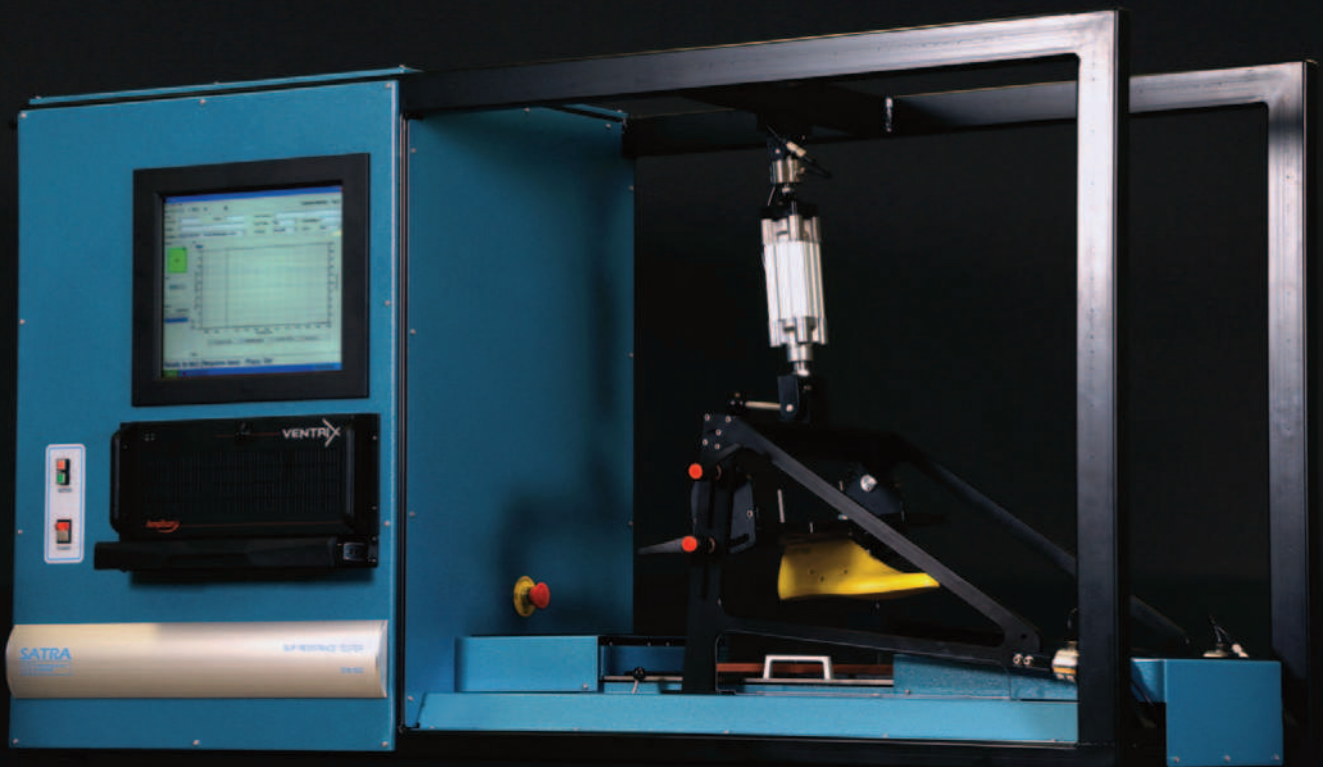


TEST EQUIPMENT CATALOGUE

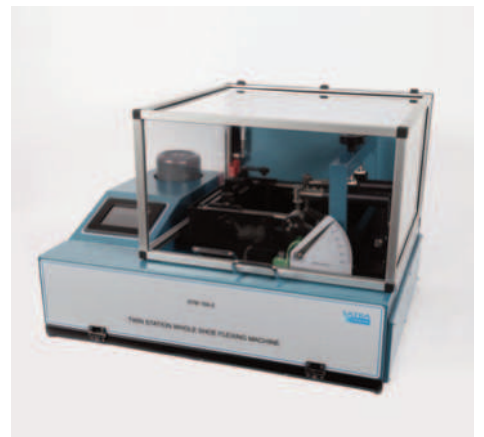


SATRA TEST EQUIPMENT

Our in-house design and manufacturing facility produces the test equipment used in our own laboratories and those of our customers in numerous industries around the world.

