proceq

Solutions since 1954

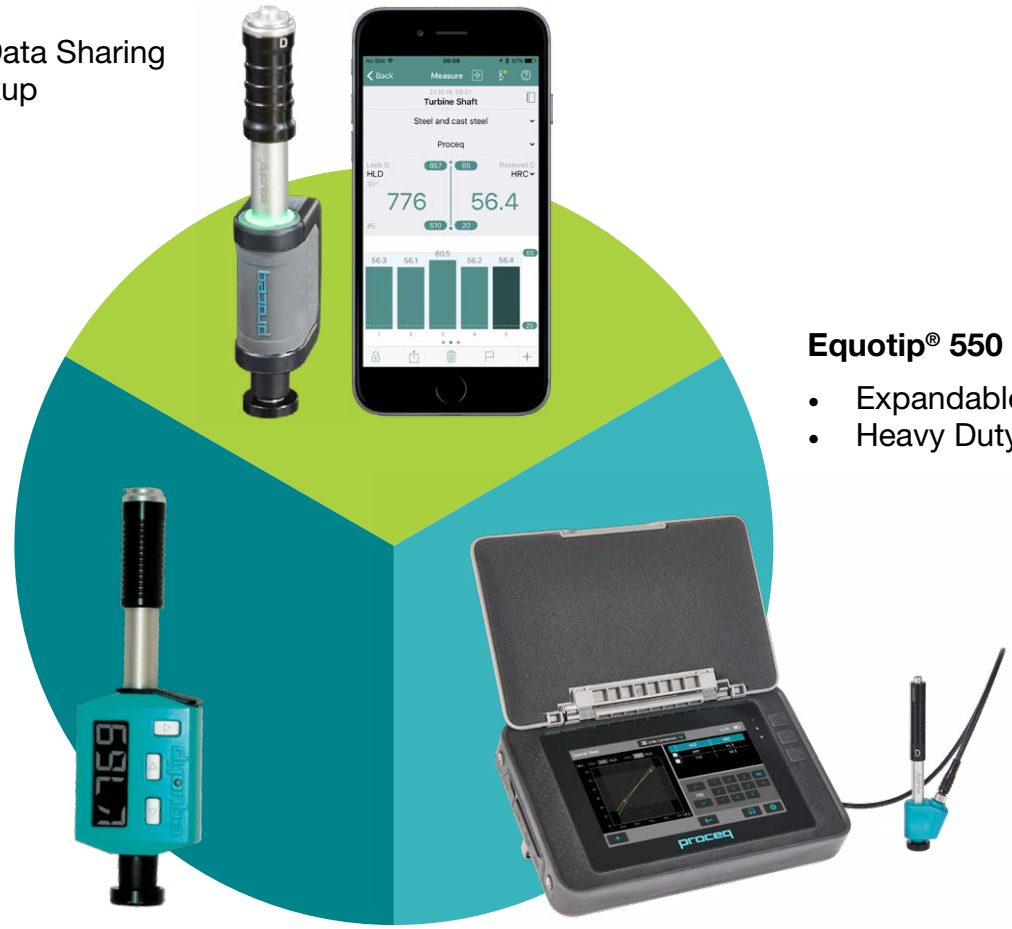
# equotip® live

## Smart Portable Wireless Leeb Hardness Solution

# Equotip® Leeb D
## Complete Portfolio

### Equotip® Live

- Wireless
- Real-time Data Sharing
- Cloud Backup




### Equotip® 550

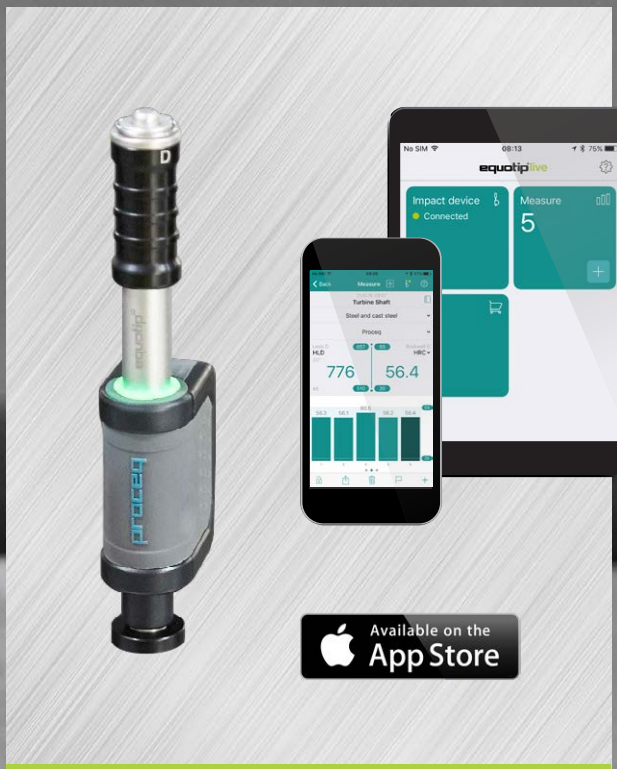
- Expandable
- Heavy Duty

### Equotip® Piccolo / Bambino 2

- Integrated

# equotip® live

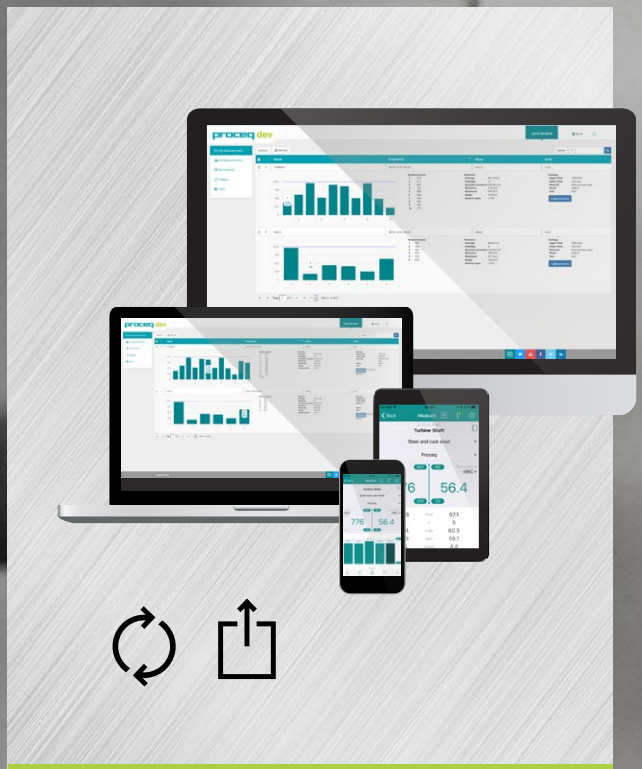
## The global industry standard reinvented




### Measure

New generation wireless impact device and mobile app

Find out more (Page 4)



### Sync and share

Quick and easy data review and sharing

Find out more (Page 9)

# Equotip® Live Leeb D Impact Device

Patented Design

**Mounting ring**
For easy and secure carrying

**Loading grip**
Innovative loading grip for safe operation

**Multi-color LED ring**
With status indication

**On/Off button**
And additional functions

