

# Surtronic® Duo II



Handheld portable surface roughness testers

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## Handheld portable surface roughness testers **Tough, fast and reliable**

The Surtronic® Duo II is a portable surface roughness tester that measures multiple roughness parameters with a 1-button click.

Roughness measurement parameters such as Ra, Rz, Rp, Rv and Rt are displayed on a brightly lit intuitive 2.4" daylight readable LCD colour display.

Its rechargeable battery operation makes it a convenient way of performing fast, easy and precise on-the-spot measurements.





### How it does it

The hard-wearing diamond stylus is drawn across the part with a precision motorised traverse mechanism to ensure that the correct horizontal distance is travelled. Vertical movement of the stylus is detected by a high quality piezo-electric pick-up as it travels across peaks and valleys which converts mechanical movement into electrical signals.

The electrical signal is digitised and sent to a microprocessor for instant calculation of surface parameters using standardised algorithms.

### Keeping it simple

The Surtronic® philosophy keeps the process simple. It is the perfect tool for any inspector to check surface roughness even in the most demanding applications.

-  Incoming inspections
-  Final inspection before shipment
-  Process control on the production line
-  Checking large components and structures



### Fast and reliable...

Simply press the measurement button and in a few seconds a full set of traceable measurement results including a detailed profile graph is displayed.

#### 1 Measure

Tactile measurement button great for challenging orientations. InstantOn technology enables measure to be taken in less than 5 seconds from switching on!

#### 2 Bluetooth Low Energy technology

With Bluetooth LE's power consumption, applications can run on a small battery for a long time. It is vital for applications that only need to exchange small amounts of data periodically.



### 3 Profile graph

Clear detailed graph showing measurement area – excellent for visually identifying defects.

### 4 Separates

The Surtronic® Duo II splits into a display/control unit and traverse unit via a slide and lock mechanism.

### 5 Simple 3-button navigation

Instant access to menu options and settings.

### 6 Diamond stylus and piezo-electric pick-up

The hard wearing, robust piezo-electric pick-up stylus with diamond tip assures very reliable measurement.

### 7 Li-Poly battery

Advanced rechargeable battery technology for unrivalled reliability and battery life with over 2000 measurements from a single charge.

### 8 Rubberised moulding

Enhanced durability and improved grip provides unbeatable protection in harsh shop floor environments.

### 9 USB mini charging port

The mini USB port can be used for charging with the included mains charger (or with any standard USB charger).

# Tough, fast and reliable handheld roughness testers

Ideal for shop floor, industrial & inspection room applications



## Measurement principle

The Surtronic Duo II is a skidded device. The skid guides the pick-up along the workpiece, with the workpiece itself forming the datum for measurement.

This method usually eases set-up by reducing the need for leveling. It also reduces the effects of vibration due to a much smaller measuring loop.

The skid is an integral part of the gauge and has a radius large enough to prevent movement in and out the roughness characteristics of the surface. The stylus and the skid are independent in their height (Z) movement but move together in the measurement direction. Surface deviations are recorded as the difference between the stylus and the skid movement in the Z direction.

