Portable Hardness Testing
Using Leeb and Portable Rockwell
The All-In-One Hardness Testing Solution

Leeb

Portable Rockwell

Future Proof

Find out more

Find out more

Sign up for news

Swiss Precision since 1954
**Equotip® 550 Touchscreen Unit**

**Built for Demanding Environments**

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**Touchscreen Features**
For simplified and improved usability on high resolution display

**Personalized Screens**
Arrange the view according to your needs

**Elaborated User Interface**
Designed by industry experts for smooth operation

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**Display**
7” color display 800x480 pixels

**Memory**
Internal 8 GB flash memory

**Regional Settings**
Metric and Imperial units, multi-language and timezone supported

**Power Input**
12 V +/-25% / 1.5 A

**Connectors**
Probe, USB host / device and Ethernet

**Dimensions**
250 x 162 x 62 mm

**Weight**
About 1525 g (incl. Battery)

**Battery**
Lithium Polymer, 3.6 V, 14.0 Ah

**Battery Lifetime**
> 8 h (in standard operating mode)

**Humidity**
< 95 % RH, non condensing

**Operating Temperature**
-0 °C – 30 °C (Charging*, instrument on)
0 °C – 40 °C (Charging*, instrument off)
-10 °C – 50 °C (Non-charging)

**Certification**
CE

*charging equipment is for indoor use only (no IP classification)

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**Special housing optimized for robustness**
Ergonomically designed and shock-absorbing rubberised housing. Protection against dust and water splashes (IP 54).

**Connectors and circuits protected against dust and voltage spikes**
Specifically designed protective rubber caps for all connectors, meeting the directives for low voltage safety and electromagnetic compatibility (EMC).

**Scratch-resistant solid touchscreen**
Durable and scratch-resistant touchscreen thanks to Gorilla® Glass Technology. Less reflection on screen thanks to optional antiglare foil.

**Functional in wide temperature range**
Operates in temperatures from -10°C to +50°C (14 to 122°F) and in humidity up to 95%.

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Swiss Precision since 1954
Equotip® 550 Touchscreen Unit
Unique Features

Equotip 550 takes advantage of a new generation full color, dual processor Touchscreen Unit with enhanced software capabilities. The instrument offers a unique range of functions which ultimately help speed up on-site and laboratory inspections and analysis.

Best-in-class reliability arising from 40 years of experience
Equotip solutions are recognised worldwide for providing best-in-class durability, high long-term accuracy and premium service.

Increased accuracy through conversion curve options
Select from preloaded established conversions. Create, edit and verify material conversion curves directly on the instrument (one-point, two-point shift or polynomial). PC software allows to share conversions with customers, suppliers and associated companies.

Reduce incorrect measurements with interactive guides
Intelligent on-screen notifications to obtain the most relevant settings for any application and to recognize and prevent faulty usage.

Time saving through customized reports
The Equotip 550 allows to easily create pdf reports on-site directly on the instrument and export to a USB stick.

The reports can be fully configured and enhanced with customer specific information and company logo.
Traceable precision by verification management

Step by step verification wizard in line with applicable standards helps to regularly check the proper functioning of the instrument over time.

Optimized production process with automation package

Comprehensive software tools and libraries help to easily include the Equotip 550 into existing production chains. Feed the measurement results directly into data management systems.

Reduced costs due to a future proof all-in-one solution

The high versatile Equotip 550 gives the possibility to apply three measuring principles and to connect nine different probes to only one device. There is no need to buy several instruments from now on.

Enlarged application range by combining methods

The step by step combined method wizard allows automatic on-site correlation of two different measuring principles to reduce dependencies on material and geometries.
Equotip 550 comes loaded with interactive wizards handpicked for specific industry applications in order to increase reliability and to assure precise measurements. A special new feature is the automatic combination of measurement methods which extends the scope of the Equotip 550 to a large area of use.

