics is a powerful polygon editing and creation tool. Great 3D Pringin and 3D scanning.

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EMS - 3D Scanning Deliverable CAD Data Formats

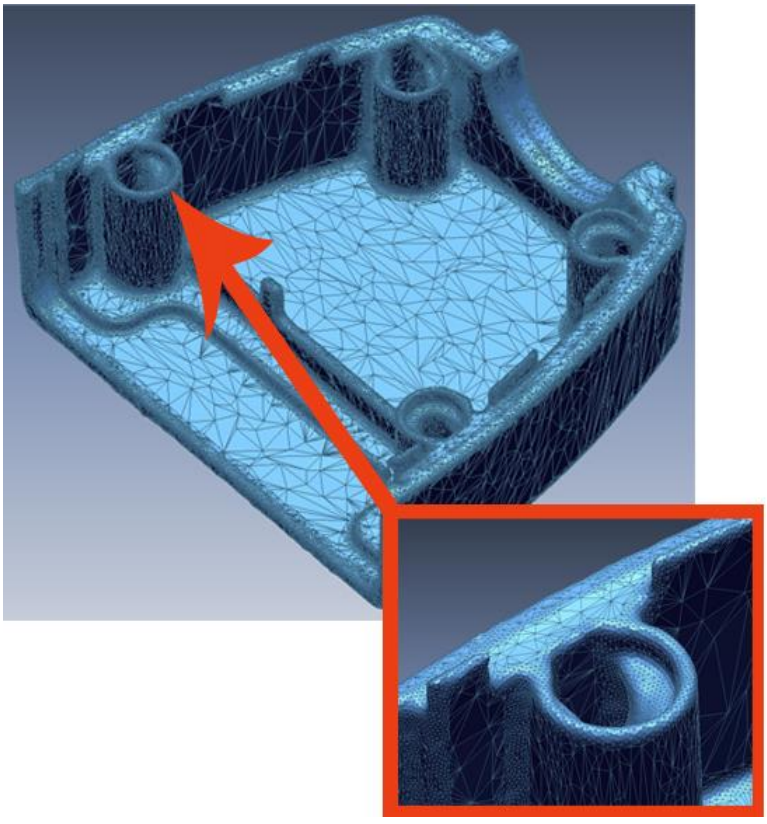
Sample Scan Part

This sample part is a cable connector housing about 2" x 2" x .5" in size. It was scanned with one of EMS's high resolution 3D scanners. Below is an outline of the different data formats that can be delivered.

Contact EMS to receive the 3D scan and CAD data of this connector as described below.

Polygon File

File Format: STL, PLY, OBJ, VRML
Description: A polygon file is a mesh file consisting of 3 sided triangles and a normal vector. Polygon files are the first step in the scanning process. The final polygon file will be "watertight" and the mesh optimized. Polygon files are good for "organic" free form shaped objects. They can be imported into animation, rendering and any software that can work with a polygon file. Many CAM software programs can generate a CNC cutterpath from a polygon file. Most mechanical CAD systems can NOT work with polygon files to make changes to the model.



Pros

- Lowest cost option
- Perfect for animation & simulation
- Many CAM programs can machine direct from STL
- Good for organic free form shape models like sculptures, artwork and archeological applications

Cons

- Not easy to work with in CAD software
- Files can be very large
- Making design changes can be difficult without special software (SensAble, 3D Max, Maya, etc)
- Sharp corners, planes, holes and other features may not be perfect

