

## Hardness

# Wallace Benchtop Hardness Testers

### Overview

Wallace provides the full range of benchtop Shore and IRHD hardness testers to the rubber, polymer, plastics and scientific industries. These instruments are designed for quick and easy set-up and operation, and conform to international testing standards.

The range includes:

- **H12 Micro IRHD Hardness Tester**
- **H14 Macro IRHD Hardness Tester**
- **H17A/B/C/D/O Macro Shore Hardness Tester**
- **H17M Micro Shore Hardness Tester**

Our proven C-frame design provides rigidity for unrivalled stability and repeatability of results.

### Features

- **Simple one-off set up**
- **One touch fully automatic operation**
- **Minimal operator training required**
- **Visual LED indication of foot and indenter contact**
- **Accurate and consistent results**
- **Range of sample tables available**
- **Digital display with programmable resolution to 0.1, 0.2, 0.5 or 1 units**

### Flexibility

Wallace offers competitive packages of a combination of our hardness testers which takes advantage of the one-off set up and stability, whilst providing flexibility to test to different standards.

Our Extended Head Hardness Tester range allows for flexibility to measure larger items. Maximum sample thickness is 75mm. Our easily exchangeable sample tables turns an extended head to normal use in seconds.

Bespoke sample tables can be provided for specialised applications.



**Maximum Clearance**



**Easy conversion to standard operation**



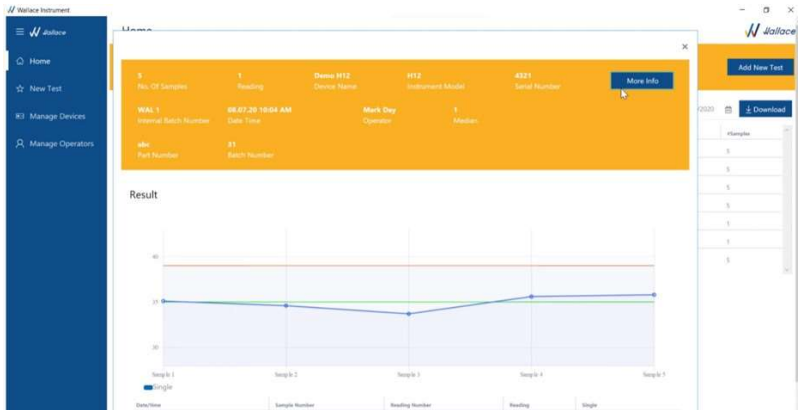
**Bespoke application**



FM12340

## Traceability Software

Wallace provides traceability software which adapts to your own internal operating practice through user defined parameters (including operators, instruments and testing methods). Readings are displayed visually and recorded in a secure database for further analyses or integration with other systems.



An optional X23 add-in datalogger tool for Excel is available.

## Range of Accessories

A wide range of accessories are available for use with our Hardness Testers:

- Data Input Terminal
- Printer
- Software
- O-ring Holder
- Test Blocks
- Matrix Tables
- 'V' Groove Tables
- Oversized Tables

Bespoke accessories can be designed and manufactured for specialised applications.

## Overview of Hardness Tester Range

IRHD	Standard	Force Method	Foot Force	Contact Force	Indenting Force	Force Duration	Indenter Shape & Diameter	Max. Indentation Depth	Sample Thickness	Measurement Range	Application Material
WAH12 Micro	ASTM D1415 ISO 48-2	Weight	235mN ±30	8.3mN ±0.5	145mN ±0.5	5 + 30 seconds	Ball, Ø 0.395mm	0.30mm	2.0mm ±0.5	30 - 100 Micro IRHD	Soft thin vulcanized rubber, O-rings, thermoplastic elastomers.
WAH14 Macro (Normal)	ASTM D1415 ISO 48-2	Weight	8.3N ±1.5	0.3N ±0.02	5.4N ±0.01	5 + 30 seconds	Ball, Ø 2.50mm	1.80mm	8 - 10mm	30 - 85 IRHD	Soft, vulcanized rubber, natural rubber, nitriles, thermoplastic elastomers, flexible polyacrylics and thermosets, wax, felt and leathers.
WAH14 Macro (High)	ASTM D1415 ISO 48-2	Weight	8.3N ±1.5	0.3N ±0.02	5.4N ±0.01	5 + 30 seconds	Ball, Ø 1.00mm	0.44mm	8 - 10mm	85 - 100 IRHD	Hard rubber, thermoplastic elastomers, harder plastics and rigid thermoplastics.
WAH14 Macro (Low)	ASTM D1415 ISO 48-2	Weight	8.3N ±1.5	0.3N ±0.02	5.4N ±0.01	5 + 30 seconds	Ball, Ø 5.00mm	3.18mm	8 - 10mm	10 - 35 IRHD	Soft rubber, thermoplastic elastomers, very soft plastics and thermoplastics, medium-dense textile windings.

