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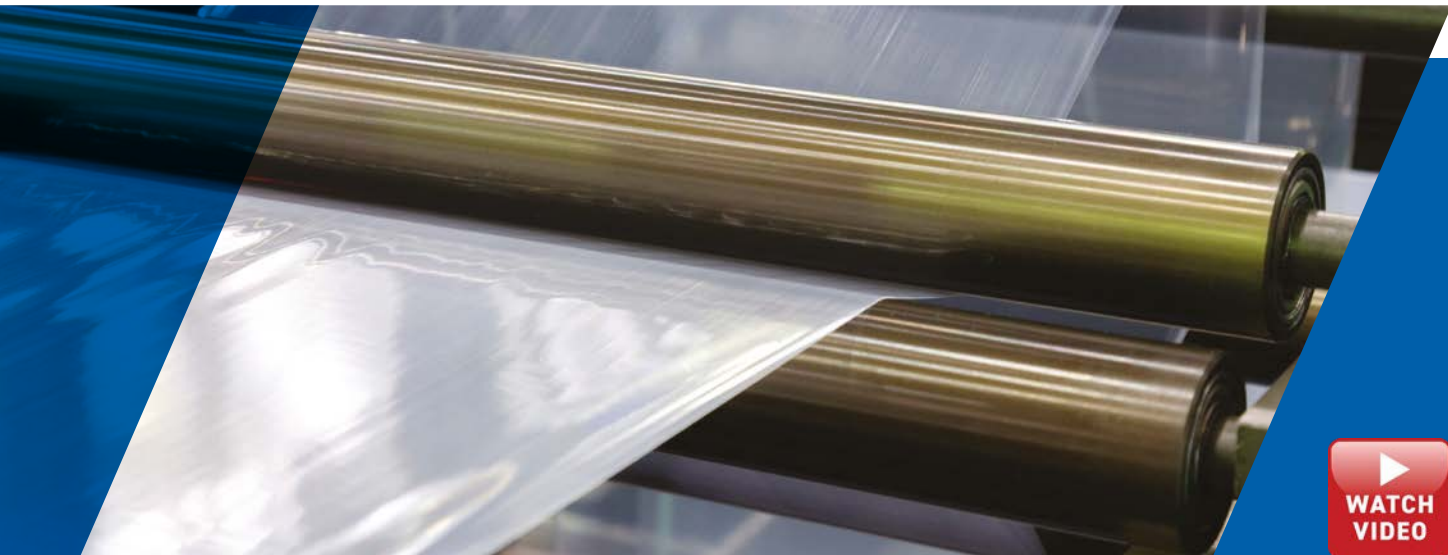


**HANATEK** **FT3**  
PRECISION THICKNESS GAUGE

## Precision Thickness Gauge

- Accurate and repeatable thickness measurements
- Compliant to multiple standards
- Choice of configuration

# Why is thickness measured?



Accurate and repeatable thickness measurements can improve product quality whilst controlling the costs associated with raw material usage.

The thickness of a material can directly impact the value of many other parameters including:

- **Strength**
- **Stiffness**
- **Puncture resistance**
- **WVTR**
- **CO<sub>2</sub>**
- **O<sub>2</sub>**
- **Haze**
- **Opacity**
- **Direct Costs**
  - Raw materials, especially speciality polymers
- **Indirect Costs**
  - Rework/Recycling/Replacement cost
  - Spoiled package content

## Why is film thickness important?

Plastic films are often used to encapsulate, protect and preserve products that are sold to consumers or industry. The film is used as a two way barrier to stop product leaking out and also external contaminants migrating in.



# How is thickness measured?

Physical test parameters can be factory configured according to international standards or customer requirements. The accuracy of thickness measurement is determined by several key operating factors.

