



MICROTAP
— U S A —



TAPPING TORQUE TEST SYSTEM from MICROTAP USA

RAPID AND RELEVANT LUBRICANT TESTING

Machining performance is the main goal of all metalworking fluids but one of the most persistent challenges is how to measure product performance in the laboratory. Tribology equipment often uses time consuming procedures and costly test pieces which depend on simulations rather than actual metalworking operations. The LT-120, utilizing an instrumented tapping machine from Tauro, provides researchers with test procedures that are economical to use, rapid to perform, and easy to analyze. The net result is that product modifications, manufacturing quality and competitive product performance can be measured quickly.

PRECISE MEASUREMENT

MICROTAP'S LT-120 features many improvements compared to our previous and other tapping torque testers. The synchronous servo motor delivers seventy percent higher power with extremely smooth running performance at both high and low speeds. Torque is measured every millisecond giving rapid response and control. Vertical displacement of the tap is measured directly rather than estimated and is repeatable to 0.1 mm. Speed is regulated precisely at values as low as 50 rpm compared to 300 rpm and above. This insures the ability to perform in difficult test situations such as form tapping of stainless or tool steels. The X-Y autotable indexes with an accuracy of 30 microns to avoid misalignment from hole to hole. Test pieces have up to 120 holes to avoid misalignment from hole to hole.

ADVANCED REPORTING CAPABILITIES

Data is output to an external PC by Ethernet. The TauroLink software controls the tap speed and torque limit while collecting and analyzing run data. Repeat runs are automatically averaged and displayed. Results can be exported as image files for presentations or Excel compatible csv files for further analysis. The software license allows use on other computers for reports.



STATE THE ART TECHNOLOGY

Large color display with clear menus and prompts for rapid setup. Separate procedures optimized for cutting and form tapping. Torque, tap depth and speed are continuously monitored. Separate processors for improved control and data collection. One processor controls table positioning while a second controls the depth and a third controls tap speed and torque. Control is very fast with the torque measured constantly to stop the drive before a tap is broken or a work-piece is damaged.

Tauro LT-120
Tribometer Tapping Unit
Description

Tap sizes	M2 – M12 (aluminum), M2 – M10 (stainless steel)
Torque range	0.30 – 120 Nm
RPM range	50 – 2,400 rpm (continuously adjustable)
Spindle travel	90/80 mm (3.54/3.15 in)
Depth accuracy	0.1 mm (0.004 in)
Spindle height adjust	Base to tool holder (70 – 415 mm (2.8x16.3"))
Automatic Spindle Feed	Pneumatic cylinder, 60-80 psig
Operation	Menu driven or PC controlled
Color LCD Unit	4.3" TFT
Digital IO	3 inputs, 10 outputs
Built-in Languages	English, German, Spanish (others available upon request)
Units	Thread depth: mm/inch; Torque: N-m
Control programs	Thread cutting, thread forming, rethreading
Rotation	Right or left hand switchable
Reversal program	Variable speed
Other	Triggered relays for external control
Construction	Cable connected modules for tapping unit, control and display
Dimensions	Machine: 390 x 450 x 882 mm (15.3"x 17.7"x 34.7") Controller: 220 x 400 x 400 mm (8.7"x 15.7"x 15.7")
Power requirements	230 V ±10%, 1.1kW, 1 phase, 48-62 Hz

X-Y autotable
Description

Pendant Control	Two axis, point-point linear table with automatic position control for efficient multi-test evaluations; includes table, fixtures, stepper motor drives, PLC and pendant
Positioning accuracy	Four line LCD and keypad for operator control
Repeatability	30 microns
Table dimensions	1.3 microns
Table range	18" x 8"
Fixtures	12" x 4"
External control module	14" x 2" test bars
Power requirements	14" x 12" x 6"
	100 – 240 VAC, 2 amp, single phase

TauroLink Software
Description

Tapping unit control	Program for tapping unit control, data acquisition, analysis, presentation and export
Data acquisition	Remote control of tapping unit including torque limits and rpm
Data analysis	Torque and tap travel data with 1 ms sampling rate
	Maximum, standard deviation and mean torque for each run or multiple runs calculated; mean torque curves plotted against each other for multiple evaluations; bar graph comparisons of different groups of runs
Data presentation	Torque curve vs. tap depth curve automatically plotted for each run; mean curves from multiple test runs compared on a separate graph
Data storage	Data stored in Tauro tdg files which can be exported to bmp or Excel compatible files
System requirements	Intel Pentium 3 or equal with 1 GHz - 1 GB RAM - 100 MB hard disk - Windows 7, 8, 10

Supplies
Test bars

Test bars	Standard bars are 14"x 2"x ½" with 69 to 120 through holes for M6 cutting or forming tap. Standard bars include aluminum (6061, 319, 356, 380), steel (1018, 1045, 4140), stainless (303, 304, 316), plus titanium, Inconel, copper, CGI, and cast iron. Special orders are accommodated.
Taps and holders	Microtap USA, Inc. is an authorized distributor for YMW, Emuge and others.