SATRA can supply all the test equipment needed to fit out a complete laboratory – from simple devices, such as crockmeters, to highly complex, computer-controlled machines, like the Pedatron.

All SATRA test machines benefit from SATRA technical expertise from start to finish and are trialled first in SATRA laboratories. This gives our customers a supply chain advantage as the SATRA name is recognised, respected and valued in more than 70 countries.



HTE 703/903

Ozone test cabinets

The HTE703 and 903 Ozone test chambers are designed to create an atmosphere to degrade rubber and rubber compounds. The machines create a controlled level of Ozone, temperature and airflow. The HTE903 also incorporates humidity and machines have a low temperature option for testing samples in freezing conditions. The test is applicable to all rubber types, plastics and composites including electrical cables, tires and printed ink.

Applicable testing standards

BS ISO 1431-1:2012
ASTM D1149-18

Weight and dimensions

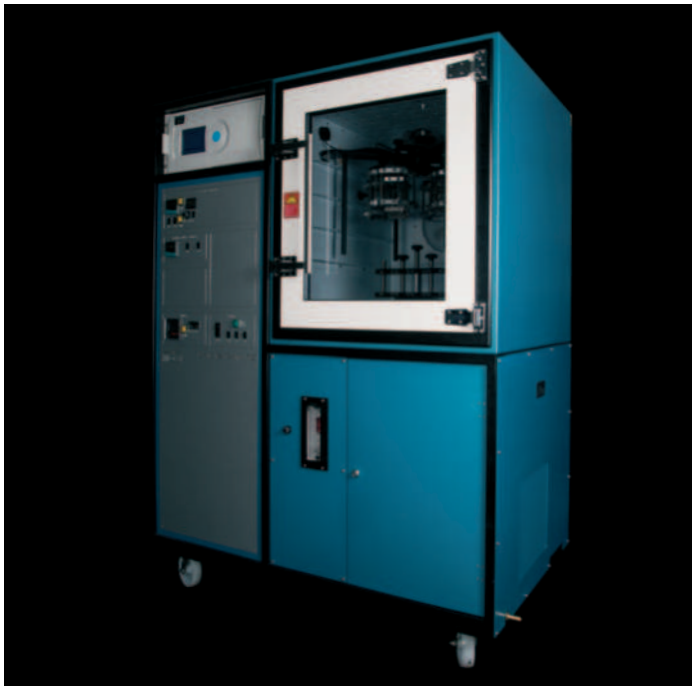
	Length	Width	Height	Weight
HTE 703	1270mm	870mm	1720mm	370Kg
HTE 903	1850mm	870mm	1720mm	520Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC
The Low Voltage Directive (LVD) 2006/95/EEC
The Electromagnetic Compatibility Directive (EMC)
2014/30/EU



Functionality

The machine comprises of a test chamber with a glass door and internal lighting for improved sample visibility. A timed door lock prevents opening before gas has dissipated. Fully adjustable ozone concentration, temperature and airflow. A range of accessories and options are available, including sample rotation and flexing. Used gas is cleaned after exiting the chamber so no exhausting is necessary.

Machine features

- Clear user interface panel
- Digital system controllers
- Timed door lock release
- Internal lighting
- Adjustable temperature range up to 70°C
- Low temperature option (-5°C)
- Humidity option (HTE903)
- High ozone option (2000pphm)
- 7-day programmable timer
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- 12-month warranty
- Spare carbon purifier (H3000-028)
- RS 485 Interface kit (HTE-CAL) for real time computer monitoring

Consumables and accessories

- Carbon purifier
- UV lamp
- Particulate filter
- Mobile test piece carrier (24 or 48 samples)
- Dynamic test rig (8 or 16 samples)
- Static test piece carriers
- Dumbbell sample holders

STD 422 Crockmeter

The STD 422 Crockmeter is designed to test the degree of colour transfer transferred from a coloured material to another material by rubbing. Mainly applicable to fabrics, leathers, yarns, threads and any coloured sheet materials.