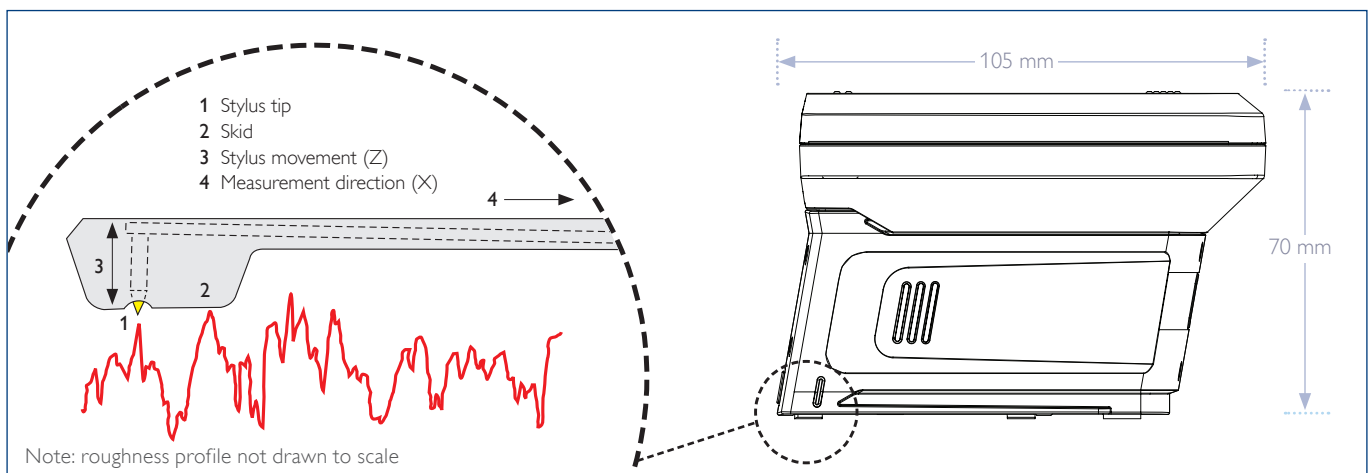
The skid will act as a mechanical filter, taking out much of the general form of the component. Also, wavelengths greater than the diameter of the skid will not register.

## Measurement of small surface characteristics

These instruments use a 5 µm (200 µin) stylus tip radius. This suits their purpose as a portable tool for checking roughness in three ways:

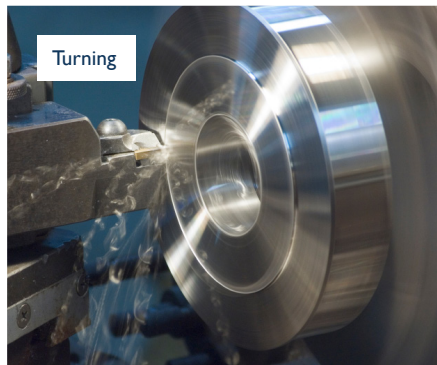
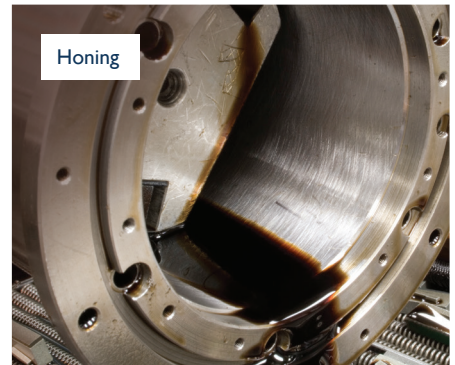
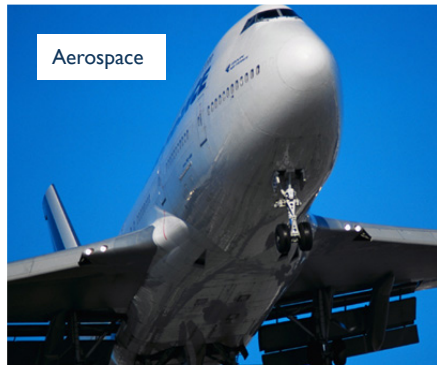
- **Durability** – It is less likely to be damaged even when subjected to mishandling.
- **Maintenance** – It is easier to remove dirt and oil that collects on the tip during use.
- **Suitability** – It acts as a filter to remove the highest surface frequencies that are more reliably measured in a controlled environment.

Other Taylor Hobson instruments use a stylus with a tip radius of 2 µm (80 µin). This smaller radius coupled with an inductive gauge head having low contact force enables analysis of even the smallest surface imperfections.



# Designed to suit your application

Meeting the ever increasing demands of next generation technologies...



Plus many more...

- **Process control** – Grinding, milling, turning, honing, polishing, extrusion
- **Heavy industry** – Shipbuilding, pipelines, sheet steel
- **Aerospace** – Turbine blades, turbine shafts, wing composites
- **Other** – Print rollers, flooring, bonding, glass

## Further benefits...

### Built to last, by design...

Impact resistant rubberised mouldings surround a recessed, Mylar protected high durability screen making the unit robust enough for even the most demanding industrial environments.