MICROTAPUSA

Email: sales@threadtapping.com

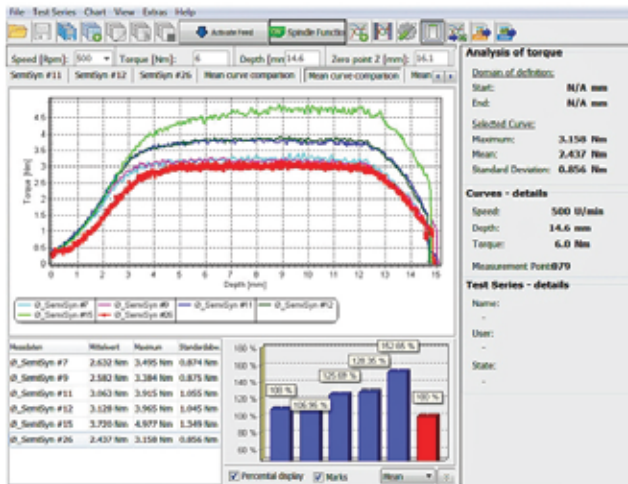
Phone: (248) 852-8277

Location: 1854 Star Batt Drive Rochester Hills, MI 48309

www.threadtapping.com

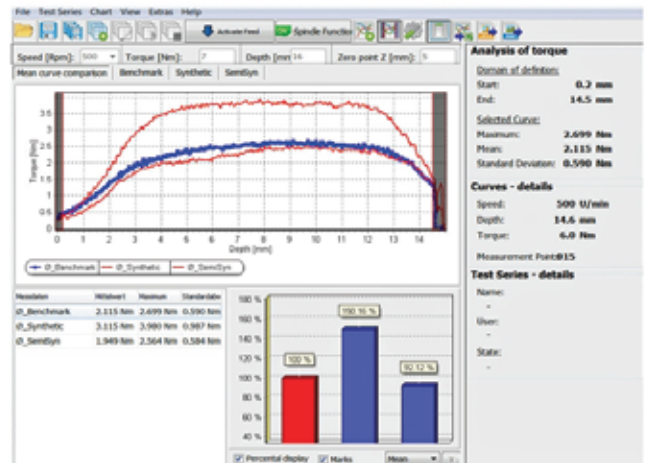
LT-120 CASE HISTORIES

The **Tauro** tapping torque tester is more than a versatile research tool. Some of its other uses include quality control, lubricant monitoring and raw material substitution for cost savings. Testing can be carried out under a wide range of conditions and with a variety of metals. Below are some examples of how the LT-120 can be used. These tests use 6061 aluminum test bars with an M6 forming tap operating at 500 rpm. Data from the LT-120 can be placed on a network for remote analysis since the software license allows multiple installations.



RESEARCH & DEVELOPMENT

The marketing department of a coolant company has determined that their flagship synthetic coolant must machine both aluminum and ferrous metals. The current product works very well on ferrous metals but high concentrations are required to machine aluminum. This makes it uneconomical and causes residues that interfere with gauging and setup. A semi-synthetic product known to work well on aluminum is used to benchmark the research products.

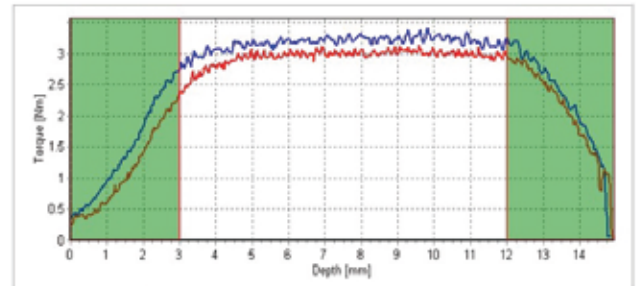


Two versions of a company's synthetic coolant (red curves) compared to a benchmark semisynthetic (blue curve). The company will now test the lower torque version of the synthetic as a substitute for the semi-synthetic.

The TauroLink software shows the actual tapping curves in the upper portion of the window while the lower portion shows the data in tabular and column graph formats. Any of the test runs can be set as the reference and the data can be displayed in N-m or as a percent of the reference sample.

SALES SUPPORT

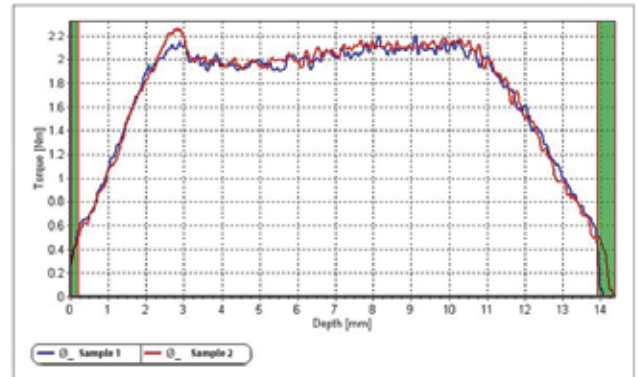
A local coolant company has a sales opportunity to replace a higher cost product from a well-known, international company. The local company would like to determine if one of their existing products is an acceptable alternative or if they must develop a new product.



Lubricity for two products is compared using the LT-120. The mean values and standard deviations are calculated for the plateaus using the LT-120's domain of definition feature. It can be seen that the competitor (red trace) is comparable to the Sales Department's suggestion shown in blue.

LONG-TERM REPEATABILITY STUDY

The repeatability of the LT-120 is important for its use as a QC or tech service tool. To do this the lab prepares a 10% emulsion and then taps four holes using a 6061 aluminum substrate and M6 forming tap. The test is repeated with the same sample over a week later. Each curve is the average of four individual runs and there is variation of about 0.5%. It is important to retain the same test bar and tap.



