

# **NANOVEA T100**

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**THE COMPACT  
PNEUMATIC TRIBOMETER**





# ***ULTIMATE TESTING***

*Designed with advanced pneumatic technology,  
the NANOVEA T100 provides controlled loading up to 100 N.*

*For highly accurate and repeatable wear, scratch & friction testing.*

*ADVANCED PNEUMATIC TRIBOMETER WITH  
**PERFECT VERTICAL LOADING***

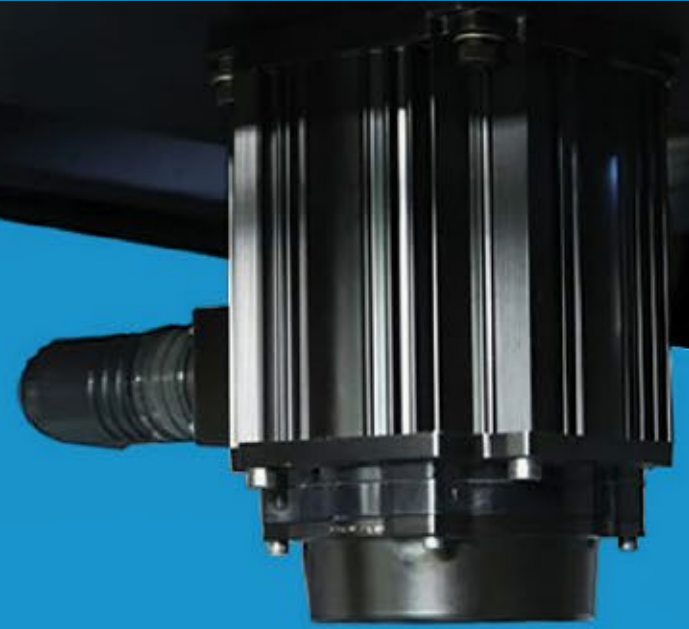
*DIRECT FRICTION MEASUREMENT FROM  
**INDEPENDENT LOAD CELL SENSORS***

*NON-CONTACT PROFILER INTEGRATION FOR  
**WEAR TRACK ANALYSIS***

*SMART MODULAR DESIGN FOR  
**A WIDE RANGE OF APPLICATIONS***

# ***SUPERIOR MOTOR TECHNOLOGY***

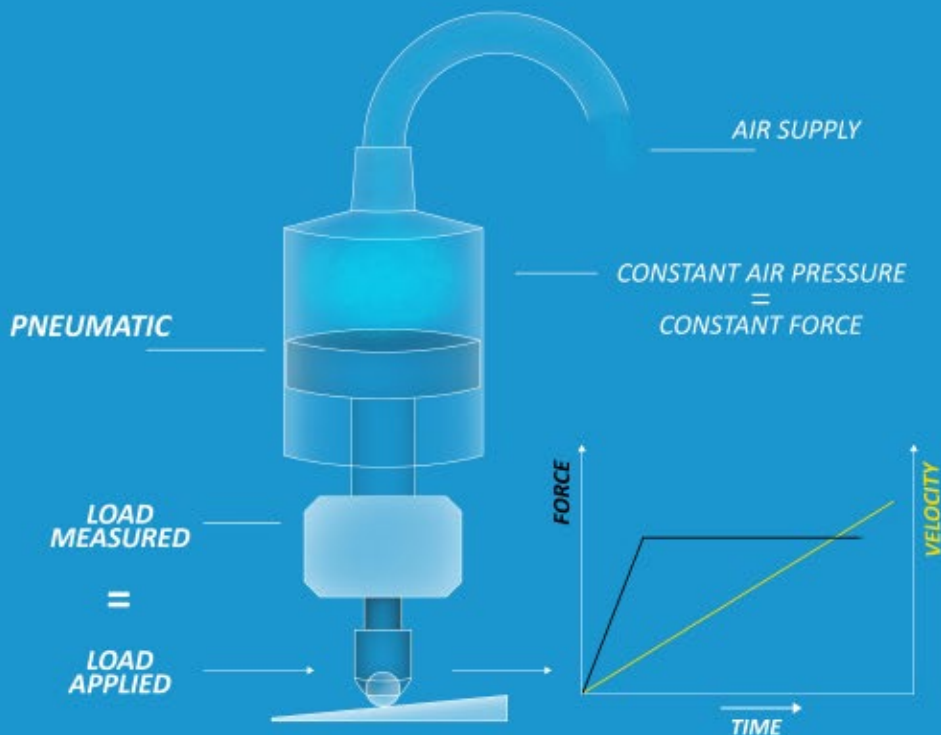
- ***WIDE SPEED RANGE***
- ***UNMATCHED SPEED CONTROL***  
*w/ 20 bit internal speed encoder*
- ***ULTIMATE POSITIONING PRECISION***  
*w/ 16 bit external position* **>0.006°**
- ***STUDY OF QUASI STATIC COF*** **0.01 to 0.1 rpm**
- ***POWERFUL MAX INTERMITTENT TORQUE*** **up to 4.4 Nm**
- ***INSTANTANEOUS SPEED CHANGE*** **0 to 1000 rpm in 0.23 s**