<table>
<thead>
<tr>
<th>Recommended Test Methods</th>
<th>Leeb</th>
<th>Portable Rockwell</th>
<th>Combined*</th>
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<td>Weld, Base Material &amp; HAZ</td>
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<td>Pressure Vessels</td>
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<td>Wellhead Equipment</td>
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<td><strong>Automotive</strong></td>
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<td>Engine Blocks</td>
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<td>Shafts</td>
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<td>Panels</td>
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<td>Gears</td>
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<td>Brake Systems</td>
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<td><strong>Aerospace</strong></td>
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<td>Casings / Housings</td>
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<td>Panels</td>
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<td>Cast Objects</td>
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<td>Landing Gears</td>
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<td><strong>Manufacturing and Machinery</strong></td>
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<td>Roll Testing</td>
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<td>Coils</td>
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<td>Wedge Tightness</td>
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<tr>
<td>Heat Treatment / Casting</td>
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<td>Wires</td>
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</table>
New Equotip 550 Interactive Animation

Simulate a real measurement situation right now! Get an insight into the software features, unique user interface and innovative wizards!

Click here to start the interactive Equotip Demo!

Overcome the limitations of stationary hardness testing

- 100% portable and extremely flexible
- No interruptions in production due to 24h availability
- Equally reliable, accurate and standardized
**The Leeb Measuring Principle**

Leeb hardness principle is based on the dynamic (rebound) method. An impact body with a hard metal test tip is propelled by spring force against the surface of the test piece. Surface deformation takes place when the impact body hits the test surface, which results in loss of kinetic energy. This energy loss is detected by a comparison of velocities $v_i$ and $v_r$ when the impact body is at a precise distance from the surface for both the impact and rebound phase of the test, respectively.

Velocities are measured using a permanent magnet in the impact body that generates an induction voltage in the coil which is precisely positioned in the impact device. The detected voltage is proportional to the velocity of the impact body. Signal processing is then providing the hardness reading.

**Wide Measurement Range**

Leeb impact devices are best suited for on-site testing of heavy, large or already installed parts.

**Impact Devices & Accessories**

Proceq offers a wide variety of impact devices along with support rings to serve most hardness testing requirements.

**Broad Hardness Scales Coverage**

The measurements are automatically converted to all common hardness scales (HV, HB, HRC, HRB, HRA, HS) as required.

**Test Blocks Portfolio**

Extensive range of precise hardness test blocks available for each impact device with different hardness levels for regular verification.
# Impact Devices

**Equotip® Leeb**  
Impact Devices

### Impact energy
- D/DC: 11 Nmm  
- DL: 11 Nmm  
- S: 11 Nmm  
- E: 11 Nmm  
- G: 90 Nmm  
- C: 3 Nmm

### Indenter
- Tungsten carbide 3 mm  
- Tungsten carbide 2.8 mm  
- Ceramics 3 mm  
- Polycrystalline diamond 3 mm  
- Tungsten carbide 5 mm  
- Tungsten carbide 3 mm

### Scope
- Most commonly used probe. For the majority of applications.  
- Narrow indenter (probe) tip for measurement on hard reach areas or spaces with limited access.  
- For measurements in extreme hardness ranges. Tool steels with a high carbide content.  
- For measurements in extreme hardness ranges. Tool steels with high carbide content.  
- Large and heavy components, e.g. casts and forged parts.  
- For surface hardened components, coatings, thin or impact-sensitive parts.

### Test blocks
- Test blocks:
  - Vickers: 81-955  
  - Rockwell: 81-654  
  - Shore: 38-100

### Measuring Range
- Steel and cast iron:
  - Vickers: 81-955  
  - Rockwell: 81-654
- Stainless steel:
  - Vickers: 85-802  
  - Rockwell: 46-102
- Cast iron lamellar graphite GG:
  - Vickers: 90-698  
  - Rockwell: 21-69
- Cast iron, nodular graphite GGG:
  - Vickers: 95-648  
  - Rockwell: 21-60
- Cast aluminium alloys:
  - Vickers: 19-164  
  - Rockwell: 24-85
- Copper/zinc alloys (brass):
  - Vickers: 40-173  
  - Rockwell: 14-95
- CuAl/CuSn-alloys (bronze):
  - Vickers: 40-290
- Wrought copper alloys, low alloyed:
  - Vickers: 45-315