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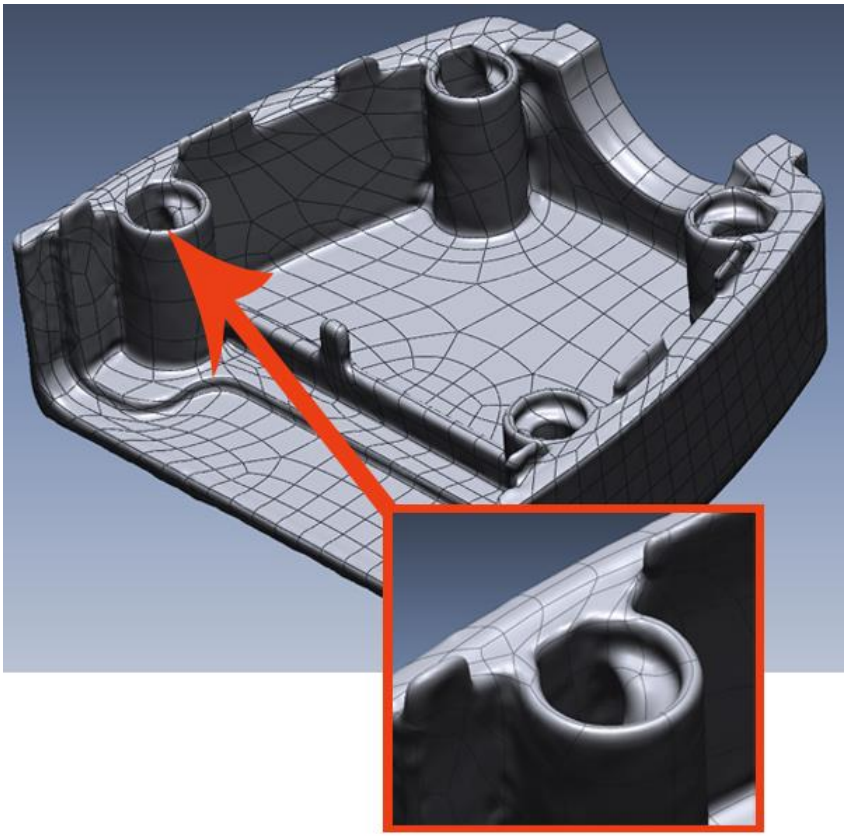
Surface Model

File Format: IGES, STEP
Description: A surface model is generated from a water tight polygon model. A surface model contains mathematical information that can be used in most CAD/CAM systems. This format is very useful for organic free form shape models such as boat hulls, automotive body panels, sculpture and more.

Pros
- Modest price
- Great for free form organic models
- All CAM software can use the data
- All CAD systems can import and work with a surface model but may have limits in editing the data

Cons
- Surface "patches" are random
- Limited editing capability in many CAD systems
- Sharp corners and holes may not be perfect

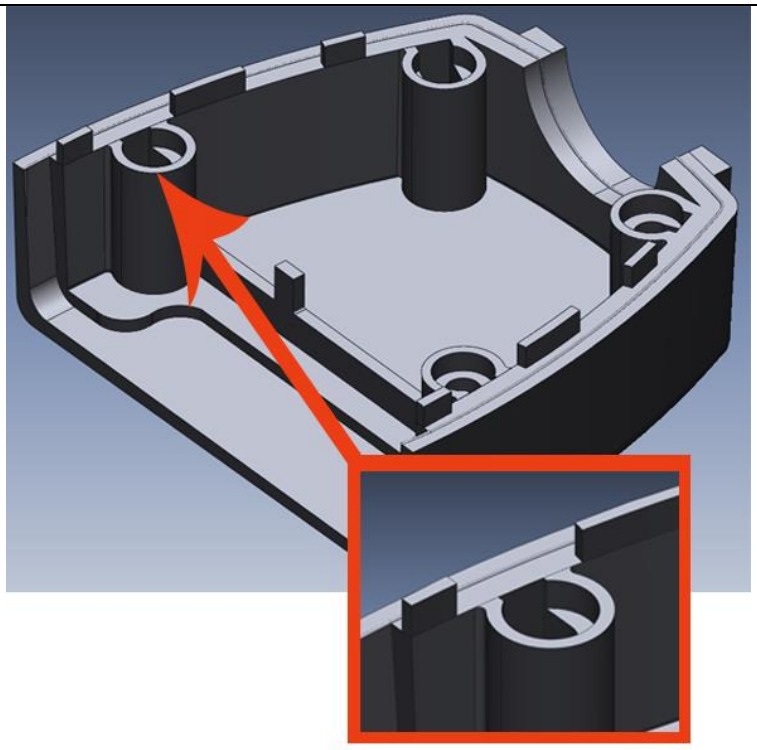


Feature Based Solid Model

File Format: IGES, STEP, Parasolid
Description: A feature based solid model is generated by recreating the model similar to most solid modeling CAD systems. The difference is the input information is the raw scan data. This process allows for the exact recreation of all features including sharp corners, holes and other features. The finished model can be compared to the raw scan data for accuracy.