# ADVANCED PNEUMATIC LOADING TECHNOLOGY

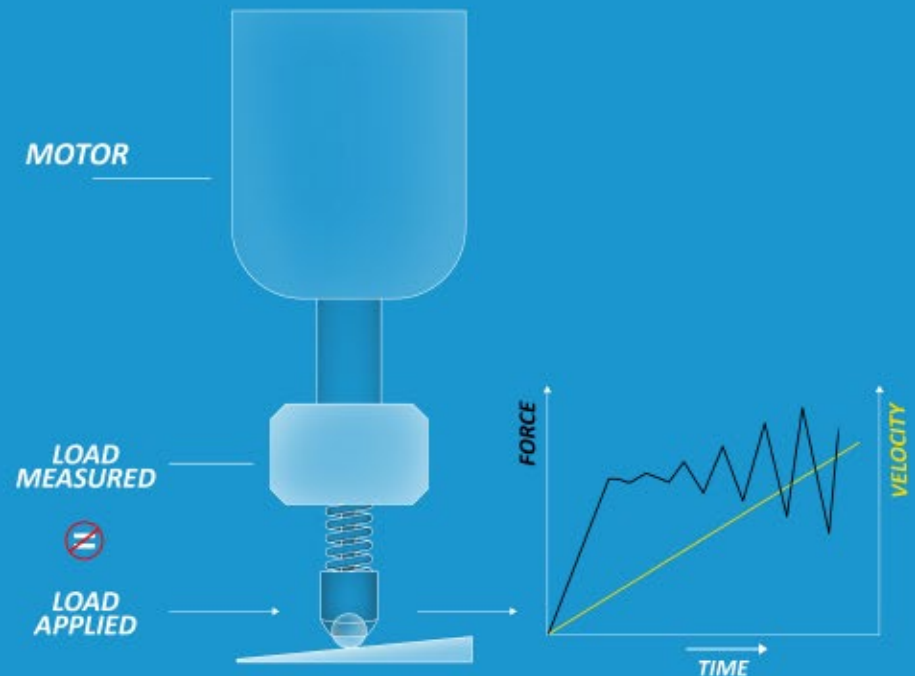
- Accurate Load Measurement (no spring in-between load cell and surface)
- Superiority of air medium as a natural fast damper
- Unmatched normal load stability (for fast speed & rough surfaces)
- Speeds of up to 5000 rpm

## ADVANCED PNEUMATIC



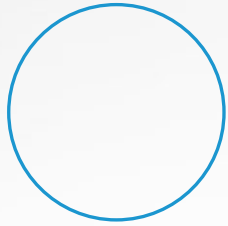
**N** **NANOVEA**

## PASSIVE SERVO MOTOR



**OTHERS**

# TESTING MODULES



**ROTATIONAL**



**LINEAR**



**BLOCK-ON-RING**



**SCRATCH**

## **ROTATIONAL**

<i>MAX ROTATIONAL SPEED</i> .....	<i>5000 rpm</i>
<i>MIN ROTATIONAL SPEED</i> .....	<i>0.01 rpm</i>
<i>SPEED ACCELERATION (0 to 1000 rpm)</i> .....	<i>0.23 s</i>
<i>MOUNTING AREA (Disk Size)</i> .....	<i>100 mm Dia.</i>
<i>OPTIONAL MODE</i> .....	<i>Reciprocating Arc, Spiral</i>