Parameters affecting the accuracy of thickness measurement:

## Momentum and Profile of Measurement Probe



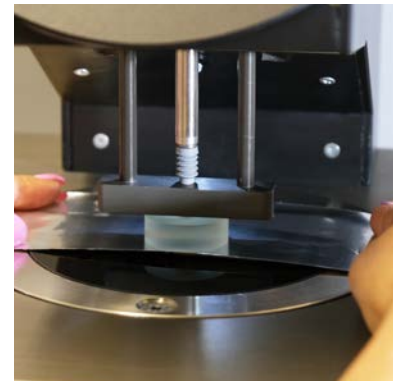
Measurement probes are factory configured according to the test standard required

## Measurement Pressure



Additional weights are added to vary the pressure according to requirements from standards

## Measurement Dwell Time



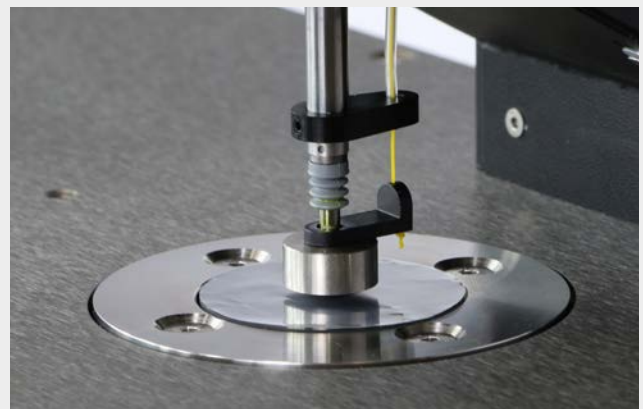
Dwell time can be varied according to application requirements

## Instrument



The Instrument is linearised throughout its measurement range using multi point calibration

