



unconventional testing machines  
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Portable Instrumented Indentation Testing System

# PIIS 3000™

Accuracy decides...

Fully automatic, non-destructive, portable instrumented indentation testing system designed for determining mechanical (yield strength, ultimate tensile strength, Young's modulus, Brinell hardness, strain hardening exponent, strain hardening constant, accumulated yield strain) and fracture toughness (critical SIF for mode I KIC, II KIC) material properties of structural components operating under industrial conditions (in-situ) using instrumented indentation testing method (IIT) in accordance with ISO/TR 29381, GB/T 39635-2020, GB/T 37782-2019, KSB0950.



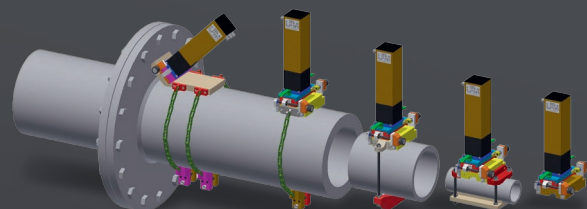
- Fully automated indentation process controlled by highly reliably industrial computer with Microsoft Windows operating system
- Brand, high accurate a fast sampling system
- Easy calibration / verification via reference materials
- User friendly control software

## SPECIFICATIONS

- Testing force up to 3 kN measured by high accuracy class sensor
- Indentation depth sensor with resolution 0,01 um
- Maximum indenter displacement: ±15 mm
- Indentation speed range (0,001÷10) mm/min
- Data acquisition sampling system with maximum sampling rate 10 kHz
- Clamping system with XY professional digital positioning system (range of movement X ± 25 mm, Y ± 5 mm - resolution 0,1 mm)

## FEATURES

- Machine design in accordance with EN ISO 204, ASTM E 292, ASTM E139 and N675 (ISO/TC 164 / SC 1)
- Legally protected system for precise instrumented indentation measurement without influence of machine compliance
- Fully suitable for quality systems according to ISO 9001: 2009.
- Testing without service interruption and damaging of examined machinery parts
- Sophisticated clamping system for easily and quick instrumented indentation testing on tubes, straight, fillet welds or flat surfaces



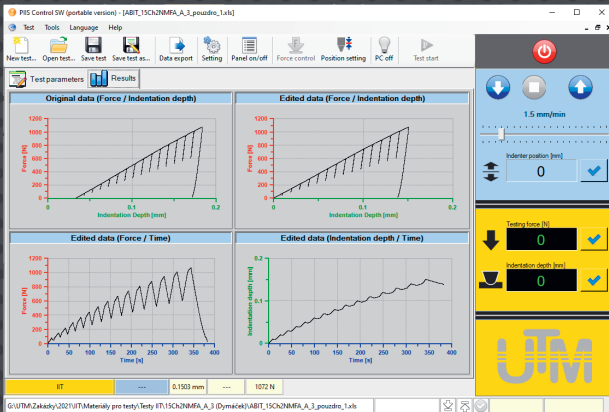


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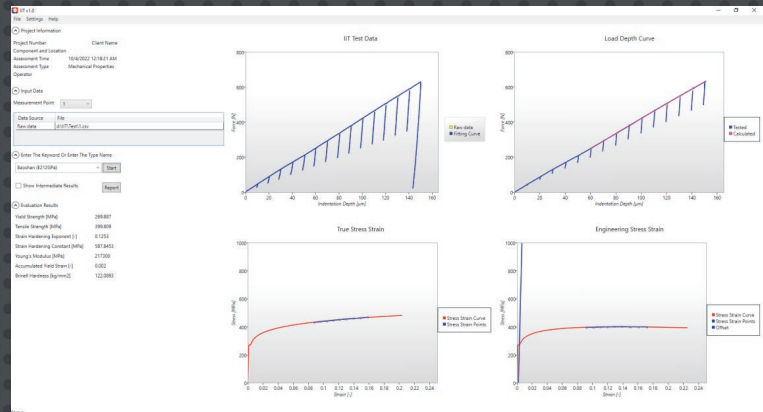


## EVALUATION OF MATERIAL PROPERTIES

- User friendly analytic software calculating mechanical properties and fracture toughness of materials, covering carbon steels, low alloy steels, austenitic steels, high strength steels.
- Analytic estimation includes yield strength, tensile strength, Young's modulus, Brinell hardness, strain hardening constant and exponent, accumulated yield strain and fracture toughness KIC.
- In comparison with standard tests, the testing inaccuracy of mechanical material properties is commonly less than 5-10 %, inaccuracy of fracture toughness less than 15-20 %.
- Analytic report is created automatically and output details are archived.
- **Convergence procedure is shown during calculation as follows:**

## DIMENSIONS / WEIGHT

- Instrumented indentation tester (l x w x h): 95 x 95 x 375 mm, 6,2 kg
- Instrumented indentation tester including suitcase (l x w x h): 540 x 430 x 210 mm, 9,7 kg
- Control unit in suitcase (l x w x h): 480 x 390 x 190 mm, 10,3 kg
- Laboratory stand (l x w x h): 155 x 150 x 175 mm, 7,6 kg
- Accessories (clamping system) in suitcase (l x w x h): 540 x 430 x 410 mm, 17 kg
- Positioning XY unit with digital measuring (l x w x h): 275 x 250 x 135 mm, 4,7 kg



## OPERATIONAL REQUIREMENTS

- Input power requirement - 1 NPE 230 V AC 50 Hz, TN-S, protection 10 A or 1 NPE 110 V AC 60 Hz, TN-S, protection 20 A, overvoltage protection in accordance with EN 61643-11, SPD type 1 and SPD type 2