## **LINEAR**

<i>MAX STROKE RANGE</i> .....	<i>25 mm</i>
<i>MAX FREQUENCY (up to 5 mm stroke)</i> .....	<i>60 Hz</i>
<i>MOUNTING AREA</i> .....	<i>62 x 76 mm</i>

## **SCRATCH**

<i>MAX SCRATCH LENGTH</i> .....	<i>40 mm</i>
<i>SCRATCH SPEED</i> .....	<i>0.002-10 mm/s</i>
<i>LOADING RATE</i> .....	<i>0.2-100 N/min</i>

# ROTATIONAL MODULE



## PROPERTIES ANALYZED

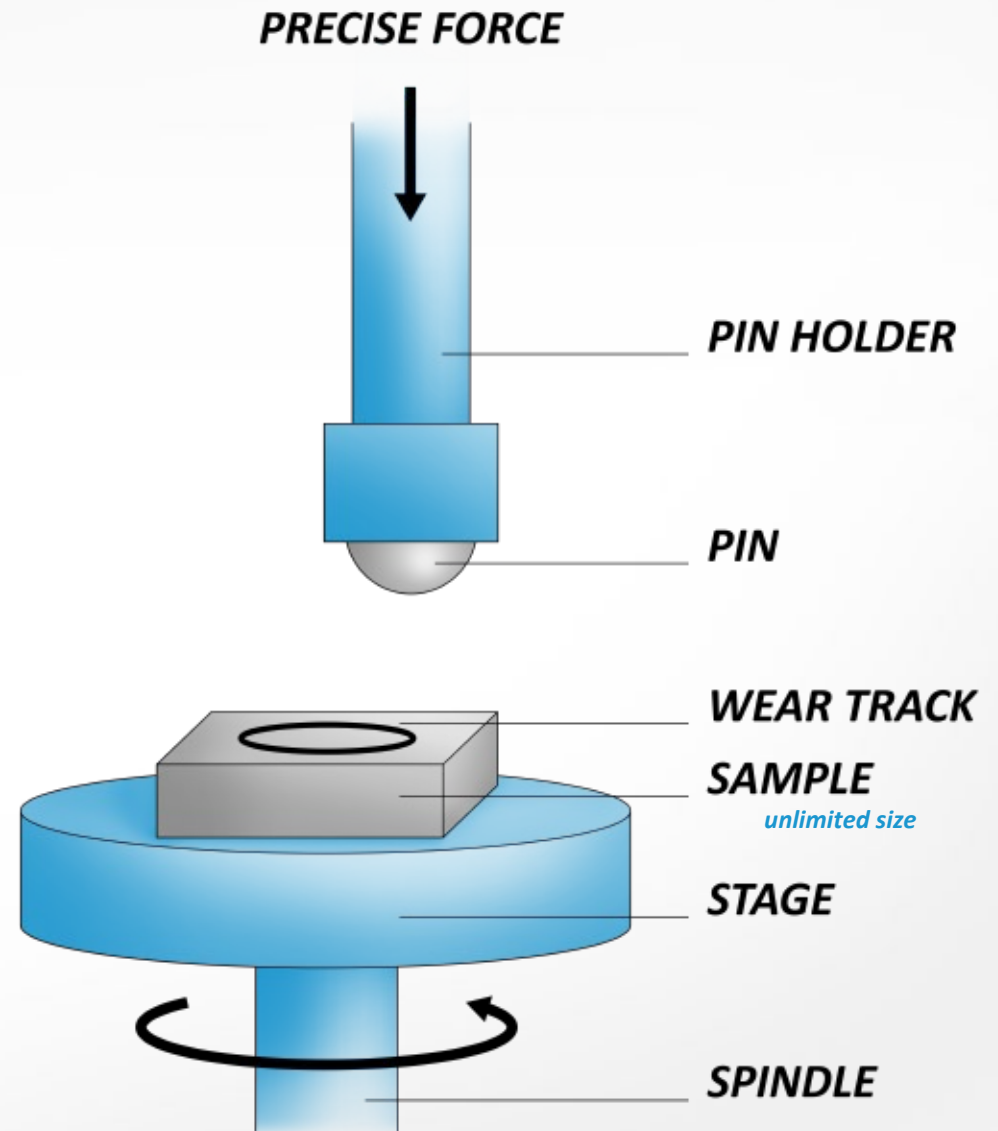
- Coefficient of Friction *Static & Dynamic*
- Wear Analysis
- Stribeck Curve
- Lubricity
- Reciprocating Arc
- Spiral Test
- Friction vs Load / Speed / Time *& more*

