



ATOS III

White Light Scanning

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ATOS III White Light Scanning System

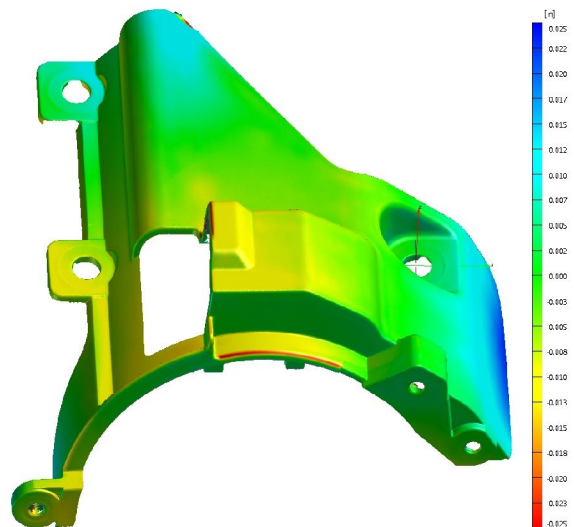
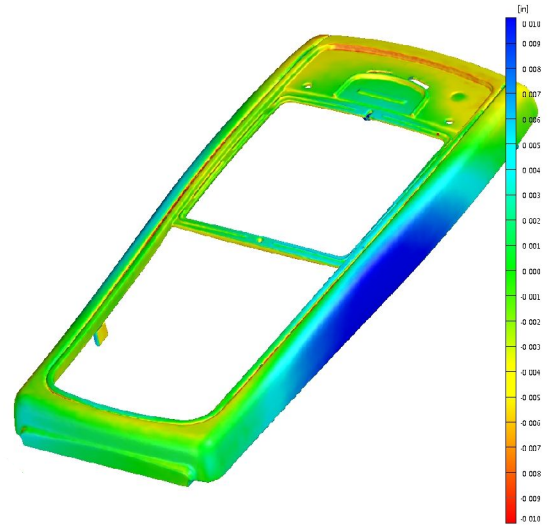
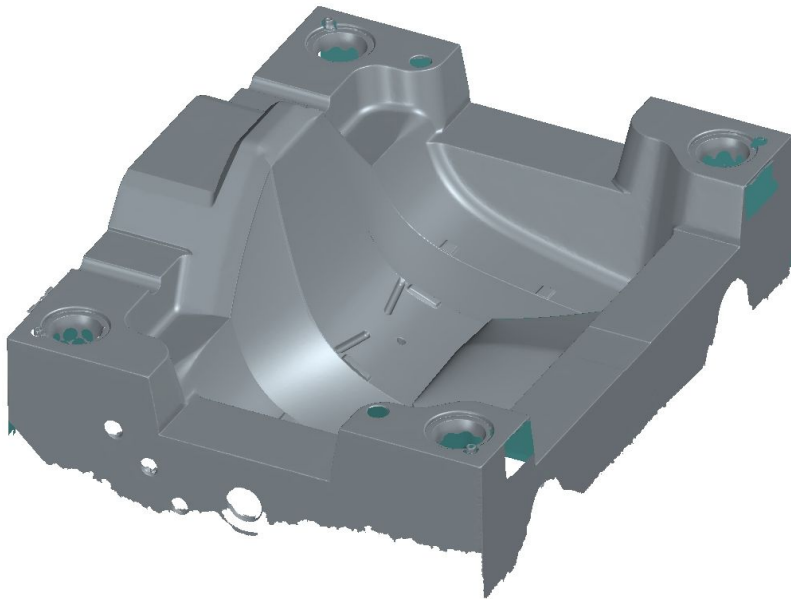


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Intro:

Chicago

The ATOS III system is portable, enabling us to perform services at our customers' locations!!!

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Chicago Mold Engineering Co., Inc. has been a leader in the injection mold making business in the Chicago area since 1944. We have provided quality molds for the automotive, housewares, electronics, building supply, and sporting goods markets. We take great pride in our heritage, and attribute our success to an ongoing effort to maintain a state of the art environment to engineer and build our quality molds. Our 40,000 square foot facility houses a manufacturing plant, engineering and design department, office space and conference areas. Staying at the forefront of technology, in all aspects of the manufacturing industry, has enabled us to move forward in our quest to continually meet our customers' expectations. One of our most recent acquisitions is the ATOS III photogrammetry system.