QUALITY CONTROL

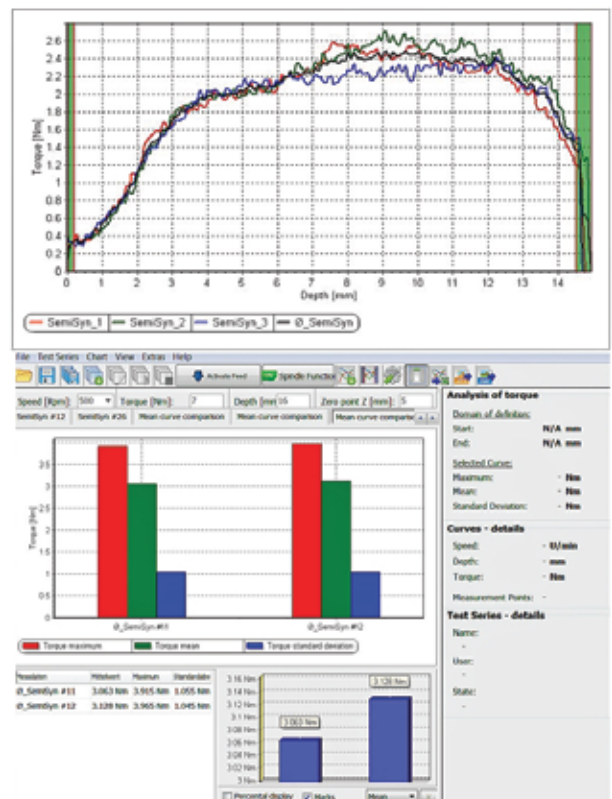
The QC Lab of a coolant supplier checks each batch of their semi-synthetic before packaging and shipment. Using the LT-120 the lab reports the lubricity for the certificate of analysis given to their customer.

Individual curves are shown in blue, red, and green curves and LT-120 then automatically averages the result (black curve) for the lab manager to compare to prior production batches.

Test bars contain 120 holes allowing many batches to be compared using the same test piece removing it as a variable. The test takes approximately 10 minutes to run and the cost of consumables is about \$5.00 - 10.00.

Comparison of the current production batch (right group) with a reference standard (left). The red bars show the maximum torque for each batch while the green and blue bars show the average and standard deviation values of the torque plateau. Both fall within the QC specification.

Units are in Newton-meters. Charts can also be created with one or two characteristics.

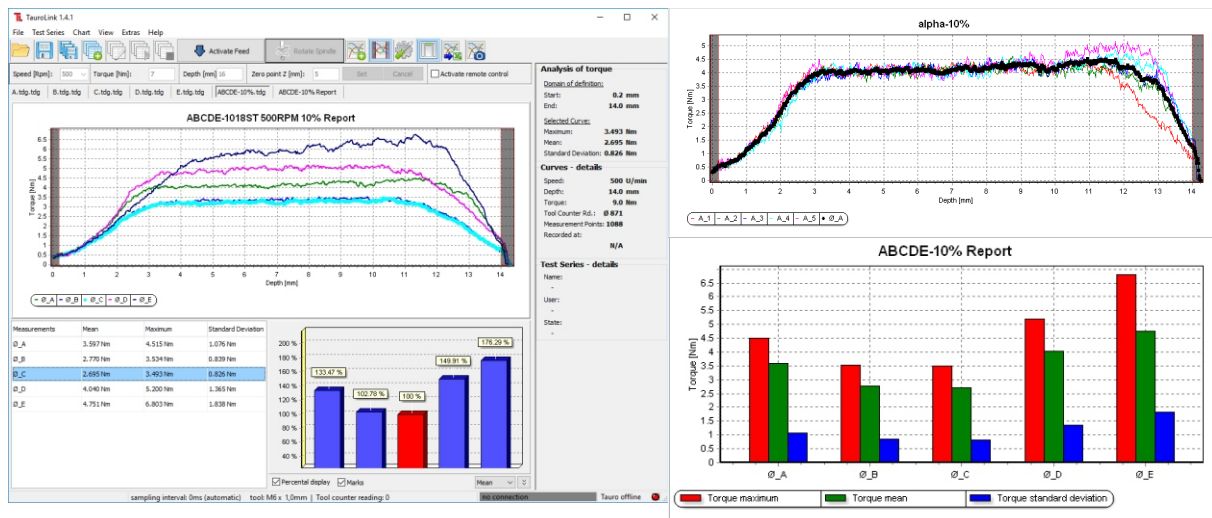


TAPPING TORQUE TESTING SERVICES

Evaluation of Metalworking Fluids and Cutting Tool Geometry
NEED TEST ANALYSIS IN THE REAL WORLD? WE CAN PUT OUR EQUIPMENT TO WORK FOR YOU.

Let **MICROTAP USA** put you ahead of the competition.

Send us your metalworking fluids or taps for comparative testing. Choose from our standard TestBars in aluminum and steel or your special metal requirements for cut or form tapping. You receive comprehensive results in summary form for presentation and detailed spreadsheets and graphs to analyze fluid formulations or tap geometries.