## ENVIRONMENTAL MODULES

- High Temp** up to 1000°C
- Low Temp** down to -150°C
- Lubrication** up to 150°C
- Humidity** 10 - 90%/Td
- Gas** inert

## STANDARDS

ASTM G99 ♦ ASTM G132  
DIN 50324





# LINEAR MODULE

## PROPERTIES ANALYZED

Coefficient of Friction **Dynamic**

Wear Analysis

Lubricity

Friction vs Load / Speed / Time & more

## ENVIRONMENTAL MODULES

**High Temp**  
up to 900°C



**Low Temp**  
down to -150°C



**Lubrication**  
up to 150°C



**Corrosion**  
up to 40 N



**Humidity**  
10 - 90%/Td



**Gas**  
inert



## STANDARDS

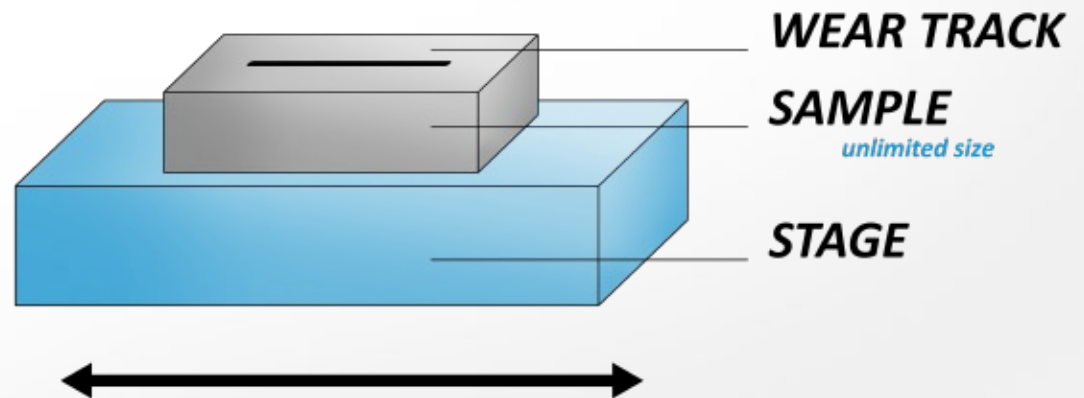
ASTM G132 • ASTM G133  
ASTM F732

**PRECISE FORCE**



**PIN HOLDER**

**PIN**



**WEAR TRACK**

**SAMPLE**

*unlimited size*

**STAGE**

# BLOCK-ON-RING MODULE



## PROPERTIES ANALYZED

Coefficient of Friction **Dynamic**