SHORE TYPE	Standard	Force Method	Foot Force	Spring Force	Force Duration	Indenter Diameter & Shape	Max. Indentation Depth	Sample Thickness	Measurement Range	Application Material
WA17A	ASTM D2240 ISO 48-4	Spring	1kg	8.05N	1 or 3 seconds	35° Truncated Cone (Frustrum)	2.50mm	>6mm	20 - 90 A	Soft vulcanized rubber, natural rubber, nitriles, thermoplastic elastomers, flexible polyacrylics and thermosets, wax, felt and leathers.
WA17B	ASTM D2240 ISO 48-4	Spring	1kg	8.05N	1 or 3 seconds	30° Cone	2.50mm	>6mm	Above 90 A Below 20 D	Moderately hard rubber, thermoplastic elastomers, paper products and fibrous materials.
WA17C	ASTM D2240 ISO 48-4	Spring	5kg	44.45N	1 or 3 seconds	35° Truncated Cone (Frustrum)	2.50mm	>6mm	Above 90 B Below 20 D	Medium hard rubber, thermoplastic elastomers, medium hard plastics and thermoplastics.
WA17D	ASTM D2240 ISO 48-4	Spring	5kg	44.45N	1 or 3 seconds	30° Cone	2.50mm	>6mm	Above 90 A	Hard rubber, thermoplastic elastomers, harder plastics and rigid thermoplastics.
WA17DO	ASTM D2240 ISO 48-4	Spring	5kg	44.45N	1 or 3 seconds	Ø 2.38mm ½ Ball	2.50mm	>6mm	Above 90 C Below 20 D	Moderately hard rubber, thermoplastic elastomers, and very dense windings.
WA17M	ASTM D2240 ISO 48-4	Spring	0.25kg	0.765N	1 or 3 seconds	30° Cone	1.25mm	>1.5mm	20 - 85 A	Thin, irregularly shaped rubber, O-rings, thermoplastic elastomers and plastic specimens.
WA17O	ASTM D2240 ISO 48-4	Spring	1kg	8.05N	1 or 3 seconds	Ø 2.38mm ½ Ball	2.50mm	>6mm	Below 20 DO	Soft rubber, thermoplastic elastomers, very soft plastics and thermoplastics, medium-dense textile windings.
WA17OO	ASTM D2240 ISO 48-4	Spring	0.4kg	1.111N	1 or 3 seconds	Ø 2.38mm ½ Ball	2.50mm	>6mm	Below 20 O	Extremely soft rubber, thermoplastic elastomers, sponge, extremely soft plastics and thermoplastics, foams, low density textile windings, human and animal tissue.

## H12 Micro IRHD Hardness Tester

The Wallace H12 Micro Hardness Tester allows accurate and repeatable measurements of small/thin samples such as O-rings in International Rubber Hardness Degrees (IRHD).

This model is often used with the O-ring holder (H19/ORA) that ensures the centre of the ring is directly beneath the centre line of the indenter.

### Principle of Operation

The Wallace H12 is a digital benchtop hardness tester that measures the hardness of rubber samples in IRHD. In particular it has been designed to accurately test thin sections and small test pieces such as O-rings.

The robust 'C' frame design allows the operator easy access from front and sides to safely load and remove samples. The indenter mounting is essentially frictionless and its position sensed by a linear variable differential transformer, providing the instrument with outstanding sensitivity. Adjustable anti-vibration feet reduce the effect of external vibration.

By simply pressing the start button, the instrument functions automatically, giving accurate and repeatable results.

As minimal training is required, new operators soon become confident with the H12, achieving consistent readings from the outset.