Fluid Comparison 0.2 to 14.0 mm, tap travel 14 mm							
Comment	Fluid	Fluid Results in N-M			Calculated Efficiency vs.		
		Mean Average	SD of Mean	Uncertainty	Reference Fluid	Best Fluid	All Fluids
BRIX=10.4	A	3.597	0.112	3.1%	100.0%	74.9%	99.3%
BRIX=10.6	B	2.772	0.030	1.1%	129.8%	97.2%	128.8%
BRIX=14.1	C	2.695	0.029	1.1%	133.5%	100.0%	132.5%
BRIX=12.7	D	4.040	0.040	1.0%	89.0%	66.7%	88.4%
BRIX=13.1	E	4.749	0.077	1.6%	75.7%	56.7%	75.2%

Reference Fluid: A Best and worst fluids are highlighted

<p>Discover your EFFICIENCY OF MIXTURE EFFECTIVENESS OF ADDITIVES OR EVALUATE THE COMPETITION</p>	<p>Our laboratory will compare two or more fluid samples at \$150.00 each. 50 ml of solution or 10 ml concentrate is necessary for MMF test analysis.</p>
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CONFIDENTIAL AND SECURE

Testing at **MICROTAP USA** provides researchers with economical real world procedures that are rapid to perform and easy to analyze. The net result is product modifications, manufacturing quality, and competitive products are quickly measured.



MICROTAP USA
THREAD TAPPING TECHNOLOGY

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TAUROX E. K.: SPECIALISTS IN THREAD MACHINING

Taurox e. K. presents innovation in torque monitored tapping! Our machines are used for thread cutting and forming. They also offer solutions for other torque monitored applications, such as thread gauging and the insertion of threaded bushings or bolts. The Tauro® product lines cover several ranges of power with a thread cutting capacity from M0.8 to M22 and 0.03 Nm to 90 Nm. Tauro® branded machines are ideal for all jobs whether they're single parts and prototypes or high volume automated manufacturing. Microtap USA's unique advantage is Tauro® tapping machines: They continuously monitor all process operations and intervene before a tool breaks or a part is damaged. Tauro® machines are ideally suited for various industries because of their high quality of the material processing and ability to be integrated into existing automated manufacturing. Applications range from small shops to production plants for metal, plastic and sheet metal machining. Users in the automotive industry and its suppliers, the aerospace industry, optics, and medical-technology manufacturing all benefit from the Tauro® threading machines.



TALK TO US ABOUT YOUR REQUIREMENTS

As specialists in the field of thread machining we offer you professional consulting and technical support for the integration of machinery plus intelligent implementation. We take the time to adjust and integrate the Tauro® and Taurox® products into your existing automation solution.

TAURO® ADVANTAGES IN A NUTSHELL

- Continuously adjustable speed from 25 to 3000 rpm depending on model
- Continuously adjustable torque from 0.03 Nm to 90 Nm
- Rapid dynamic response with synchronous servo technology
- Intelligent control and workpiece machining
- Smooth and reliable running performance
- Machining with carbide tools
- Graphic display of all settings with a menu-guided user interface
- Modular design and PLC interface
- Useful for a variety of applications
- Robust and maintenance-free

TAURO® / TAUROX® THREAD MACHINING CONVINCES USERS

- Exact monitoring, measuring and process optimization of process parameters, contributes to quality assurance during the machining process.
- Production costs are significantly reduced with no tool breakage or material reject.
- Optimize process parameters to increase tool life.