Wear Analysis

Lubricity

Friction vs Load / Speed / Time & more

## ENVIRONMENTAL MODULES

Lubrication



Humidity

10 - 90%/Td

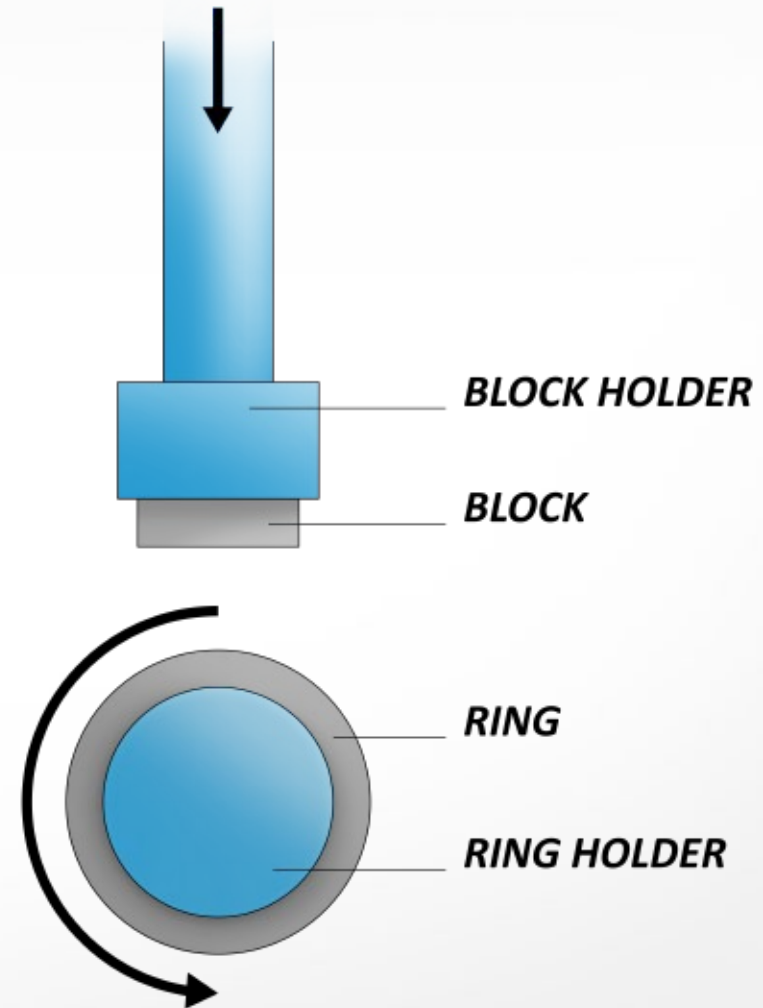


Gas

inert



PRECISE FORCE



## STANDARDS

ASTM G77








# SCRATCH TESTING



## PROPERTIES ANALYZED

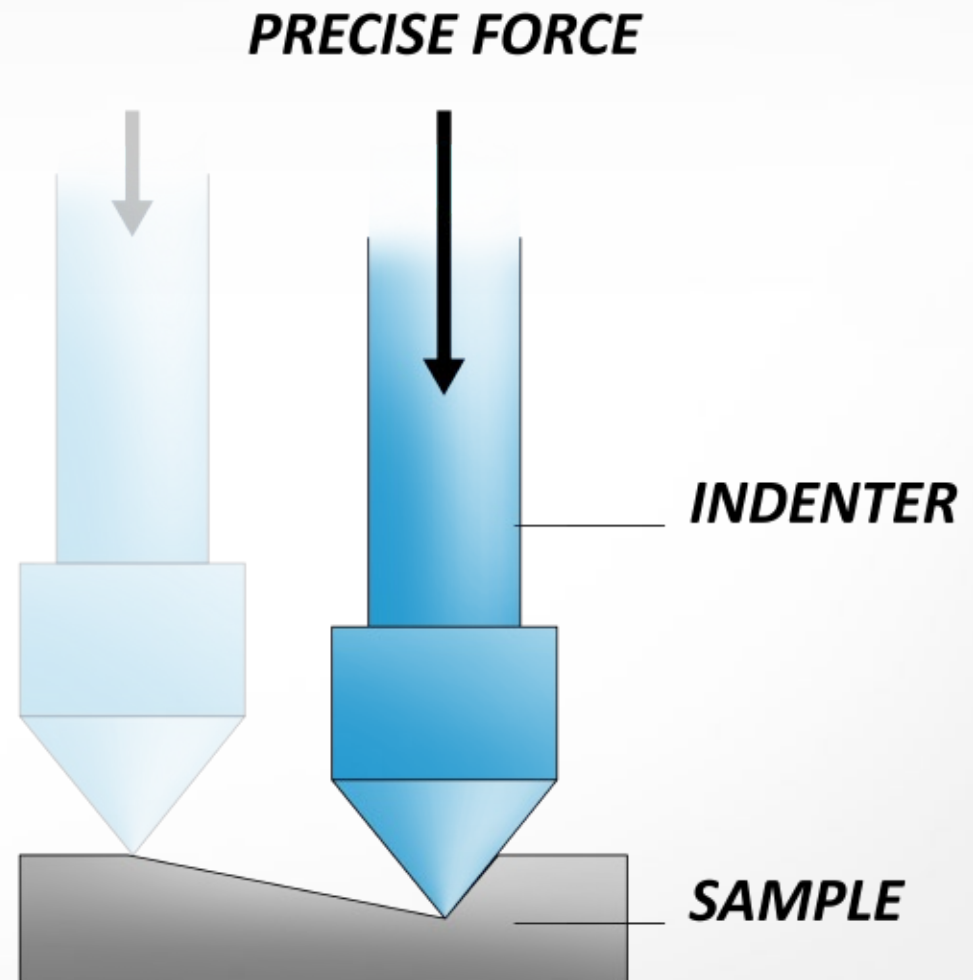
Cohesive & Adhesive Failure / Strength  
Scratch Hardness  
Surface Cracking / Marring  
Scratch Depth  
Acoustic Emissions

## ENVIRONMENTAL MODULES

**High Temp** >900°C   
**Low Temp** down to -150°C   
**Lubrication** up to 150°C   
**Humidity** 10-90%/Td   
**Gas** inert 

## STANDARDS

ASTM C1624  
ASTM D7027 ♦ ASTM G171  
ISO 20502 ♦ ISO 1518  
DIN EN 1071 ♦ DVM-0058-PA

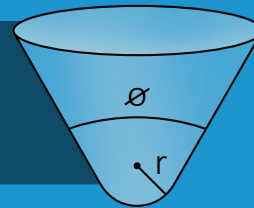
