

# Providing the world leading solutions for tire- and friction-testing technology

Since more than 35 years

# **Product Information**

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 $\ensuremath{\mathbb{C}}$  Altracon S.A., 56 Rue de la Gare, L-6440 Echternach 04/ 2023

## **Indoor Tire Testing**

### **Science Friction**

- High Speed Linear Friction Tester HSLFT
- Linear Friction Tester LFT
- High Dynamic Oscillation Tester HDOT

### Tire Homologation and operational Safety Testing

Tire Multifunction Tester TMT

- Tire Stiffness/ Load Deflection
- Sidwall Contour Measurenment
- Foot- and Loadprint Analysis
- Plunger Test
- Bead Unseating
- Air Retention Test Facilty ART
- Tire Burst Testing Equipment TBT
- Drum Tire Testing Machines DTTM
  - Tire Endurance
  - High Speed Endurance
  - Rolling Resistance
  - Tire Non-Uniformity
  - Force and Moment
  - Wear
  - Fatigue
  - Noise
  - Cleat Testing

# **Outdoor Tire Testing**

### Friction-, Grip-, Contact-Patch-Measurement

- Industry Grip Testing System IGTS
  - Tire Braking Performance Measurement
  - Force and Moment Measurement
- Outdoor Foot- and Loadprint Analysis
- Track Scanner STS mobile

## Assistive Technologies for Tire R&D

### **Precision Tire Cutting**

- High Pressure Tire Cutter HPTC

### **Tire- and Track-Condition**

- Sample and Track Scanner STS
- Snow Compression Unit SCU (please see www.altracon.com)

### Automation

GROSCH Autoloader for LAT 100 (please see www.altracon.com)

### Services

- Technical Services
- CATM and Retrofit

Products



# **Indoor Tire Testing Machines**

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# **Science Friction**

**Product Description** 

# High Speed Linear Friction Tester (HSLFT)

Measuring the real  $\mu$ 

- Determination of friction coefficients of rubber samples
- Any road type/ track surface
- Any operating condition including all tire load classes (MC/ PC/ LT/ T&B/ Aircraft)
- Any environmental condition -25°C (-13°F) to +50°C (122°F)
- Full environmental and conditions control
- Top sliding performance Fx 2.500 N (8.000 N peak) / 8 m/s / 100 m/s<sup>2</sup>
- Fully controlled hybrid (hydraulic/ pneumatic) high performance loading system Fz max 7.500 N
- Prediction of compound and pattern influences on grip and traction performance
- Tread block analyses with synchronized high Speed camera system
- New developed linear induction motor
- Special technologies to produce ice- and snow tracks
- Hot road track temperatures up to 90°C
- Upgradable for future needs
- Modules for conditioning and cleaning
- Scanner for tracks and samples for wear
- Highly cost efficient
- Reference Measurement System for tire industry



### A key solution for development engineers

HSLFT is a friction tester, neither for measurement of wear nor abrasion. Friction testing with the HSLFT is a huge step forward in the process of tire development. It reduces risk by increasing the number of test cycles offers the customer a far shorter delay of launching his product by reducing the number of road tests and cuts development costs by creating an indoor all-season tire test environment.

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### **Full parameter control**



### Cost and efficiency of testing

The High Speed Linear Friction Tester (HSLFT) is the tool to improve the efficiency of the tire development process to keep development cost and effort on a payable level. Reliable material performance data measured in the lab will shorten the feedback-loop to the development specialists and will allow to respond to the multiple development and testing demands which face the tire industries by powerful material pre-selection.



The development process optimization from compound recipe to tire performance

### **HSLFT Technical Specification**

The High Speed Linear Friction Tester is a modular system. These offer different performances for different application areas. Customization with various options is possible. However, performance limits are shown in the table below.

PARAMETER	MEASURING RANGE	ACCURACY
Longitudinal force F <sub>x</sub>	0 8000 N peak 0 2500 continuous	± 0.1 % of set range (500/ 1000/ 5000/ 10000 N)
Lateral force F <sub>y</sub>	0 500 N	± 0.1 % of set range (500/ 1000/ 5000 N)
Vertical force (load) F <sub>z</sub>	20 7500 N	± 0.1 % of set range (500/ 1000/ 5000/ 10000 N)
Sliding distance/ positioning s <sub>x</sub>	0 2500 mm total 0 550 mm testing	10 μm
Vertical travel/ positioning $s_z$	0 20 mm	1 μm
Sliding velocity v <sub>x</sub>	0,001 8 m/s <sup>1)</sup>	± 0.001 m/s
Loading-/ unloading time	≥ 20 ms	
Longitudinal acceleration a <sub>x</sub>	0 100 m/s²	≤ 1 % FS
Longitudinal track inclination $\alpha(y)$	-3 +3°	± 0.001°
Lateral track inclination $\alpha(x)$	-3 +3°	± 0,001°
Vertical track lifter	180 mm	± 0,001 mm
Lateral track positioning	± 200 mm	0,1 mm
Sample holder rotation angle $\alpha$ (z)	0 360°	1° (manual adjustment)
Sample temperature T <sub>sample</sub>	RT <sup>2)</sup> 180°C with opt. heater -25° 80°C with opt. charger depot	± 0.5°C
Track temperature T <sub>track</sub>	RT <sup>2)</sup> -25° 90°C with opt. conditioner	± 0.5°C
Temperature test room T <sub>Test</sub>	5° 50°C with opt. climatic chamber -25° 50°C with opt. freezing pack	± 1°C
Temperature snow & ice room T <sub>s&amp;ice</sub>	-25°5°C	± 1°C
Sample rate	100 Hz 20 kHz per channel	

1) Speed depending on test method

2) RT = Room Temperature

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### **HSLFT Layout** (only base machine)







### Layout Example Climatic Chamber with HSLFT base machine and Ice & Snow Compartment



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# **Science Friction**

**Product Description** 

# Linear Friction Tester (LFT)

Measuring the real  $\mu$  indoor and outdoor

- Determination of friction coefficients of rubber samples
- Any road type/ track surface
- Top sliding performance Fx 5.000 N / 2 m/s / 40 m/s<sup>2</sup>
- High performance pneumatic loading system Fz max 3.000 N
- Prediction of compound and pattern influences on grip and traction performance
- Powerful hydraulic motion drive
- Indoor use allows:
  - Any operating condition including all tire load classes (MC/ PC/ LT/ T&B/ Aircraft)
  - Any environmental condition -25°C (-13°F) to +50°C (122°F)
  - Full environmental and conditions control
  - Special technologies to produce ice- and snow tracks
  - o Tread block analyses with synchronized high Speed camera system
  - Upgradable for future needs
  - Modules for conditioning and cleaning
- Scanner for tracks and samples for wear
- Highly cost efficient



### A key solution for development engineers

LFT is a friction tester, neither for measurement of wear nor abrasion. Friction testing with the LFT is a huge step forward in the process of tire development. It reduces risk by increasing the number of test cycles offers the customer a far shorter delay of launching his product by reducing the number of road tests and cuts development costs by creating an indoor all-season tire test environment.