**USB connector**
For charging and firmware updates

**Functional materials**
Slip proofed rubber and IP 54 sealed housing

**Removable Bluetooth 4.0 low energy module**
Built for Internet of Things (IoT)

**Exchangeable support ring**
Compatible with existing Proceq accessories

**AAA battery compartment**
Single use or rechargeable

Easy to remove for faster check-in and shipping

- \+ Following Proceq's known high quality standards and ensuring an accuracy of ± 4 HL
- \+ Ultra portable wireless device perfect for confined spaces on-site
- \+ Multiple users can share same impact device / Use multiple impact devices with the same app

# Developed for Challenging Environments

- IP 54 protected Equotip Live Leeb D Impact Device
- Special mobile covers and gloves to further increase protection
- Ultra portable solution with wireless connection
- Suitable for confined spaces

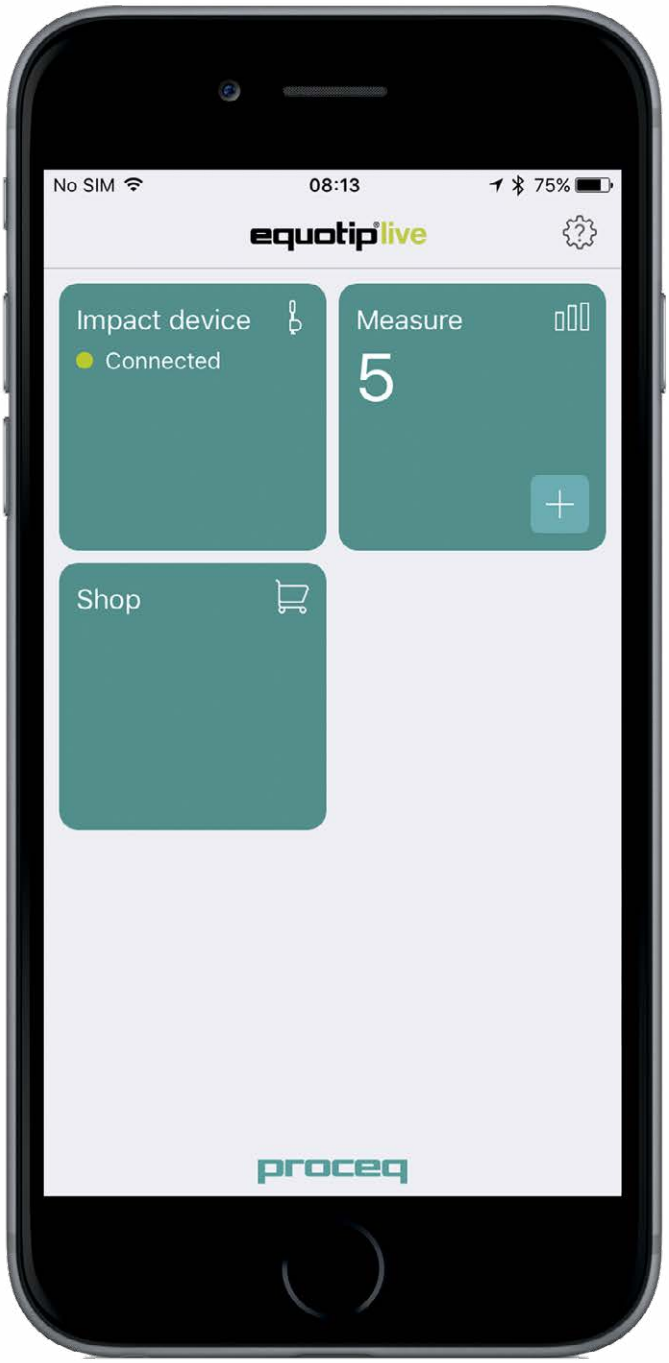
# Equotip® App
## Hardness Testing Made Simple