Pros
- Best for "mechanical" type parts
- Accurate representation of part
- Model can be edited in most CAD systems

Cons
- More expensive option
- More time consuming to generate a finished model
- Not useful for organic free form models
- Some editing limitations in some CAD systems



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Parametric Feature Based Solid Models

File Format: SolidWorks, Pro/E Wildfire, Siemens NX, AutoCAD

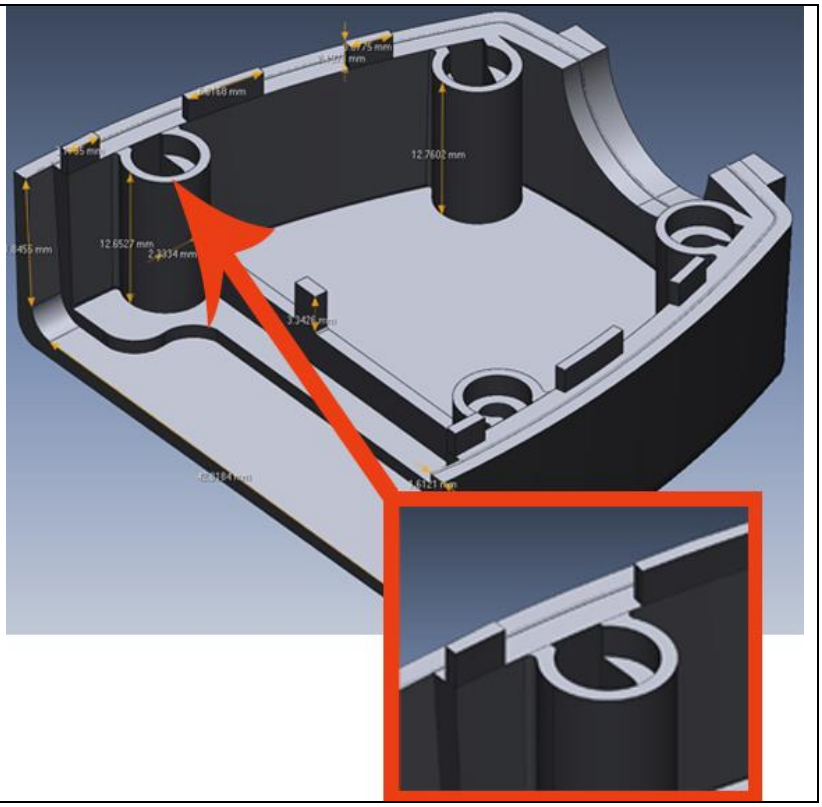
Description: A parametric feature based model includes additional information including dimensions, parametrics and the history tree. This is done by using a "live transfer" that recreates the model step by step in the native CAD system.

Pros

- Model is usually fully editable in the supported CAD systems

Cons

- Most time consuming to create
- Most expensive option



Inspection Report

File Format: PPT, PDF, Excel, XML

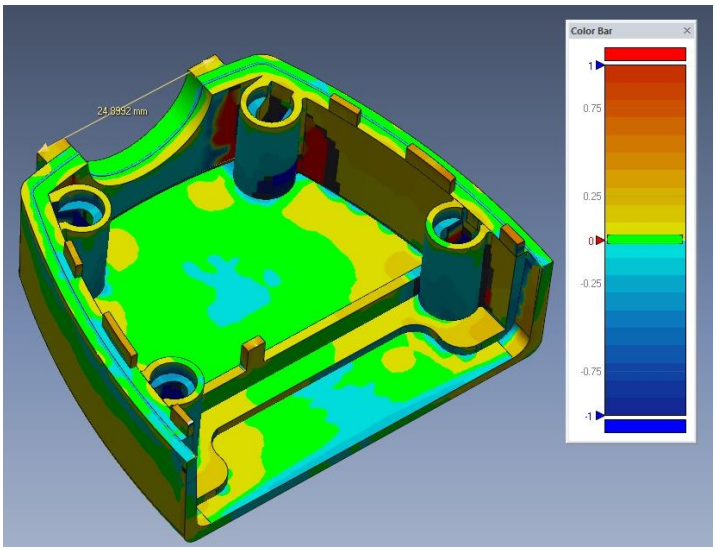
Description: An inspection report gives you a very detailed analysis of 3D scan data. This inspection report can compare the 3D scan data to a nominal CAD file, or other scan data,

Pros

- Extremely detailed report capturing millions of points on a part. Great for complicated and organic shaped parts.

Cons

- Not as accurate as a CMM. Not the best choice for prismatic features (holes, threads, etc)



The EMS team has been involved in 3D scanning, product development and rapid prototyping for more than 15 years. Contact EMS at **877-845-2700** to speak with an engineer who can answer any questions you may have about your needs.

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