Applicable testing standards

TM167:2017 - Colour fastness to rubbing - crockmeter
EN ISO 20433:2012 - Leather. Tests for colour fastness. Colour fastness to crocking
ASTM D5053 - 03(2023) - Standard Test Method for Colorfastness of Crocking of Leather

Weight and dimensions

Length: 650mm
Width: 170mm (including handle)
Height: 175mm
Weight: 5.45Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC



Functionality

For the test the sample is clamp on the flat surface, a sliding mechanism is used to traverse a finger along the sample under a defined mass. The end of the finger is covered with a piece of cloth which can be assessed for colour transfer following the test.

- **Time:** 20s per sample (standard test not including preparation time)
- **Rub variations:** Wet, black cloth for white samples

Machine features

- Reliable mechanical mechanism
- Simple sample clamping
- Simple abradant mounting

Purchase includes

- STD 422 Crockmeter
- STD 422CL Cotton lawn (pack of 50)
- 305074 & 305075 Small test piece clamp
- STD 461GS Grey scale (staining)
- 12-month warranty

Consumables and accessories

- STD 422CL Cotton lawn (pack of 50)
- STM 500 Colour assessment cabinet

STM 141

Ross flexing machine

The STM 141 Ross flexing machine is designed to determine the resistance to cut growth of a polymeric material during repeated flexing. The test is relevant to all footwear outsole materials, sheet materials and whole outsole units.

Applicable testing standards

SATRA TM60:2020 Ross Flex Test – Resistance to Cut Growth on Flexing

ISO 5423:1992 Moulded plastics footwear — Lined or unlined polyurethane boots for general industrial use — Specification

BS 5131-2.1: 1991 – Methods of test for footwear and footwear materials. Solings - Ross flexing method for cut growth resistance of soling materials

ASTM D1052-09 (2019) – Standard Test Method for Measuring Rubber

Weight and dimensions

Length: 765mm

Width: 450mm

Height: 360mm (closed), 660mm (open)

Weight: 40Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

Samples are clamped in the flexing mechanism of the machine and repeatedly flexed over a mandrel of defined diameter.

- **Time:** Up to 42 hours (standard test not including preparation time)
- **Variations:** Low temperature STM 141F

Machine features

- Auto stop counter
- Dual speed for SATRA, ISO and ASTM test methods
- Simple mounting
- Door safety interlocks
- Up to 12 standard samples
- Up to 5 whole sole unit samples
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 141 Ross flexing machine
- 307530 Inspection mandrel
- UK, USA or European power cable
- 12-month warranty

Consumables and accessories

- STD 405 Chisel holding jig
- STD 405A Chisel for ASTM test
- STD 405M x10 Measuring magnifier
- STD 405S Chisel for SATRA/ISO Test

STM 156

Heel fatigue tester

The STM 156 Heel fatigue tester is used to measure the resistance of high heels to repeated impacts similar to those experienced during normal walking. Applicable to all high heels and particularly tall slender stilettos.

Applicable testing standards

TM21:2017 - Fatigue test for shoe heels

EN 19956:2004 – Footwear. Test methods for heels. Fatigue resistance.

Weight and dimensions

Length: 400mm

Width: 400mm + control box

Height: 530mm

Weight: 57Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The machine allows a pendulum to freely and repeatedly impact the heel tip with a defined energy in a forward direction. The test continues until failure or it is apparent that the sample has satisfactory fatigue resistance. The test sample is mounted into the setting block using molten tin alloy to secure the sample in place.

- **Time:** 6 hours per sample (standard test not including preparation time)

Machine features

- Auto stop counter
- Simple sample positioning gauge
- Auto shut off due to sample failure
- Sturdy construction to prevent movement due to vibration
- Simple user interface
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- UK, USA or European power cable
- Setting blocks x 3
- 307618 Low melting point alloy
- 12-month warranty

Consumables and accessories

- 307618 Low melting point alloy
- STM 156MP

STM 184-2

Whole shoe flexing machine

The STM 184-2 Whole shoe flexing machine is designed to assess the flexing endurance of complete footwear. The twin station machine simulates the flexing of footwear during normal wear up to an angle of 50°. The machine can be used to assess footwear failure particularly assessing the bottom construction and bonding of finished samples.

