



unconventional testing machines  
research & development

Small Punch Test system for tensile  
and fracture material properties  
determination

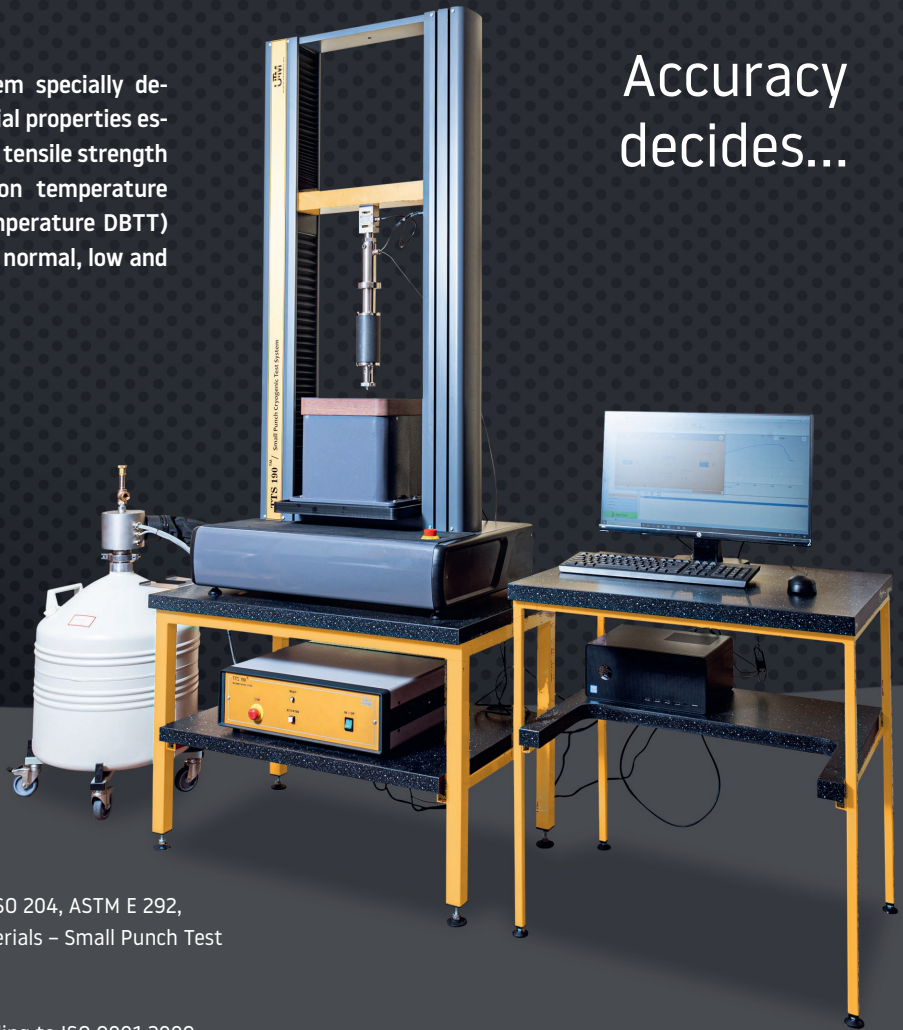
# TTS 190™

5<sup>th</sup> generation

Unique, fully compact testing system specially designed for tensile and fracture material properties estimation (Yield strength  $R_p$ , Ultimate tensile strength  $R_m$ , Maximum energy  $E_m$ , Transition temperature TSP, Ductile to brittle transition temperature DBTT) using Small Punch Testing method in normal, low and higher temperatures.

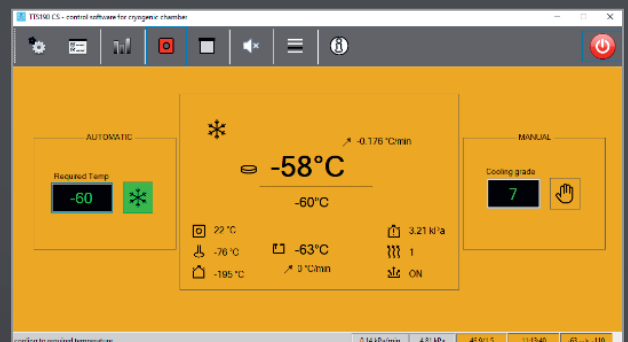
Small Punch Test is unique, powerful and indispensable testing method capable of providing actual values of material properties (tensile and fracture) at components in service without disintegration of their structural integrity.

Accuracy  
decides...