### Test Procedure

Buttons on the front panel easily adjust the measuring head up and down to suit the sample height. Once the start button is pressed, the foot descends to secure the sample, followed by the indenter, which lowers through the centre of the foot with a contact force of 8.3mN to find its datum position. After 5 seconds, in line with the standards, the indenting force of 145mN is added, giving a total force of 153.3mN and applied for a further 30 seconds. At this point the instrument identifies the indenter position and the hardness value is automatically frozen and displayed clearly on the LCD screen. Data is easily captured in our traceability software.

## H12 Micro IRHD Hardness Tester

### Specifications

H12 Micro IRHD Hardness Tester	
Part Number	H12/1, H12/2, H12/3
Dimensions (mm)	300 (h) x 215 (w) x 255 (d)
Weight	6.5kg
Resolution	Selectable rounding to 0.1, 0.2, 0.5 or 1
Indenter Shape	Ball
Indenter Diameter	0.395mm $\pm$ 0.005
Maximum Indentation Depth	0.3mm
Measurement Range	30 - 100 Micro IRHD
Force Method	Weight
Foot Force	235mN $\pm$ 30
Contact Force	8.3mN $\pm$ 0.5
Indenting Force	145mN $\pm$ 0.5
Force Duration	5 + 30 seconds
Sample Thickness (as per standard)	2.0mm $\pm$ 0.5
Operating Temperature	5 to 40°C; Altitude 2000m maximum
Humidity Range	10 to 80% RH non-condensing
Output of Test Results to PC/Printer/Datalogger	USB connection (RS232 protocol)

### Standards

ISO 48-2, ASTM D1414, ASTM D1415



## H14 Macro IRHD Hardness Tester

The Wallace H14 Macro IRHD Hardness Tester allows accurate and repeatable measurements of larger samples in International Rubber Hardness Degrees (IRHD).

### Principle of Operation

The Wallace H14 is a digital benchtop hardness tester designed for measuring the hardness of standard rubber samples in IRHD.

The robust 'C' frame design allows the operator easy access from front and sides to safely load and remove samples. The indenter mounting is essentially frictionless and its position sensed by a linear variable differential transformer, providing the instrument with outstanding sensitivity. The adjustable anti-vibration feet reduce the effect of external vibration.

By simply pressing the start button, the instrument functions automatically, giving accurate and repeatable results.

As minimal training is required, new operators soon become confident with the H14, achieving consistent readings from the outset.



### Test Procedure

Buttons on the front panel easily adjust the measuring head up and down to suit the sample height. Once the start button is pressed, the foot descends to secure the sample, followed by the indenter, which lowers through the centre of the foot with a primary load of 0.3N to find its datum position. After 5 seconds, in line with the Standards, the indenting force of 5.4N is added, giving a total force of 5.7N and applied for a further 30 seconds. At this point the instrument identifies the indenter position and the hardness value is automatically frozen and displayed clearly on the LCD screen. Two LEDs on the instrument's front panel monitor all stages of the test cycle. Data is easily captured in our traceability software.

# H14 Macro IRHD Hardness Tester

## Specifications

H14 Macro IRHD Hardness Tester			
	WAH14 (Normal)	WAH14 (High)	WAH14 (Low)
Part Number	H14/1, H14/2, H14/3	H14/1, H14/2, H14/3	H14/1, H14/2, H14/3
Dimensions (mm)	300 (h) x 215 (w) x 255 (d)	300 (h) x 215 (w) x 255 (d)	300 (h) x 215 (w) x 255 (d)
Weight	8kg	8kg	8kg
Resolution	Selectable rounding to 0.1, 0.2, 0.5 or 1	Selectable rounding to 0.1, 0.2, 0.5 or 1	Selectable rounding to 0.1, 0.2, 0.5 or 1
Indenter Shape	Ball	Ball	Ball
Indenter Diameter	2.50mm $\pm 0.01$	1.00mm $\pm 0.01$	5.00mm $\pm 0.01$
Maximum Indentation Depth	1.80mm	0.44mm	3.18mm
Measurement Range	30 - 85 IRHD	85 - 100 IRHD	10 - 35 IRHD
Force Method	Weight		
Foot Force	8.3N $\pm 1.5$		
Contact Force	0.3N $\pm 0.02$		
Indenting Force	5.4N $\pm 0.01$		
Force Duration	5 + 30 seconds		
Sample Thickness (as per standard)	8 to 10mm		
Operating Temperature	5 to 40°C; Altitude 2000m maximum		
Humidity Range	10 to 80% RH non-condensing		
Output of Test Results to PC/Printer/Datalogger	USB connection (RS232 protocol)		

## Standards

ISO 48-2, ASTM D1414, ASTM D1415



## H17 Shore Scale Hardness Testers

The Wallace H17 series of hardness testers allows accurate measurement of both soft and hard materials using multiple Shore Scales.