What is white light scanning?

White light scanning is the art, science, and technology of obtaining reliable information about physical objects through the process of recording, measuring, and interpreting photographic images. White light scanning uses the image of a 3D scene on a 2D medium to reconstruct a reliable and accurate model of the original 3D scene.

How can white light scanning benefit me?

Services which may be of interest to your industry such as reverse engineering and CAD re-creation can be provided using white light scanning. The remote sensing, non-contact measuring feature of the ATOS III system is fast and extremely accurate. It allows the retrieval of up to 4 million surface points in under a minute and creates a reliable database enabling part measurements and verifications.

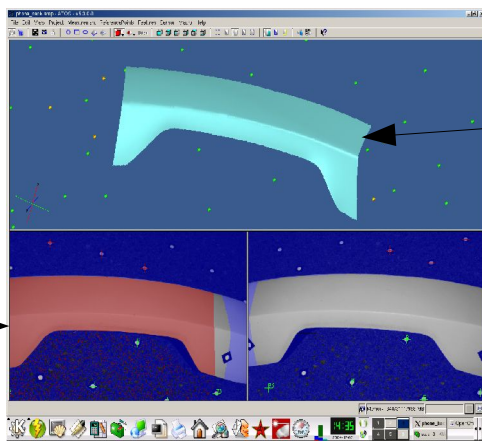
The Process:

As a non-contact measuring device, the ATOS III system retrieves all of its data through photographs. The system is comprised of a projector and two cameras which are mounted to a frame. By projecting a fringe pattern onto an object and simultaneously recording the pattern, the software is able to create an accurate point cloud of up to 4 million points of the surface of the object. For larger projects, reference points are added which allow a quick and accurate way to join together multiple measurements. The ATOS III system is able to take on projects from the size of a dime up to the size of an airplane. After the measurements are taken, the software processes the data creating a single point cloud file with a common point of origin. The data can then be aligned and manipulated to suit the needs of the required task.

Step 1:

take a single measurement

data retrieved with left hand camera



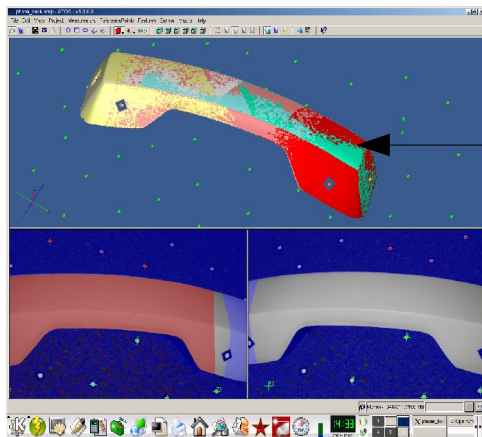
combined data from the left and right cameras creating a polygon mesh from a single measurement

data retrieved with right hand camera

Step 2:

join together multiple measurements

measurements

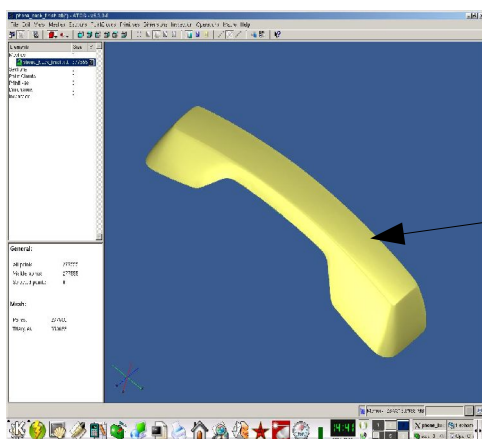


multiple measurements joined together using reference points

Step 3:

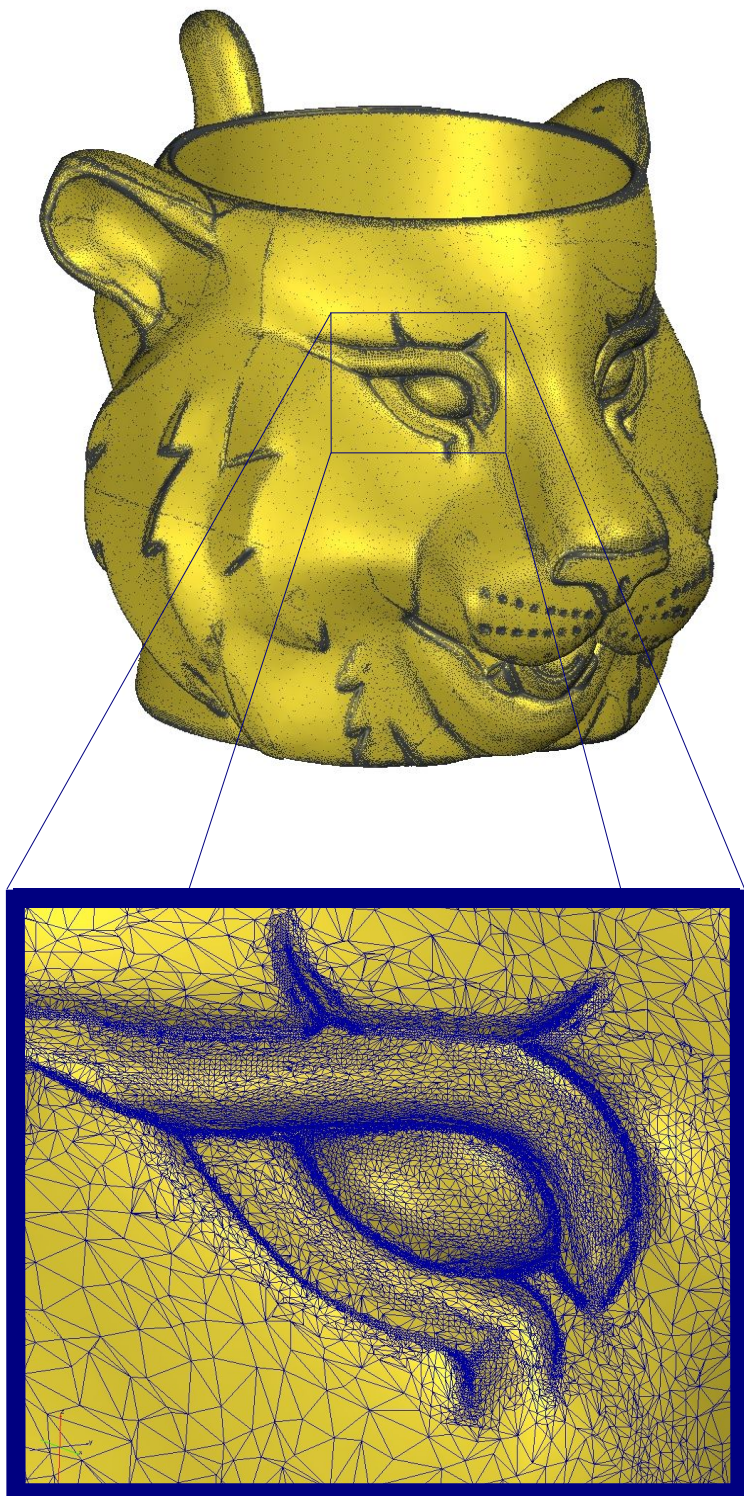
process the data and align the part

finished data after processing



The Results:

After all of the scans have been taken and processing has been completed, the 3 dimensional object is now part of the virtual world. The information retrieved can now be worked on and exported as either point clouds, sections, or STL data. The STL data, which is comprised of small triangular surfaces and is automatically created from the point cloud, can be used for machining or creating surface files.



processed data illustrating the point cloud

STL data illustrating the small triangles created from the point cloud

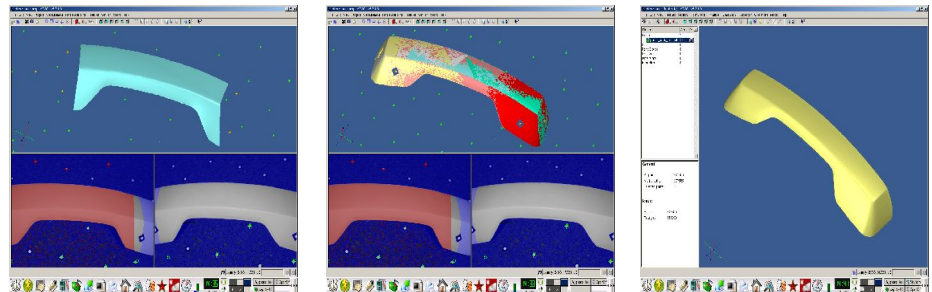
Reverse Engineering:

Using the ATOS III system, surface data of an object is obtainable quickly and accurately. Laborious jobs such as reverse engineering and CAD re-creation are now possible in a very efficient and affordable manner.