The Linear Friction Tester - LFT is the "small brother" of the High Speed Linear Friction Tester – HSLFT, which is established as the reference for friction testing in tire industries. The LFT is developed to determine friction coefficients of rubber samples on different surfaces and under various operating conditions in order to predict compound and pattern influences on the grip and traction performance of tires with lower performance and limited variability of testing compared to the HSLFT but with the same precision and similar functionality. Both systems are compatible.

The LFT is made to **measure the real linear friction** of compounds in a discretionary direction of the compound sample on various surfaces incl. real road tracks at any environmental condition. The measurement may be combined with records from a high-speed camera taken synchronously from the sample to support the interpretation of data measured with the HSLFT and to perform tread block analyses. It is neither a wear nor abrasion tester.

The testing machine was designed and constructed in such a way that all relevant tire testing conditions can be simulated with this equipment. The sample is moved with a hydraulic actuator with performance of 5.000 N Fx (continuous), which allows sliding velocities up to 2,0 m/s and generates accelerations up to 40 m/s<sup>2</sup>. Loading with vertical forces up to 3.000 N can be applied. The load application is done with a new hybrid loading system using a combined hydraulics and pneumatics technology to cover the full operating range.



### LFT set-up for indoor use

The rubber sample is vulcanized or bonded to a carrier. It will be loaded to the testing surface, which is applied to an exchangeable cassette and will be rubbed over it by motion of the track before it is unloaded again. A rotational sample holder allows to adjust the direction relative to the track. The process is controlled with variable parameters. The environment is usually conditioned and -depending on the equipment of the machine-also the test specimen and the track.

### Indoor- and outdoor testing of friction

The LFT is available for indoor- and outdoor use. The LFT for outdoor friction testing only uses the upper part of the machine with the measuring head and the high performance hydraulic drive, which is directly loading the sample to the real track, while the indoor version is equipped with the track intake on a massive machine base-frame to measure the friction on the prepared track cut outs. The outdoor version also includes levelling and positioning features to enable fast and repeatable adjustment to the road surfaces at various locations.



LFT set-up for outdoor use

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## LFT Technical Specification

The Linear Friction Tester is a compact and modular system. Customization with various options is possible. However, performance limits are shown in the table below.

PARAMETER	MEASURING RANGE	ACCURACY
Longitudinal force $F_{x}$	0 5000 N continuous	± 0.1 % of set range (500/ 1000/ 5000N)
Lateral force $F_y$	0 500 N	± 0.1 % of set range (500/ 1000/ 5000 N)
Vertical force (load) $F_z$	20 3000 N	± 0.1 % of set range (500/ 1000/ 5000 N)
Sliding distance/ positioning S <sub>x</sub>	0 500 mm total 0 300 mm testing	10 µm
Vertical travel/ positioning Sz	0 20 mm	1 μm
Sliding velocity $V_{x}$	0,001 2,0 m/s	± 0.001 m/s
Loading-/ unloading time	≥ 20 ms	
Longitudinal acceleration $\mathbf{a}_{\mathbf{x}}$	0 40 m/s²	≤ 1 % FS
Sample holder rotation angle $lpha({ t z})$	0 360°	1° (manual adjustment)
Sample temperature T <sub>sample</sub>	RT* 200°C with opt. heater	± 0.5°C
Track temperature $T_{track}$	RT* 200°C with optional heater -25° 180°C with opt. conditioner	± 0.5°C
Temperature test room $T_{Test}$	5° 50°C with opt. climatic chamber -25° 50°C with opt. freezing pack	± 1°C
Sample rate	100 Hz 20 kHz per channel	

\*) RT = Room Temperature

1) Speed depending on test method

2) RT = Room Temperature

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**Product Description** 

# **HDOT - High Dynamic Oscillation Tester**

Biaxial transient tread oscillation machine

HDOT is a system to measure the transient response of tread-rubbers on different friction-/ road surfaces. It is based on the customers experience with the HSLFT and advanced customer needs. Geometrically standardized rubber samples are activated with high frequency in various loading conditions, bi-axial in longitudinal and vertical direction.

Road surfaces and samples are replaceable and free to configure and may be conditioned with various temperatures. This machine opens complete new opportunities to describe the material properties of elastomers.



The activation may happen selectively with different signal wave forms with a defined number of cycles or also one-time activation with force- or stroke-control. The amount of cycles per test is limited under maximum conditions to keep the temperature of the rubber sample during the test on a constant level.

The HDOT perfectly supplements the capabilities of the HSLFT for dynamic measurements in higher frequency ranges with unique hydraulic equipment developed by Altracon. A MUST to learn about the material properties of new developed elastomers.

200Hz

### **Key Performance Data:**

- Max. excitation frequency:
- Max. Amplitude:
- Max. hydraulic power:
- Max. track carrier weight:
- Track Size:
- Max. Sample Size:
- Max. load Fz:

25mm (50mm p/p) 50kW (continuous) / 300kW peak 15kg 310 x 180mm 250 x 250mm 10.000N



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Force-control:

- 1) frequency; force-amplitude Fx max./ min.  $\rightarrow$  output dx (n) (n = amount of cycles)
- 2) frequency; force-amplitude Fz max./ min.  $\rightarrow$  output dz (n) (n = amount of cycles)

Stroke-control:

- 3) frequency; stroke-amplitude max./ min. dx  $\rightarrow$  output Fx (n) (n = amount of cycles)
- 4) frequency; stroke-amplitude max./ min. dz  $\rightarrow$  output Fz (n) (n = amount of cycles)

### Additional output calculated

-μ

- M(y) (for verification of exact sample positioning)

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**Product Description** 

# Tire Multifunction Tester TMT PC/LT

A combined Spring Rate-/ Load Distribution Tester and Footprint Analysis System

### **Key facts**

- Tire radial, lateral, longitudinal and torsional stiffness
- Loadprint/ Pressure map
- Footprint
- Loaded contour
- Bead unseating
- Plunger testing
- Pitch cut test
- Proven stiff L-shape design
- MC, PC, LT, T&B tires
- Combined spindle and hydraulic loading
- Wheel loads ≤ 50 kN



### Test Standards

- ASM F1971
- GBT 23663-2009, GBT 4502-2009
- SAE J2705, SAE J2704

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Dynamic tire sidewall contour measurement



Lateral stiffness measurement



Bead unseating test



Plunger pin unit



Footprint-/ optical pressure mapping Foot-/ Loadprint Analysis example graphical report

Foot print deflection

### **TECHNICAL DATA**

PARAMETER	SPECIFICATION
	PC/ LT
Tire Diameter Range	≤ 1.000 mm
Max. Section Width	450 mm
Max. Load	≤ 5000 kg
Internal Tire Pressure	0 - 6 bar
Pressure Accuracy	0.25 % of FS
Bead Diameter	<u>≥</u> 10"
Ambient Temperature	0 - 45° C
Temperature Accuracy	0,1° C
Radial Force	50kN
Load Accuracy	≤ 0.5% set range load Fz
	(depending on measuring system)
Load plate	500 x 500mm
Ambient Temperature	0 – 45° C
Temperature Accuracy	0,1° C
Force Measurement Fz	50kN
Force Measurement Fx, Fy	20kN (others on request)
Force and Moment Measurement accuracies	≤±0,5% set range
	(depending on measuring system)
Vertical positioning	Z = 700 mm/ ± 0,1 mm
	(200 900 mm)
Vertical (radial) deflection	Z - 250 mm/ ± 0,01 mm
Longitudinal & Lateral Force Fx; Fy	±1 N max. 20kN
Longitudinal/lateral deflection	≤ 200 mm/ ± 0,01 mm
Longitudinal/ lateral sliding speed	variable 1 100 mm/min
Torsional torque	± 5 kNm
Torsional deflection	≥±15°/±0,1°
Standard supply voltages	400 V (50/ 60 Hz,
	3 phase)
Control Voltage	24 V
Camber adjustment (optional)	+/- 10°/ ± 0,1°

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General Layout TMT PC/LT





**Product Description** 

# **ART – Air Retention Test Facility**

Rate of inflation pressure loss testing

Rate of inflation pressure loss testing is deemed to being a mandatory material test according to ASTM F 1112-06a standards. Altracon offers a turnkey solution for a fully equipped test room, customized in terms of the number of tires to be tested.