Wallace offer a full range including the H17A for testing standard rubber, H17O for soft rubber and medium density textiles, H17D for hard rubbers and plastics, and the H17M for thin/small rubber samples.

### Principle of Operation

The Wallace range of H17 digital benchtop hardness testers are designed for measuring the hardness of various materials in Shore scale.

The robust 'C' frame design allows the operator easy access from front and sides to safely load and remove samples. The adjustable anti-vibration feet reduce the effect of external vibration.

By simply pressing the start button, the instrument functions automatically, giving accurate and repeatable results.

As minimal training is required, new operators soon become confident with the H17, achieving consistent readings from the outset.

### Test Procedure

Buttons on the front panel easily adjust the measuring head up and down to suit the sample height. Once the start button is pressed, the foot descends to secure the sample. In line with the testing standards, once the foot contacts the sample the indentation depth is recorded, after a pre set dwell time, typically 3 seconds. At this point the instrument identifies the indenter position and the hardness value is automatically frozen and displayed clearly on the LCD screen. Data is easily captured in our traceability software.



H17A Model



H17D Model



# H17 Shore Scale Hardness Testers

## Specifications

	Model H17A	Model H17B	Model H17C	Model H17D
Dimensions (mm)	300(h) x 215(w) x 255(d)	300(h) x 215(w) x 255(d)	350(h) x 215(w) x 255(d)	350(h) x 215(w) x 255(d)
Weight	7.5kg	7.5kg	12kg	12kg
Resolution	0.1 units	0.1 units	0.1 units	0.1 units
Indenter Diameter & Shape	35° Truncated Cone (Frustum)	30° Cone	35° Truncated Cone (Frustum)	30° Cone
Indenter Radius	Flat	0.1mm	Flat	0.1mm
Max, Indention Depth	2.50mm	2.50mm	2.50mm	2.50mm
Measurement Range	20 - 90 A	Above 90 A Below 20 D	Above 90 B Below 20 D	Above 90 A
Force Method	Spring	Spring	Spring	Spring
Foot Force	1kg	1kg	5kg	5kg
Spring Force	8.05N	8.05N	44.45N	44.45N
Force Duration	1 or 3 seconds	1 or 3 seconds	1 or 3 seconds	1 or 3 seconds
Sample Thickness	>6mm	>6mm	>6mm	>6mm
Operating Temperature	5 to 40°C; Altitude 2000m maximum			
Humidity Range	10 to 80% RH non-condensing			
Output of Test Results to PC/Printer/Datalogger	USB connection (RS232 protocol)			

	Model H17DO	Model H17M	Model H17O	Model H17OO
Dimensions (mm)	350(h) x 215(w) x 255(d)	300(h) x 215(w) x 255(d)	300(h) x 215(w) x 255(d)	300(h) x 215(w) x 255(d)
Weight	12kg	6.5kg	7.5 kg	6.5kg
Resolution	0.1 units	0.1 units	0.1 units	0.1 units
Indenter Diameter & Shape	Ø 2.38mm ½ Ball	30° Cone	Ø 2.38mm ½ Ball	Ø 2.38mm ½ Ball
Indenter Radius	1.19mm	0.1mm	1.19mm	1.19mm
Max, Indention Depth	2.50mm	1.25mm	2.50mm	2.50mm
Measurement Range	Above 90 C Below 20 D	20 - 85 A	Below 20 DO	Below 20 O
Force Method	Spring	Spring	Spring	Spring
Foot Force	5kg	0.25kg	1kg	0.4kg
Indenting Force	44.45N	0.765N	8.05N	1.111N
Force Duration	1 or 3 seconds	1 or 3 seconds	1 or 3 seconds	1 or 3 seconds
Sample Thickness	>6mm	>1.5mm	>6mm	>6mm
Operating Temperature	5 to 40°C; Altitude 2000m maximum			
Humidity Range	10 to 80% RH non-condensing			
Output of Test Results to PC/Printer/Datalogger	USB connection (RS232 protocol)			

## Standards

ISO 48-4, ASTM D2240, JIS 6301



## Sample Tables

The sample tables will fit any of the benchtop Wallace Hardness Testers. Every hardness tester comes with a standard sample table. Wallace also provides sample tables for specific applications. Sample tables can be swapped over easily with no set-up, as the tables accurately locate onto precision dowels.

