



# THoT Technologies, Inc.

## Model 42020 Optical Engineering Tool



The Model 42020 Series Optical Engineering Tool consists of the equipment rack (pictured at right) and a stand-alone spin stand. The spin stand is available in several models depending on the intended application.

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

The spin stand is coupled to the equipment rack via pneumatic lines for the air bearing spindle and slide, an electrical umbilical cord for the

motion control signals and an armored fiberoptic cable for the laser.

This tool is designed for the user specified application(s). This configuration is only used where highly specialized applications are required. For example, the Flyability™ option is only available on the Model 42030. Likewise, the Drive Test Option and Drive Flyability Option are only available on the Model 42030.

No picture of the spin stand for this model is provided as the spin stands are either special designs to meet a specific customer requirement or they are modified versions of the small spin stand used on the Model 42010, large spin stand used with the microscope on the Model 42040 or integrated tools used on the Model 42030 production version.

This tool can be equipped with features of any of the Model 42000 systems including:

**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 (OG) and those that protrude into the surface, pits (OC).

**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.

**Filtered Waviness Testing (FWT):** This is the basic morphology feature and allows the user to examine programmable wavelengths including roughness through waviness.

**Runout / Velocity / Acceleration (RVA):** While most are familiar with runout specifications, it is the acceleration specification that is most important when using different head configurations with various drive spindle speeds.

**Power Spectral Density (PSD):** This is one of the most powerful tools to examine and control the disk manufacturing process. This function allows the user to take up to four programmed radii of the full spectrum of the surface topography and examine it in detail.

**Reflectivity:** This feature allows the user to examine the surface for reflectivity changes that are commonly associated with stains and contamination haze and discolorations.

**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.

**Defect Analysis Station:** The Model 42020 Engineering Tool can also be configured to use the Model 42040 Defect Analysis Station as the basis and include the microscope system. This may limit the application, for example, it could not be combined with the Burnish and Degauss functions.

In addition to these standard tests that are available on the other tools, there are special test options that are only available on the Model 42020 tool:

**Head Flyability Adapter:** This feature uses a head mount adapter to hold two heads along the center-line of travel of the laser. Two heads are used to insure that the dynamics of the drive are maintained. For single-sided applications, the user can install only the upper head. Adapters are provided to mount both laser beams in a downward facing orientation (the dual beam option is required). One beam tracks the head while the second tracks the disk. Heads can be skewed up to fifteen degrees and positioned to any track to simulate drive conditions.

**Drive Test Adapter:** This test adapter allows the user to mount a drive on a small optical platform located over the spindle. The drive can be scanned for clamp distortion and, by synchronizing the tool spindle with the drive spin speed, other functions such as filtered waviness, PSD and Optical Glide and Optical Certification can be accessed.

**Drive Flyability Adapter:** This uses the same probe adapters that are used in the Head Flyability Adapter to allow the user to position both beams (the dual beam option is required) over the top of the drive and focus one on the head and the other of the disk surface. The user can then map the interaction between the two elements to examine head fly height modulation in relation to the dynamics of the disk surface.

Special features will be considered on request.

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