## Flatness/Parallelism of Measurement Area

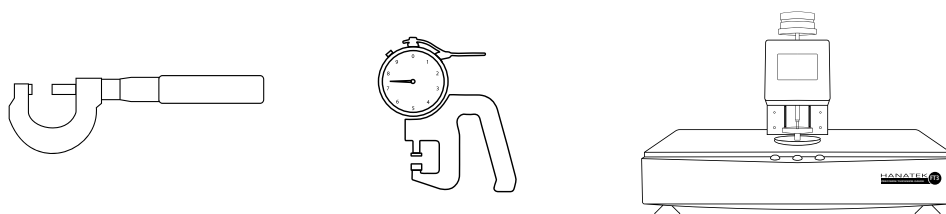


Flatness of measurement head/anvil < 0.2µm.  
Typical parallelism < 1µm

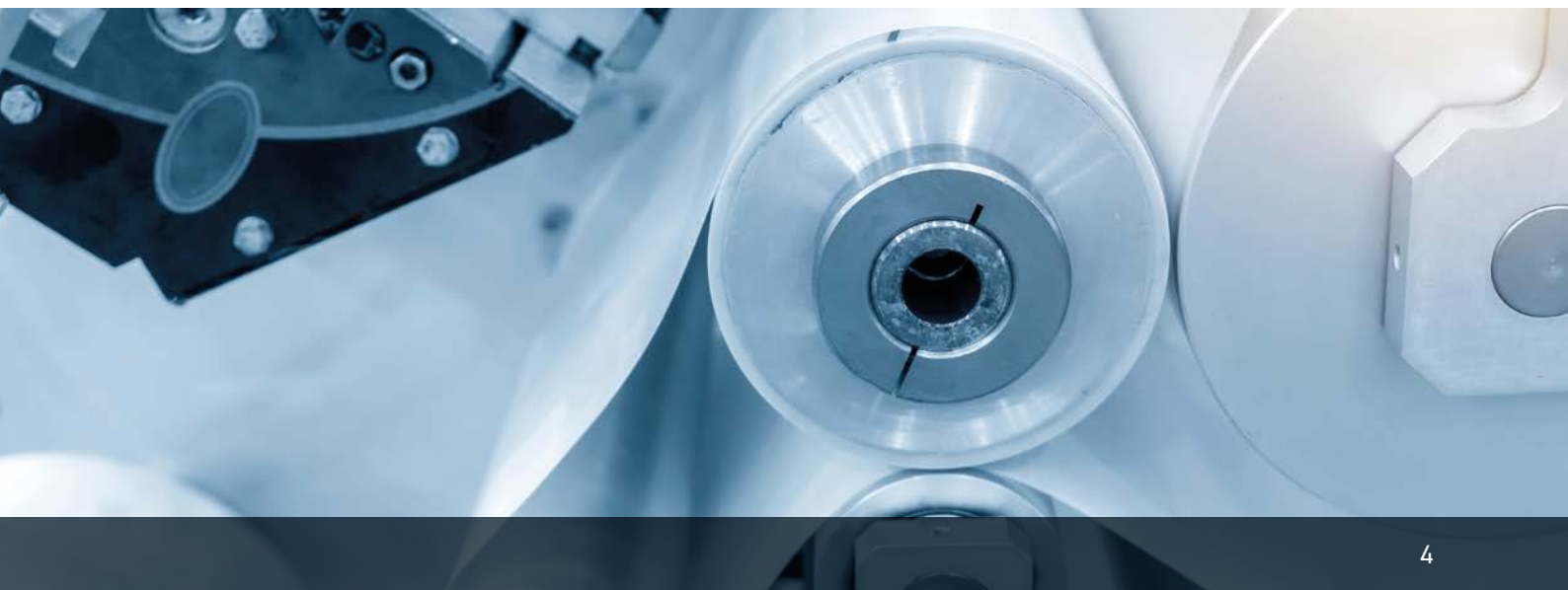


# Comparison of thickness measurement techniques

The accuracy of thickness measurement is determined by several key operating factors.



	Hand Held Micrometer	Bench/Sprung Micrometer	Precision Thickness Gauge
<b>Measurement pressure</b>	Variable by operator	Not always to standard	Fixed to standard or variable
<b>Measurement foot</b>	Not always to standard	Not always to standard	Fixed to relevant standard
<b>Dwell time</b>	Not controlled	Not controlled	Selected by operator
<b>Measurement speed</b>	Not controlled	Not controlled	Selected by operator
<b>Programmable measurements</b>	None	None	User select up to 500 readings
<b>Statistical analysis</b>	None	Manual/automatic	Automatic with time/date stamped printout
<b>Sensor resolution</b>	1 $\mu\text{m}$	1 $\mu\text{m}$	0.1 / 0.01 $\mu\text{m}$
<b>Repeatability</b>	2-10 $\mu\text{m}$	2-10 $\mu\text{m}$	0.4 $\mu\text{m}$ (or better dependant on operating conditions)
<b>Reproducibility</b>	2-20 $\mu\text{m}$	2-10 $\mu\text{m}$	0.8 $\mu\text{m}$ (or better dependant on operating conditions)



# Applications

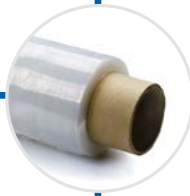
The Hanatek Precision Thickness Gauge (FT3) is specifically designed to quickly and accurately measure the thickness of a variety of substrates including film, paper, board, foil, tissue and textiles.



**Carton board**  
Carton board thickness  
**ISO 3034**



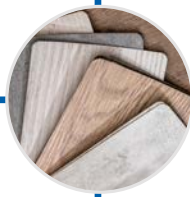
**Plastic film**  
Thickness of plastic film  
**ASTM6988; ISO 4593 / BS2782**



**Flexible packaging**  
Flexible packaging thickness  
**ASTM F2251**



**Flooring**  
Floor coverings thickness  
Solid throughout  
**EN428**



**Tissue paper**  
Tissue thickness  
**ISO 12625**



**Paper**  
Thickness of paper and board  
**ISO 534, TAPPI T411**



**Adhesive tape**  
Thickness of pressure sensitive tapes  
**ASTM 3652**



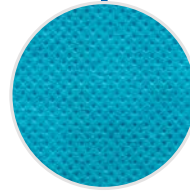
**Textiles**  
Thickness of textile, leather  
**ASTM D1777, ISO 2589, ISO 5084**



**Geomembrane**  
Geosynthetics thickness  
**ASTM D5199**

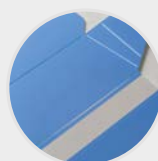


**Nonwoven**  
Nonwoven thickness  
**ISO 9073-2/EDANA**

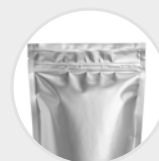


## Other Applications

Rhopoint can configure thickness gauges to suit applications that do not have a recommended international standard