Creation of a core and cavity block from a piece part:

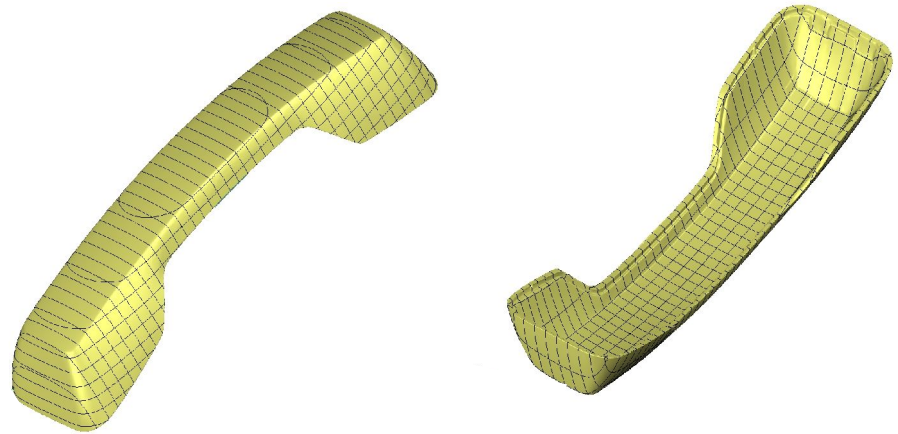
Step 1:

an STL file of the piece part needed to be created



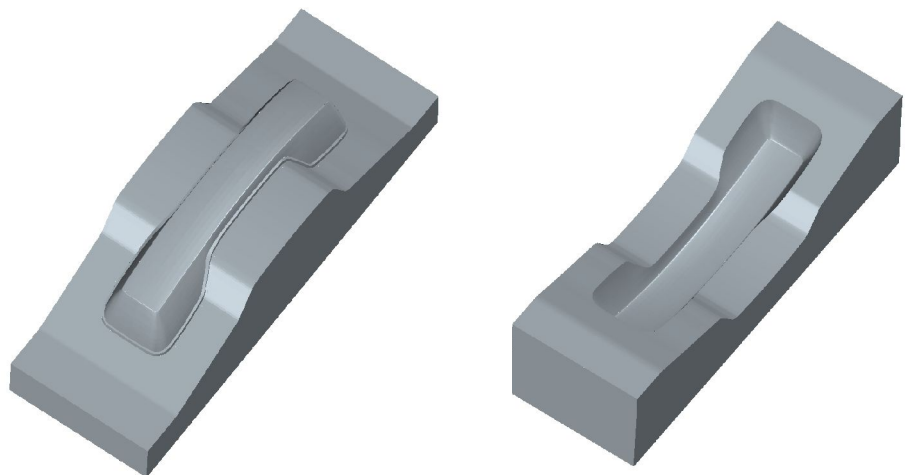
Step 2:

a surface file (igs.) needed to be created from the STL file



Step 3:

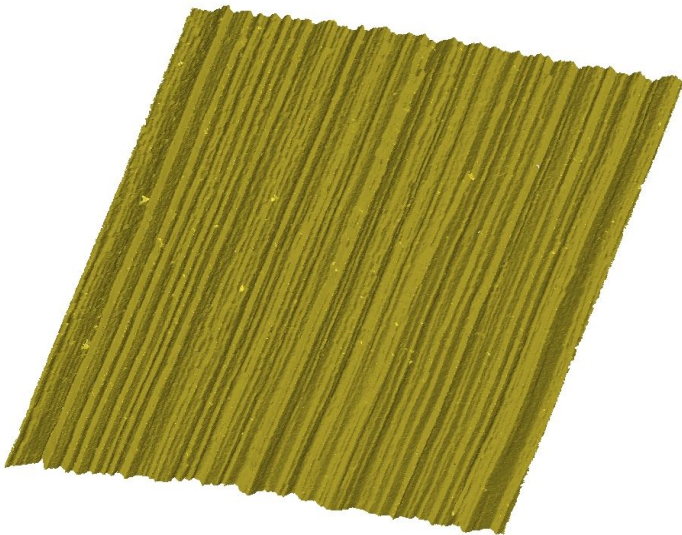
a parting line is established and a cavity and core are created