Technical data

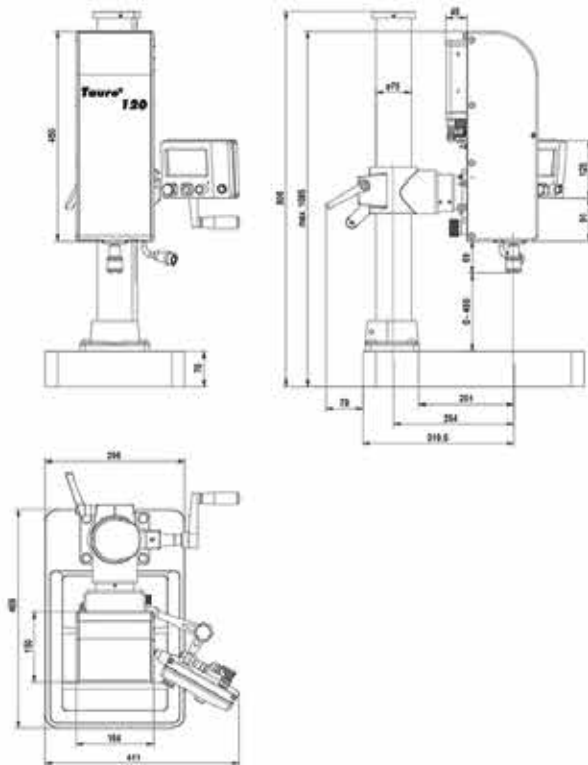


Fig.: View of the thread tapping machine **Tauro[®] 120**

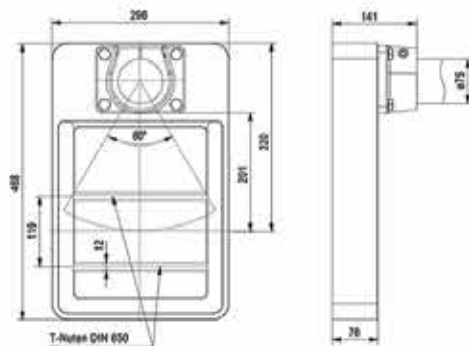


Fig.: View of the machine pedestal **Tauro[®] 120**

Technical data

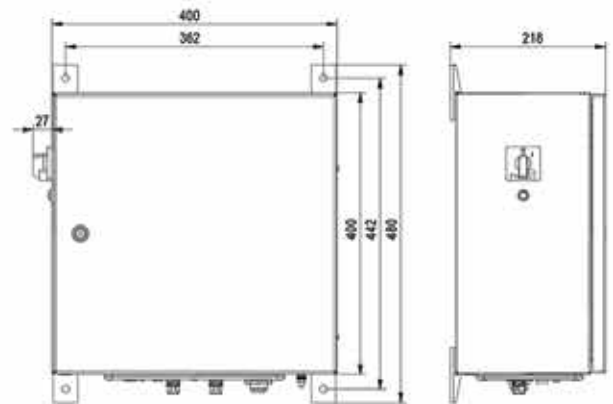


Fig.: View of the control unit **Tauro[®] 120**

Accessories:

- Quick change inserts
- Spindle feed system
- Minimum lubricant unit with lubricant pulse, air pulse
- Signal column red, orange, green and horn
- Key switch with lock-out
- Additional push selection for parameter data base
- Automation connection

Technical data

Taurox®

Type of machine	Tauro® 120
Thread capacity (Thread cutting - blind hole 2,0 x D in aluminum)	M2 – M12
Thread capacity (Thread cutting - blind hole 1,5 x D in stainless steel X6CrNiMoTi17-12-2 / 1.4571 / V4A)	M2 – M10
Torque range (continuously adjustable)	0,3 – 12Nm
RPM range (continuously adjustable)	50 – 2400RPM
Spindle / tool holder	quick change holder Size 1
Throat	201mm
Travel height adjustment	0 – 488mm with crank
Column Ø / length / swivel range	70mm / 730mm / 60°
Machine pedestal (WxDxH) 2 x T-slots	469 x 296 x 75mm T-slots DIN 650–12
Dimensions machine (WxDxH)	411 / 469 / 1085mm
Dimensions control unit (WxDxH)	400 / 210 / 400mm
Electric supply / Power input	230 V +/-10%, 1.1kW, 1 phase, 48-62 Hz
Cable length between the modules	3m
Spindle travel / thread depth	90 / 80mm
Modular construction (3-parts)	– spindle unit – operator and display unit – control unit
Entrance protection class	IP54
Engineer standard	Conforms to CE / EMV
LCD Display	4.3" TFT–display, 65536 colors
Operation	Menu driven
Digital inputs / outputs (24V DC / 3.6W) (PLC capable for automation & valves)	3 inputs* 10 outputs*
Depth accuracy	0,1mm
Finish	RAL 7035 / light grey
RAL / color name	RAL 5005 / signal blue
Quality evaluations / Error messages	Display with error message Evaluation and audible signal

Software:

- Languages: German / English / Spanish (more on request)
- Depth unit: mm / inch
- Process programs: thread cutting, rethreading, thread forming, thread inserts, screw-setting, thread plug gauge*
- Grade of quality: blowhole, array of torque, tolerance of depth, tool wear
- Control torque with indicator
- Independent of thread type and pitch
- Rotation: right-hand or left-hand switchable
- Reversal program: variable speed
- Different start menus, such as, manual button, automatic zero-point identification with rotating spindle
- Chip clearance programs
- Parameter data storage
- Part counter
- Lubricant: cooling, and blow off control*
- Switching function for power outputs* for valves such as pneumatic part holder

Accessories*

Subject to change without notice



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TECHNOLOGY

Thread Machining with Tauro®

Based on a counter-balance system, the spindle is free floating to avoid any axial force on the thread tapping tool and workpiece. The tool pulls itself into the workpiece utilizing the pitch of the tap. Depth is controlled by the measurement system at all times. Remachining threads is easy and risk free since the tool always finds an existing thread again.

SIMPLE OPERATION

Clearly presented menu-driven operations allow the user to simply input the working parameters using a 4.3" TFT LCD color display with a rotary encoder and push buttons. Typical entries are torque, depth, speed, thread and hole type cutting or forming, blind or through, etc. The tool is held by a quick-change system and the spindle operates using preset parameters for precise depth and sequence.

INTELLIGENT CONTROL UNIT

The high capacity processors of each single module are networked together. One processor controls the depth while a second processor monitors the drive and the torque. The control and display are operated by a third processor. Control is very fast since the drive has its own processor to constantly measure torque to stop the tap before the tool is broken or the workpiece is damaged if torque is exceeded.

QUALITY EVALUATION

The intelligent control unit assures secure processing and quality evaluation. Parameter monitoring occurs during operation with the results displayed immediately on the TFT display. Data reported includes error-free machining verification, monitoring of operation, excessive torque, tool wear, or pilot hole too large or small.

DYNAMIC DRIVE

The highly dynamic synchronous servo motor of the Tauro has complex control engineering to ensure extremely smooth-running performance at low and high speeds. Even the use of carbide tools is possible.



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ACCESSORIES

We provide suitable accessories for your applications. Custom-made products and adapters are available on short notice.