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### **ART – Air Retention Test Facility**

The tires are horizontally stored in a three story rack system. In the exemplary set-up shown on the sketches, three rack lines are positioned longline within the test room. They will keep up to 51 tires, whereof 36 stations are prepared for PCR and 15 for LTR tires. However, any other configuration is possible for customization. Stations for PCR and LTR differ through their compartment height which is adaptable at the time of installation. A mono-rail system between the racks allows easy loading and unloading with a handling crane which is moved by hand.

Each position is equipped with an extractable base to enable easy feeding from the top, assisted by the handling crane. The tires are mounted on rims which are not part of the offer. The assembly will be positioned on cones for testing.

The tire is ready for testing after the sensor has been mounted to the valve of the probe with a Y-adapter, which also allows inflating through a by-pass. The HMI is the control PC which is located external of the testing room. Alternatively each positions condition may be also displayed on a WIFI connected handheld Display (Tablet PC). This is also foreseen to be used as operators interface and remote control inside of the testing room. It shows all specific data and testing parameters for each testing position. Recording of the DOT number is possible either manually or by reading the barcode information with the in-built camera of the Tablet PC.

The inflation of the tire is done automatically through a temporarily connected, central inflation pipe/ tube, commanded by the Tablet PC. The target inflation will be addressed individually for each specific station. Relevant testing data of the tire and its environment, such as inflation pressure, room temperature, humidity and atmospheric pressure, will be recorded in free configurable time intervals during the test. The data storage is done on a permanent memory of the PLC control.

The physical separation of the operating PC and the data recording as well as a battery back-up system (UPS) ensure best reliability of operation even if there should be a breakdown of power supply or the requirement of a re-start. An interruption of the network or of the control PC will with this not lead to a loss of data.

The software allows a window-supervision of the specific measuring data, which generates an alarm and a log-information if previously defined limits are exceeded.

The sensors specification meets ASTM F 1112-06a requirements in any case. The provision of sensors that offer even higher precision is possible.

### **Key Features**

- Multi-level rack storage
- Adjustable compartments for PLT / TBR tires
- Extractable base system
- Easy feeding with handheld crane
- PLC controlled inflation pressure setting and measurement
- HMI with handheld PC for remote operation
- Precision inflation pressure sensors
- Non-dissipative tube connections
- Tire diameter max. 1100mm
- Tire width max 800mm
- Inflation pressure max. 10 bar
- Accuracy +/- 0,03% FS





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# **TBT** Tire Burst Testing Equipment

- Water based burst testing compliant with all valid standards (i.e. ECE R 106)
- Environment friendly with water-management for re-use of water
- Total Safety CAT 4
- Burst testing

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- Over pressure air retention testing
- Tire growth measurement
- Pressure flow measurement
- HPEX early damage detection
- Full automatic process operation
- Test-wheel fixation without touching the ground
- Variable rim-disk concept for testing
- All categories (2 wheelers, PC, LT, TBR, OTR, OTR MAX)



*Tire Burst Testing Equipment* (without safety housing)

*Tire Burst Testing Equipment with optional safety housing (example: TBT for 2-wheeler tires)* 



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**Altracon TBT** is suitable to fill tires, which are mounted to rigid rims, with water to analyze them for the critical burst pressure according to the valid standards and to provide information for the failure examination and meets the latest safety and ergonomic standards.

The system consists of a water pressure management system, which is connected to the facilities water supply, one or multiple mobile wheel carrier, which will be placed and fixated in a test room for testing, rigid steel made test rims and a barcode reader with QM database system including a customized interface to register the tire. The systems water pressure management system includes a high pressure water pump, optional water conditioning if applicable and the necessary piping. A control PC cares for the control of the pressure provided by high pressure pump. The control process variable is the water flow. The pump control is in closed loop with a precision pressure measurement gauge.

The tire/ wheel assembly is connected with a tube to a water tap or a connector hub of the water management system for testing. The water tube is connected to the wheels valve connector.

The respective tire is mounted to its rim and to the mobile wheel carrier for testing. It is automatically controlled deflated to prepare the test. An injection lance is inserted through a second valve hole of the special test rim, alternatively is a hollow needle pierced radially to the tire through the tread if the system is used with a standard OE rim. It is to allow total deflating of the enclosed air while the tire is filled with water and protects with this against tire explosion. The injection lance respectively the hollow needle is equipped with a water level guard, which is connected to the control system. The pressure is measured in the tube system. The wheel carrier ensures that the tire does not touch the ground, which might affect the test result, and that it is securely fixated. This assembly may be prepared in a separate location.

When placed in the test room and connected to the water management the wheel/ tire is still deflated, which means that it is only filled with air without being under pressure. The burst test is proceeded and controlled automatically. The test starts by filling the tire with water. The remaining air is leaking from the inside of the tire through a deflating hose, which is connected by the injection lance or the hollow needle. The system recognizes by itself when the tire is completely filled. At this moment the filling procedure is stopped and the system switches to the test mode. The increase of pressure is done time controlled (pressure gain/ time). The rate is variable. The pressure gauge will measure the increasing pressure and pressure variations due to damage of the structure and finally the burst pressure. The values are recorded by the data acquisition system. The system will stop the test by itself after the tire burst. Maximum inflation pressure for testing is 35bar for the base unit, which is capable to test PC, LT as well as T&B tires up to 1200mm diameter.

### ALTRACON HPEX, early detection of tire failure/ damage

ALTRACON TBT is capable to perform the usual functions of a totally controlled burst tester to examine the continuous pressure level (p(t)) and the burst pressure ( $p_{max}$ )according to the valid standards such as ECE R106. However, these tests and measurements only give a rating of the quality but don't provide measurements as suitable information for product development. The ALTRACON TBT is also equipped with HPEX, a High Pressure Expansion Measurement functionality and is with this enhanced to a tool which is of particular importance for the quality control. The complete evacuation of the air creates a highly precise measurement condition of the filling- and expansion volume in the tire. The system analyses the expansion characteristics of a tire by measurement of the pressure- and volume- variation during the filling process and with this indicates deviations in tire quality, which might be caused by variation in the production process or material quality as a possible cause for changing defect developments.

The measurement data taken during the filling process are used to process the analysis of the stiffness and the energy intake of the tire, which allows for a precise predication (fingerprint) of the tire in comparison to the series product. By means of monitoring the intrinsic line of the measuring data a deviation and early detection of the initial defect of the tire is offered prior to that it will burst.