Applicable testing standards

TM92:2016 Resistance of Footwear to Flexing

Weight and dimensions

Length: 675mm

Width: 870mm

Height: 585mm (closed), 1250mm (open)

Weight: 89Kg

General specification

Compliance: CE Marking

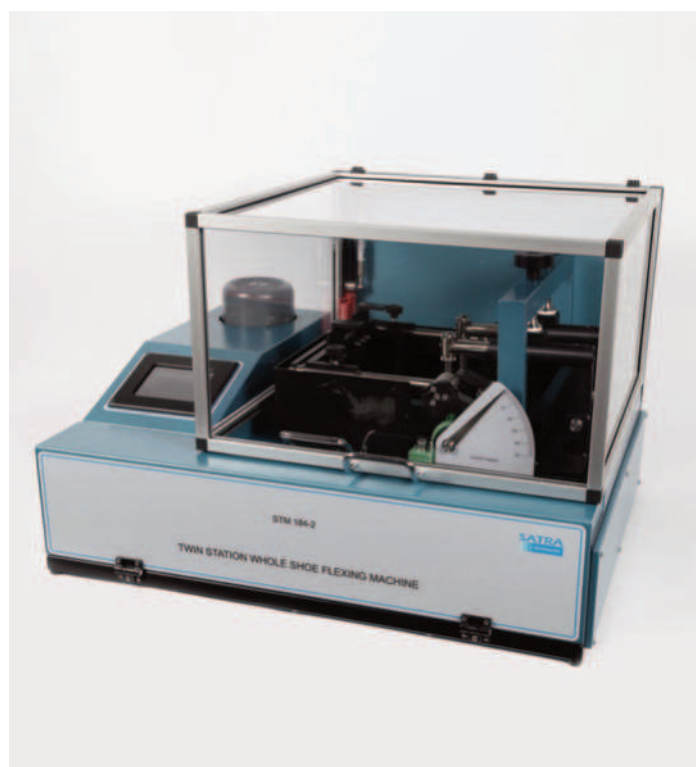
In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC)

2014/30/EU



Functionality

Footwear is clamped to the machine at the toe end using the appropriate toe clamp from one of five pairs supplied. The heel end is secured to the flexing bar. A predetermining counter is fitted and once the appropriate number of flexes have been registered, it will stop the machine so that the shoe can be inspected.

- **Time:** 140 cycles permit, overall time depends on the sample requirements.

Machine features

- Auto stop counter
- Simple motion jog feature
- Simple mounting
- Door safety interlocks
- Sample pair testing capability
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 184-2 Whole shoe flexing machine
- 4mm Allen key
- 5mm Allen key
- 6mm Allen key
- Small G-clamp
- Set of 5 pairs of toe clamps
- UK, USA or European power cable
- 12-month warranty

STM 421

Rub fastness tester

The STM 421 rub fastness tester is designed to test marring and colour transfer of most sheet materials. This includes leather, textile, plastics, fibreboard and most other materials prone to back and forth rubbing during everyday wear. This would include footwear uppers, linings, footbeds, insoles, insoles and clothing.

Applicable testing standards

TM173:2021 - Colour fastness to rubbing - reciprocating method
TM177:1995 - Resistance to scuffing by mild to-and-fro abrasion
EN ISO 20344:2021 - Personal protective equipment. Test methods for footwear
EN ISO 20345:2022 - Personal protective equipment. Safety footwear
EN ISO 11640:2018 - Leather. Tests for colour fastness. Colour fastness to cycles of to-and-fro rubbing
EN ISO 17700:2019 - Footwear. Test methods for upper components and insoles. Colour fastness to rubbing and bleeding

Weight and dimensions

Length: 410mm
Width: 240mm
Height: 440mm
Weight: 20Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC
The Low Voltage Directive (LVD) 2006/95/EEC
The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The test uses a small felt pad under a defined load to apply a mild back and forth motion across the sample surface. The sample can then be assessed for damage as well as the wool pad being assessed for colour transfer.

- **Time:** 3 minutes per sample (standard test not including preparation time)
- **Rub variations:** Wet, alkaline perspiration, sodium chloride, white spirits. Black pads for light materials

Machine features

- Auto stop counter
- Quick clamping method with easy sample extension
- Simple positioning adjustment
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 421 rub fastness tester
- UK, USA or European power cable
- STD 461/GS Grey scale for staining
- STD 461/GC Grey scale for colour
- 100 White felt pads
- 12-month warranty

Consumables and accessories

- STM 421P White felt pads
- STM 421PBLACK Black felt pads
- STM 500 Colour assessment cabinet

STM 463

Lastometer

The STM 463 Lastometer ball burst test is designed to simulate the type of forces applied to footwear upper materials during manufacturing processes. Applicable to most upper materials in particular measuring grain layer cracks in leather.