### H19/ORA O-ring Holder

This holder is designed to reliably and easily locate the centre of an O-ring directly beneath the indenter of Wallace Hardness Testers.

It simply requires location of the O-ring between two pins and turning a knurled wheel to accurately locate the O-ring. The holder accommodates cross section diameters of between 1 and 5.5mm.

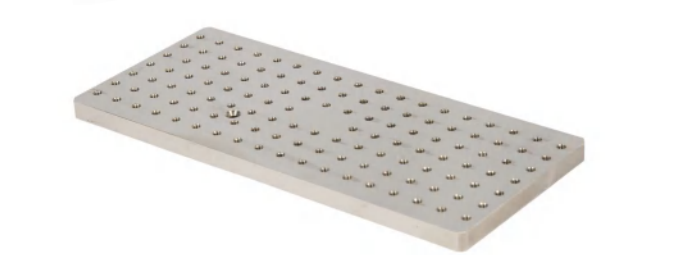
Dimensions: 23mm (h) x 130mm (w) x 80mm (d)



### H19/5 Matrix Table

Designed for precise location of sample holding fixture. The matrix consists of 126 holes located on 10mm centres. Alternate holes are tapped to accept M3 threaded screws or drilled to 3mm to accept a dowel.

Dimensions: 180mm (w) x 76mm (d)



### 'V' Groove Tables

Designed for location of solid section extrusions and mouldings.

H19/2 1mm wide 'V' groove

H19/3 4mm wide 'V' groove

H19/4 8mm wide 'V' Groove

Dimensions: 180mm (w) x 76mm (d)

### Custom Tables

Wallace can offer custom designed tables for specialist applications.



### H19/7 Oversized Table

A flat surface for easy positioning of large samples.

Dimensions: 300mm (w) x 76mm (d)



## Hardness Test Blocks

Wallace Rubber Hardness Test Blocks are available in six scales – IRHD (Micro), IRHD (Macro), Shore A, D, O and M.

### Features

- Manufactured from specially formulated high-quality rubber
- Resistant to ageing effects of temperature and time on hardness.

The test blocks are for use as a routine check to ensure instruments are functioning properly and read correctly.

*Test blocks should be returned to Wallace every 12 months for re-calibration.* The table below lists the test blocks available.



### Specifications

Test Blocks	Scale	Hardness Range (type)	Quantity in Set	Instrument Model
H10	IRHD Macro	40-90	6	H1, H2, H3, H14, H15
H11	IRHD Micro	40-70	4	H5, H5A, H5B, H12
H10A	Shore A	20-90	6	H16A, H17A
H10D	Shore D	30-80	5	H16D, H17D
H11M	Shore M	40-70	4	H17M
H100	Shore O	10-80	6	H17O

## Accessories

### X19 Data Input Terminal

*Includes: Data input terminal cable*

The data input terminal contains a 16 character, two-line LCD display and QWERTY keypad. It supplies additional information on the operation of the hardness tester and offers the user several new options. Test parameters are more easily set. Data for operator and sample identification can be entered. The timing of the primary and secondary indenter loads (H12 and H14) can also be pre set.

Other features include:

- Date and time recording and traceability
- Calibration check reminder



<b>WAX19 Data Input Terminal</b>	
Dimensions (mm)	40 (h) x 225 (w) x 165 (d)
Weight	800g

### X20 Printer

*Includes: Power supply, mains lead, printer, 2 printer paper rolls and printer cable*

The compact, high-speed, 24 character-width printer, provides a permanent record of results and instrument settings. Various parameters can be set including:

- Sample identification with auto-increasing suffix
- Date and time of test
- Traceability of aborted tests



<b>WAX20 Printer</b>	
Dimensions (mm)	70 (h) x 125 (w) x 110 (d)
Weight	300g + PSU 450g