With this fully controlled and automated recognition and early cut off during the pressure increase HDEX allows to do a failure analysis of the non-destroyed tire.

### Test rims/ wheel fixation

PC, LT and TBR tires up to 1.500mm diameter are recommended to be mounted to test rims, which are then carried by a mobile wheel carrier for testing. The wheel carrier ensures that the tire does not touch the ground, which might affect the test result. It is securely fixated and adjusted. The assembly of wheel and wheel carrier may be prepared in a separate location before it is placed in the test room.

Tire adapter sets with pressure plates for tire intake, which will be mounted to a solid, non-spinning spindle are an alternative to test rims. They are available in all sizes and offer very flexible mounting in terms of width and diameter.



Tire adapter sets with pressure plates, available for all sizes

Larger diameter tires may be tested while hanging on a crane. This also ensures that the tire doesn't touch the ground. It may be fixated with tensioning ropes. Special test rims with eyelet rings are available on request. Other fixations are available i.e. for two wheeler tires.





**Product Description** 

# Foot- and Load-print Tester FPT

Load Distribution Measurement and Footprint Analysis System

### **Key facts**

- Stiff and compact H-frame design
- Loadprint/ Pressure map
- Footprint
- Use with standard rims
- Combined spindle and hydraulic loading
- Inflation pressure control system
- Intake for matrix sensors or paper for ink-footprint
- Re-usable optical precision measurement equipment (optional)
- MC, PC, LT, T&B
- Customized versions for OTR tires
- Optional extension for rolling (dynamic) footprint testing



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The Foot- and Loadprint Tester for passenger car and light truck tires is based on a stiff H–frame design base with spindle loading of the tire. A combined spindle positioning and hydraulic loading system is optional available.

The tests are done with the non-spinning tire. The wheel/ tire is loaded to a flat load plate with fixations for paper to do ink-loadprints, for electric sensor mats i.e. made by Tekscan®, or a glass-plate with a camera system underneath, both mounted on top of a load table at the machine base. (Might be arranged under floor). The wheel spindle is locked for the test. The vertical force is measured with precision load cells and synchronously recorded with the vertical motion.

The wheel/ tire is loaded to a flat surface, which consists of a crystal clear glass plate while the wheel spindle is locked. Special lighting of the glass plate allows to visualize the contact patch and to record it either with a video camera or with a photo camera from underneath through the glass plate. Vertical force and deflection of the tire are synchronously measured and recorded. The glass plate can also be covered with a special foil, which is calibrated for its grey scale appearance depending on the load being applied. This will be used to visualize and calculate the contact pressure distribution.

All relevant conditions of the tire/ wheel will be controlled or measured. Data are stored in a system data base.

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0	255	0	9	0.0438	350	15,25	0,610196	15,59	0.036296	17
84	255	0	10	0.0854	123	8.04	0.321696	5.48	0.0127%	25
128	255	0	11	0.0980	18.5	18 18	0.647196	7.25	0.0171%	38
100	265	0	12	0.1470	165	22.70	0.011000	6.00	0.0180%	50
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200	192	0	14	0,3309	64	21,17	0,8471%	2,85	0,0068%	128
255	128	0	15	0,4963	28	13,90	0,5559%	1,25	0,0029%	192
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typical load print analysis report

### **TECHNICAL DATA**

PARAMETER	SPECIFICATION
	MC/ PC/ LT
Tire Diameter Range	≤ 1.100 mm
Max. Section Width	450 mm
Max. Load	≤ 3.000 kg / 5.000 kg
Internal Tire Pressure	0 – 6 bar
Pressure Accuracy	0.25 % of FS
Bead Diameter	≥ 10"
Ambient Temperature	0 - 45° C
Temperature Accuracy	0,1° C
Radial Force	30 kN/ 50 kN
Load Accuracy	≤ 0.5% set range load Fz (depending on measuring system)
Load plate	500 x 500 mm
Ambient Temperature	0 – 45° C
Temperature Accuracy	0,1° C
Force Measurement Fz	50kN
Force-measurement accuracies	$\leq \pm 0,5\%$ set range (depending on measuring system)
Vertical positioning	Z = 600 mm/ ± 0,1 mm
Vertical (radial) deflection	$\leq$ 250 mm/ ± 0,01 mm
Standard supply voltages	400 V (50/ 60 Hz, 3 phase)
Control Voltage	24 V
Camber adjustment (optional)	+/- 10°/ ± 0,1°

PARAMETER	SPECIFICATION
	T&B
Tire Diameter Range	≤ 1.400 mm
Max. Section Width	480 mm
Max. Load	≤ 10.000 kg
Internal Tire Pressure	0 – 12 bar
Pressure Accuracy	0.25 % of FS
Bead Diameter	<u>≥</u> 15"
Ambient Temperature	0 - 45° C
Temperature Accuracy	0,1° C
Radial Force	100 kN
Load Accuracy	$\leq$ 0.5% set range load Fz (depending on measuring system)
Load plate	500 x 500mm
Ambient Temperature	0 – 45° C
Temperature Accuracy	0,1° C
Force Measurement Fz	100 kN
Force-measurement accuracies	$\leq \pm 0,5\%$ set range (depending on measuring system)
Vertical positioning	Z = 800 mm/ ± 0,1 mm
Vertical (radial) deflection	300 mm/ ± 0,01 mm
Standard supply voltages	400 V (50/ 60 Hz, 3 phase)
Control Voltage	24 V



Altracon

**Product Description** 

# **DTTM - Drum Tire Testing Machines**

A powerful, modular test machine concept

A powerful, modular test machine concept according to valid regulations, customizable to meet your requirements. High precision measurement solutions and hydraulic systems, which were especially developed in-house for tire testing equipment, offer unique test stand solutions with extended life-time. The modularity offers easy extension and modification for changing requirements. The high quality standards assure good value for your investment.

- 1-; 2-; 4-Posion test stands
- Rolling Resistance-Measurement
   ISO 28580/ 16377/ 9948/ 1816
  - R 117, GB/T 29042-2012
  - SAE J2452/ J1269/ J1270
- Non Uniformity-Measurement
   ISO 13328/ 23671,
  - SAE J2730/ J332/ J2731
- Force & Moment Measurement
   SAE J1106/ J1107/ J1987
- High-Speed-/ Endurance-Testing
  - FMVSS 109/ 119/ 139
  - ISO 10231/ 10191
  - SAE J1561/ J1633
  - UN ECE R30/ R54/ R64/ R75/ R106/ R108/ R109
- Wear-Testing
- Cleat-Testing
- Motorcycle-, Passenger-, Light Truck-, Truck and Bus-, OTR-, Aircraft- tire testing
- Solid-tire testing
- Various drum diameters
- Hydraulic-, pneumatic-, electric loading
- Variable design concept
- Customized layouts, designs, measurements
- Camber and slip variation
- Economic operation with Altracon Efficient Power Consumption Management EPCM
- Tire failure early detection and prediction with Altracon Failure Detection System FDS
- Tire dynamic growth measurement
- Remote Service interface



