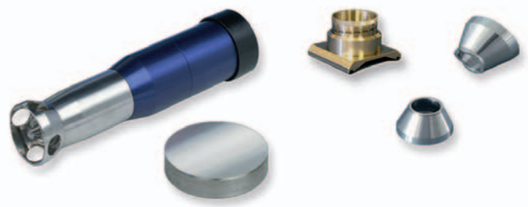
Accessories for the TIV method



Test instrument

Optical TIV hardness testing instrument

Light, mobile testing instrument for optical hardness testing according to Vickers under test load (Through-Indenter-Viewing): optical system including CCD camera for the automatic or manual determination of the diagonal lengths through the Vickers diamond under test load. Direct observation of the indentation process on the display, immediate monitoring and assessment of the quality of the diamond indentation and thus of the measured value, direct monitoring of the state of the indenter (Vickers diamond).

Application Software:
UltraDAT

Probes

For the TIV hardness testing instrument we offer two probes for manual and stationary hardness tests. Product features: diamond pyramid according to Vickers, 136° roof angle, CCD/B/W camera, Ø=47 mm, L=45 mm, weight approx. 630 g. Power supply is provided via the TIV hardness testing instrument. Test load of the probes is provided independently of the test direction.

Probe:	**TIV 101**	**TIV 105**
Test load:	10 N/1 kp	50 N/5 kp
Measuring range:	30 HV up to 500 HV approx.	100 HV up to 1000 HV approx.

Typical areas of application

Measurement independent of material, mass and geometry of the test part, e.g.:

- very small and thin test parts
- e.g. coils or sheet metals and foils
- Ferrous and non-ferrous metals, carbide
- different alloys
- different coatings
- plastics of all kind
- glass and ceramics

Special accessories

Stands

MIC 222-A
Precision test stand

Probe attachments

TIV P-12 (Ø = 12 mm)
TIV P-20 (Ø = 20 mm)

TIV P-P
(Prism probe attachment for Ø 8–100 mm)
TIV P-V
(Prism probe attachment for Ø 100–1,000 mm)

Hardness reference plates**

TIV2V010	(280 HV1)
TIV2V050	(280 HV5)
MIC 25C	(25 HRC)*
MIC 45C	(45 HRC)*
MIC 65C	(65 HRC)*
MIC2V10	(240 HV1)*
MIC2V50	(240 HV1)*

**) More accessories available on request, *) Hardness reference plates with MPA certificate

General and universal accessories

Our selection of high-quality accessories ideally complement our instruments for mobile hardness testing: e.g. comfortable instrument cases, accumulator packs and data transfer cables. We also offer the **MIC 1060 battery-powered grinding set.**

Owing to its high idle running speed this battery-powered grinder is suitable for working gently on any test material

For your individual test tasks you can receive further accessories on request.

Accessories for mobile hardness testing

Three testing methods, five instrument series – varied solutions for high testing security

Three different physical methods can be used particularly successfully in practice: static UCI (Ultrasonic-Contact-Impedance) and dynamic rebound hardness testing as well as the optical TIV (Through-Indenter-Viewing) method.

The choice of method used depends exclusively on the testing problem. We offer you five series for mobile hardness testing which work using the UCI, the rebound or the TIV method: DynaPOCKET, DynaMIC, MIC 10, MIC 20, TIV.

The combination of test instrument and accessories offers high testing security, simple handling and exceptional operating comfort.

Many different areas of application are opened up for your testing tasks with a variety of probes and accessories. The tailor-made software solutions UltraHARD and UltraDAT add to the functional scope of the equipment in the areas of evaluations, statistics, documentation and data management.

Accessories for the UCI method

Testing instruments

MIC 10 / MIC 10 DL
Light, portable hardness testing instrument with a digital display for hardness tests with Vickers diamonds (136° pyramid) using the UCI method, works with all motorised and manual probes. Two instrument versions are available: a basic version and a data logger version with internal storage capacity and an additional data card for measurement data, automatic instrument settings and special report formats.