User interface designed by experts for intuitive hardness testing

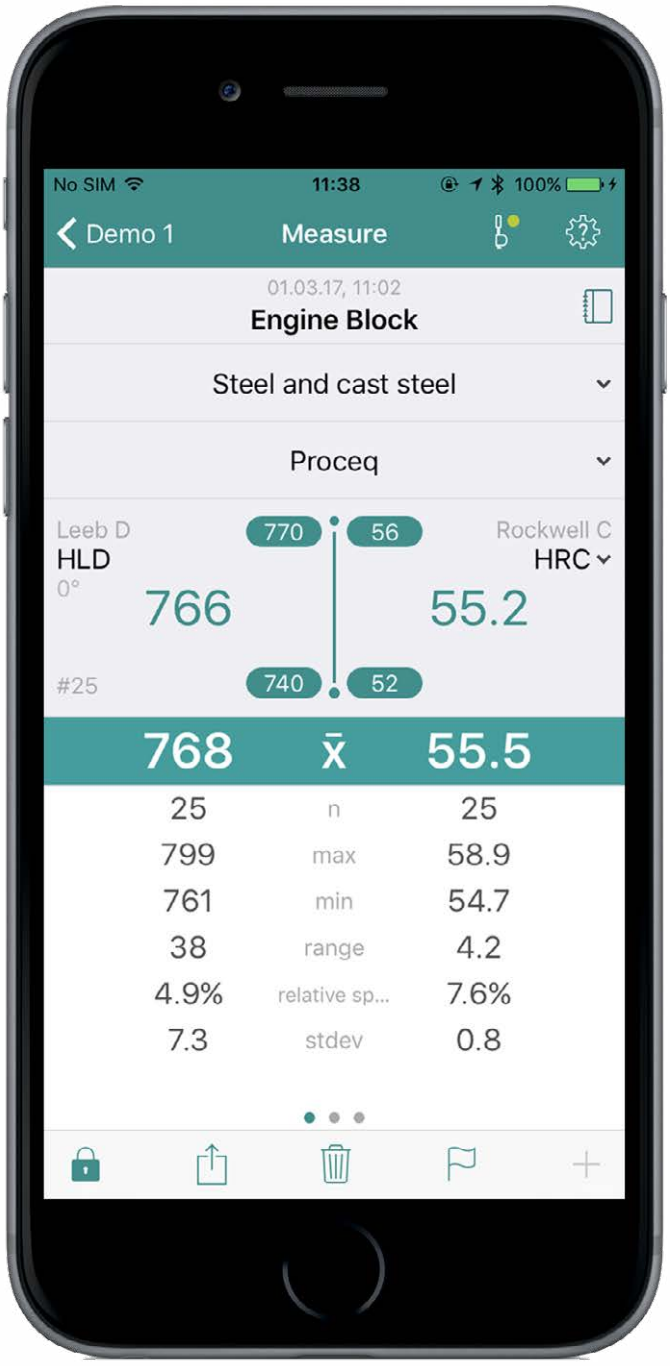
Hotspots: Predefined shortcuts for fast measuring and handling

Audio output of readings allow to keep mobile device in the pocket

On-screen help through measuring and settings steps



# Equotip® App
## A New Measuring Experience




Globally accessible measuring data via live.proceq.com

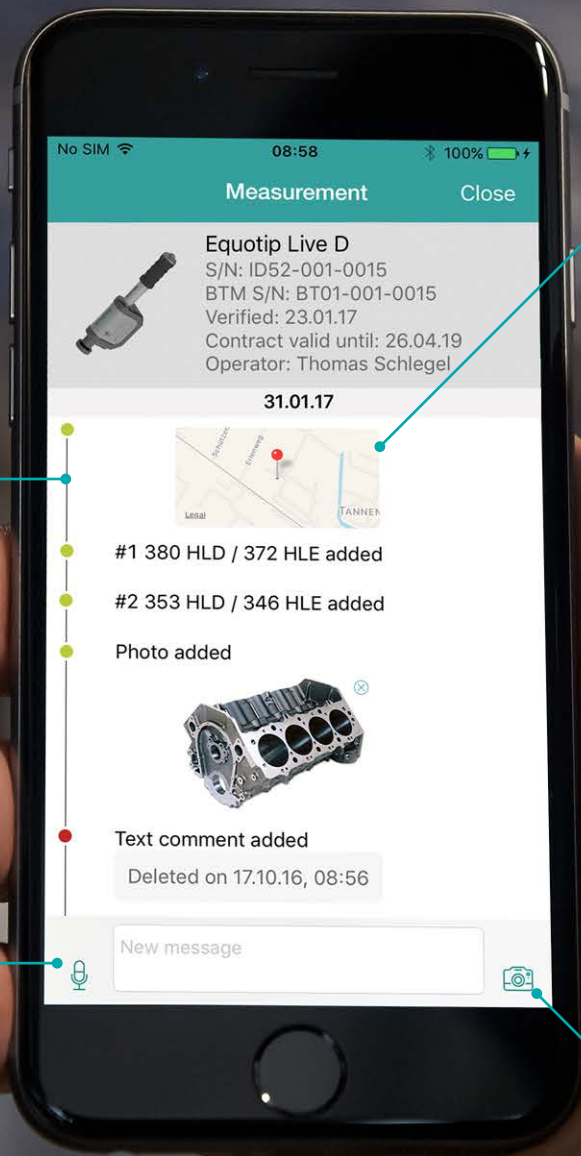
Custom conversion curve options to increase accuracy on exotic materials