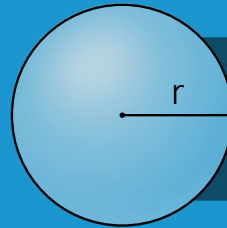


# AVAILABLE PIN GEOMETRIES

## BALL

3 mm, 6 mm, 10 mm, 25 mm

*\* any material + custom sizes upon request*



## CONICO-SPHERICAL

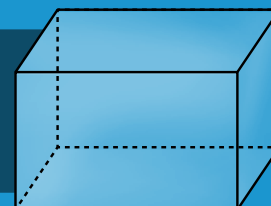
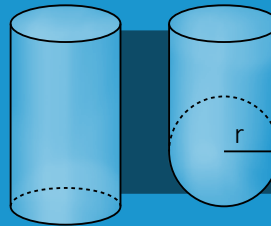
200 mm, 500 mm, 800 mm

*\* custom indenters upon request*

## CYLINDER

3 mm, 6 mm, 10 mm, 25 mm

*\* any material + custom sizes upon request*



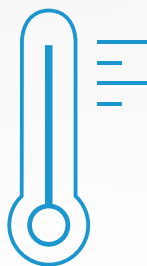
## BLOCK

*for Block-on-Ring*

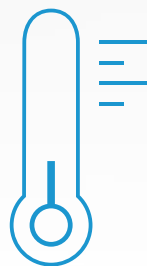
# ENVIRONMENTAL MODULES



**CORROSION**



**HIGH TEMP**



**LOW TEMP**



**LIQUID**



**HUMIDITY & GAS**

## HIGH TEMPERATURE

MOUNTING AREA .....	78 mm <sup>2</sup>
BALL & SAMPLE MAX TEMP <i>for rotational</i> .....	1000°C
BALL & SAMPLE MAX TEMP* <i>for linear</i> .....	900°C

