



# THoT Technologies, Inc.

## Model 42030 Optical Defect Scanner for Production Use with Automation



The Model 42030 Series Optical Defect Scanner consists of the equipment rack (pictured at right) with built-in spin stand. The spin stand can be equipped with an optional burnish and degauss station.

The equipment rack contains the pneumatics controls, the keyboard, monitor and mouse drawer, the computer system, electronics signal processor drawer, programmable filter, laser controller, laser, servo driver and stepper driver.

The spin stand is mounted on top of the equipment rack and contains the air bearing spindle and slide with laser probe(s) and, as pictured, can also hold an optional burnish station for finished media.

This tool is designed for disk manufacturing process defect detection for cleanliness and surface finish control. It uses laser Doppler

vibrometry (LDV) to measure the surface of the disk. LDV technology is extremely accurate in the separation and measurement of pits and asperities.

Data is processed in the analog electronics signal processor and digitized with multi-channel high speed analog to digital converters 1024 times per revolution. The data is velocity information containing the high speed velocity signature of defect information. Low frequency information concerning surface topography is filtered out to allow the high velocity signatures of the defect information to be captured. These defects are critical for low flying Perpendicular Magnetic Recording (PMR) media.

A programmable defect capture circuit allows the user to select one of three levels of sensitivity. The levels allow the full sensitivity of the system to be applied to very low defect levels on very smooth surfaces. For example, cleanliness of a polish process may be checked at a low sensitivity while pre-sputter wash may require a very high sensitivity. Defect capture ranges are a gain of one with a maximum measurement limit of 1024Å, gain of four with a maximum of 256Å or a gain of sixteen with a maximum of 64Å

One of the most important features of this tool is the excellent repeatability and tool-to-tool correlation coupled with the ability to calibrate to virtually any repeatable reference source.

The tool can be configured with several options to provide the user with flexibility to meet the needs of their exact requirements for process control or incoming quality control. These options include:

**Optical Glide™ / Optical Certification™ (OGC):** This is the basic defect test feature and allows the user to examine defects that rise above the surface, asperities (Optical Glide) and those that protrude into the surface, pits (Optical Certification). This is a standard feature on all Model 42030 ODS's.

**Nano-Scan™:** This option allows the user to scan the surface at a very fine resolution and, with a deconvolution technique, defects can be sorted by size and classified. Defect location (radius and angle) along with defect size and classification as well as height and depth are all captured.

**Defect Reflectivity:** This feature allows the user to examine the surface for reflectivity changes that are commonly associated with defects in the carbon protective layer or underlying stains and contamination.

**Burnish and Degauss:** This option adds a head burnish stage for finished media or drive media rework. It includes a dual-sided burnish station with quick change heads and automatic alignment. A degauss fixture can be added to the burnish arms if required.

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