Verification and calibration information for increased reliability

- Full traceability of data
- Try out app: Download for free and review Proceq's training data set
- Visit live.proceq.com for compatibility information

Available on the App Store

# Equotip® Live App
## Logbook for Full Control and Review



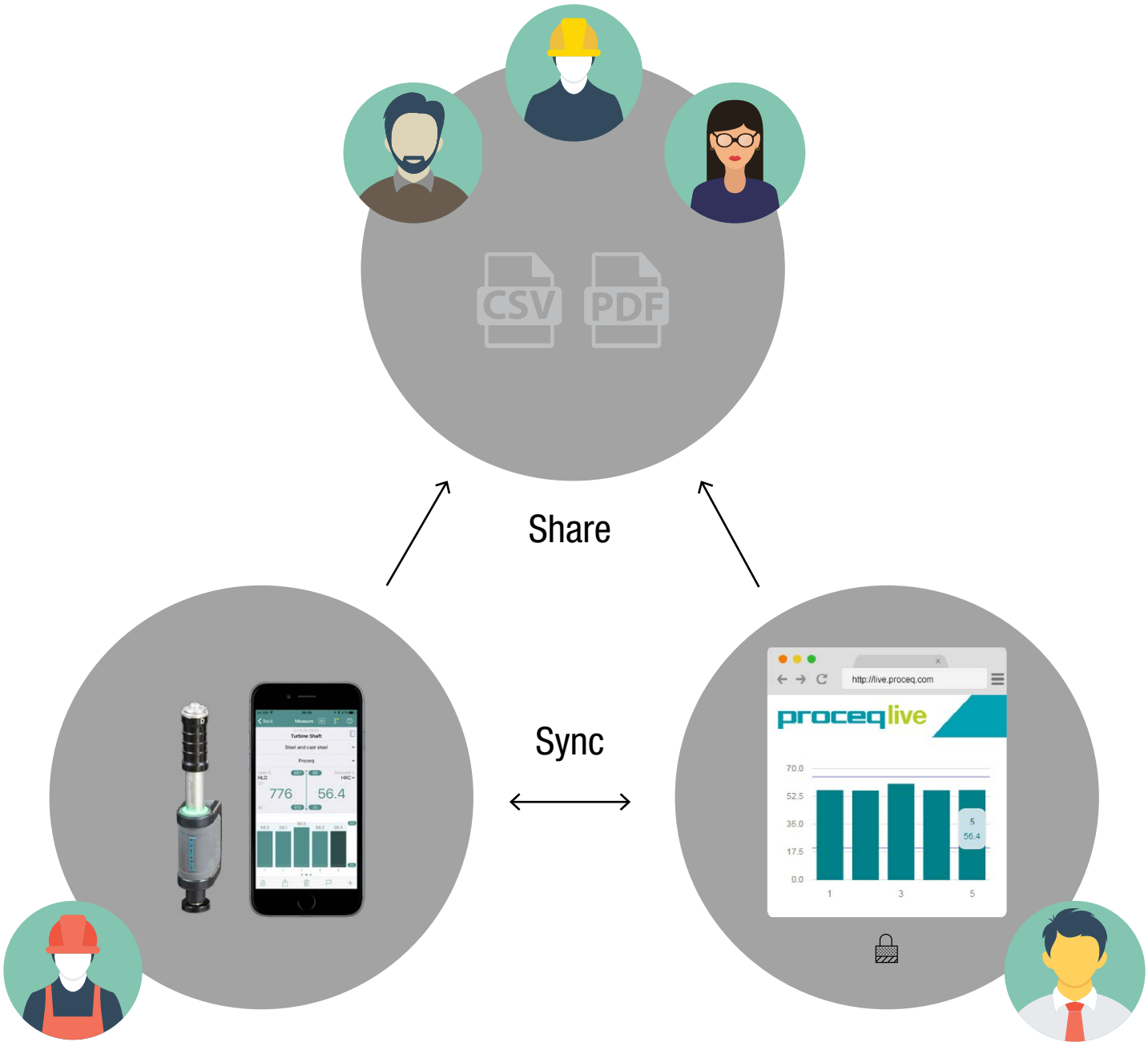

Geolocation

Timeline with activities

Assign voice recordings to your readings

Take and insert pictures

# Proceq Live Sync
## Fast and Secure Report Generation




- Secure web platform live.proceq.com
- Centralized report template and profile management
- Full data traceability with continuous online backup to prevent data loss