## LOW TEMPERATURE

AIR COOLING MODULE TEMP .....	-10°C to RT
CRYOGENIC MODULE TEMP <i>with liquid nitrogen</i> .....	-150°C

## LIQUID

LINEAR MOUNTING AREA .....	80 x 45 x 25 mm
ROTATIONAL MOUNTING AREA DIA. ....	78 x 25   100 x 30 mm
LIQUID HEATING .....	RT to 150°C
HUMIDITY CONTROL .....	10 - 90%/Td
DROP BY DROP .....	Available

\* higher temp upon request



# CORROSION

## COMPATIBLE TESTING MODULES:

LINEAR (MAX OF 40 N)

## PROPERTIES ANALYZED

Corrosion Resistance - Tribocorrosion Behavior - Wear at Open Circuit Potential - Potentiodynamic Polarization  
Wear at Anodic/Cathodic Potential - Electrochemical Impedance Spectroscopy Analysis



# HIGH TEMP

## COMPATIBLE TESTING MODULES:

ROTATIONAL - LINEAR

## PROPERTIES ANALYZED

Temperature Wear & Friction Data



# LOW TEMP

## COMPATIBLE TESTING MODULES:

ROTATIONAL - LINEAR

## PROPERTIES ANALYZED

Temperature Wear & Friction Data



# LIQUID

## COMPATIBLE TESTING MODULES:

ROTATIONAL - LINEAR

## PROPERTIES ANALYZED

Wear Rates - Friction vs Speed - Stribeck Curve



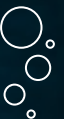
# HUMIDITY & GASES

## COMPATIBLE TESTING MODULES:

ROTATIONAL - LINEAR - BLOCK-ON-RING (CUSTOM)

## PROPERTIES ANALYZED

Friction & Wear vs % Humidity



# VISUAL & MEASURING ADD-ONS

## 2D + 3D OPTICAL PROFILER

*An endoscopic optical sensor can be installed to measure the depth of the wear track.*