Applicable testing standards

TM24:2017 Lastometer ball burst test

BS 3144:1981 Addendum 2 Methods of Sampling and Physical Testing of Leather - Addendum 2: Measurement of Water Vapor Absorption

ISO 3379:2015 (IUP 9 / SLP 9) Leather. Determination of distension and strength of surface (Ball burst method)

DIN 53325:1974 Testing of leather; ball compression test for determination of grain expansion capacity and the force of fracture with the lastometer

Weight and dimensions

Length: 340mm

Width: 345mm

Height: 210mm

Weight: 13.6Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

In the test a disc of leather is clamped around its edge and a small metal ball on the end of a rod is thrust against the centre from the flesh side so as to deform it in a direction at right angles to its original plane. At a sufficiently high distension the grain cracks where it is stretched over the ball and usually at a higher distension still, the leather bursts. Both load and distension are indicated and recorded continuously.

- **Time:** 3 minutes per sample (standard test not including preparation time)

Machine features

- Simple recording of first damage and complete failure
- Easy pneumatic clamp operation
- USB port for exporting result data
- Simple zeroing procedure
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 463 Lastometer
- 155T06 6mm x 2M pneumatic airline
- 463009 Setting disc
- 327168 USB pen
- UK, USA or European power cable
- 12-month warranty

STM 465

Whole sole flexing machine

The STM 465 Whole sole flexing machine is design to measure a materials resistance to repeated flexing and cut growth. The test is applicable to outsole materials and can be used for other flexible components.

Applicable testing standards

TM161:2004 - Bennewart flex test - resistance to cut growth on flexing

EN ISO 20344:2021 - Personal protective equipment. Test methods for footwear

EN ISO 17707:2005 - Footwear. Test methods for outsoles. Flex resistance

Weight and dimensions

Length: 380mm

Width: 940mm

Height: 440mm

Weight: 63Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

A number of cuts are added to the sample parallel to its flexing line. The sample is then clamped in the machine so that it can be repeatedly flexed along its flexing line to an angle of 90°. At inspection points any growth in the length of cuts or new visible cracking can be recorded.

- **Time:** 3.5 hours (standard test not including preparation time)

Machine features

- Digital auto stop counter
- Manual position adjustment for ease of loading samples
- Door safety cut off

Purchase includes

- STM 465 Whole sole flexing machine
- UK, USA or European power cable
- 386320 10mm spanner
- 12-month warranty

Consumables and accessories

- STM 465SG Stiffness gauge
- STD 465C De Mattia type chisel
- STM 465J Cutting holder C/W Chisel

STM 473

Water vapour permeability apparatus

The STM 473 Water vapour permeability apparatus is designed to determine a materials ability to remove perspiration from the surface of the wearers skin. Mainly applicable to leather and textiles used in footwear uppers, clothing and gloves.

Applicable testing standards

- TM172:1993 - Water vapour permeability
- EN ISO 20344:2021 - Personal protective equipment. Test methods for footwear
- EN ISO 14268:2023 - Leather. Physical and mechanical tests. Determination of water vapour permeability

Weight and dimensions

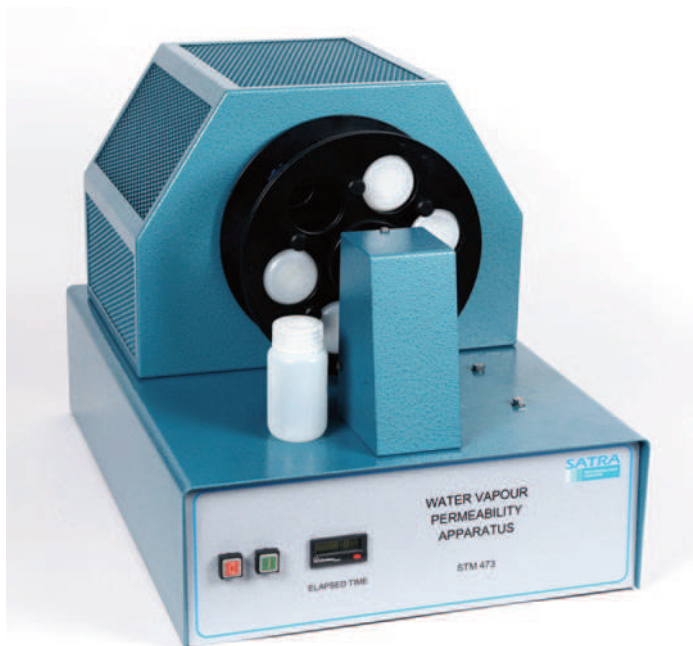
- Length:** 550mm
- Width:** 400mm
- Height:** 400mm
- Weight:** 30Kg