**Laminated packaging**



**Foil packaging**



**Barcode labels**

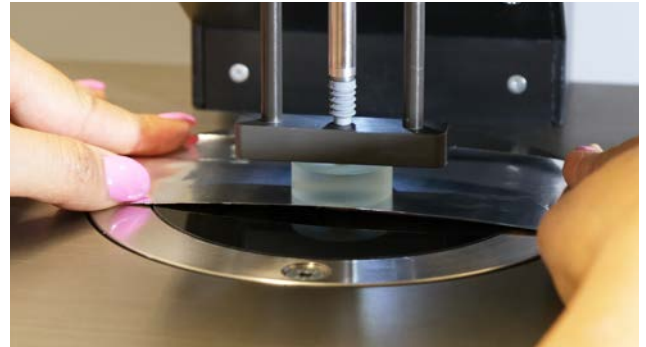
# Test types



## Standard Test

Full statistical analysis of up to 500 readings.  
Maximum, minimum, mean and standard deviation.

This option is for measuring sample sets using pre-defined up and down times as well as the speed of the measurement head.



## Batch Test

This option puts the instrument into comparative test mode. This test is used to measure the relative thickness of two materials. Two batches of readings are taken; the average thickness difference between the two values is displayed. Calculates the thickness difference between two measurement sets, used to assess the thickness of coating, adhesives or sample batches.



## Standard Tare Test

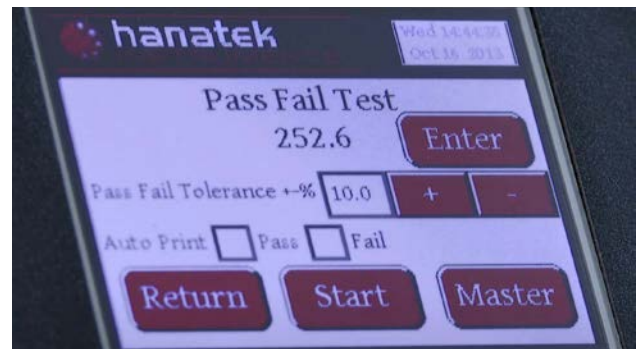
Automatically tares the instrument before each test using user defined conditions. When this option is selected, the instrument is automatically TARED before each sample set is measured. This option virtually eliminates thermo-electronic drift and thermo-mechanical errors from measurement.





## Pass/Fail Test

Enter the target material thickness and the allowed percentage tolerance. If the target thickness is not known, the material can be measured and assigned as the 'master'. Subsequent measurements this can be made against this reference material.



## Sheet Count Test

This test mode will count sheets or layers of sample as well as showing the total thickness of a stack of samples. A master count of user selectable size is measured as a reference. This value is stored and subsequent measurements will be compared to this master reading. A pass/fail option is available to reject any reading out of the desired tolerance.



## Benefits of using the Hanatek FT3

- ✓ Repeatability of better than 0.4  $\mu\text{m}$
- ✓ 0.01  $\mu\text{m}$  resolution on the FT3-U version
- ✓ Measure in micron, millimeter or thou
- ✓ User programmable number of readings, dwell time and down speed
- ✓ Constant contact pressure, configured to ISO and ASTM standards

## Defined Parameters

**Up Time:** This parameter allows the user to manipulate samples between measurements (1-10s).

**Speed Measurement:** The speed of the measurement head is especially important when measuring deformable materials (1-5mm/s).

**Dwell/Down Time:** The dwell time determines the setting time of the measuring head on compressible materials (1-1s).





# Results

This flexible instrument can be configured for quality or research use.  
All operations and test methods have comprehensive graphical on-screen help.



