Imprint Testing
Indentation Plastometry

i3D

Stress [MPa]

UTS

YS

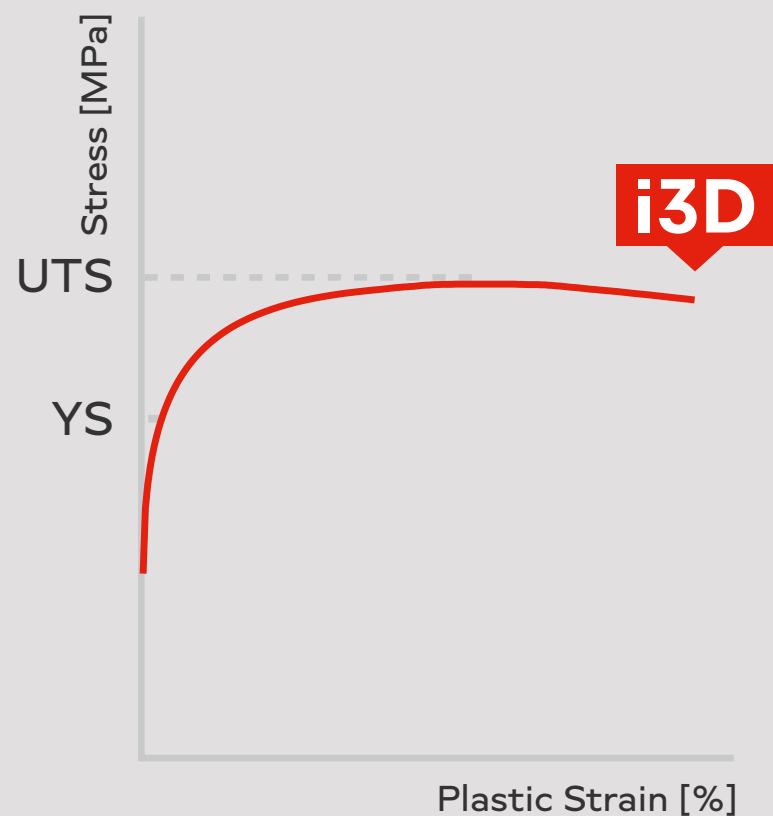Plastic Strain [%]

MATERIAL TESTING SOLUTIONS

Abstract

Imprint Testing | Indentation Plastometry | "Eindruckverfahren"

The Imprint Test according to DIN SPEC 4864 offers extended possibilities | Abstract
in the field of materials testing. Many metals (steel, aluminum, nickel, titanium
and copper) can be tested locally and more extensively for mechanical properties
comparable to the tensile test with less effort.

DIN SPEC 4864 was the very first standard of its kind developed in collaboration | Standard
with the Federal Institute for Materials Testing, the Materials Testing Office NRW,
the "Physikalisch Technische Bundesanstalt" and industry partners
(published by Beuth Verlag in Germany in November 2019).

The Imprint Test is based on indentations and high-precision 3D measurements, | Procedure
using a white light interferometer, and finite element simulations to determine
a plastic stress strain curve out of the indentation (pile-up profile). The indent,
characterized by plastic deformation above the surface known as pile-up,
reflects the unique mechanical properties of the tested material. Real measured
data according to the geometry of the plastic deformation is brought into
precise agreement with simulated data, and material properties such as
yield strength and tensile strength from indentation are available.

The test procedure was initially invented at the RUB (Ruhr-Universität Bochum) | Development
and developed by the team of Imprintec GmbH. Measurements can now be fully
automated and completed in less than a minute, whether in laboratories, inline,
or using mobile devices.

It enables the fast and cost-effective determination of mechanical properties. | Application
Furthermore, the indentation enables testing of components, thin/small parts,
strength gradients and high-throughput testing. This makes a significant
contribution to the development and optimization of components and processes.
It is particularly impactful in sectors such as aerospace, automotive,
civil engineering, oil & gas, construction, medical devices, mechanical engineering,
and the energy sector.

Tel. +49 234970 414 04
vertrieb@imprintec.de
www.imprintec.de