TTT Tapping-Torque-Testsystem

TTT Standard-Equipment

Conditions and Quality

The latest microtap **TTT Standard** for measurement requests offers a new solution for TTT customers with a demand for measurement applications, structural connectivity & tribological comparability of lubricants. All Measurement-Equipment (testbars materials & measurement-tools) will be delivered in consistently precise quality.
Every testbar is **manually proofed** and has max. 7 marked faulty holes.
The new TTT Standard test-bars has a ferifide homogenous structure.This equipment is also used for customer specific laboratory examinations and requirements for laboratory-directions.

TTT Standard-Testbars

Measurement-Equipment / M4F Forming

Stainless Steel

X6CrNiMoTi17-12-2 / 1.4571 (V4A) / 316Ti
Hardness R_m 725N/mm² / 225 HB / 112 PSIx1000
Ultimate elongation A 5 (%) > 40 / R_m = 775N/mm²

Depth **20 mm** (max. Measurement-Depth 5 x D*)
Price € 400,-- / pc

Aluminium

AlZnMgCu01,5 / 3.4365 / 7075
Hardness R_m 420-450 N/mm² / $R_{p0,2}$ = 420 N/mm²
Ultimate elongation A5 > 5-7% / HB 140 / density 2.78 Kg/dm³
Aircraft - CarEngine standard/classic

Depth **20 mm** (max. Measurement-Depth 5 x D*)
Price € 390, -- / pc

TTT Standard-Tools

Specially Gauged M4F Tools

Selected Forming Tools M4F (e.g. pitch-diameter 3.642 mm)

TTT_M4F-NT Forming vaporised/nitrated with gauged pitch-diameter 60 €
TTT_M4F-TIN-T Forming TIN coated with gauged pitch-diameter **70 €**

* At determination of the friction coefficient the physical load parameters in a wear process are defined:

- Normal Force FN (Spindle Torque)
- Velocity V (Cutting Speed)
- Time of Load tB** (Depth of thread* & speed)
- Temperature T (Delta T)

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Additional Reference Aluminium Testbars

M4F **Forming** and M4C **Cutting**

AlMgSi1 / 3.2315 / 6082
Hardness R_m 295 N/mm² / $R_{p0,2}$ 240 N/mm²
Ultimate elongation A5 > 8% / 89 HB

AlZnMgCu0,5 / 3.4345 / 7022 (also with 20 mm depth available)
Hardness R_m 420-450 N/mm² / $R_{p0,2}$ 340-370 N/mm²
Ultimate elongation A5 > 5-7% / HB 140 / density 2.78 Kg/dm³
Machinery standard/classic - good for "Duktilitaet"

G-AlSi12Cu / 3.2583 / GD-3-298 / SAE 413.1 / JIS ADC1)
Hardness R_m 150-290 N/mm² / $R_{p0,2}$ 80-130 N/mm²
Ultimate elongation A5 (1-3,5%) / HB 50 / density 2,65 Kg/dm³

AlZnMgCu01,5 / 3.4365 / 7075

Depth of all testbars: **12 mm** Forming / Cutting (max. Measurement-Depth 3 x D*)
Price: € 320,-- / pc

Additional Reference Steel Testbars

Stainless Steel

X6CrNiMoTi17-12-2 / 1.4571 (V4A) / 316Ti
Hardness R_m 725N/mm² / 225 HB / 112 PSIx1000
Ultimate elongation A 5 (%) > 40 / R_m = 775N/mm²
Price: € 360,-- / pc

Carbon steel

C45N/C45E / 1.1730 (1.1191) 1045 / JIS S48C
Hardness R_m 600N/mm² / 175 HB / 85 PSIx1000
Ultimate elongation A 5 (%) > 14 / R_e>355N/mm²
Price: € 320,-- / pc

Heat treated steel

42CrMo4V / 1.7225 / 4140 / JIS SNB7 (SCM440(H)
Hardness R_m 1100N/mm² / 300 HB / 145 PSIx1000
Ultimate elongation A 5 (%)
Price: € 450,-- / pc

Titan Grad 5
(No steel)

TiAl6V4 / 3.7164 / TiAl6V4 / 49-11-28-35-54-65-67
Hardness R_m 1150N/mm² / 340 HB / 163 PSIx1000 / 36 HRC
Ultimate elongation / $R_em^{2'}$
Price: € 500,-- / pc

Depth of all testbars: **12 mm** Forming / Cutting (max. Measurement-Depth 3 x D*)

Laboratory Measuring Tools

TTT_M4F-N Forming Standard / vaporised – nitrated / **50 €**
TTT_M4F-NT Forming with gauged pitch-diameter / **60 €**
TTT_M4F-NS Forming with lubrication groove / **60 €**
TTT_M4F-TIN TIN coated) / **60 €**
TTT_M4F-TIN-T TIN coated with gauged pitch-diameter) / **70 €**
TTT_M4F-T for Titan applications / **70 €**
TTT_M4C Cutting-Standard / blank for cutting / **50 €**
TTT_M4C-T Cutting-Standard / with gauged pitch-diameter / **50 €**
TTT_M4C-TIN TIN coated / **60 €**
TTT_M4C-TIN-T TIN coated with gauged pitch-diameter / **70 €**
TTT_M4C-NI Cutting for nickel-based alloys / **60 €**
TTT_G 6 Tolerance-proof-gauge M4F & M4S (green/yellow/red) / **60 €**