## **Typical Technical Data**

PAR	AMETER	Specification	
	Road Wheel Type	Steel welded (tbd)	
	Material	Steel 1.0036 (DIN)	
	Road wheel diameter	1.700/ 2.000/ 3.000/ 5.000mm	
	Road wheel diameter accuracy	+0/ -0.2mm	
	Road wheel Width	300 1.200 mm	
	Road Wheel Runout (radial and lateral)	< 0.2 mm	
	Surface roughness	< 0.5 µm	
ive	Road wheel balance	VDI 2060 Accuracy class Q 6.3	
l Dr	Levelness road wheel axis	< 0,2mm/ 1000mm	
anc	Tire axis vs. road wheel surface parallelism	< 0,3mm/ 1000mm	
ule	Cleat fixation on road wheel surface	On request	
Jod	Max. Speed	≤ 500 km/h	
2	Speed Instrumentation Accuracy	+/- 0.01% FS	
Dru	Speed Control Accuracy	+/- 0.1 kmph	
	Acceleration	20km/h in < 30 sec adjusted	
	Operation Temperature	10 - 50° C	
	Time measurement accuracy	1ms	
	Hydraulic Power Unit	Rexroth	
	Drive torque transmission	Pulley wheel/ direct drive	
	Drive Unit Motor Power	AC servo Drive, power tbd.	
	Voltage	400V 50/60Hz	
	Tire Diameter / Loaded Radius (RL) Range	customization	
	RL Accuracy	± 0.1 mm	
	Effective Rolling Radius (Re) Range	no limits, calculated value	
	Re Accuracy	± 0.1 mm	
	Carriage Travel Speed Loading	standard 5 mm/s, fast gear 25mm/ s (customiza- ble)	
	Bead-/ rim diameter	11 24"	
	Rim width range	4 15″	
	Max. Section Width	Depending on drum width	
u	Load Range	0 300 kN ( 30 t)	
tati	Load Instrumentation accuracy	0,01% FS	
ad S	Load Control accuracy	± 3N	
ILo	Camber angle adjustment range	± 10°	
hee	Camber angle measurement accuracy	< ± 0.05°	
≥	Slip angle adjustment range	± 15°	
	Slip angle measurement accuracy	< ± 0.1°	
	Tire tread surface temperature measurement range	15 150°C	
	Tire tread surface temperature measurement accuracy	± 1°	
	Inflation pressure (Pi) regulation range	0 600 kPa/1MPa/ 2MPa	
	Pressure Instrumentation accuracy	± 0.1% FS	
	Pi Control Accuracy	± 1.0 kPa	
	Pi Control Capability	Cap & Control	
	Test Standard	Customizable, technical specification according to valid regulations	

### **Altracon HMI with workstation**

The system is equipped with a state of the art Operator Workstation including a large LCD monitor for machine control and an additional LCD monitor for the optional monitoring system. The Workstation is the human machine interface (HMI) to fully control the machine function as well as test definition, execution and standard reporting guided by a graphical user interface (GUI).

Test recipes are stored in a database as well as all the measurement- and test data. The GUI design is customized as well as the standard test report. All data can be exported to be further treated with common analysis tools. The operator dialogue is switchable between multiple languages.

The GUI design is customized as well as the standard test report. All data can be exported to be further treated with common analysis tools. Test reports can be copied and pasted to MS WORD and allow a fast and easy to handle integration into customized reports.

### Altracon Software package

The main functions of the software package besides the base capabilities are

- Test Management
- Controller and Test-Setting Database operation
- Data post processing
- Extended Display of online signals
- Extended Data Reporting
- Sensor and component database support
- The test program is customizable

The operator dialogue is multi-lingual switchable.

The GUI design is customized as well as the standard test report. All data can be exported to be further treated with common analysis tools, i.e. to MS EXCEL. Test reports can be copied and pasted to MS WORD and allow a fast and easy to handle integration into customized reports.

### Modular machine concept



Variable machine concept with standardized interfaces

# Custom made innovation made in germany



20 tons 2 Pos. Test machine for Agricultural Tires with tire footprint plate (left station)



5 tons 4 Pos. Test machine for Passenger and Light Truck Tires



**Product Description** 

# 6 Position PLT Endurance Tire Test Machine

Highly efficient endurance testing

Altracon

A testing machine, designed to test tires under heavy load condition to evaluate stability for driving and compliance with mandatory regulations local and abroad.



- horizontal drum
- 6 wheel stations
- standard mechanical interfaces
- a high performance AC servo motor with pulley wheel drive
- wheel carrier under load free from bending torque
- pneumatic or optional hydraulic loading
- Precision linear guides for smooth motion of the wheel carriers
- best control performance with highest accuracy
- bulge detector systems for emergency shut down
- safety housing according to CE Standards
- sliding doors with safety guard
- load stations accessible with crane to support mounting
- workstation with graphical user interface (GUI) for easy set-up and management of tests
- customized GUI design and standard test report
- data export and further treatment with common analysis tools, i.e. to MS EXCEL/ MS WORD

## Custom made innovation made in germany

### Wheel loading stations



Wheel load station with pneumatic loading  $\leq$  35 kN and camber adjustment  $\pm$  5° (Load capacity  $\leq$  50 kN is available with hydraulic loading)

## **Technical Data**

GeneralImage: Constraint of the second systemNo. of Loading Positions6Tire ClassPC/ LTNo. of road wheels1Drum module and driveImage: Constraint of the second systemRoad Wheel TypeSteel welded (tbd)MaterialSteel 1.0036 (DIN)Road wheel diameter1.707,6 mmRoad wheel diameter accuracy+0/-0.2mmRoad wheel Width500 mmRoad wheel Runout (radial and lateral)< 0.2 mmSurface roughness< 4.5 μmRoad wheel balanceVDI 2060 Accuracy class Q 6.3Levelpess road wheel axis< 0.2mm/ 1000mm
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Road wheel balanceVDI 2060 Accuracy class Q 6.3Levelpess road wheel axis< 0.2mm/1000mm
Levelness road wheel axis $< 0.2 \text{ mm}/1000 \text{ mm}$
Tire axis vs. road wheel surface parallelism < 0,3mm/ 1000mm
Cleat fixation on road wheel surface none
Max. Speed $\leq 160 \text{ km/h}$ optional $\geq 160 \text{ km/h}$
Speed Instrumentation Accuracy +/- 0.05 km/h
Speed Control Accuracy+/- 0.1 km/h
Acceleration 20 km/h in < 30 sec
Operation Temperature 5 - 50° C
Ambient temperature monitoring range 0 60° C
Ambient temperature monitoring accuracy± 0.5° C
Time measurement accuracy 1ms
Hydraulic Power UnitRexrothoptional
Drive torque transmission Pulley wheel
Drive Unit Motor Power AC servo Drive, power tbd.
Voltage 440V; 50/60Hz; 3 phase
Wheel load station
Tire Diameter Range400 1100 mm
Loaded Radius (RL) Range 200 550 mm
RL Accuracy± 0.1 mm
Effective Rolling Radius (Re) Range no limits, calculated value
Re Accuracy ± 0.1 mm
Carriage Travel Speed Loading standard 5 mm/s, fast gear
Camber adjustment + 5°
Bead-/ rim diameter 11 28"
Rim width range       4 15"

