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The Use of 3D Scanning in the Defense of Product Liability Cases: Practical Issues, Discovery and Admissibility at Trial

I. How 3D Scanning Works

A. Depictions of Equipment

3D scanning is a high-tech method of measurement. A computerized camera is mounted on a post. The computerized camera scans a designated area thousands of times per second. The computerized camera uses designated-reference points for scaling. The reference points are set out with markers. Photographs of the equipment will be shown during our presentation.

B. Applications and Accuracy of Measurements

3D scanning can be used for modeling, computer animations, and demonstrative evidence and admissible evidence at trial. 3D scanning information can also be used as the basis of accident-reconstruction calculations, either by input into other peer-reviewed-accepted programming, such as the computer-program suites available in accident reconstruction.

3D scanning measures an entire object or scene within thousandths of an inch. The ability to measure within thousandths of an inch actually creates evidence that was not capable of being measured before 3D scanning.

3D scanning is different than 3D printing. 3D scanning is a method of taking measurements. 3D printing is something one might do with those measurements. The data that is measured through 3D scanning can be put into a 3D printer and the 3D printer then uses material in particulate form to build something. This type of additive manufacturing is similar for all 3D printers.

3D printers may also print objects based on other information such as CAD, blueprints, conventional photographs, or other forms of measurements fed into the 3D printer.

Not all 3D scanning measured data must be used for 3D printing as noted above. The 3D scanning data can be used for many purposes and is, in fact, frequently

used to form the basis of accident reconstructions. It is the most accurate data to be put into accident reconstruction programs and for computer animations.

C. Costs of Scanning

The equipment is expensive. There are a number of competitors that manufacture the equipment. Nevertheless, the equipment is an investment of \$15,000 or more depending on the manufacturer of the equipment.

The overall cost for measurement of an accident scene in a fire case or an automobile product liability case is the range of \$2,500. This includes the fee for a technician from a consulting firm plus the time for conducting the measurements. Raw data can be stored in the cloud or in conventional media.

At the beginning of a lawsuit, notify interested parties that you are proposing a 3D scan of an accident scene or other evidence. Suggest the mutual retention of a technician to operate 3D scanning equipment and to share the data with everyone. This shares the costs and then facilitates in the use of data as a basis for trial evidence when the time comes. If the parties will not agree, it is still worth it to proceed especially in a severe-injury, high-exposure product-liability case.

1. Use of Experts

Consulting engineers invest in 3D scanning as part of their business plans. 3D scanning is becoming so popular that major consulting firms have all been required to invest in 3D scanning. It has become the most persuasive method of presenting evidence in court.

Typically, an outside expert is required to operate the equipment. The operation of the equipment is complicated enough that it is beyond the capability of the average layperson in the absence of a dedicated-study course.

Equipment used for 3D scanning must be calibrated. Each manufacturer has calibration procedures and recommended intervals. It is the responsibility of the consulting engineer who operates the equipment to provide adequate documentation of a timely calibration.

2. Measurements of Accident Scenes, Accident Products, & Exemplar Products

3D scanning can be used to produce models of products or accident scenes.

3D scanning can be used to measure exemplar products. Of course, we have issues in product-liability cases as to whether a product was manufactured to specification. One can determine whether products

were manufactured within specified tolerances by 3D scanning exemplars and accident products.

It is important to measure all relevant objects in each product-liability case. Mating surfaces among objects that hit each other can be measured and scaled with meticulous accuracy. Scratches and gouge marks can be measured. The exact contours of surfaces that have melted or been impacted, can be measured and then later recreated.

II. Benefits of 3D Measurements

There are many advantages of 3D scanning they include:

A. Preservation of Evidence

3D scanning has also become the most reliable method for preservation of accident scenes, accident products, and other evidence, in the form of measurements. This is a redundant method of preservation in addition to preserving objects themselves.

B. Accuracy & Speed, Safe to Gather Quickly

3D scanning is safe method of measuring an accident scene. 3D scanning equipment can be placed on the side of any road or highway. It will scan so accurately that it will scan the height of every curb and every topographical measurement. It does this even while traffic may be passing by.