# Equotip® Live

## First Internet of Things (IoT) Hardness Testing Solution

**Flexible budgeting**

Initial set-up contribution and small monthly fee to preserve capital for your business

**Predictable cost planning**

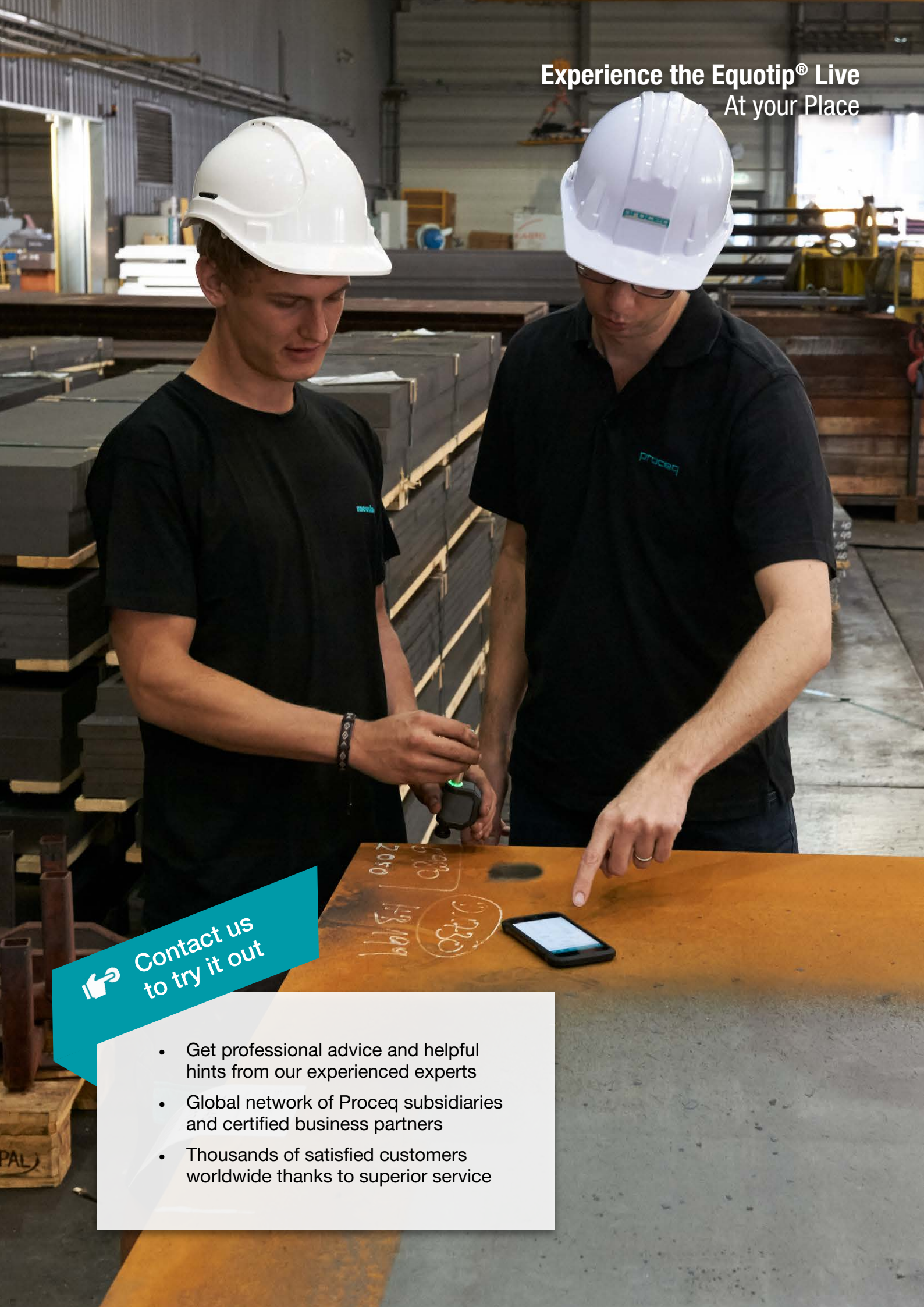
Fixed fee to help you plan well in advance