CAD Re-creation:

Creating surface data, from items such as soft surfaces and extremely contoured surfaces, was previously impossible. Now, in less than one minute, one scan from the ATOS III system can retrieve up to 4 million points with less than .003 of an inch spacings between them. Using this high resolution white light scanner, re-creation of these items are possible.

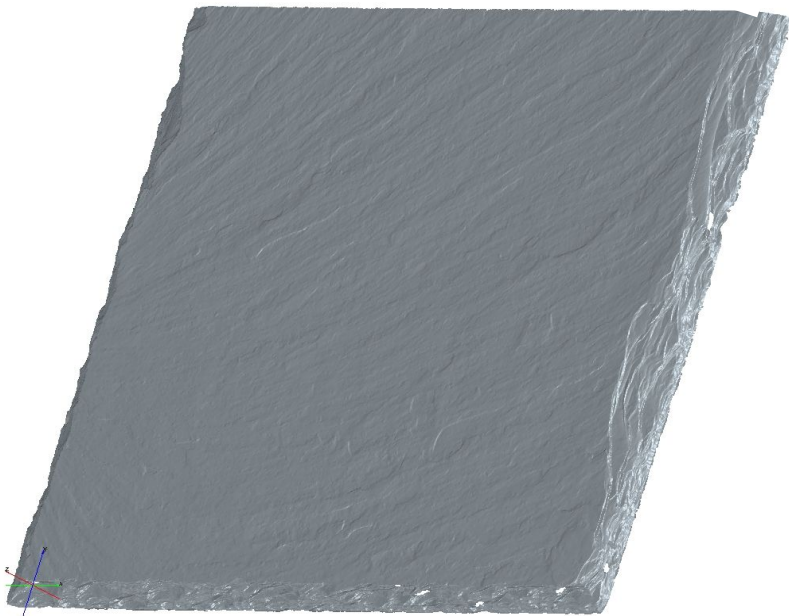
Some examples:
wood grain



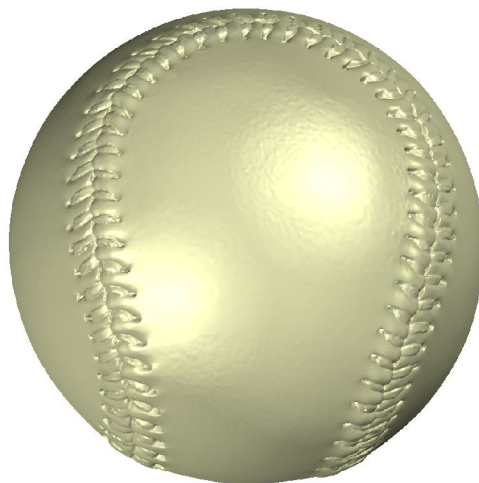
3 ft. by 3 ft.
section of the
fuselage of an
airplane