## Reporting and Data Transfer

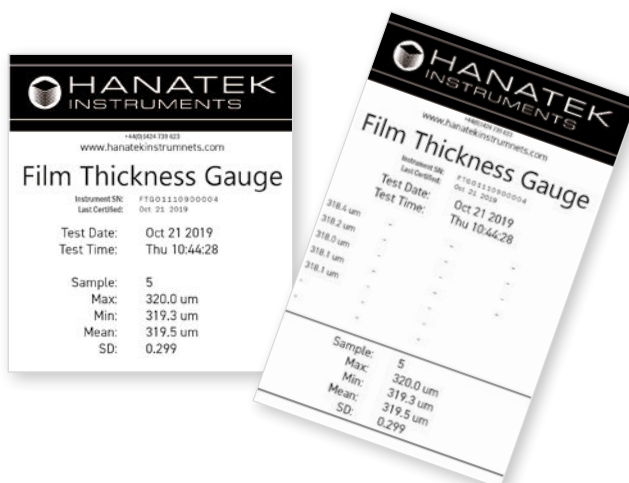
Measurements made using the FT3 thickness gauge can be exported to Microsoft Excel/.csv via interface software\*.

All measured and calculated parameters are transferred along with the date/time stamp, instrument serial number and calibration date.

\*sample Microsoft Excel sheets available on request.

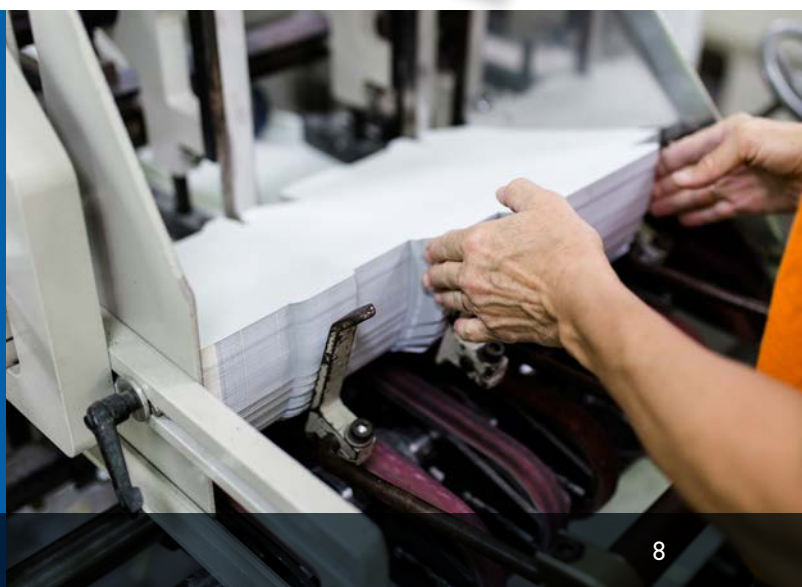
## Print All Samples

This option allows all measured values in a test to be output to the Hanatek printer/ RS232 port.



## QA Labels Record Results Throughout the Batch

Securely time and date stamped labels with statistical results can be produced throughout a batch run and attached to job card or retained samples. This traceable control gives the customer confidence that the whole batch of product is within specification and allows manufacturers to issue certificates of conformance.





# Available configurations

Each standard of compliance specifies a different pressure which is calculated by the force applied to the sample through a measuring head of a given diameter.



## FT3: Standard Instrument

Fixed pressure, factory configured to meet a single test standard or specification of your choice.

- Repeatability of better than 0.4  $\mu\text{m}$
- 0.1  $\mu\text{m}$  resolution
- User programmable number of readings, dwell time and down speed

Thickness of plastic film ASTM 6988; ISO 4593/BS2782



## FT3-V: Variable Instrument\*

Test pressure is varied by adding external weights to the instrument platform. Factory configured measurement head size. One external weight is included to achieve compliance to a second measurement standard or assess material compressibility.

- Additional external weights can be applied to increase measurement pressure up to 4kg total
- Variable force by manual addition of weight

Thickness of paper and card board ISO 534 & TAPPI T411

\*Note: The standards must be able to utilise the same size measuring head





### FT3V-LAB: Laboratory Instrument\*

Test pressure is varied by adding extra weights to the instrument platform or changing the size of the measurement head.

- Two external weights and one additional measuring head included to achieve compliance to multiple standards or customer specifications
- Achieve compliance to multiple standards

#### Multiple standards and applications

\*Note: This product is suitable for use by test and calibration laboratories as full re-calibration is required between measurement head changes



### FT3-U: Ultra High Precision Instrument

Fixed pressure configured to meet a single test standard or specification

- Enhanced resolution of 0.01  $\mu\text{m}$  for applications requiring ultra high precision
- Factory configured measurement mass between 50g and 500g available
- Measurement Head: 25.5mm radius domed
- Custom radius domed heads available on request

#### ISO 4593 standard of compliance, fixed pressure

### Other available options

#### FT3-20:

As per FT3 but with extended 19mm measuring range.