### In situ measurements

Monitor wear and roughness changes in situ during product's life.

E.g. monitoring changes in turbine blade roughness as an early warning sign for defects and efficiency losses.

### Standards and traceability

The reference standard supplied can be used both to calibrate the instrument and check for stylus wear to ensure the most accurate results are always being achieved.

Measurement	Best capability
Roughness standards (Ra)	$\pm(2\% + 0.004 \mu\text{m})$
Workpiece or component surface texture (Ra)	$\pm 3\%$ of measured value per trace

### UKAS calibration & testing

Taylor Hobson provides full certification for artefacts and instruments in our purpose built ISO graded clean room UKAS facility.

Our UKAS laboratory is able to measure all of the parameters associated with surface texture, including French, German, USA and Japanese derivatives.



# Accessories and spares

Included as standard

## 1 Compact portable carry bag

Helps secure the Surtronic® Duo II and prevent accidental drops especially for applications involving measuring at heights.

112-5029



## 2 USB charger

Mini USB charger 5V, 1A, 110-240VAC, 50/60 Hz with international adapters.

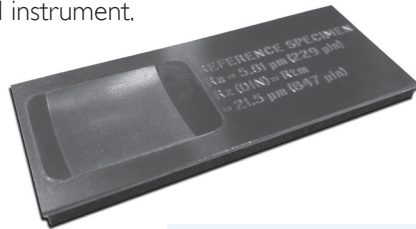
112-4545



## 3 Calibration standard

For calibrating and checking the Surtronic® Duo II instrument.

112-2937



Ra 5.81 µm (229 µin)

## 4 Instrument user guide

Introductory user guide for measurement and calibration.

K505-444



## Optional accessories

## 5 Magnetic base\*

Lightweight compact base specially designed to allow for measurements in multiple orientations including upside down on metallic surfaces.

112-4981



## 6 Hard transport case\*

Air and water tight case that provides the Surtronic® Duo II with extra protection for safe storage and/or transportation.

112-5003



\* Not supplied as standard with Surtronic® Duo II.

All accessories listed above are available for order. Please contact your local Taylor Hobson representative for additional or special requirements

# Technical specifications

Instrument performance		
Gauge	Resolution	0.01 $\mu\text{m}$ (0.4 $\mu\text{in}$ )
	Z Range	200 $\mu\text{m}$ (7800 $\mu\text{in}$ )
Measurement	Accuracy <sup>1</sup>	$\pm(5\%$ of reading + noise)
	Noise <sup>2</sup>	0.07 $\mu\text{m}$ (3 $\mu\text{in}$ )
Calibration	Process	Automatic software calibration
	Standard	Able to calibrate to ISO 5436 Type C1 Standards
Parameters	Standards	ISO 4287
	ISO 4287 (Roughness)	Ra, Rz, Rp, Rv, Rt, Rz1max, Rsk, Rq, Rku