General specification

- Compliance:** CE Marking

In accordance with the following directives

- The Machinery Directive 2006/42/EC
- The Low Voltage Directive (LVD) 2006/95/EEC
- The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The machine rotates samples at a controlled speed in front of a high airflow, the samples are mounted on jars filled with a desiccant. In a controlled environment the high airflow and desiccant encourages moisture to pass through the sample. The moisture gained by the gel and the sample can then be measured and the materials permeability calculated.

- **Time:** 7-16 hours depending on test method (standard test not including preparation time)

Machine features

- Digital time counter
- Simple sample mounting
- Clutched drive system to prevent jamming
- Fully enclosed fan for safety
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 473 Water vapour permeability apparatus
- UK, USA or European power cable
- 473024 Sample jars x 6
- STM473S Silica gel (1Kg)
- 12-month warranty

Consumables and accessories

- STM 473S Silica gel (1Kg)
- STM 473K Cutting knife
- STM 701 Bally flexometer
- STD 488I Oven

STM 479

Dynamic shock absorption tester

The STM479 Dynamic shock absorption tester is designed to determine the shock absorption properties of a material or assembly. The test is applicable to whole shoe soling assemblies as well as any compressible sheet material such as those used for outsoles, midsoles and insoles.

Applicable testing standards

SATRA TM142:1992 - Falling mass shock absorption

Weight and dimensions

Length: 450mm

Width: 350mm

Height: 1480

Weight: 267Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC)
2014/30/EU



Functionality

The test allows a known mass to freely drop onto the test sample from a measured height. The deceleration, penetration and the rebound height are recorded to measure the sample's ability to spread the force over a longer period of time and assess the energy return on rebound. The sample can also be checked for damage and any gradual loss in its ability to absorb shock.

- **Time:** 5 minutes per sample (standard test not including preparation time)

Machine features

- Auto generated results via Shockmaster software
- Simple operation
- Simple clamping and height adjustment.
- 12V machine supplied with multi-voltage power supply

Purchase includes

- STM 479 Shock absorption tester
- Laptop
- Software
- UK, USA or European power cable
- 12-month warranty

Consumables and accessories

- STM 469CR Sample Din rubber discs

STM 505

Dynamic footwear water resistance tester

The STM 505 Dynamic footwear water resistance tester has been developed to test the water resistance of whole footwear. The test is suitable for all water-resistant footwear and water-resistant finishes applied to footwear.

Applicable testing standards

TM230:2017 - Dynamic water penetration test
EN ISO 20344:2021 - Personal protective equipment. Test methods for footwear
EN ISO 20345:2022 - Personal protective equipment. Safety footwear

Weight and dimensions

Length: 745mm
Width: 645mm
Height: 1020mm
Weight: 69Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC
The Low Voltage Directive (LVD) 2006/95/EEC
The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The test sample is secured in the flexing machine with water at a specified level. The sample is flexed at a constant rate using a limited force and monitored for leaks. Sample shape is maintained with either steel balls or optional foot forms.

