

## Technical Information

# Using Equotip Support Rings

Leeb hardness testers provide accurate measurements if the impact body has a certain position in the guiding tube at the moment of its impact onto the test surface. When testing flat samples with standard support rings, the spherical test tip is located precisely at the end of the guiding tube. However, when testing curved samples with the Equotip standard support rings, this may not always be the case. To ensure accurate measurements in all cases, Proceq offers a range of special support rings designed for measurements on curved sample surfaces.

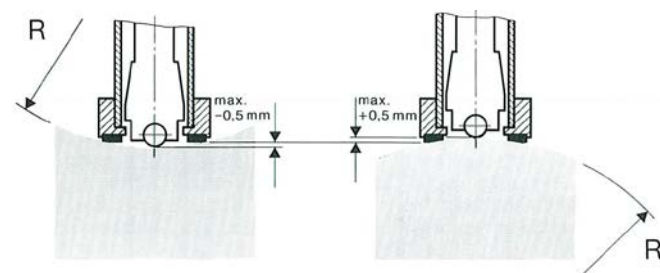
### Most Common Test Situations:

#### Equotip Impact Devices D/DC, C, E, S and G with Standard Support Rings

With each Equotip impact device D/DC, C, E, S or G, respectively, Proceq delivers two support rings. The 13.5 mm outer diameter (OD) support ring – named “D6a” – provides accurate results if the test surface curvature is larger than  $R = 30$  mm. The 19.5mm OD support ring D6 can be used down to a minimum test surface curvature of  $R = 60$  mm. Equotip impact devices G sell with two support rings with 19.5 mm (G6a) and 29.5 mm OD (G6), respectively. These provide accurate measurements as long as the surface curvature of the sample has a radius above 50 mm for G6 and 100 mm for G6a.



For test surfaces that do not comply with these standard situations, Proceq’s special support rings offer apt solutions for impact devices of types D/DC, C, E and S.



## Testing on Cylindrical Test Surfaces (e.g. boilers and pipes)

Cylindrical test objects can be tested with the support rings Z10–15 (R = 10 to 15 mm cylinder radius), Z14.5–30 (R = 14.5 to 30 mm), and Z25–50 (R = 25 to 50 mm cylinder radius). The support rings HZ11–13, HZ12.5–17, and HZ16.5–30 are well suited for Equotip hardness measurements on hollow-cylindrical surfaces, such as the inside of pipes and boilers of R = 11 to 13 mm, R = 12.5 to 17 mm, and R = 16.5 to 30 mm cylinder radii, respectively.

For convenience particularly when used with Proceq's advanced Equotip 3 impact devices, these support rings can be rotated by 360° around the longitudinal axis of the impact device. By means of a grub screw, the user can freely align the rectangular support ring to match the orientation of the impact device handle and to find the optimal position with respect to the sample.

## Testing on Spherical Test Surfaces

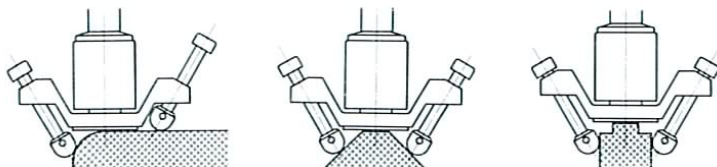
For spherical test situations, Proceq offers the support rings K10–15 (10 to 15 mm spherical radius) and K14.5–30 (R = 14.5 to 30 mm spherical radius). Accordingly, hollow-spherical surfaces can be tested with the support rings HK11–13 (R = 11 to 13 mm spherical radius), HK12.5–17 (R = 12.5 to 17 mm spherical radius), and HK16.5–30 (R = 16.5 to 30 mm spherical radius). The support rings for spherical test requirements are symmetrical around the guide tube, eliminating the need of alignment of the support ring.

## Testing in Recesses

For hardness tests inside recesses such as the bases between the teeth of gears, the support rings of the above-mentioned impact devices do not fit. For these situations, Proceq offers the DL long tip system. This is a special impact body and support ring combination, which can reach into many such recesses.

## Universal Support Ring

The most versatile support ring is called UN. This ring embraces the need to test even more complex geometries. Examples can be seen below.



If none of these solutions apply to your sample geometry, please contact your local Proceq representative or visit <http://www.proceq.com> and <http://www.equotip.com/>.