**Unbeatable value for your hardness solution**

Latest technology from the inventor of Leeb for a fraction of the cost

**Protect your investments**

Use existing mobile devices to leverage your IoT and Industry 4.0 investments

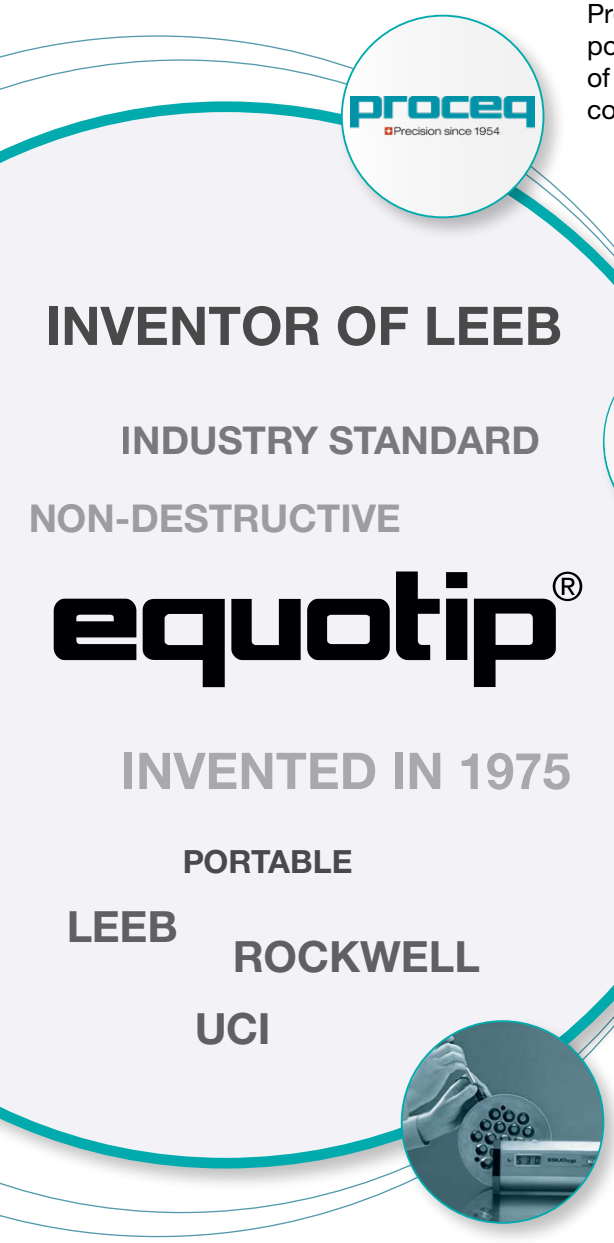


## Experience the Equotip® Live
At your Place

**Contact us to try it out**

- Get professional advice and helpful hints from our experienced experts
- Global network of Proceq subsidiaries and certified business partners
- Thousands of satisfied customers worldwide thanks to superior service

# Proceq – A Story of Success




## Market Leader

Proceq SA, founded 1954 in Switzerland, is the global leader in portable measurement solutions for the non-destructive testing of material properties of metal, concrete, rock, paper and composites.

**Find out more on the Proceq history**

## Worldwide Local Support

Our team of dedicated experts are available to advise you on our instruments and their applications. In addition you may take further benefits from our instructional videos, evaluation tools, online webinars and of course our live seminars globally.

## Swiss Made

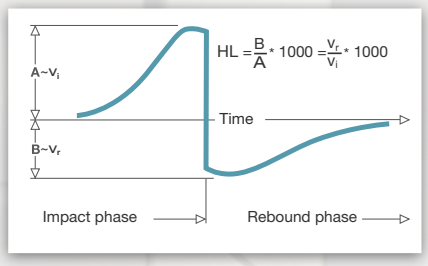
Proceq instruments are developed, designed and manufactured in Switzerland, that guarantees the highest product and service quality. Since 1994, the management system of Proceq SA is also certified according to ISO 9001.

## Experience

Proceq has been a proud innovator in the field of portable non-destructive testing, developing solutions that have conquered the inspection industry for decades. Most famous brands are Equotip®, Schmidt®, Pundit®, Profometer® and Carboteq®.

# The Leeb Measuring Principle
## Invented by Proceq

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.

**Measuring Range**

| | Scales | Units | Range |
|---|---|---|---|
| **Steel and cast steel** | Vickers<br>Brinell<br>Rockwell<br><br><br>Shore<br>Rm N/mm² | HV<br>HB<br>HRB<br>HRC<br>HS<br>σ1<br>σ2<br>σ3 | 81-955<br>81-654<br>38-100<br>20-68<br>30-99<br>275-2194<br>616-1480<br>449-847 |
| **Cold work tool steel** | Vickers<br>Rockwell | HV<br>HRC | 80-900<br>21-67 |
| **Stainless steel** | Vickers<br>Brinell<br>Rockwell | HV<br>HB<br>HRB<br>HRC | 85-802<br>85-655<br>46-102<br>20-62 |
| **Cast iron lamellar graphite GG** | Brinell<br>Vickers<br>Rockwell | HB<br>HV<br>HRC | 90-664<br>90-698<br>21-59 |
| **Cast iron, nodular graphite GGG** | Brinell<br>Vickers<br>Rockwell | HB<br>HV<br>HRC | 95-686<br>96-724<br>21-60 |
| **Cast aluminium alloys** | Brinell<br>Vickers<br>Rockwell | HB<br>HV<br>HRB | 19-164<br>22-193<br>24-85 |
| **Copper/zinc alloys (brass)** | Brinell<br>Rockwell | HB<br>HRB | 40-173<br>14-95 |
| **CuAl/CuSn-alloys (bronze)** | Brinell | HB | 60-290 |
| **Wrought copper alloys, low alloyed** | Brinell | HB | 45-315 |