Application Software:
UltraHARD, UltraHARD Light
(MIC 10 DL only)

MIC 20
Combined hardness testing instrument for quasi-stationary hardness testing using the UCI method and dynamic hardness testing using the rebound method. Internal data storage for approx. 5000 measurement sets, interfaces: RS 232 C bi-directional, Ethernet.
Measuring ranges for UCI method:
20 - 1740 HV, 76 - 618 HB, 41 - 105 HRB, 20,3 -68, 0 HRC, only wtih 98 N-nanual probes 255 - 2180 N/mm

Application Software:
UltraDAT

Probes

Article description:	**MIC 2101-A***	**MIC 2103-A***	**MIC 211-A***	**MIC 201-A ** MIC 201-AL****	**MIC 205-A ** MIC 205-AL****	**MIC 2010-A ****
Test Load:	1N (0.1 kgf)	3N (0.3 kgf)	8 N (0.8 kgf)	10 N (1 kgf)	50 N (5 kgf)	98 N (10 kgf)

*) Motorised probe with automatic application of load, **) manual probes with various length versions

Typical areas of application

Probes of 1 - 8 N (0.1 - 0.8 kgf)
- thin layers with polished surface
- chrome layers on steel cylinders, copper rotogravure cylinders
- coatings, hardened layers (≥ 20 µm)

Probes of 8 - 10 N (0.8 - 1 kgf)
- ready-made precision parts, drives, bearing cones
- Turbine blades, insides of pipes
- Bearings, tooth flanks
- ionitrided coining dies and matrices, moulds, presses, thin-walled parts

Probes of 50 - 98 N (1 - 10 kgf)
- Measurement in notches, wheel flanks and tooth roots
- Induction machine parts or hardened machine parts, e.g. camshafts, turbines
- Small forged parts
- Weld-seam testing (HAZ)

Special accessories

Stands
MIC 221
Universal test stand
MIC 222-A
Precision test stand
MIC 227
Test stand for the determination of hardness progression

Guides
MIC 270
Flat probe attachment
MIC 271
Prism probe attachment
MIC 220
Test pliers

Hardness reference plates
MIC 25C (25 HRC)*
MIC 45C (45 HRC)*
MIC 65C (65 HRC)*

MIC 2V050 (240 HV5)*
MIC 5V050 (540 HV5)*
MIC 8V050 (840 HV5)*

*) Hardness reference plates with MPA certificatet

Accessories for the rebound method

Testing instruments

DynaPOCKET
Light, digital hardness testing instrument in pocket format for dynamic hardness testing using the rebound method.
Integrated impact devices with hard metal ball (Ø = 3 mm) and 12 N/mm impact energy, measurement in all directions, automatic conversion: HV, HB, HS, HRB, HRC and N/mm². .

DynaMIC / DynaMIC DL
Light, portable hardness testing instrument for dynamic hardness testing using the rebound method.
Conversion and display of the hardness value in the scales:
HL, HS, HB, HV, HRC, HRB, N/mm², statistical functions, automatic recognition of the impact device.

Application Software:
DynaSoft, UltraHARD, UltraHARD light
(DynaMIC DL only)

MIC 20
Combined hardness testing instrument for quasi-stationary hardness testing using the UCI method and dynamic hardness testing using the rebound method.
Measurement ranges of the rebound method:
150 - 1000 HL, 75 - 1000 HV, 75 - 700 HB, 30 - 100 HS, 35 - 100 HRB, 19 - 70 HRC, 250 - 2200 N/mm² (dependent on material and impact device).
Application Software:
UltraDAT

Impact devices (measurements in any direction)

Article description:	**Dyna D / DynaPOCKET**	**Dyna E**	**Dyna G**
Size and type of the indenter:	Ø = 3 mm Hard metal ball	Ø = 3 mm Diamond	Ø = 5 mm Hard metal ball
Impact energy:	12 (N/mm)	12 (N/mm)	90 (N/mm)

Typical areas of application

Dyna D and DynaPOCKET impact devices
- general testing of homogeneous materials
- solid coarse grained parts
- forged parts with non-homogeneous surface structure
- cast material

Dyna E impact device
- > 50 HRC, e.g. forged and hardened steelworks rolls

Dyna G impact device
- < 650 HB, e.g. large cast and forged parts, low demands on the surface (as compared with Dyna D)

Special accessories

Probe attachments (1 set, 5 pieces)
Dyna 41
(for cylindrical and hollow cylindrical surfaces, r = 10 - 30 mm)

Dyna 42
(for spherical and hollow spherical surfaces r = 10 - 30 mm)

Hardness reference plates
MIC D62 (approx. 620 HV 100)
(for Dyna D, Dyna E and DynaPOCKET impact devices)
MIC D62 MPA (approx. 620 HV 100)*
(for Dyna D and Dyna E impact devices)
MIC G38 (approx. 380 HV 100)
MIC G38 MPA (approx. 380 HV 100)*
(for Dyna G impact device)

Further accessories on request, *)Hardness reference plates with official testing certificate, certification optional