PARAMETER	Specification	Remarks
Max. Section Width	450 mm	
Load Range	0 35.000N (3.500 kg)	Higher loads with hy-
		draulic loading system
Load Instrumentation accuracy	0,01% FS	
Load Control accuracy	± 6 N	
Tire tread surface temperature measure-	15 150°C	adjustable position
ment range		(scanning system op-
		tional available)
Tire tread surface temperature measure-	± 1°C	
ment accuracy		
Inflation pressure (Pi) control range	0 7 bar/ 0 700 kPa	Requires 8 bar/ 50l/min
		pressurized air supply
Pressure Instrumentation accuracy	± 0.1% FS	
Pi Control Accuracy	± 1.0 kPa	
Pi Control Capability	Cap & Control	
Test Standard	Customizable	technical specification
		according to valid regu-
		lations



Test Stand outline





**Product Description** 

# 30t / 2 Pos. Endurance Tire Testing Machine

Strong and reliable tire testing of Farm Tires

The **2** Pos. Farm Tire Endurance Testing Machine made by Altracon is a heavy duty machine with multiple built in design- and functionality-features such as

- Rolling Resistance-
- Plunger-

Altracor

• Footprint-Testing

capabilities, combined with incredible performance values. It is designed for 20t or optional 30t wheel load capability for up to 2.500mm diameter tires.

The test machine is equipped with a 3.000mm road-wheel/ drum. It is driven by a high performance AC servo motor with direct drive torque transmission. An optional emergency brake-/ lock- system may be applied to the drive spindle to stop and block the drum. The test-wheel axis is equipped with a spin lock-/ brake system. Different test rims are adapted with adapter rings available for each wheel spindle. Special machine rims are available on request.

The wheel load is applied and measured directly in the vertical wheel axis, which keeps the wheel carrier free from bending torque. High precision linear guides care for smooth motion of the wheel carriers and contribute to best control performance with highest accuracy.

A bulge detector systems care for emergency unloading of the test position in case of a fault detection.

The test stand includes an inflation pressure control system including cap test function and may be optionally equipped with a tire inside air temperature measurement system with a rotary transducer or with a 3 channel RF wireless data transfer system.



A foldable platform for ink-footprint applications can be mounted at the center module and will be clamped to the drum, which is then locked for spinning. The platform offers a flat and vertically adjusted surface to load the wheel/ tire to take the footprints. Paper is kept in position with magnets. The same platform will be used to hold a plunger pin for plunger testing. The standardized length of the pin limits the maximum wheel diameter which can be tested, therefore is the wheel carrier optionally extended at the side where this test is foreseen to be performed.

Altracon machines are generally equipped with a TCP/ IP remote service connection to enable immediate access to the system by our specialists via customer controlled VPN tunnel in case of emergency, assistance or any other cases of urgency. The machine and its measurement equipment comply with the regulations for all valid standards in terms of set-up/ design and accuracy and supersede the set requirements in many cases.

# Custom made innovation

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### Altracon HMI with workstation

The system is equipped with a state of the art Operator Workstation including a large LCD monitor for machine control and an additional LCD monitor for the optional monitoring system. The Workstation is the human machine interface (HMI) to fully control the machine function as well as test definition, execution and standard reporting guided by a graphical user interface (GUI).

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- Extended Data Reporting
- Sensor and component database support
- The test program is customizable

The operator dialogue is multi-lingual switchable.

The GUI design is customized as well as the standard test report. All data can be exported to be further treated with common analysis tools, i.e. to MS EXCEL. Test reports can be copied and pasted to MS WORD and allow a fast and easy to handle integration into customized reports.

### Technical Data of the 2 Pos. Farm Tire Endurance Tire Test Machine

PARAMETER	Specification	Remarks
General		
No. of Loading Positions	2	
Tire Class	Farm / OTR	
No. of road wheels	1	
Drum module and drive		
Road Wheel Type	Steel welded (tbd)	
Material	Steel 1.0036 (DIN)	
Road wheel diameter	3.000mm	Up to 5.000mm available
Road wheel diameter accuracy	+0/ -0.2mm	
Road wheel Width	1.200 mm	
Road Wheel Runout (radial and lateral)	< 0.2 mm	
Surface roughness	< 0.5 μm	
Road wheel balance	VDI 2060 Accuracy class Q 6.3	
Levelness road wheel axis	< 0,2mm/ 1000mm	
Tire axis vs. road wheel surface parallelism	< 0,3mm/ 1000mm	
Cleat fixation on road wheel surface	none	
Max. Speed	≤ 120 km/h	
Speed Instrumentation Accuracy	+/- 0.05 kmph	
Speed Control Accuracy	+/- 0.1 kmph	
Acceleration	20km/h in < 30 sec	
Operation Temperature	10 - 50° C	
Time measurement accuracy	1ms	
Hydraulic Power Unit	Rexroth	
Drive torque transmission	Direct drive (gear-box)	
Drive Unit Motor Power	AC servo Drive, power ~260 kW	
Voltage	400V 50/60Hz	
Wheel load station		
Tire Diameter Range	600 2.500 mm	
Loaded Radius (RL) Range	250 1.250 mm	
RL Accuracy	± 0.1 mm	
Effective Rolling Radius (Re) Range	no limits, calculated value	
Re Accuracy	± 0.1 mm	
Carriage Travel Speed Loading	≤ 20mm/s adjustable, multi-level storage	
Bead-/ rim diameter	15 52"	
Max. Section Width	1.200 mm	
Load Range	0 200 kN (20.000 kg)	optional 0 300 kN
Load Instrumentation accuracy	1/32.000 FS	
Load Control accuracy	± 100N/ 1.5% FS With 200 kN load capability	± 150N/ 1.5% FS with 300 kN load capability

PARAMETER	Specification	Remarks
Inflation pressure (Pi) regulation range	0 12.5 bar/ 0 1.250 kPa	Range 1) 0500 kPa/
	(measuring range 01.600 kPa)	Range 2) ≥ 5001.250 kPa
Pressure Instrumentation accuracy	± 0.1% FS	
Pi Control Accuracy	± 1.0 kPa	
Pi Control Capability	Cap & Control	
Test Standard	customizable	technical specification accord- ing to valid regulations
<b>Optional Measurement Equipment</b>		
Rolling Resistance (RR)-measurement range	0 8.000 N	0 12.000 N
	(with 200 kN max. load)	(with 300 kN max. load)
RR instrumentation accuracy	0.2% (10 kNm)	0.2% (15 kNm)
RR repeatability	0.03% (10 kNm)	0.03% (15 kNm)
RR Drift	0.03% (10 kNm)	0.03% (15 kNm)





Altracon Farm Tire Endurance and Rolling Resistance test stand with 3m drum diameter and foldable platform for ink-footprint and plunger testing





# **Outdoor Tire Testing**

www.altracon.com



Product Description

# **IGTS – Industrial Grip Testing System**

Tire braking and traction performance measurement

- The reference for wet and dry grip measurements on the road
- Complies with international regulations and meet future labelling requirements
- Light-weight wheel suspension to reduce the mass of inertia
- Low rolling resistance high-performance long-life wheel spindle
- Measurement systems as single axle or with dynamometer technics
- High precise load control designed for equalized axle weight
- Eigen-mode adjustment by fully automatic and adjustable damping control at the testing axle
- Brake system with high speed characteristics hydraulic supply to simulate braking performance (ABS) and quick release brake pressure
- Test sequences with up to 8 tests per 100 m in a row.
- Modular trailer undercarriage
- characteristics testing and drive performance measurement capability
- Eigen-mode adjustment in vertical and lateral direction
- Integration to existing testing environment and customized data solution
- Different control- and measurement-technics for referencing, speed and position recording
- Optional water-levelling system to apply an adjustable water film







