



ROUGHNESS, WAVINESS AND ROLL OFF FOR DISK MEDIA

Using the MP2100 Non-Contact Surface Profiler System

The MP2100 from Chapman Instruments provides both good vertical height and lateral resolution, providing multi-benefits for disk media measurements. Measurements can be made on either Aluminum or Glass disks. Examples include roughness, waviness and roll off. Roughness control for disk media is important for controlling the small surface features associated with read/write performance. Small differences in disk roughness are often important to control on both Aluminum and Glass disk media. Chapman non-contact systems offer very high resolution to distinguish small differences in the surface roughness. Measurements can be configured from ID-OD with no loss of resolution over the entire measurement, circular roughness geometry and most recently area roughness maps. Waviness control is provided with the same measurement system, in either a linear ID-OD or 360 degree circular measurement. Waviness control is offered with a user selection of spatial filters to examine different lateral affects. The waviness control is useful for read/write head fly control, especially in a circular geometry. Automated roll off measurements are provided on either Aluminum or Glass disks, providing control of the disk shape at the edge. The all-in one measurement solution by Chapman provides roughness, waviness and roll-off control in one measurement system. Figure 1 shows a 2-D contour of waviness measurements using the MP2100. Figure 2 shows a circumferential scan of a disk surface with several of the surface topography statistics. This is only a small representation of the potential surface statistics available. Figure 3 shows roll off measurements at four locations of a disk media with 10mm scan length.

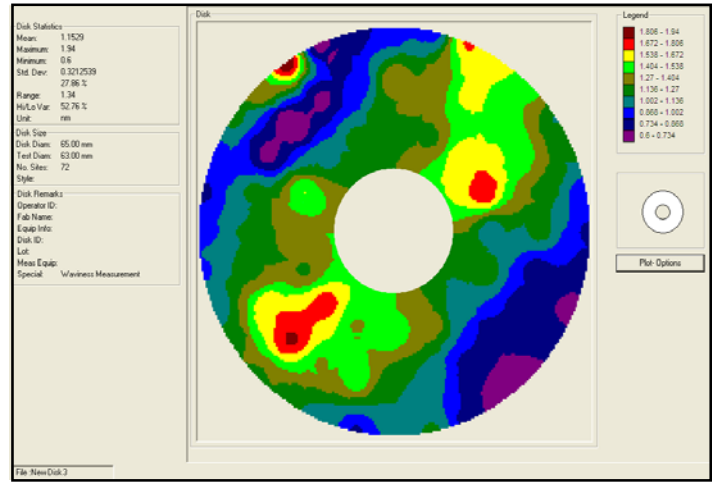


Figure 1: 2-D contour of waviness measurements with 50 to 500 μm band-pass filter.