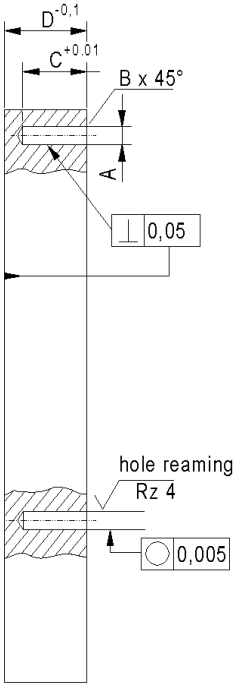
TTT Tapping-Torque-Testsystem

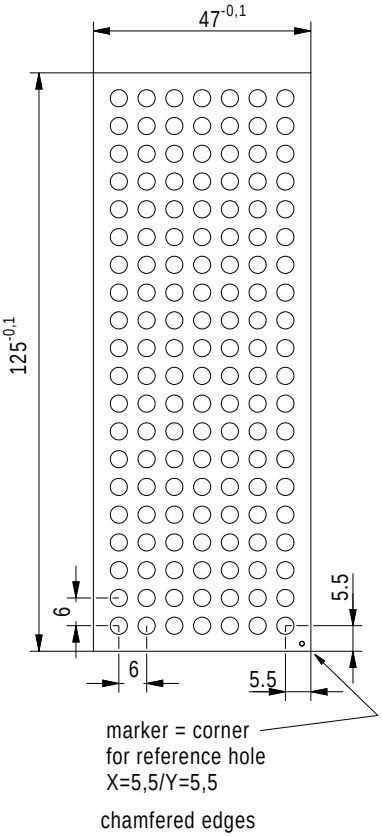
Laboratory
Measurement Equipment

Material Conditions & Tolerances
for TTT Measurement-Tools M4 Forming & Cutting

Measuring TTT Testbars with 12 and 20 mm Thread Depth

Test bar sizes: 125 x 47 x 18 / 30mm (D - with counter sinking)
140 drilled array at 6 mm for TTT Measurement Tools – M4F and M4C





New TTT Standard

20 mm ➔ Mechanical load time **tB** ** - depending on depth / speed
➔ **M4F Thread** with 5 x Diameter* **NEW 20 mm** thread depth **!**
Test bars size 125 x 47 x 30 mm / 140 holes – M4

Forming
Counterbore
Depth

Thread Forming and Cutting (12 mm / 20 mm thread depth)
A = 3.70 mm + 0.01 mm
B = 0.2 mm
C = 12 mm

Cutting
Counterbore
Depth

A = 3.30 mm + 0.01 mm (12 mm thread depth)
B = 0.4 mm
C = 12 mm

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Laboratory
Measurement Equipment

Legend

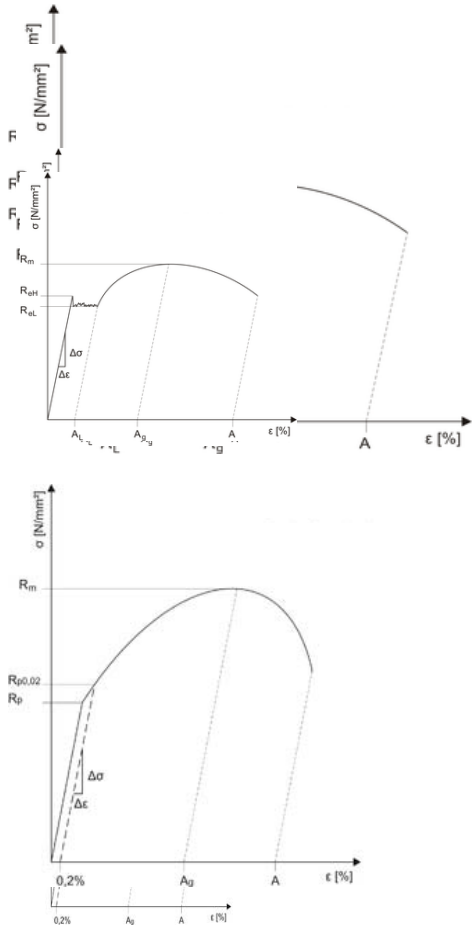
R_m Hardness
Indicates the tension at the peak of the stress-strain-chart.

A Fracture strain
Indicates the remaining distension when breaking. This is the measure for the utmost distension of a material.

R_e Yield strength
Indicates the tension prevailing in material immediately before stretching.

$R_{p0,2}$ 0,2% Yield point
Indicates the tension at which tension test displays a yield point of 0,2 % of plastic deformation after release. $R_{p0,2}$ value is only used with materials lacking a yield strength.

Stress-Strain-Chart



R_{eH} Upper yield strength
R_{eL} Lower yield strength
E Flexibility module
A_g Symmetry distension / start of necking
ε Distension [%]
σ Tension [N/mm²]
A Fracture

Conditions
Pricing: Terms of delivery of micro**tap** GmbH
Payment: **€ /** ex work / excl. packaging
Delivery time: 14 days net / Foreign countries payment in advance
Approximately 1 week after order

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