» Other combinations possible through custom conversions

**Test Piece Requirements**

| | | | |
|---|---|---|---|
| **Surface preparation** | Roughness grade class ISO 1302 | | N7 |
| | Max. roughness depth $R_t$ (µm / µinch) | | 10 / 400 |
| | Average roughness $R_a$ (µm / µinch) | | 2 / 80 |
| **Minimum sample mass** | Of compact shape (kg / lbs) | | 5 / 11 |
| | On solid support (kg / lbs) | | 2 / 4.5 |
| | Coupled on plate (kg / lbs) | | 0.05 / 0.2 |
| **Minimum sample thickness** | Uncoupled (mm / inch) | | 25 / 0.98 |
| | Coupled (mm / inch) | | 3 / 0.12 |
| | Surface layer thickness (mm / inch) | | 0.8 / 0.03 |
| **Indentation size on test surface** | With 300 HV, 30 HRC | Diameter (mm / inch) | 0.54 / 0.021 |
| | | Depth (µm / µinch) | 24 / 960 |
| | With 600 HV, 55 HRC | Diameter (mm / inch) | 0.45 / 0.017 |
| | | Depth (µm / µinch) | 17 / 680 |
| | With 800 HV, 63 HRC | Diameter (mm / inch) | 0.35 / 0.013 |
| | | Depth (µm / µinch) | 10 / 400 |

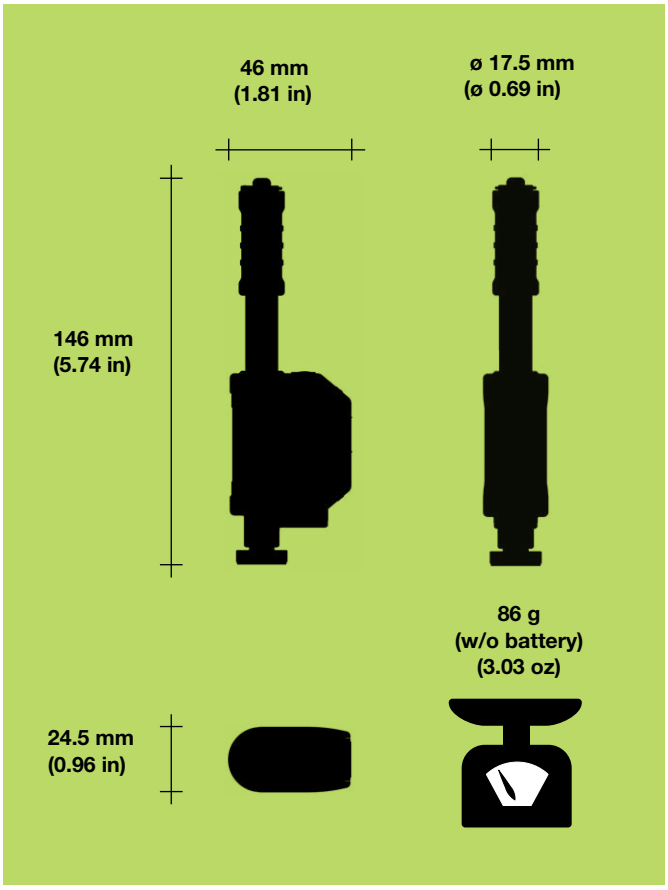
# Technical Specifications
## Full Standard Compliance and Traceability

## Measuring

| | |
|---|---|
| **Measuring range** | 100 - 1000 HLD |
| **Measuring accuracy** | ± 4 HL (0.5 % at 800 HL) |
| **Measuring resolution** | 1 HL / HV / HB<br>0.1 HRC / HRB / HS<br>1 N/mm² Rm |
| **Impact direction** | Automatic compensation (± 5°) |
| **Storage temperature** | -20 to 60° C (-4 to 140° F) |
| **Operating temperature** | -10 to 50° C (14 to 122° F) |
| **Charging temperature** | 0 to 40° C (32 to 104° F) |
| **Humidity** | 90% max. |
| **IP rating** | IP 54 |

## General

| | |
|---|---|
| **Battery type** | 1x rechargeable AAA NiMH 1000 mAh |
| **Operating hours** | > 20 h continuously measuring (1 impact/5 sec) |
| **Communication** | USB 2.0, Bluetooth 4.0 Low Energy |
| **Connector** | Micro-USB B |




## Full Traceability

In combination with the Equotip Leeb test blocks, hardness testing with the Equotip Live solution is fully traceable.

## Standards

| | |
|---|---|
| **ASTM** | A956 / A370 |
| **ISO** | 16859 |
| **DIN** | 50156 (withdrawn) |
| **GB/T** | 17394 |
| **JB/T** | 9378 |

## Conversion Standard

| | |
|---|---|
| **ASTM** | E140 |

## Guidelines

- ASME CRTD-91
- DGZfP Guideline MC 1
- VDI / VDE Guideline 2616 Paper 1
- Nordtest Technical Reports 421-1, 424-2, 424-3