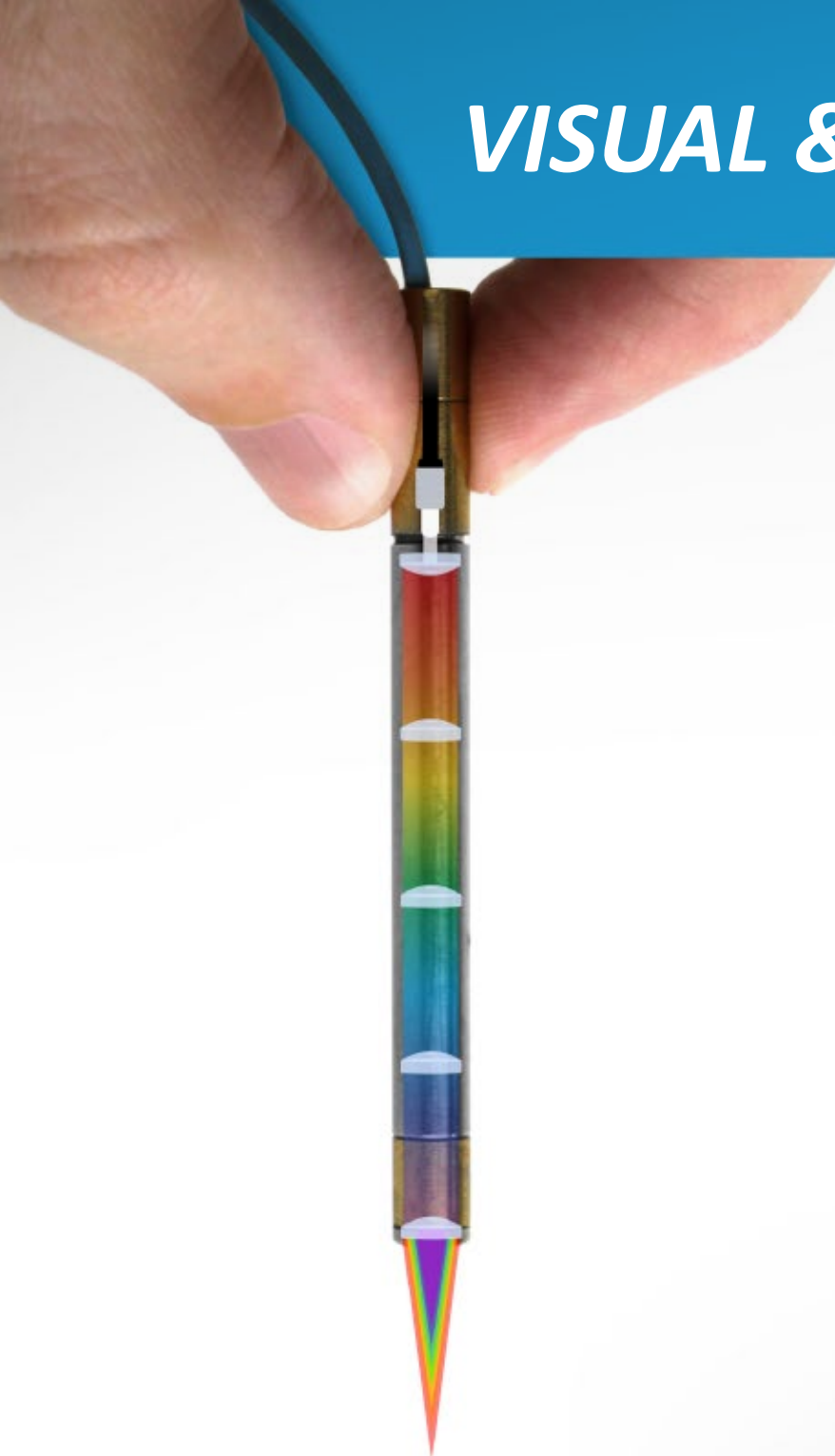
*The **Chromatic Light** technology used in our profilometer line is ideal for tribology applications because it works on any type of material and is the best optical technology for rough high angular surfaces. The profiler, which has a wide measurement capability, can also be used for roughness and many other surface topography studies.*

## DIGITAL IMAGING

*A visual analysis tool in the form of a digital 1.3 MP camera with up to 330x magnification can be installed on a flexible mounting arm or hand-held to capture the surface features created during wear & friction testing. It is also considered to be essential for imaging of scratch tests which allows a user to determine critical failures along the scratch.*

## DEPTH SENSOR

*A high precision depth sensor tracks the height change on the surface during the test. This data can be used to calculate wear rates. It also gives information on rate of wear change during tribology mechanisms.*





# **SPECIFICATIONS**

*of the T100 Tribometer*

<b>MAX TESTING LOADS</b> .....	<b>100 N</b>
<b>LOAD RESOLUTION</b> .....	<b>0.006 mN</b>
<b>FRICTIONAL FORCE MAX   RESOLUTION</b> .....	<b>±40 N   2.4 µN</b>
<b>MAX TORQUE</b> .....	<b>4.4 Nm</b>
<b>20 bit SPEED &amp; 16 bit POSITION ENCODERS</b> .....	<b>Included</b>
<b>X MOTORIZED TRAVEL</b> .....	<b>50 mm</b>
<b>DEPTH SENSOR RANGE   RESOLUTION</b> .....	<b>2 mm   0.1 nm</b>
<b>INSTRUMENT DIMENSION</b> .....	<b>65 x 52 x 65 cm (Benchtop)</b>
<b>WEIGHT</b> .....	<b>70 kg</b>

*Specifications subject to change, please contact us for the latest.*



# NANOVEA **T100**

THE COMPACT PNEUMATIC  
**TRIBOMETER**

For pricing information, please contact  
[SALES@NANOVEA.COM](mailto:SALES@NANOVEA.COM)

ALSO AVAILABLE:

**NANOVEA T2000**

The *High Load* Pneumatic Tribometer



[NANOVEA.COM](http://NANOVEA.COM)