#### FT3-V20:

As per FT3-V but with 19mm measuring range.

#### FT3V20-LAB:

As per FT3V-Lab but with 19mm measuring range.



# Accessories

Included:



UKAS traceable  
calibration certificate



Traceable 2000 µm and  
500 µm checking gauges



Weights



Measurement  
heads

Instrument	UKAS traceable calibration certificate	Traceable 2000 µm and 500 µm checking gauges	Additional Weights	Additional Measurement Head
FT3: Standard Instrument	✓	✓	✗	✗
FT3-V: Variable Instrument	✓	✓	One weight included	✗
FT3-LAB: Laboratory Instrument	✓	✓	One weight included	One head included
FT3-U: Ultra High Precision Instrument	✓	✓	✗	✗

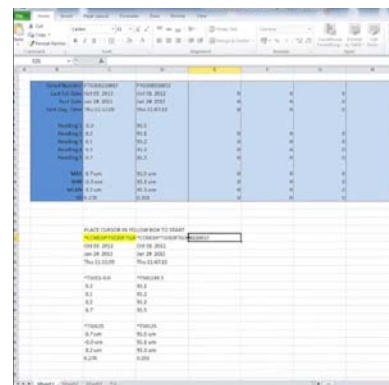
Optional Extras - sold separately



Result printer



Foot switch



Data transfer software



# Ordering information

Standard	Application	Details	Order Code
<b>FT3-Standard</b>			
<b>ISO 3034</b>	Carton Board	Board thickness	HAN-A8041-ISO3034
<b>ASTM D5199</b>	Geomembrane	Geomembranes thickness	HAN-A8041-ASTMD5199
<b>ASTM6988</b>	Film	Thickness of plastic film standard pressure	HAN-A8041-ASTMD6988/STD
<b>ASTM6988</b>	Film	Thickness of plastic film	HAN-A8041-ASTMD6988
<b>ISO 4593 / BS2782</b>	Film	PART B Plastic film thickness	HAN-A8041-ISO4593/BS2782-6
<b>ASTM6988</b>	Film	Thickness of plastic film, low pressure (films <25 µm)	HAN-A8041-ASTMD6988/LOW
<b>ASTM F2251</b>	Flexible Packaging	Flexible packaging thickness	HAN-A8041-ASTMF2251
<b>EN428</b>	Flooring	Resilient floor coverings thickness composition cork	HAN-A8041-EN428/11.3MM
<b>EN428</b>	Flooring	Resilient floor coverings thickness at least 1 non solid layer	HAN-A8041-EN428/25.3MM
<b>EN428</b>	Flooring	Resilient floor coverings thickness Rubber and other relief materials	HAN-A8041-EN428/50MM
<b>EN428</b>	Flooring	Resilient floor coverings thickness Solid throughout	HAN-A8041-EN428/8MM
<b>ISO 9073-2/EDANA</b>	Nonwoven	Nonwoven thickness	HAN-A8041-ISO9073/2
<b>ISO 534</b>	Paper, Carton Board	Thickness of paper and board	HAN-A8041-ISO534
<b>TAPPI T411</b>	Paper, Carton Board	Thickness of paper and board	HAN-A8041-TAPPIT411
<b>TAPPIT411+ISO534</b>	Paper, Carton Board	Thickness of paper and board	HAN-A8041-TAPPIT411+ISO534
<b>ASTM 3652</b>	Tape	Standard test method for thickness of pressure sensitive tapes	HAN-A8041-ASTM3652
<b>DIN EN1942</b>	Tape	Self-adhesive tape thickness	HAN-A8041-DINEN1942
<b>ASTM D1777 Part 1</b>	Textile	Woven, knitted and textured fabrics	HAN-A8041-ASTMD1777/1
<b>ASTM D1777 Part 2</b>	Textile	Coated fabrics, narrow fabrics, webbing, tapes, ribbons, braids	HAN-A8041-ASTMD1777/2
<b>ASTM D1777 Part 3</b>	Textile	Films, glass cloths, glass tapes thickness	HAN-A8041-ASTMD1777/3
<b>ASTM D1777 Part 4</b>	Textile	Glass fibre mat	HAN-A8041-ASTMD1777/4
<b>ASTM D1777 Part 5</b>	Textile	Blankets, pile fabrics, napped fabrics thickness	HAN-A8041-ASTMD1777/5
<b>ISO 2589</b>	Textile	Thickness of leather	HAN-A8041-ISO2589
<b>ISO 5084</b>	Textile	Thickness of textile	HAN-A8041-ISO5084
<b>ISO 12625</b>	Tissue	Tissue thickness	HAN-A8041-ISO12625
<b>FT3-V</b>			
<b>TAPPI T411/ISO 534</b>	Paper, Carton Board	Thickness of paper and board	HAN-A8041-TAPPIT411+ISO534
<b>ASTMD6988 (both parts)</b>	Film	Thickness of plastic film	HAN-A8041-ASTMD6988
<b>ASTMD1777 Part 1 &amp; 5</b>	Textile	Thickness of textile	HAN-A8041-ASTMD1777/1+5
<b>FT3V-LAB</b>			
<b>Multiple</b>		Interchangeable measuring heads, variable downforce, includes 2 measuring heads, 2 weights and recalibration kit	HAN-A8041 P THICK L
<b>FT3-U</b>			
<b>Multiple</b>		Precision Thickness Gauge, Fixed Downforce, 21.56rad Domed Measuring Head, 0.01µm	HAN-A8041 P THICK U
<b>Other ordering codes</b>			
<b>FT3 to PC interface software</b>		HAN-B8041-100	
<b>Printer</b>		HAN-B-PRINTER/2	
<b>Footswitch</b>		HAN-B8041-FOOTSWITCH	