QUICK CHANGE INSERTS

- sizes 0 – 2
- to mount taps in quick change tapping chucks.
- the selection of the taps results out of shank diameter and square

FEED SYSTEM FOR SPINDLE

- ideally suited for solutions and automation
- continuously adjustable limit for gating force with presentation in display
- continuously adjustable speed of feed
- damping for low tool wear
- start by foot switch, sensor, or PLC interface start on adjustable release height for time saving

FOOT SWITCH, PROXIMITY SWITCH FOR FEED SYSTEM

- foot switch in standard design
- foot switch in robust design
- inductive proximity switch with plug

MINIMUM LUBRICANT / LUBRICANT PULSE UNIT

- pneumatic 87psi / 6bar
- dosage adjustable in the microliter range
- 1 vent to control
- without spray mist
- time and pulse adjustable by user interface unit
- very low usage of cooling lubricant

MINIMUM LUBRICANT UNIT WITH LUBRICANT PULSE, AIR PULSE, AIR CLEANING PULSE

Same as above with the addition of

- air blow off for final cleaning after work process
- air blow control in the chip cleaning work mode

SIGNAL LIGHT COLUMN FOR QUALITY EVALUATION

- red, orange, green and horn
- green means: quality good, work process without errors
- orange means: machine is working
- red and horn (short signal) means: errors occurred during work process

KEY SWITCH WITH LOCK-OUT

- locks the user interface
- locks the output signal of the clamping function in case of errors during work process

PUSH BUTTON ACCESS TO PROCEDURE DATA BASE

- direct access to saved parameter sets, fast switch of tool, and assigning special functions at low and high speeds. Even the use of carbide tools is possible.

SUPPLIES

TESTBARS

Microtap USA supplies precisely machined TestBars in various alloys and configurations. The most common bars are 3 or 4 rows of M6 holes (69 or 120 total holes) on a 14x2x 1/2 inch bar which fits directly into the autoindexing table. Standard cutting or forming bars are available for aluminum (6061 and 7075), cast aluminum (319, 356 and 380), cast iron, steel (1018, 1045 and 4140) and stainless steel (303, 304, and 316).

Custom bars with different hole sizes or special alloys such as titanium, copper or even Inconel® are available on a make to order basis. Turnaround time can be as little as one week.

TAPS AND HOLDERS

Microtap USA, Inc. is an authorized distributor for taps from YMW, Emuge and others.

	C=Cut								Reference Drill Diameter	Spindle RPM	Recommended	
	Profile	Alloy	Metal	Holes	Tap	F=Form	Price ea.	Price 3+			YMW Tap	Price ea.
Carbon Steel	1425	1018	ST	69	M6	C	\$ 148.00	\$ 135.00	M5 / 0.1969	400-600	372620/ZELXSS	\$ 22.00
	1425	1018	ST	69	M6	F	\$ 148.00	\$ 135.00	M5.55 / 0.2185	400-600	389521/N-RZ	\$ 26.00
	1425	1018	ST	120	M6	C	\$ 208.00	\$ 189.00	M5 / 0.1969	400-600	372620/ZELXSS	\$ 22.00
	1425	1018	ST	120	M6	F	\$ 208.00	\$ 189.00	M5.55 / 0.2185	400-600	389521/N-RZ	\$ 26.00
	1425	1045	ST	69	M6	C	\$ 158.00	\$ 144.00	M5 / 0.1969	400-600	372620/ZELXSS	\$ 22.00
	1425	1045	ST	69	M6	F	\$ 158.00	\$ 144.00	M5.55 / 0.2185	400-600	389521/N-RZ	\$ 26.00
	1425	4140	ST	69	M6	C	\$ 179.00	\$ 163.00	M5 / 0.1969	400-500	372620/ZELXSS	\$ 22.00
Aluminum	1425	4140	ST	69	M6	F	\$ 179.00	\$ 163.00	M5.55 / 0.2185	400-500	389521/N-RZ	\$ 26.00
	1425	6061	AL	69	M6	C	\$ 148.00	\$ 135.00	M5 / 0.1969	500-1000	386232/ZELXAL	\$ 22.00
	1425	6061	AL	69	M6	F	\$ 148.00	\$ 135.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 26.00
	1425	6061	AL	120	M6	F	\$ 208.00	\$ 189.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 26.00
	1425	7075	AL	69	M6	C	\$ 212.00	\$ 192.00	M5 / 0.1969	500-1000	386232/ZELXAL	\$ 22.00
	1425	7075	AL	69	M6	F	\$ 212.00	\$ 192.00	M5.55 / 0.2185	500-1000	388521/N-RZ	\$ 26.00
Stainless Steel	1425	7075	AL	120	M6	F	\$ 298.00	\$ 271.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 26.00
	1425	303	SS	69	M6	C	\$ 298.00	\$ 271.00	M5 / 0.1969	400-600	372620/ZELXSS	\$ 22.00
	1425	303	SS	69	M6	F	\$ 298.00	\$ 271.00	M5.55 / 0.2185	400-600	389521/N-RZ	\$ 26.00
	1425	304	SS	69	M6	C	\$ 298.00	\$ 271.00	M5 / 0.1969	400-600	372620/ZELXSS	\$ 22.00
	1425	304	SS	69	M6	F	\$ 298.00	\$ 271.00	M5.55 / 0.2185	400-600	389521/N-RZ	\$ 26.00
	1425	316	SS	69	M6	C	\$ 329.00	\$ 299.00	M5 / 0.1969	300-500	372620/ZELXSS	\$ 22.00
Cast Aluminum*	1425	316	SS	69	M6	F	\$ 329.00	\$ 299.00	M5.55 / 0.2185	300-500	389521/N-RZ	\$ 26.00
	1425	319	AL	69	M6	F	\$ 329.00	\$ 299.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 22.00
	1425	319	AL	120	M6	F	\$ 459.00	\$ 419.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 26.00
	1425	356	AL	69	M6	F	\$ 329.00	\$ 299.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 22.00
	1425	356	AL	120	M6	F	\$ 459.00	\$ 419.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 26.00
	1425	380	AL	69	M6	F	\$ 329.00	\$ 299.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 22.00
Special**	1425	380	AL	120	M6	F	\$ 459.00	\$ 419.00	M5.55 / 0.2185	500-1000	388521/N-RS	\$ 26.00
	1425	G2DURA	FE	69	M6	F	\$ 279.00	\$ 233.00	M5.55 / 0.2185	400-600	389521/N-RZ	\$ 26.00
	1425	80-55-08	FE	69	M6	F	\$ 279.00	\$ 233.00	M5.55 / 0.2185	400-600	389521/N-RZ	\$ 26.00
	1025	CGI	FE	84	M6	F	\$ 589.00	\$ 530.00	M5.55 / 0.2185	800	389521/N-RZ	\$ 26.00
	1425	718	IN	69	M6	C	\$ 700.00	Call	M5 / 0.1969	150	B03060010060	\$ 45.00
	1425	110H	CU	69	M6	F	\$ 325.00	\$ 299.00	M5.55 / 0.2185	500	388521/N-RS	\$ 26.00
	1425	6AL4V	TI	69	M5	C	\$ 460.00	\$ 418.00	M4.2 / 0.1653	300	B03060010050	\$ 45.00
Metal Ref	1425	6AL4V	TI	69	M6	C	\$ 460.00	\$ 418.00	M5 / 0.1969	300	B03060010060	\$ 45.00
	Sample part number = 1425-1018ST-69-M6F = 14.0" x 2.0" x 0.50" steel bar for M6x1 forming taps. Polyimide fluid blocking 1 mil tape 3/8"x36 yards at \$12.00 each. Printed 18-May-17										Note: Taps must be ordered in multiples of three.	
	Most any material can be made into a Test Bar. Call with your special application.										Terms - credit card for orders under \$500.00	
Metal Ref	AISI	1018	1045	4140	6061	303 SS	316 SS	356 Al	380 Al			
	DIN	1.0453	1.1191	1.7225	3.3211	1.4305	1.4401			Delivery - stock to two weeks.		
Properties		CK45	42CrMo4V	AlMg1SiCu	X10CrNiS	X5CrNiMo	AISI7Mg	AISI8Cu3Fe	** indicates 1-3 week delivery			