Page 1 of 4

### **Design features**

### The trailer

- Stiff frame with independent wheel suspension for the left and right wheels
- Equipped with a variable towing bar to level different heights of vehicles hitches
- All supplies, and functionality on board
- Ergonomic design best operator safety
  - operator access barrier-free to the wheel fixation from the back of the trailer
  - comfortable work-space
  - Required tools safely stored and carried on the trailer
  - Compressed air connection located in reach.
- Modular undercarriage set-up to extend F&M measurement capabilities

### Independent test wheel load-station

- Located in the center of the trailer between the carrying wheels
- light-weight low mass of inertia
- High-performance disk brake to apply the braking torque/ force to the test wheel
- Optional active wheel drive for braking- and traction moment application
- All functions independent from the drawing vehicle
- Active wheel load control
- Fully automatic and adjustable damping control
- Eigen-mode adjustment
- High-performance long-life wheel spindle with minimum rolling resistance





### Media Management

### Power management and supply

- On-board batteries and generators
- Customized power supply engineering

### **Compressed air supply**

- Inbuilt compressor with air tank
- inflation pressure adjustment/ control
- connection of air driven tools.

### Hydraulic supply

- Inbuilt hydraulic pump system with accumulator tank
- Hydraulic driven dynamic load, brake, and steering function.
- High-performance hydraulics unit and brake control technology suitable to
- simulate braking performance (ABS)
- quick release brake pressure at the test wheel
- Run up to 8 repeatable tests per 100 m in a sequence

### Optional Water management system

- Tank carried by the pulling vehicle
- Controlled watering of the test-wheels path
- Nozzles placed in front of the test wheel
- Adjustable spraying width
- Controlled watering height by adjustable flow-measurement
- Continuous water flow for quickest reaction times
- Pre-pressure controlled
- Switching between circulating and spraying mode without any time lag and pressure loss

### **Measurement Systems and DAQ**

#### Trailer speed measurement

- Precise measurement directly at both carrying wheels
- Independent speed measurements at the left and right side to detect deviation from the straight path

#### Wheel speed measurement

Precisely measurement directly at the test-wheel spindle with encoder

#### Forces and moments at the test wheel

- Synchronous measurement in x- and z-direction with 1-component sensors
- Multi-component force and moment dynamometer (strain gauge or quartz technology) optionally available
- Fully covered and shielded mounting
- Both set-ups are available either independent or together

### Motion

- Measurement with precision sensors
- Various technologies depending on the entire parameter
- Referencing, speed and location recording

### Data-Acquisition and –Handling

- Variable data acquisition system
- Integration to the customers' existing testing environment
- Customized solutions
- Standard data acquisition environments
- Recipe upload or measurement data download and storage.

### Variability and Extension Capabilities

- The test wheel load station, media supply and control system may also be built into other vehicles such as busses or trucks (vehicles must be prepared accordingly as a matter of fact)
- Upgradeable to IGTS "Force and Moment" trailer with dynamic camber and slip variation
- Modular undercarriage set-up to enhance directional stability for dynamic F&M tests
- Directional stability improvement by
  - o Laser based alignment control system for locomotive set of drawing vehicle and trailer
  - Drive performance control system to adjust the trailers' Eigen-modes in vertical and lateral direction

Contact us to learn more about Altracon the solution provider

**OUTDOOR Footprint and tread-mapping** 



**Product Description** 

# **OD-FPAS** Contact patch analysis system

**OD-FPAS** is a combined optical and tactile measurement system. It consists from a watertight container, which will be integrated into the pavement of a test track. The container is topped with a rigid glass-plate, which is optimized to be used for orthoscopic recording or photographing of overrunning objects from underneath. The glass-plate itself is mounted in either single- or multi-component load cells to measure the actual load of an overrunning object, as long as it is in contact with the glass-plate. Multi-component load cells allow the measurement of lateral and longitudinal forces as well as the corresponding moments.

A camera system which may consist of a high speed video or a photo camera is catching the scene triggered by a laser gauge. A special LED lighting system illuminates the scenery.





- Footprint analysis
- Driving under dry and wet conditions
- Defined water depth
- Optical tread mapping
- Photo or High speed camera video systems
- Special high contrast lightening
- PC/ LT version 3.500 daN
- TBR version 10.000 daN Fz; 8.000 daN Fx, Fy
- Customized systems with higher load
- Max. Travelling speed 200kph.

It is highly recommended to have the installation done underneath a shading/ roof to avoid sunlight reflections and overheating conditions.

Page 1 of 4

### **Analysis Examples**



Water displacement and tread contact

- Visual footprint
- Dry and wet test analysis
  - Acceleration and deceleration measurement
- Tread block deformation and stiffness

measurement

- Grey scale load measurement
- Evaluation of land and sea area
- Force evaluation Fz, Fx, Fy line diagram
- Customized software solutions



Load distribution



Land and Sea/ Load print Analysis

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Inflation	Load = 44% max	Load = 78% max		
	( <b>1</b>		Pres	ntact ssure
3.1 bar	4 100		C	olor
(45 psi)		9	K	ey:
	( BEER F		10.3	(150)
			9.7	(140)
			9.0	(130)
		49 组织自己的 经股上	8.3	(120)
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(io pai)	TO THE PART OF	WINGS STATISTICS AND AND AND STATISTICS	0	( 0)
		IN HARRING'	bar	(psi)



# **Technical Specification**

### Loading capacity of the glass-plate:

PC/ LT tire set-up	Fz (max):	3.500daN	
TBR tire set-up	Fz (max):	10.000daN	(higher loads on request)

### Measuring capability:

PC/ LT:	TBR:
Standard:	
Fz (max): 3.500daN	Fz (max): 10.000daN

### Optional with multi comp. force measurement:

Fx (max): 2.500daN	Fx (max): 8.000daN
Fy (max): 2.500daN	Fy (max): 8.000daN

### Parameter:

Travelling speed of test-vehicle max.:	150kph (optional 200kph with high speed data acquisition system)	
Speed/ acceleration measurement:	3 point 50 kHz laser guard	
Sensor size:	800 x 800 mm (standard PC/ LT) (other sizes on request)	
Measurement rate:	20 kHz (optional 200 kHz)	
Picture resolution:	1.216 x 1.216 pixles (optional 1.920 x 1.080 pixles)	
Recording speed :	1.000 fps (optional up to 10.000 fps)	
LED high speed strobe light:	10.000 Hz	
Quartz force sensor:	0,25 % FSO	
Load amplifier:	20 kHz (optional 200 kHz)	
Wet surface control:	2 – 15mm; +/-1mm	
Power supply:	80 – 240V (LiMH battery)	



