

## DATASHEET

## 3D LASER SCANNER FOR COIL SPRINGS

### GENERAL DESCRIPTION

Fully automatic system for 3D laser scanning of coil (helical) springs in free and loaded (up to 10 t) condition.

The system allows to measure spring outside diameter, pitch, free length and the length under tension, wire diameter, spring index etc.

To perform measurements, a coil spring is put to the strain gauge platform. Electromechanic cylinder rod goes through the spring. Then the rod is fixed in the top point by C-shape lock. Going down, the cylinder creates necessary pressure. Laser sensors, located on the rotating ring, moving by spiral trajectory scan external surface of the spring.

The system scans spring geometry in free and then in loaded condition. The software allows to measure all necessary dimensions, compare 3D profile of the spring with a reference model as well as 3D profiles of the spring in free condition and under tension.

### APPLICATIONS

Coil spring measurements in laboratories and workshops. Analysis of spring wear and tear during operation. Tracking changes of spring geometry during an endurance test. Tracking changes of spring geometry after each technological operation: coiling, hardening, tempering, shot blasting etc.

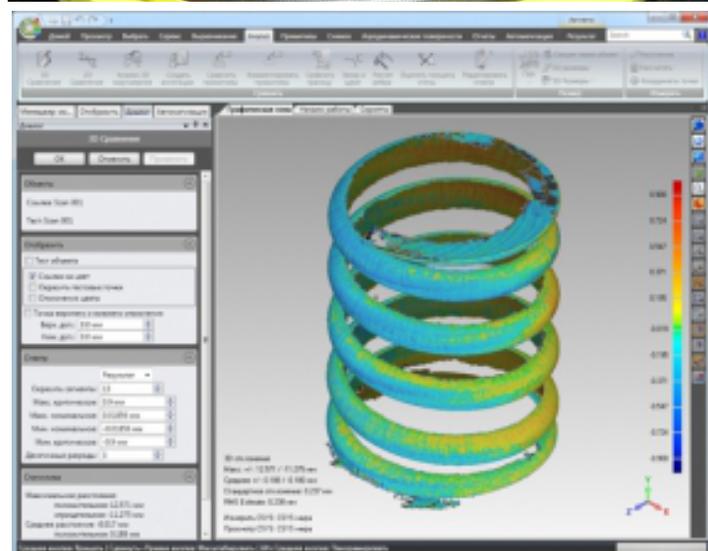
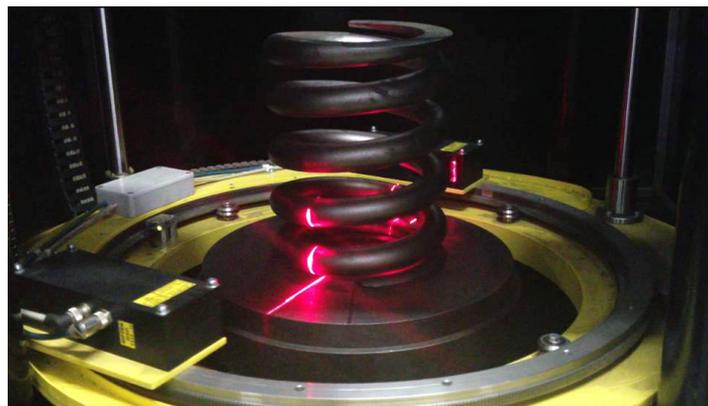
### SPECIFICATION

#### Measurable springs

Spring diameter range, mm	130..330
Spring height range, mm	160..510
Tension range, N	200..100000

#### Measurable parameters:

- Wire diameter;
- Spring outer diameter in cross-section;
- Average spring outer diameter;
- Inner spring diameter (calculated value);
- Spring height in free condition;
- Spring height under estimated static load;
- Spring height under estimated workload;
- Spring height under test load;
- Number of active coils;
- Total number of coils;
- Nominal pitch of working coils;
- Pitch of inactive coil;



#### Accuracy

3D scanning accuracy without tension,mm	+/-0.1
3D scanning accuracy under tension,mm	+/-0.15
Strain gage accuracy, N	+/- 100

#### Software

The systems is based on Geomagic Qualify/Control X software.

\*) Geomagic is a product by 3D Systems.

Geomagic Qualify/Control X is a comprehensive metrology software platform that delivers the industry's most powerful tools within straightforward workflows.

## SOFTWARE

The process of scanning is operated by D-TEST plug-in for Geomagic which controls all the mechanisms, load cells and laser scanners. The plug-in transmits measured points from the laser scanners to Geomagic software.

Using Geomagic features 3D profiles are cleaned up, merged and passed other pre-inspection processes. With Geomagic Software you can analyze the size, shape and location of deviation groups. This key inspection capability allows you to quickly identify and measure surface deviation, including dents, corrosion, and other types of wear. Automatic measurements allow for quick and turn-key inspection.

The new Multi-Alignment Inspection capability allows you to create repeatable inspection routines that require measurement in different alignment environments. This is especially useful when inspecting parts that could have large deformations.

- Auto-create geometry and measure between features using different alignment schemes.
- Repeatable set up allows for automated inspection of the most deformed parts.

Reporting has been enhanced giving users more tools to easily create inspection reports to analyze their results with:

- Data table templates allow for more flexible reporting
- Result Navigator information can be inserted into reports
- Users can now export into a 3D PDF format
- Algorithm improvements that decrease calculation times by ~33%

## OPTIONS

### Also available:

Revision for cars and trucks coil springs - more precise system with the tension range up to 5 t.  
Revision without the tension module but with an addition laser sensor to scan internal surface of spring.

### Options:

- Reference set for laser scanner calibration;
- Reference set for load cell calibration;

## OVERALL DIMENSIONS

Length x Width x Height, mm	1200x1200x2400
Weight, kg	1200