ACCESSORIES

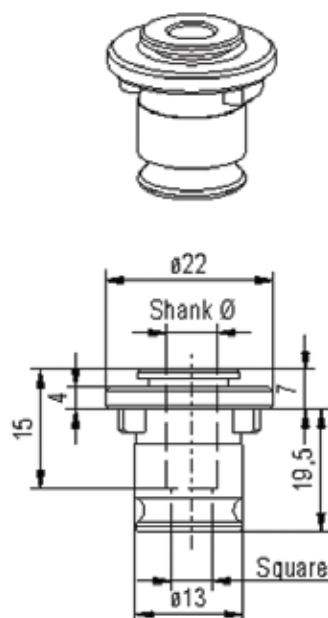


We provide suitable accessories for your applications. Custom-made products and adapters are available on short notice.

Quick change inserts Size 0 (Tauro® 25)

To mount taps in quick change tapping chucks.

The selection of the taps results out of shank diameter and square

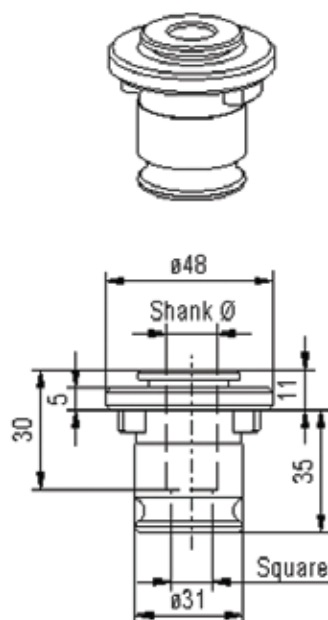


Tap		DIN 371 DIN 2174	DIN 376
2,5	2,1	M1 - M1,8	M3,5
2,8	2,1	M2 - M2,6	M4
3,15	2,5		
3,5	2,7	M3	M4,5 - M5
3,55	2,8		
4	3	M3,5	M5,5
4	3,15		
4,5	3,4	M4	M6
5	4		
6	4,9	M4,5 - M6	M8
6,3	5		
7	5,5	M7	M9 - M10
8	6,2	M8	M11

Quick change inserts Size 2 (Taurox® 400 / 900)

To mount taps in quick change tapping chucks.