Set-up proposal in a track





# Assistive Technologies for Tire R&D

www.altracon.com



Product Description

### **HPTC**

## A High Pressure Tire Cutter with waterjet cutting technology

- Preparation of thin sliced tire cross sections
- Cutting of complete tires and tire sections
- Perfect surface
- No grinding or polishing
- No closing of holes with grind
- Cutting of green tires or sealing jellies
- Cold cut no heat implementation
- Parallel cuts or Ω-cuts
- Perfect cut of steel and textile layers no ripping or blooming
- Environmental friendly water management and filtering
- 3D cutting capability
- Suitable for 2-wheelers, PCR, LTR, TBR
- Special OTR solutions available
- Optional cross section analysis system
- Optional data management system with barcode reader



### **HPTC System-components:**

Abrasive water jet cutting system Suitable for: MC/PC/LT/T&B tires *Limited suitable for:* OTR/ Agro

HPTC 3-axes high pressure cutting system (base system) High pressure pump Silo with sand filling station Water management system incl. waste water filter unit PLC / GUI / control system Data capturing/ handling and recipe management system Monitoring system for HPTC and cutting process Insulation power transformer for incoming power supply



### **Recipe Management System;**

The system has an own database incl. a recipe management. It is network compatible to be backed up. Reading and reproduction is possible. The interface I/O is customizable.

### Safety requirements

The HPTC has to be installed and operated in a closed room or in a closed container, which is optionally available. The doors are equipped with a safeguard system. The optional pre-cutting station will be equipped with a suitable safety fence. Both according to CE regulations.





# Technical Specification HSLFT PC/ LT/ TBR:

Tire diameter Range	complete tire cutting for tires $\leq$ 900mm tire diameter (pre-cutting (rough cut) of tires required for tires $\geq$ 900 mm) max. tire diameter 1.100 mm	
Section width	≤ 400mm	
Section height	≤ 400mm	
Tire Section precision cut thickness	≥ 1 mm (parallel cut)	
Max no. of steel breakers	4	
Steel chafer thickness	1 3mm (I.H. and r.H.)	
Dead wire diameter	≤1.9mm	
No. of bead per bead bundle	10 x 10	
Bead area thickness	≤ 50mm	
Cross area thickness (rubber and steel) ≤ 50mm		
Pre-cut section weight	≤ 25kg	
Cycle time	depending on size and quality	
Power supply	440V/ 50Hz / 3 phase/ 80A	
Control Voltage	24V	
Water supply	Standard fresh water quality ≥ 4bar	
Water consumption	≤ 12 l/min	
Air Pressure supply	not required for machine operation	
Operating/ cutting pressure	≤ 4.500 bar	
Cutting width	0,1 0,35mm	



Machine outline

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Pre-cut tire section ready to prepare section cut





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Tire and Track Condition Measurement

# **STS - Sample and Track Multi Scanner**

Precision surface characteristic measurement indoor and outdoor

STS is the ultimate surface scanner for indoor and outdoor use. Switchable power supply and modularity allows most flexible use either for scanning surfaces such as tracks with the scan head positioned directly on the road or test track, or in the lab with the scan head applied to the sample intake where track cut-outs can be scanned which are mounted to the standard track carrier which is also used in LFT and HSLFT for friction testing.

Also rubber samples from HSLFT or LFT fit to the scanner to record their wear condition. This compatibility makes the STS also an ideal supplementation to Altracon's friction testing equipment to rate the sample and track quality for testing.

A special image scanning function allows to also scan tire section cuts for quality control. This scanner is a real multi-talent.





- OUTDOOR track scanner
- INDOOR multifunctional scanner
- Roughness and structure determination
- HSLFT rubber-samples wear condition
- HSLFT track condition wear condition
- Tire section scanning



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- Surface roughness resolution
- **Step resolution** •
- Scan speed •
- Scan frequency •
- Software surface matching •
- Surface wear recording •
- Laboratory use/ •
- Mobile / outdoor use
- 2µm 20µm 1,5 m/s 350 kHz Auto ± 100 μm Long term repeatable Standard AC power supply LFT/ HSLFT Track cassette intake **12 V DC power supply** Direct track surface scan GPS repositioning ± 5 cm Auto levelling function

Contact us to learn more about Altracon the solution provider

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# Services

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# **Technical SERVICES** Valuable, reliable, experienced

Altracon is specialized in process- and QM technology with more than 35 years of experience in development and service of mechanical and electrical systems.

Our understanding of quality is based on our early experience from aircraft and jet-engine testing equipment and meets even highest standards. As a matter of course this is also valid for the services offered by Altracon. Customers world-wide benefit from this experience and keep their equipment always in best condition independent from which machine builder it is made.

You may rely on our best efforts and can be sure to get extraordinary service quality for your invested money.

The following services are available:

- Regular Maintenance
- Initial operation
- Machine Inspection
- Calibration
- Repair
- Software
- Training
- any brand
- world-wide





Services are available for testing equipment built from

### ASM – HASBACH - MIDLAND – MTS – STL – TMSI – TS – VMI and others



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# **CATM and Retrofit**

### ...more than just service

Altracon delivers customized solutions and modification of test and measurement systems. Besides the upgrade of the mechanical set-up our globally offered retrofit service includes electric-, hydraulic replacement and the integration of latest measurement technology as well as CATM - Computer aided Test Management.

We provide references in the area of retrofitting

- PLC/ control systems
- Measurement systems
- Hydraulics
- GUI software
- Customizing
- Replacements



### "Second Life – Retrofit"

- modernization or expansion of existing machines
- state of the art standards assures availability of wear and spare parts after the retrofit
- modern HMI with GUI and ergonomic workplace
- Computer aided test management CATM
- increase in productivity at a significantly lower cost
- upgrade of the entire system and the components in place
  - no dismantling and reassembling
  - cost advantage
  - minimized standstill times
- assures quality, performance and compliance with latest technical standards
- over 35 year of experience
- individual retrofit concepts

Retrofitting is available for testing equipment built from

ASM – HASBACH - MIDLAND – MTS – STL – TMSI – TS – VMI and others

Contact us to learn more about Altracon the solution provider

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Providing the world leading solutions for tire- and friction-testing technology

We are the experts for high performance test- and measurement equipment with more than 35 years of experience in development and service of mechanical and electrical systems. Our exceptional knowledge in the fields of tire testing and material property measurement have provided serious competitive advantages to our customers around the globe.

## **Altracon Group Companies:**

### Luxembourg

- Altracon S.A.
- Altracon Consulting S.a.r.l.

### Germany

• ATS Device GmbH



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Automation Testing Service

# The solution provider for tire R&D and homologation testing equipment

We are the experts for high performance test- and measurement equipment with more than 35 years of experience in development, building and service of mechanical and electrical systems solutions. Our exceptional knowledge in the field of tire testing and material property measurement has provided serious competitive advantages to our customers around the globe.

- Tire testing machines and equipment for MC, PC, LT, T&B, OTR, Agro, Aircraft
- Indoor and outdoor measurement systems
- Friction measurement
- Foot- and loadprint analysis
- Stiffness measurement
- Tire homologation testing systems
  - Loss of inflation pressure measurement
  - Tire burst testing systems
  - Drum tire testing machines
  - Dry-/ wet-braking grip measurement trailer
- Road surface evaluation systems
- Water jet cutting solutions for tires
- Retrofitting service

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