## FEATURES

- Machine design in accordance with EN ISO 204, ASTM E 292, ASTM E139 and EN 10371 "Metallic Materials – Small Punch Test Method"
- Legally protected machine design
- Fully suitable for quality systems according to ISO 9001:2009
- Latest hi-tech materials guarantee long term durability
- Extremely precise of design and arrangement guarantees high repeatability measured results
- System verified by reference specimens
- Economic operation (low consumption of energy and liquid nitrogen)
- Fully automated, user friendly control software
- Test remote control (Windows, macOS, iOS, Android, Linux, etc.)







unconventional testing machines  
research & development

Small Punch Test system for tensile  
and fracture material properties  
determination

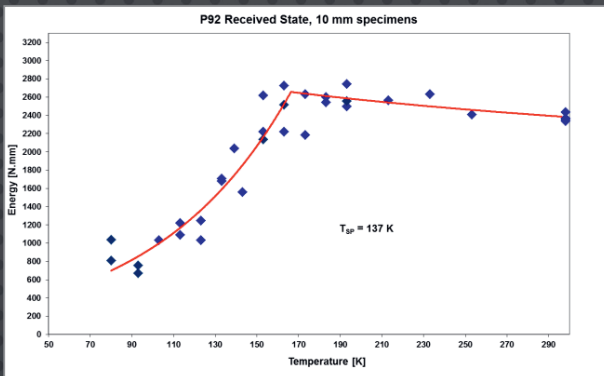
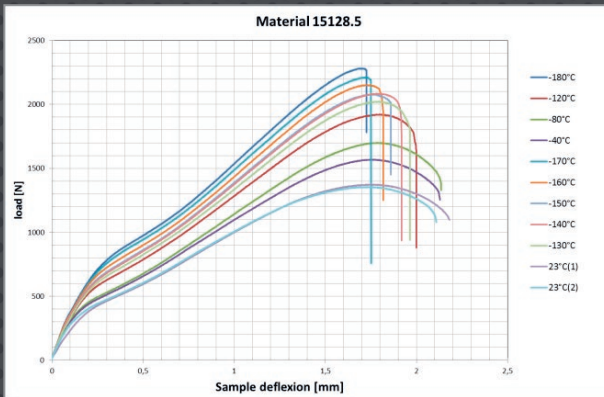
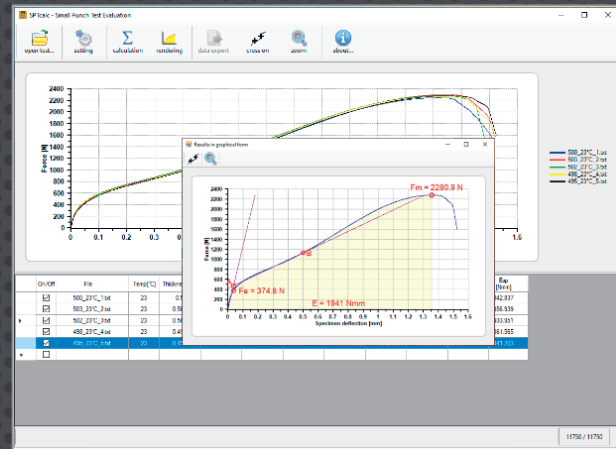
# TTS 190™

5<sup>th</sup> generation

Accuracy decides...

## SPECIFICATION

- Loading range up to 10 kN, accuracy class 0,05 or optional
- Testing temperature range (-196 °C ÷ 23 °C), resolution: 0,1 °C, accuracy: ± 1 °C or 0,75 % F. S. (optionally up to 350 °C)
- Specimen dimension  $\varnothing$  8 mm × 0,5mm (optionally 10 × 10 × 0,5 or 8 × 8 × 0,5)
- Test punch  $\varnothing$  2,5 mm (optionally  $\varnothing$  2 mm)
- Test lower die with receiving hole  $\varnothing$  4 mm and radius R0,2 (optionally chamfer 0,2 × 45°)
- Accuracy of a specimen deflection measurement: ± 0,001 mm



## DIMENSIONS

- Testing machine (width × depth × height): 1600 × 600 × 720 mm
- Testing system including Dewar container (width × depth × height): 2200 × 700 × 2320 mm

## WEIGHT

- Testing machine: 180 kg
- Cryogenic chamber: 15 kg
- Chamber for higher temperature testing: 15 kg
- Dewar container with dispensing probe: 20 kg
- Control unit for cryogenic temperatures: 7 kg
- Control unit for higher temperatures: 7 kg
- Testing table: 40 kg
- Personal computer with monitor: 11 kg

## OPERATIONAL REQUIREMENTS

- Input power requirement – 1 NPE 220÷230V AC 50÷60Hz, TN-S, protection 10 A, flexible lead, overvoltage protection in accordance with EN 61643-11, SPD type 1 a SPD type 2 (110 V optional)
- Air conditioned laboratory with maintained value of relative humidity