### Test Piece Requirements
- Surface preparation:
  - Roughness grade class ISO 1302 N7  
  - Max. roughness depth Rₐ (μm / μinch) 10 / 400  
  - Average roughness Rₐ (μm / μinch) 2 / 80
- Minimum sample mass:
  - Of compact shape (kg / lbs) 5 / 11  
  - On solid support (kg / lbs) 2 / 4.5
- Minimum sample thickness:
  - Coupled (mm / inch) 3 / 0.12  
  - Surface layer thickness (mm / inch) 0.8 / 0.03
- Indentation size on test surface:
  - With 300 HV, 3D HRC Diameter (mm / inch) 0.54 / 0.021  
  - Depth (μm / μinch) 24 / 960
  - With 600 HV, 5S HRC Diameter (mm / inch) 0.45 / 0.017  
  - Depth (μm / μinch) 17 / 680
  - With 800 HV, 6S HRC Diameter (mm / inch) 0.35 / 0.013  
  - Depth (μm / μinch) 10 / 400

*Custom conversion curve / correlation

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**D/DC**  
**DL**  
**S**  
**E**  
**G**  
**C**

---

**proceq**  
Swiss Precision since 1954
The Rockwell Measuring Principle

The test principle of the Equotip Portable Rockwell follows the traditional Rockwell static test method. During measurements with the Equotip Portable Rockwell Probe, a diamond indenter is forced into the test piece using a precisely controlled force. The indentation depth of the diamond is continuously measured while a load is applied and released. From the indentation depths $d_1$ and $d_2$ recorded at two defined loads, the difference is calculated: $\Delta = d_2 - d_1$. This is traditionally referred to as plastic deformation.

Specially For Thin Parts

Particularly suited for scratch-sensitive and polished parts or on thin parts, profiles and pipes with a wall thickness that is below 2 mm (0.08”).

Suits Various Sample Geometries

Unique measuring clamp and support feet are available for the probe allowing tests to be carried out on various geometries.

Broad Hardness Scales Coverage

Measurements in HRC and HV with automatic integrated conversions to HB, HRA, HRB and many more common scales in compliance to ASTM E140 and ISO 18265.

For Any Environment

The Equotip 550 Portable Rockwell can be utilized for on-site, factory and lab environment with almost no limitation.
Equotip® Portable Rockwell
Probe and Accessories

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring range</td>
<td>0-100 μm; 19-70 HRC; 35-1'000 HV</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 μm; 0.1 HRC; 1 HV</td>
</tr>
<tr>
<td>Measuring accuracy</td>
<td>± 0.8 μm; ≈ ± 1.0 HRC over entire range</td>
</tr>
<tr>
<td>Maximum test hardness</td>
<td>70 HRC; approx. 1'000 HV</td>
</tr>
<tr>
<td>Test loads</td>
<td>Preload 10 N / Total Load 50 N</td>
</tr>
<tr>
<td>Diamond indenter</td>
<td>Angle 100.0° ± 0.5°, diameter of flat area of 60 μm ± 0.5 μm</td>
</tr>
</tbody>
</table>

Round standard foot (magnetic)
Ideal for flat parts, and test locations more than 10 mm from an edge.

Tripod foot
Designed for tests that require accurate positioning (welds, heat-affected zones).

Special feet RZ 18-70 and 70-∞
Designed for curved test pieces such as cylindrical parts, tubes, pipes.

The Portable Rockwell Measuring Clamp

Support Z1
for flat parts

Support Z2
for thin cylindrical parts, wires, bolts

Support Z4
for tubes and pipes up to Ø 28 mm

Support Z4+28
for tubes and pipes over Ø 28 mm
«It’s the ease of use of the Equotip solution that is the outstanding feature for us»
### Prepacked Units

All units include: Equotip Touchscreen incl. Battery, Power Supply, USB Cable, Surface Roughness Comparator Plate, DVD with Software, Documentation, Carrying Strap and Carrying Case