Traditional methods of measurement, such roller tapes and tape measures are accurate, but 3D scanning technology allows for measurements to within thousandths of an inch. This means measurements of everything visible within a designated-accident scene or every part of a designated product or other piece of evidence measured to within thousandths of an inch. There is a general acceptance in the scientific community regarding the software, hardware, and 3D scanning methodology.

C. Simplified Chain of Custody

Raw data can easily be duplicated for production to other parties or for redundant storage in the form of a portable media.

Immediately produce the raw data from 3D scanning to adverse parties who did not participate in any measurement. A high-minded defendant realizes that the physical evidence should be the same for everyone. There could be disputes about the interpretation of physical evidence, but the actual measurements should be freely dispersed so there is certainly nothing to hide and no benefits to raising obstacles just to pursue a segment of the costs.

There are larger goals at stake in the defense product-liability claims.

D. Basis for Demonstrative Evidence

3D scanning data can be used to readily prepare a variety of demonstrative aids and trial exhibits.

III. 3D Modeling

A. Examples of “Fly Through” Renderings

3D scanning can be used to depict fly through views of accident scenes. It can even be used to do a fly-through of an accident product, such as the inside of an automobile or the control carrier of an industrial machine. Fly throughs will be depicted during our presentation.

B. Examples of Modeling

The measurement of 3D scanning has some cost-effective benefits in that it makes the use of accident-reconstruction programs, computer animations, and the preparation of scaled models much easier and the money invested in 3D scanning is recouped when these items are able to be prepared for much less than they would have back when they relied on the input into a computer of manual measured data.

IV. Discovery Issues

Shared Measurements, Protocols, and Shared Data

Discovery Demands and Production Data

Discovery Disputes and Case Law

The data is certainly discoverable. It is a measurement. If it is requested by an advisory in litigation, it should be produced. There are few court decisions addressing this issue. Some defendants may ask for adverse parties to share in the costs of the 3D measurement before they share the raw data. But in practicality, this can be short sighted. The benefits of 3D scanning will be worth it when it comes time to offer evidence at trial.

Defendants will be hard pressed to argue that raw measurement data is not discoverable. It is understandable how defendants might feel that they extended a large amount of money to take these measurements and they will feel pressured into having to give them for free to adverse parties.

V. Admissibility At Trial

In preparation for trial, it is best that the data has already been shared with adverse parties. The data and any demonstrative aides or trial exhibits prepared by defense expert should be produced through the expert's deposition and subject to cross examination.

Of course, one can expect that a plaintiff's attorney will nitpick and attempt to criticize every aspect of the measurement system starting with calibration and moving on to the possibility that things were different at the time of the measurement than they were at the time of the accident. But there is no question that those issues of fact are readily addressed and they will be the same for both sides in the case. The practical method of measuring everything as quickly as possible after the accident has always been obvious to all defendants and it stands true in the context of 3D printing.

A. Required Witnesses

In preparation for *Daubert* challenges, each expert should have experience with the equipment that he/she has used and there will be a body of engineering organizations that use that equipment in non-litigation context that form the basis of peer acceptance. This is a simple matter of review with defense expert who prepares to offer evidence at trial.

1. Foundational Witnesses

Of course, outside consultants are necessary in order to provide the foundation necessary to offer the measurements into evidence at trial.

B. Scaled Evidence, Repeated Use of Different Scales

Scaling is such a big advantage of 3D scanning that it is worth mentioning by itself. In some product-liability cases accident products are so huge that they could never be presented in a courtroom. Courts are reluctant to permit juries to travel to visit accident scenes or look at large accident products such as industrial machines or ships, tractor trailers, etc. 3D scanning allows these things to be modeled and presented as accurate-scaled models in court. The models of various scales can be prepared. Similarly, when data is put into accident-reconstruction programs, 3D scanned information makes scaling automatic.

C. Adaptability of Computer Animations

The 3D scanned data can be used in a variety ways and presented as evidence at trial. Particularly if the raw data has been shared with the adversaries and the actual model has been produced during discovery to the adverse parties.