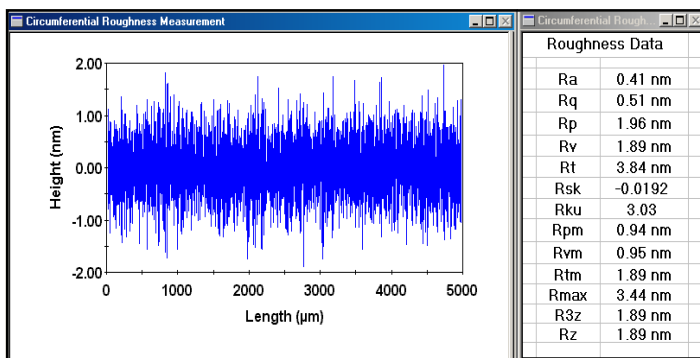


Figure 2: Circumferential measurement surface topography statistic

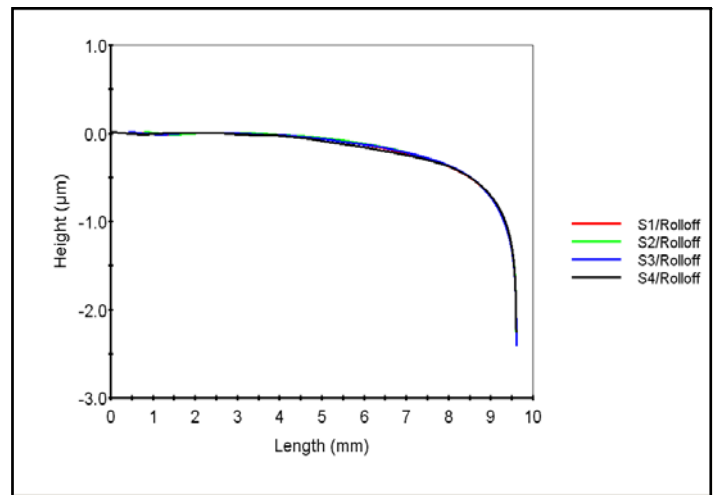


Figure 3: Roll off measurements at four locations on a disk media.

DISK MEDIA SURFACE INSPECTION WITH MP2100

System Features

Applicable to Disk Media
Measurement at any location on planar surface
Integrated CCD Nomarski Viewing System
PC Pentium computer
Windows XP® based operational software
Complete 360° Circular Scan
Autofocus/Autotracking
Programmable sample positioning
Automated event logging and viewing
Password security
Vibration isolation table workstation

Performance Specifications

Vertical Resolution:	0.01 nm
Horizontal Resolution:	0.5 μ m
Linear Scan Length:	Up to 100 mm
Circular Scan Length:	Complete circumference
X and Y Stage Resolution:	1 μ m
Theta Stage Resolution:	0.001 Degree
Data Sampling	50 nm (minimum)

Options

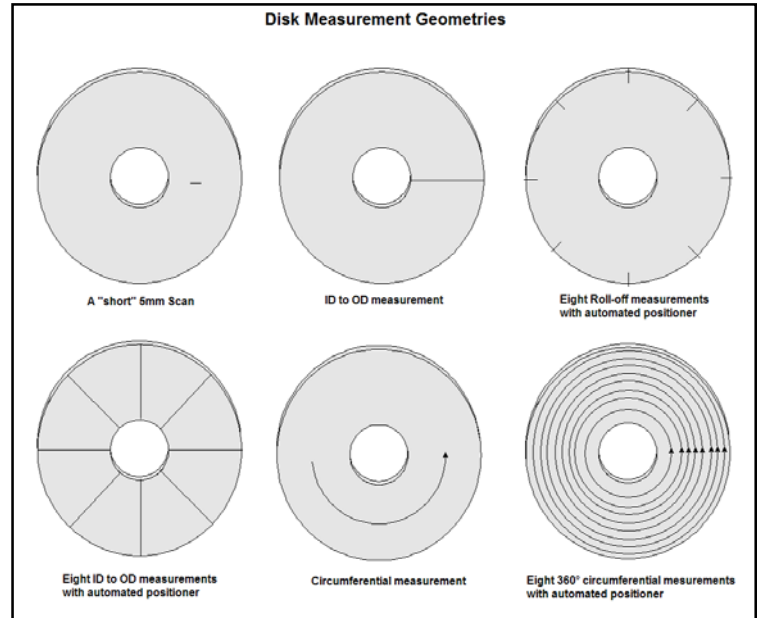
Nomarski Viewing System Printer
Color Printer
NIST Roughness Standard

Software

Roughness Parameters:	Ra, Rq, Rp, Rv, Rpm, Rvm, Rt, Rz, Rsk, Rku, and more
Waviness Parameters:	Wa, Wq, Wp, Wv, Wt
Other Parameters:	Histogram, Cumulative Distribution, Power Spectrum, Slope, etc.
Programmable Cutoff Filter:	Conforms to SEMI, ANSI B46.1 and ISO standards

Disk Media Measurements

- ID-OD Roughness or Waviness Measurements with 50nm data sampling
- Complete 360 degree circular scans at any radius
- Roll-Off Measurements on Aluminum or Glass Disks
- A single keystroke to implement a customized measurement sequence
- Roughness and waviness data from a single scan
- Surface roughness at any location, linear or circular measurement geometry.



Measurement Geometries - Multiples of linear, 360° circular and roll off measurements.