<table>
<thead>
<tr>
<th>Model</th>
<th>Additional Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equotip® 550</td>
<td></td>
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<tr>
<td>356 10 001</td>
<td></td>
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<tr>
<td></td>
<td>For flexible probe configuration and for existing owners of Equotip and Equostat 3 probes</td>
</tr>
<tr>
<td>Equotip® 550 Leeb D</td>
<td>Additionally includes Equotip Leeb Impact Device D, Impact Device Cable, Test Block ~775 HLD / ~56 HRC, Coupling Paste, Cleaning Brush</td>
</tr>
<tr>
<td>356 10 002</td>
<td></td>
</tr>
<tr>
<td>Equotip® 550 Leeb G</td>
<td>Additionally includes Equotip Leeb Impact Device G, Impact Device Cable, Test Block ~570 HLG / ~340 HB, Coupling Paste, Cleaning Brush</td>
</tr>
<tr>
<td>356 10 003</td>
<td></td>
</tr>
<tr>
<td>Equotip® 550 Portable Rockwell</td>
<td>Additionally includes Equotip Portable Rockwell Probe 50 N, Probe Cable, Test Block ~62 HRC</td>
</tr>
<tr>
<td>356 10 004</td>
<td></td>
</tr>
</tbody>
</table>

### Impact Devices & Probes

**Equotip Leeb Impact Devices**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>356 00 500</td>
<td>Equotip Leeb Impact Device C</td>
</tr>
<tr>
<td>356 00 100</td>
<td>Equotip Leeb Impact Device D</td>
</tr>
<tr>
<td>356 00 110</td>
<td>Equotip Leeb Impact Device DC</td>
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<tr>
<td>356 00 120</td>
<td>Equotip Leeb Impact Device DL</td>
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<tr>
<td>356 00 400</td>
<td>Equotip Leeb Impact Device E</td>
</tr>
<tr>
<td>356 00 300</td>
<td>Equotip Leeb Impact Device G</td>
</tr>
<tr>
<td>356 00 200</td>
<td>Equotip Leeb Impact Device S</td>
</tr>
</tbody>
</table>

**Equotip Portable Rockwell Probe**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>356 00 600</td>
<td>Equotip Portable Rockwell Probe 50 N</td>
</tr>
</tbody>
</table>

### Accessories

**Equotip Leeb Accessories**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>353 03 000</td>
<td>Set of Support Rings</td>
</tr>
<tr>
<td>356 00 080</td>
<td>Equotip Impact Device Cable 1.5 m (5 ft)</td>
</tr>
<tr>
<td>353 00 086</td>
<td>Equotip Impact Device Cable 5 m (15 ft)</td>
</tr>
</tbody>
</table>

**Equotip Portable Rockwell Accessories**

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>354 01 200</td>
<td>Equotip Portable Rockwell Measuring Clamp</td>
</tr>
<tr>
<td>354 01 130</td>
<td>Equotip Portable Rockwell Tripod</td>
</tr>
<tr>
<td>354 01 250</td>
<td>Equotip Portable Rockwell Special Foot RZ 18 - 70</td>
</tr>
<tr>
<td>354 01 253</td>
<td>Equotip Portable Rockwell Special Foot RZ 70 - ∞</td>
</tr>
</tbody>
</table>
**Service and Support**

Proceq is committed to providing the best support and service available in the industry through the Proceq certified service centers worldwide. This results in a complete support for Equotip by means of our global service and support facilities.

Subject to change without notice. All information contained in this documentation is presented in good faith and believed to be correct. Proceq SA makes no warranties and excludes all liability as to the completeness and/or accuracy of the information. For the use and application of any product manufactured and/or sold by Proceq SA explicit reference is made to the particular applicable operating instructions.

