

## Explanations on hardness data

### Scratch Hardness according to Mohs

The Mohs' hardness scale consists of 10 well known minerals, each of which represents a definite degree of hardness / scratch hardness.

Each mineral scratches all minerals with a lower hardness number.

### Hardness according to Rockwell (HRC)

For the hardness test according to Rockwell a cone-shaped test piece is pressed into the boundary layer of a working piece with a defined pressure and the remaining impression depth is measured. Depending on the pre-force, on the additional force and on the kind of the penetration stamp different Rockwell test methods are used. With the Rockwell B procedure (penetration stamp = steel ball) and the Rockwell C procedure (penetration stamp = cone) only two of the most common procedures are to be introduced here.

Example:

59 HRC            the Rockwell hardness, measured in the scale C is 59

### Hardness according to Vicker (HV)

Here the point of a pyramid of diamond is pressed into the surface of the working piece for 10-30 sec. with a defined pressure and the diagonal of the resulted imprint of the pyramid is measured.

Examples:

640 HV 30:    the Vickers hardness value 640 was determined with a pressure of 294.2 N = 30 kp and a short working period from 10 to 15 seconds.

545 HV 1/20: the Vickers hardness value 545 was determined with a pressure of 9,807 N = 1 kp and a short working period of 20 sec.

### Hardness according to Brinell (HBW)

For the hardness test according to Brinell a ball made of tungsten carbide is pressed into the surface for more than 10 sec. with a defined pressure and is left there for 10 to 15 sec. The Brinell hardness HBW is determined from the diameter of the ball impression.

Example:

350 HBW 5/750            Brinell hardness 350, is determined with a ball of 5 mm diameter and a test pressure of 7.355 kN and has been left there for 10 to sec.

## Comparison of the different hardness scales