piece of slate



baseball

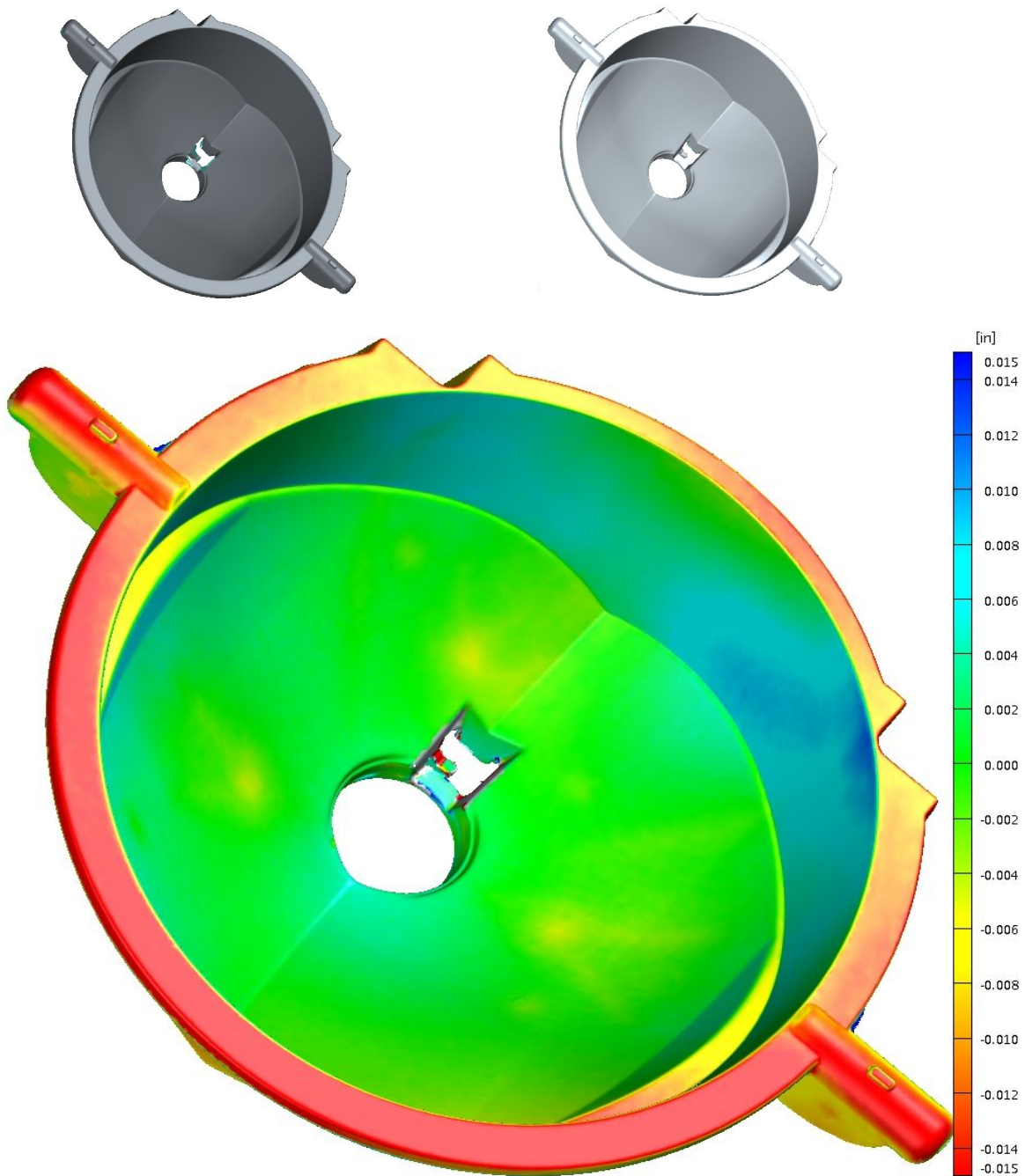


Quality Control:

By creating a virtual model of an object scanned, any measurement on that object can be accomplished. Graphical analysis in the form of colored meshes or simple dimensions can all be obtained from the STL data. By overlaying the STL file with the original CAD data, deviations in piece parts can be viewed.

Case study:

Two piece parts were molded from the same mold using different materials. The purpose of the inspection was to determine how much the different materials were warping and shrinking compared to one another. STL files of the two piece parts were created and overlaid. A colored deviation mesh was then created, enabling the visualization of the differences.



Closing:

At Chicago Mold Engineering Co., Inc. we set our sights on exceeding our customers' expectations. We offer consistent quality, commitment to customer service, on-time delivery, and a dedication to maintaining the highest levels of design and manufacturing standards and capabilities. Please contact us for further information or for a demonstration of the ATOS III system. We feel certain that we will exceed your expectations.

Designing and Building Quality Injection Molds Since 1944

Manufacturing

- Injection, Compression and Multicolor Molds
- Mold Repair and Maintenance
- High-Speed Machining
- EDM Services
- Gundrilling
- Inspection Services

Engineering

- CAD Design and Modeling
- Reverse Engineering
- Upgrades and Changes to Existing Designs

See a full list of our services and capabilities at our Web site:
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