## Equotip® Live Leeb D

Initial set-up contribution + Small monthly fee

- ✓ Low System Replacement Costs
- ✓ Regular Updates

| | |
|---|---|
| 358 99 002 | **Rental Unlimited of Equotip Live Leeb D** consisting of Equotip Live Bluetooth module, full functionality of Equotip Live Leeb D Kit incl. usage of cloud infrastructure. Requires additionally Equotip Live Leeb D Kit. |
| 358 10 001 | **Equotip Live Leeb D Kit** consisting of Equotip Live Leeb D Basic Impact Device, Equotip Impact Body D/DC, Support Ring D6, Micro USB Cable, Cleaning Brush, Rechargeable AAA battery, Documentation, Carrying Strap and Carrying Case. Requires additionally Rental Unlimited of Equotip Live Leeb D. |

### Accessories

| | |
|---|---|
| 358 00 101 | Equotip Live Leeb D Impact Device Basic |
| 350 01 004 | Equotip Impact Body D/DC |
| 341 80 112 | USB charger |
| 350 01 015 | Equotip coupling paste |
| 350 01 010 | Equotip support ring D6a |
| 353 03 000 | Set of support rings |

### Equotip Leeb Test Blocks Calibrated by Proceq

| | |
|---|---|
| 357 11 100 | Equotip Test Block D/DC, <500 HLD / <220 HB |
| 357 12 100 | Equotip Test Block D/DC, ~600 HLD / ~325 HB |
| 357 13 100 | Equotip Test Block D/DC, ~775 HLD / ~56 HRC |
| 357 13 105 | Equotip Test Block D/DC, ~775 HLD, one side |

### Additional Test Block Calibrations

| | |
|---|---|
| 357 90 909 | Equotip Leeb Test Block Additional Calibration HL (ISO 16859-3) |
| 357 90 919 | Equotip Leeb Test Block Additional Calibration HB (ISO 6506-3) |
| 357 90 929 | Equotip Leeb Test Block Additional Calibration HV (ISO 6507-3) |
| 357 90 939 | Equotip Leeb Test Block Additional Calibration HR (ISO 6508-3) |

## 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.

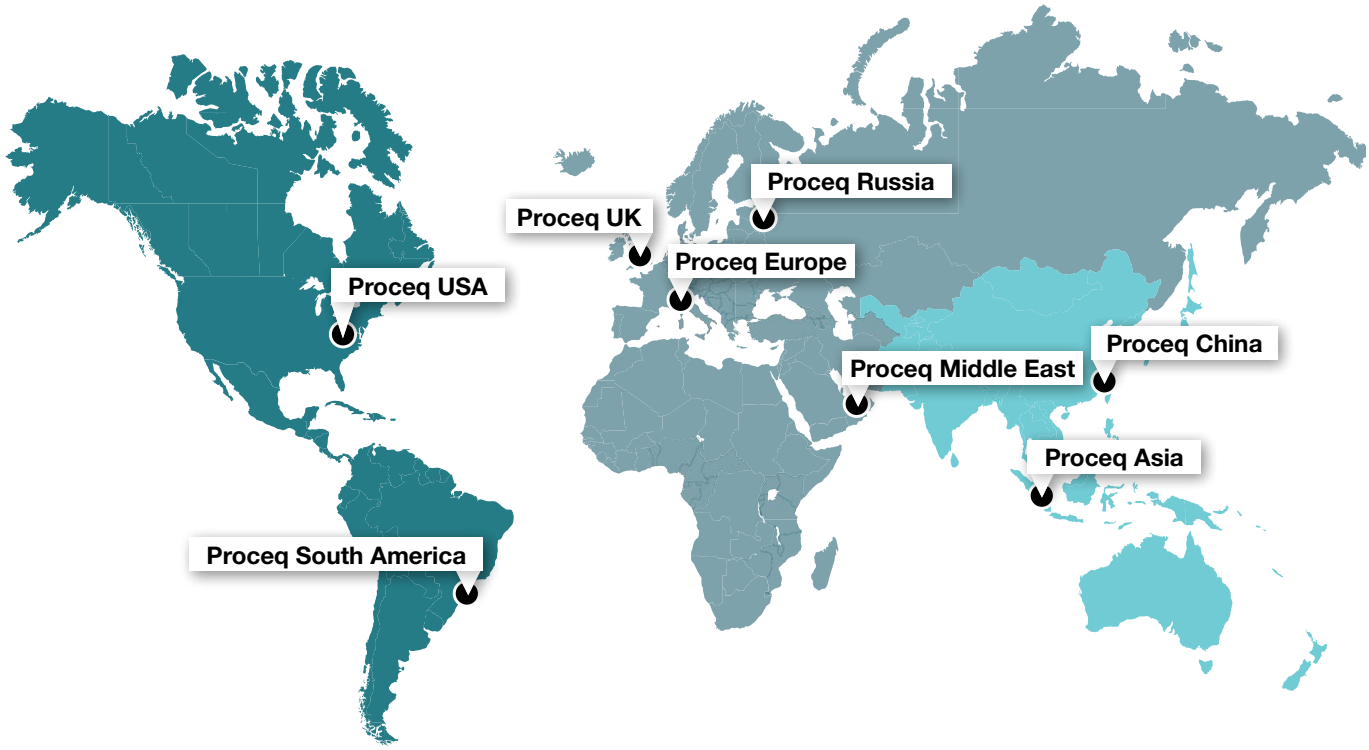
## Warranty Information

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

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.

Click on the Proceq subsidiaries for more information

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