The selection of the taps results out of shank diameter and square

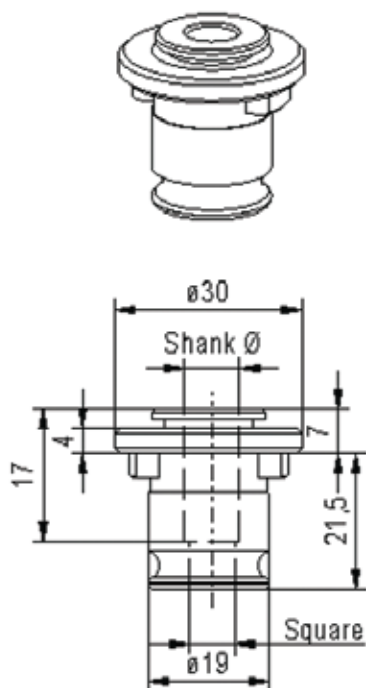


Gewindebohrer		DIN 371 DIN 2174	DIN 376
4,5	3,4	M4	M6
6	4,9	M4,5 - M6	M8
6,3	5		
7	5,5	M7	M9 - M10
8	6,2	M8	M11
9	7	M9	M12
10	8	M10	
11	9		M14
11,2	9		
12	9	M12	M16
12,5	10		
14	11		M18
14	11,2		
16	12		M20
16	12,5		
18	14		
18	14,5		M22 - M24

Quick change inserts Size 1 (Tauro® 83 / 120 / Taurox® 300)

To mount taps in quick change tapping chucks.

The selection of the taps results out of shank diameter and square

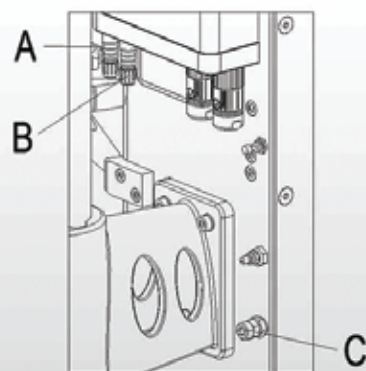


Gewindebohrer	DIN 371 DIN 2174	DIN 376
2,5	2,1	M1 - M1,8
2,8	2,1	M2 - M2,6
3,15	2,5	
3,5	2,7	M3
3,55	2,8	
4	3	M3,5
4	3,15	
4,5	3,4	M4
5	4	
6	4,9	M4,5 - M6
6,3	5	
7	5,5	M7
8	6,2	M8
9	7	M9
10	8	M10
11	9	M14
11,2	9	
12	9	M14
12,5	10	M116

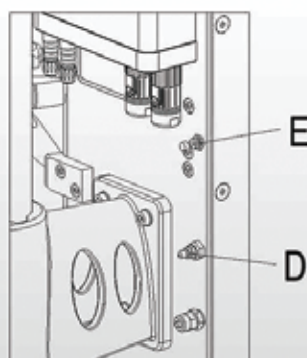
FEED SYSTEM (for spindle)

The feed is especially well suited for handling solutions and automation.

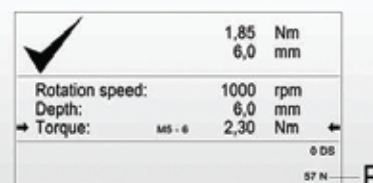
- step less adjustable limit for gating force with presentation in display
- step less adjustable speed of feed
- damping for low tool wear
- start by foot switch, sensor, or PLC interface (accessory)
- start on adjustable release height (time saving)



A - Connector for foot switch
B - Connector for proximity switch or PLC - unit
C - Connector for Compressed air



D - Flow control for the speed operation control
E - Pressure control for the setting of the feed force



F - Display of feed force limit

MINIMUM LUBRICANT UNIT (with lubricant pulse and air pulse)

- pneumatic 87psi / 6bar
- adjustable dosage in the microliter range
- 2 vent to control
- without spray mist
- time and pulse adjustable by user interface unit
- very low usage of cooling lubricant



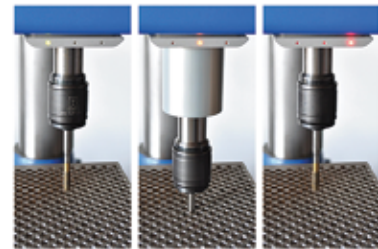
MINIMUM LUBRICANT UNIT (with lubricant pulse, air pulse and air cleaning pulse)

- pneumatic 87psi / 6bar
- adjustable dosage in the microliter range
- 3 vents for separate control
- without spray mist
- time and pulse adjustable by user interface unit
- very low usage of cooling lubricant
- the final blow cleans after work process
- final blow control at the chip cleaning work mode



SIGNALBAR (for quality evaluation)

- green, orange, red
- green means: Quality good, work process without errors
- orange means: Machine is working
- red means: Errors occurred during work process



SIGNAL LIGHT COLUMN (for quality evaluation)

- green, orange, red and horn
- green means: Quality good, work process without errors
- orange means: Machine is working
- red and horn (short signal) means: Errors occurred during work process



KEY SWITCH (with lock-out)

- locks the user interface
- locks the output signal of the clamping function in case of errors during work proces



ADDITIONAL PUSH BUTTONS (selection for parameter data base)

- direct access to saved parameter sets
- fast switch of tool
- assigning special functions (on demand)



FIXATION TO WALL (assembly kit for fixation to wall (control unit Tauro® 8/25/83))

- perpendicular mounting of the control unit
- little need of space for the control unit
- simple mounting





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