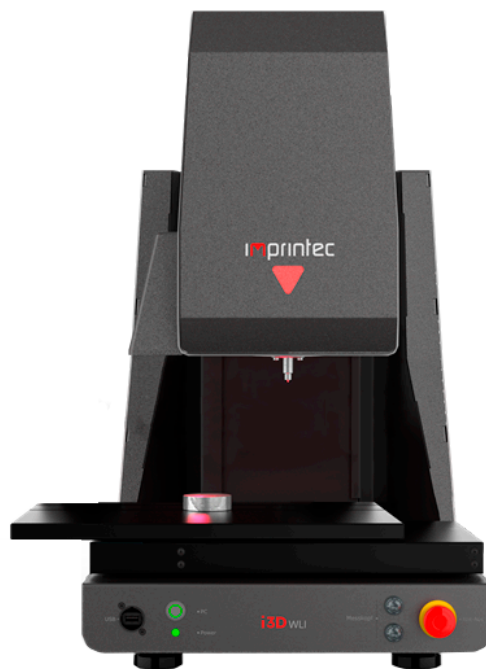




I3D WLI PRO

High-end-platform of the i3D® series with fully automated Imprint Test for the determination of mechanical material properties



I3D WLI ECO

I3D WLI PRO

High-end-platform of the i3D® series with fully automated Imprint Test for the determination of mechanical material properties



High automation and maximum data depth for local material characterization in laboratory, R&D and QA. The i3D® WLI Pro is the high-end platform of the i3D® series for the fully automated determination of local mechanical material properties. The system utilizes the Imprint Test method in accordance with DIN SPEC 4864 and ASTM E3499 and delivers local yield strength ($R_{p0.2}$), local tensile strength (R_m) as well as stress–strain curves – directly from the test indentation and without the need for a conventional tensile specimen. Equipped with a precise XY cross table, an integrated overview camera, and a Z-axis positionable measuring head, the system enables reproducible scanning of grids, lines, and point sequences.

This allows for efficient multi-sample screening, weld and heat-affected zone (HAZ) testing, as well as component analysis with a high density of measurement points in a continuous, automated workflow. In standard mode, the measurement time is approximately 72 seconds per point. With the optional Superspeed module, cycle times of around 20 seconds per point can be achieved. An optional, integrated white light interferometer (WLI) is available for 3D measurement of indentations and surface topography. Data evaluation is performed using the powerful i3D® software, based on inverse FEM calculations, ensuring precise and reliable material characterization.

YOUR ADVANTAGES AT A GLANCE

Fully automated standard testing: Fully automated high-throughput testing according to DIN SPEC 4864 / ASTM E3499 without tensile specimen

Precise multi-point positioning: XY cross table and Z-axis positionable measuring head for reproducible multi-point programs

Documented point placement: Overview camera for documented point placement and visual control

Hight testing speed: Standard cycle approx. 72 s/point; optional Superspeed mode from approx. 20 s/point

Optional 3D-Topography: Optional integrated white light interferometer (WLI) for 3D indentation and topography analysis

Material property determination: Inverse FEM evaluation via i3D® software – local $R_{p0.2}$, R_m and stress-strain curves

Wide range of application: Ideal for multisample screening, weld/HAZ testing, parameter studies and component analysis

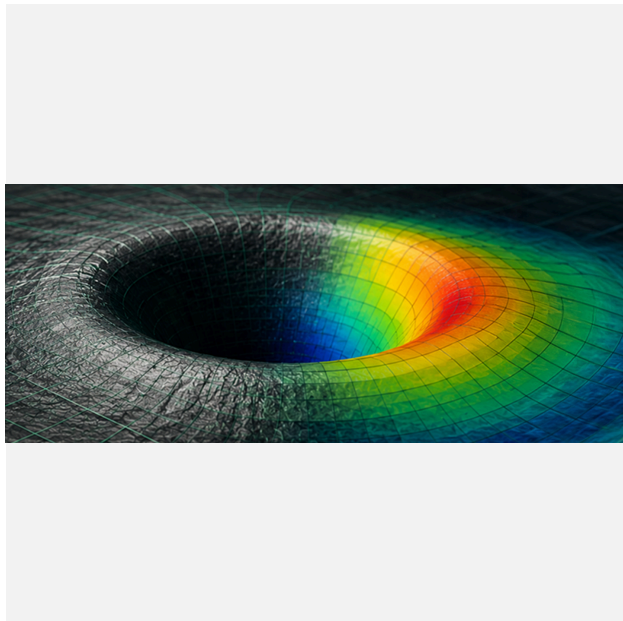
NORMS

ASTM E3499: Is an international ASTM test standard for the indentation plastometry (IP) of metallic materials.

DIN SPEC 4864: Describes a standardized, minimally destructive testing method for determining flow curves and comparative characteristic values of metallic materials.

TECHNICAL INFORMATION

TEST METHOD:	Instrumented Imprint Test according to DIN SPEC 4864 / ASTM E3499 (i3D®) - without tensile specimen
DETERMINED VALUES:	Local yield strength $R_{p0.2}$, local tensile strength R_m , stress-strain curve
MEASUREMENT TIME (STANDARD):	approx. 72 seconds per measurement point
MEASUREMENT TIME (SUPERSPEED, OPTIONAL):	from approx. 20 seconds per measurement point
AUTOMATION:	Motorized XY cross table, Z-axis positionable measuring head
VISUALIZATION:	Integrated overview camera for point selection and documentation
OPTIONAL MODULES:	White light interferometer (WLI) for 3D measurement, Superspeed mode, software packages
SOFTWARE:	i3D® software with inverse FEM evaluation



Indentation testing - Tensile Strength Without Specimen Preparation

Complementing classical tensile strength testing, indentation testing based on indentation plastometry provides an innovative and efficient alternative for determining mechanical material properties. A defined indenter is pressed into the material surface, and the resulting imprint is subsequently measured using optical 3D metrology. Through numerical evaluation, flow curves, yield strength, and ultimate tensile strength can be derived – quasi non-destructively and without time-consuming specimen preparation.

This method is particularly well suited for location-specific material characterization directly on the component, for example in weld seams, heat-affected zones, or locally treated areas. With measurement times of less than 60 seconds and a high degree of automation, indentation testing is ideal for high-throughput screening, inline inspection, and the development of new materials and alloys.



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