Please contact us for to configure an instrument to meet multiple standards not listed above

# Specification

Instrument Specifications	Details
Resolution	0.1 $\mu\text{m}$ (0.01 $\mu\text{m}$ on FT3-U)
Repeatability	Better than 0.4 $\mu\text{m}^*$
Reproducibility	Better than 0.8 $\mu\text{m}^*$
Measurement range	0 – 4000 $\mu\text{m}$ 0 – 19000 $\mu\text{m}$ (extended range version)
Output	RS232
Power	110/240V 50/60Hz

\*Dependant on operating conditions and configuration of instrument

Instrument Dimensions	Details
Size	285mm (H) x 302mm (W) x 285mm (D)
Net weight	10kg (max)
Packed dimensions	550mm (H) x 620mm (W) x 430mm (D)
Commodity code	9024 8019

Standard Measurement Heads for FT3, FT3-V & FT3-U	Details
Ball	3mm radius
Domed	25.5mm radius
Flat	6 / 6.35 / 8 / 10 / 11.3 / 16 / 25.3 / 28.7 / 35.7 / 50.5mm diameter**

\*\*Non standard heads between 6 and 50mm diameter are available on request

Test Masses	Details
FT3 Standard	50g - 2000g
FT3-V	100g - 4000g
FT3-U	50g - 500g
FT3V-LAB	100g - 4000g



**Free extended 2 year warranty:** Requires registration at [www.rhopointinstruments.com](http://www.rhopointinstruments.com) within 28 days of purchase. Without registration, 1 year standard warranty applies.

**Calibration and service:** Fast and economical service via our global network of accredited calibration and service centres. Please visit [www.rhopointinstruments.com](http://www.rhopointinstruments.com) for detailed information.



**TRY BEFORE YOU BUY**

**We offer two options for you to try out the Precision Thickness Gauge before buying**

**1**

**Online demonstration:** Online presentation of the Precision Thickness Gauge with your samples measured LIVE on Zoom, Microsoft Teams or Skype. Includes a consultation with an application specialist

**2**

**Factory sample testing:** Send in samples of your material for testing and receive a comprehensive test report

[Arrange a demo](#)

**Ready to receive a quote?**

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