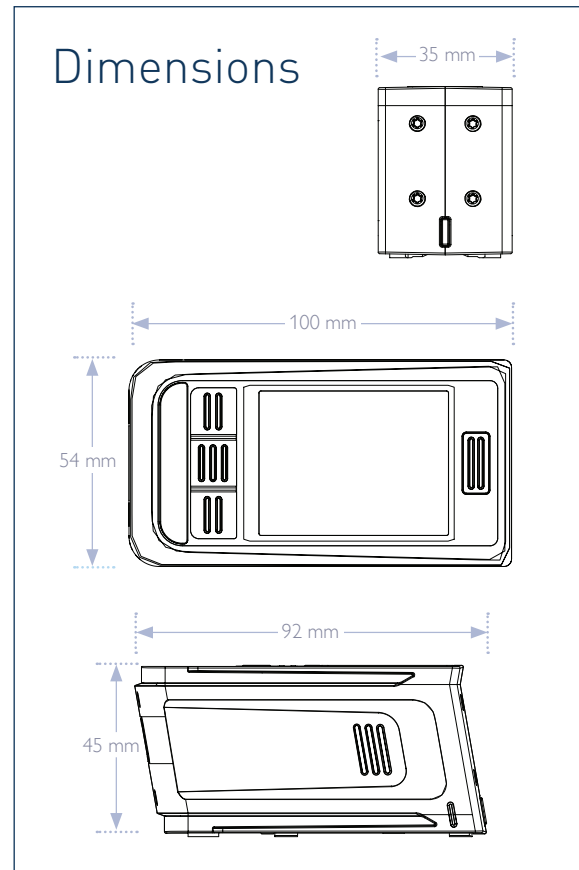
Technical		
Data output	On-screen	Up to 5 results per page, selectable on-screen graph
Battery	Charger	Mini USB 5V 1A 110-240 VAC 50 / 60 Hz
	Charging time	4 hours
Power	Battery life	> 10,000 measurements per charge
	Standby time	5,000 Hours
	InstantOn	Max 5 sec from standby to ready to measure
	Auto-sleep function	5 minutes

Instrument capability		
Pick-up assembly	Pick-up type	Piezo-electric
	Stylus type	Diamond, Radius 5 $\mu\text{m}$ (200 $\mu\text{in}$ )
Gauge	Gauge force	200 mg
	Measurement type	Skidded
Filter	Filter type	Gaussian / 2CR
	Filter cut-off	0.8 mm
Traverse	Traverse length	5 mm (0.2 in)
	Traverse Speed	2 mm/sec (0.08 in/sec)
Display	Units	$\mu\text{m}$ / $\mu\text{in}$

Environmental/physical		
Physical specifications	Weight including pickup	0.4 Kg (14 oz)
	Power source	Li-Poly rechargeable battery
Operating conditions	Temperature	5 - 40 $^{\circ}\text{C}$ (41 - 104 $^{\circ}\text{F}$ )
	Humidity	0 - 80 % non-condensing
Storage conditions	Temperature	0 - 50 $^{\circ}\text{C}$ (32 - 122 $^{\circ}\text{F}$ )
	Humidity	0 - 80 % non-condensing

1. Based on measurements of Ra taken on roughness specimens up to 6  $\mu\text{m}$  Ra.
2. Ra measured over a glass flat nominally parallel to the traverse datum.

\* Includes primary parameters.



## Surface finish fundamentals

The surface of every component has some form of texture which varies according to its structure and the way it has been manufactured.

These surfaces can be broken down into three main categories: Roughness, Waviness and Form.

In order to control the manufacturing process or predict a component's behaviour during use, it is necessary to quantify surface characteristics by using surface texture parameters.

### Parameters available:

ISO 4287 Roughness*
<b>Rt</b> – total profile height
<b>Rp</b> – maximum profile peak height
<b>Rv</b> – maximum profile valley depth
<b>Rz</b> – maximum height of the profile
<b>Ra</b> – arithmetic mean deviation
Other parameters include: <b>Rsk, Rku, Rq, Rz1max</b>

## The Metrology Experts

Established in 1886, Taylor Hobson is the world leader in surface and form metrology and developed the first roundness and surface finish measuring instruments.

[www.taylor-hobson.com](http://www.taylor-hobson.com)

## Sales department

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Tel: +44 (0) 116 276 3771

- **Design engineering** – special purpose, dedicated metrology systems for demanding applications.
- **Precision manufacturing** – contract machining services for high precision applications and industries.

## Centre of Excellence department

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- **Inspection services** – measurement of your production parts by skilled technicians using industry leading instruments in accord with ISO standards.
- **Metrology training** – practical, hands-on training courses for roundness and surface finish conducted by experienced metrologists.
- **Operator training** – on-site instruction will lead to greater proficiency and higher productivity.
- **UKAS calibration and testing** – certification for artifacts or instruments in our laboratory or at customer's site.

## Service department

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- **Preventative maintenance** – protect your metrology investment with an AMECare support agreement.



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