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**Ordering Information**

**Test Blocks**

<table>
<thead>
<tr>
<th>Equotip Leeb Test Blocks Calibrated by Proceq</th>
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<tbody>
<tr>
<td>357 11 500 Equotip Test Block C, ~565 HLC / &lt;220 HB</td>
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<tr>
<td>357 12 500 Equotip Test Block C, ~665 HLC / ~325 HB</td>
</tr>
<tr>
<td>357 13 500 Equotip Test Block C, ~835 HLC / ~56 HRC</td>
</tr>
<tr>
<td>357 11 100 Equotip Test Block D/DC, &lt;500 HLD / &lt;220 HB</td>
</tr>
<tr>
<td>357 12 100 Equotip Test Block D/DC, ~600 HLD / ~325 HB</td>
</tr>
<tr>
<td>357 13 100 Equotip Test Block D/DC, ~775 HLD / ~56 HRC</td>
</tr>
<tr>
<td>357 13 105 Equotip Test Block D/DC, ~775 HLD, one side</td>
</tr>
<tr>
<td>357 11 120 Equotip Test Block DL, &lt;710 HLDL / &lt;220 HB</td>
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<tr>
<td>357 12 120 Equotip Test Block DL, ~780 HLDL / ~325 HB</td>
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<tr>
<td>357 13 120 Equotip Test Block DL, ~890 HLDL / ~56 HRC</td>
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<tr>
<td>357 13 400 Equotip Test Block E, ~740 HLE / ~56 HRC</td>
</tr>
<tr>
<td>357 14 400 Equotip Test Block E, ~810 HLE / ~63 HRC</td>
</tr>
<tr>
<td>357 31 300 Equotip Test Block G, ~450 HLG / ~340 HB</td>
</tr>
<tr>
<td>357 32 300 Equotip Test Block G, ~570 HLG / ~340 HB</td>
</tr>
<tr>
<td>357 13 200 Equotip Test Block S, ~815 HLS / ~56 HRC</td>
</tr>
<tr>
<td>357 14 200 Equotip Test Block S, ~875 HLS / ~63 HRC</td>
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**Equotip Portable Rockwell Test Blocks**

<table>
<thead>
<tr>
<th>Equotip Portable Rockwell Test Blocks</th>
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<tr>
<td>357 41 100 Equotip Portable Rockwell Test Block ~20 HRC, ISO 6508-3 HRC Calibration</td>
</tr>
<tr>
<td>357 42 100 Equotip Portable Rockwell Test Block ~45 HRC, ISO 6508-3 HRC Calibration</td>
</tr>
<tr>
<td>357 44 100 Equotip Portable Rockwell Test Block ~62 HRC, ISO 6508-3 HRC Calibration</td>
</tr>
</tbody>
</table>

**Additional Test Block Calibrations**

**Factory Calibrations by Proceq**

| 357 10 109 Additional Calibration HLD / HLDC |
| 357 10 129 Additional Calibration HLDL |
| 357 10 209 Additional Calibration HLS |
| 357 10 409 Additional Calibration HLE |
| 357 10 509 Additional Calibration HLC |
| 357 30 309 Additional Calibration HLG |

**By Accredited Institutes**

| 357 90 909 Additional Calibration HL (DIN 50156-3) |
| 357 90 919 Additional Calibration HB (ISO 6506-3) |
| 357 90 929 Additional Calibration HV (ISO 6507-3) |
| 357 90 939 Additional Calibration HR (ISO 6508-3) |

**By Accredited Institutes**

| 357 90 918 Additional Calibration HB (ISO 6506-3) |
| 357 90 928 Additional Calibration HV (ISO 6507-3) |

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**Warranty Information**

Each instrument is backed by the standard Proceq warranty and extended warranty options.

- Electronic portion of the instrument: 24 months
- Mechanical portion of the instrument: 6 months
Swiss Made
Proceq instruments are developed, designed and manufactured in Switzerland. Since 1994, Proceq has been certified to the ISO 9001 standards that guarantee highest quality of processes, products and services.

Experience
Proceq has been a proud innovator in the field of portable non-destructive testing, developing a number of brands that have conquered the inspection industry for decades, such as the Equotip®, Schmidt® Hammers, Pundit®, Profometer® and Carboteq®.
Proceq SA
Ringstrasse 2
8603 Schwerzenbach
Switzerland

Globally organized seminars to help you learn more about our products and applications. Contact your local representative for further information.

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E-Shop Europe
E-Shop Asia