



PLTW Engineering

12/Reverse Engineering 3 of 4 – 3d Metrology and Scanning

May 20, 2020



12/EDD

Lesson: 5/19/2020

Objective/Learning Target: Students will be able to explain the use of 3d scanners as a precision measurement tool.



Metrology and 3d Measurement Scanning

In the previous presentation we looked at a manual hand tool that can measure accuracy up to .100”

In today's slides we will look at the ultimate in digital precision measurement tools - the 3d scanner.

3d scanners can measure with accuracy easily at 0.050” or even less.



Metrology and 3d Measurement Scanning

3d scanners can be used at various stages of the product development process to help support product creation and manufacturing.

Using this tool is a highly specialized skill set but no other tool can as quickly acquire and reproduce such accurate geometric data about the part being shot.



Commercially available 3d scanners

Commercially available 3d scanners range in price from \$7,500 to \$300,000.

This price range depends on many factors - mostly being portability, size, and accuracy.

Some of the manufacturers are Creaform, Hexagon, FARO, etc.

Commercially available 3d scanners





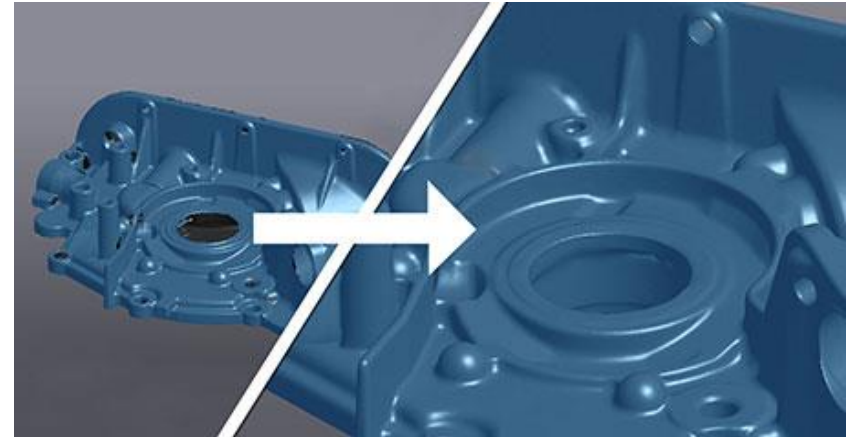
Commercially available 3d scanners

Take a look at this video to see some one using a Faro scanner to shoot a wheel.

[FARO Blue Laser Technology](#)

3d scanning software

Once the data is scanned into the computer, software is used to correct any problem areas the 3d scanner didn't interoperate as sooth as others.



3d scanning software

After the software has helped to smooth any imperfections in the CADD mesh surfacing, the software can export to any of the major solid modeling programs used by engineers and designers.



Other uses for 3d scanning

Another use for 3d scanning in the manufacturing environment is for part inspection.

Installed inside of a machine, or Attached to a robotic arm the 3d scanner can inspect parts as they are produced.

Taking measurements from pictures.



Other uses for 3d Scanning

This racing team uses 3d scanning to inspect parts after they have been used to determine the rate at which they are deteriorating and will need maintenance or replacement.





Quiz yourself

1. **How has 3D scanning impacted quality assurance in manufacturing?**
2. **What are the biggest misconceptions regarding 3D scanning for quality assurance?**
3. **What do you think are the most common mistakes you see when using 3D scanning?**
4. **What advice would you offer on purchasing a 3D scanner?**
5. **What's the most interesting or exciting 3D scanning application that you've seen?**



Helpful links

[Creaform](#)

[FARO](#)

[Artec](#)