- **Time:** 60 rpm to failure depending on the sample application (not including preparation time)
- **Variations:** Option to weigh the sample to measure amount of water absorption
- **Requirements:** 80 psi air supply

Machine features

- Auto stop digital counter
- Dual station to test sample pair at the same time
- Removable water baths for filling and cleaning
- Auto test stop
- Integrated pressure gauge and air filter
- Simple set-up and test control
- Extensive range adjustment
- One touch pneumatic clamping
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 505 Dynamic footwear water resistance tester
- UK, USA or European power cable
- 505141 Water tank x 2
- 505025 Height spacer x 2
- 306416+505019 Toe piece long x 2
- 306417+505019 Toe piece medium x 2
- 308074+505019 Toe piece short x 2
- 307797 Knurled locknut x 4
- 155T008 8mm Airline x 2M
- 12-month warranty

Consumables and accessories

- 3D printed foot forms available as an alternative to steel balls (Size 3-12)

STM 528-2

Pedatron

The STM 528-2 is designed to accurately simulate human walking to assess the abrasion resistance and fatigue of whole footwear samples. The machine can also be used to assess flooring by using standard footwear to simulate footfall and examining surface wear and damage.

The machine simulates approximately 6 month's wear in 7 days. It is applicable for all footwear and footwear component manufacturers as well as flooring manufacturers.

Applicable testing standards

SATRA TM362 (footwear), TM391 (Flooring)

Weight and dimensions

Length: 2310mm

Width: 1320mm

Height: 1940mm

Weight: 935Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

Footwear samples or a standard sample are mounted in the machine on a flexible prosthetic foot. During the test the surface rotates in an alternating pattern during each step to simulate normal walking patterns. The machine simulates a realistic heel to toe and push off cycle whilst experiencing the shear forces applied by the rotating surface.

- Around 1800 steps per hour
- Surface rotation can be disabled

Machine features

- Auto-stop counter
- Clearly visible and illuminated test area
- User-friendly interface screen
- Inspection lighting
- 3-side access to testing area for simple set up and surface changes
- Simple surface height adjustment

Purchase includes

- STM 528 Pedatron
- 1x Standard test surface (garden slab)
- Sample setting block
- 12-month warranty

Consumables and accessories

- STM 528FP Force platform

STM 528FP

Force platform

The STM 528FP force platform is designed to be used with the STM 528-2 Pedatron. The platform gives real time feedback of the forces applied by the walking motion of the Pedatron. This accessory allows the user to monitor adjustments to the Pedatron enabling them to set up tests outside of the scope of standard test methods.

Applicable testing standards

TM362 - Abrasion resistance of soles - Biomechanical method, TM391 - Flooring - biomechanical abrasion method

Weight and dimensions

Length: 450mm
Width: 450mm
Height: 38mm
Weight: 10Kg

General specification

Compliance: CE Marking

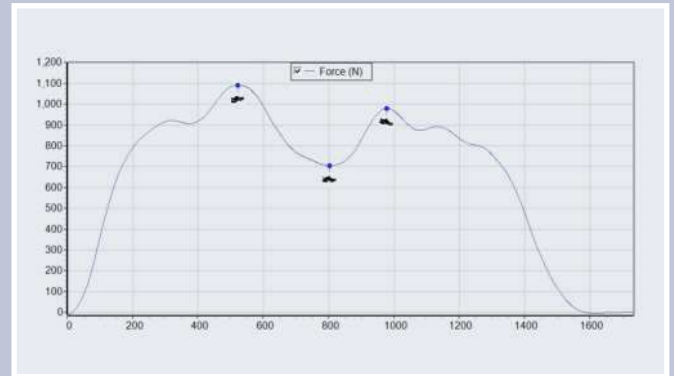
In accordance with the following directives

The Machinery Directive 2006/42/EC
The Low Voltage Directive (LVD) 2006/95/EEC
The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The force platform can be fitted in the STM 528-2 in place of a standard test surface. The device is monitored via a laptop with our custom stepMASTER software to generate a real time force/time result trace.



Machine features

- Designed to fit the STM 528-2
- Export results to CSV, PDF or Jpeg.
- Real time feedback

Purchase includes

- UK, US or European power cable
- USB cable
- 24v dc power supply
- 12-month warranty
- Force platform software

STM 567

Endofoot, Advanced moisture management and cold rating test machine

The STM 567 Endofoot is a unique machine designed to assess the thermal insulation and sweat management of complete footwear. The machine measures the thermal insulation, moisture absorption and breathability of finished products. Suitable for all sports shoes, walking boots/shoes, military, police, occupational footwear and general footwear where comfort is important.

Applicable testing standards

SATRA TM376, SATRA TM436

Weight and dimensions

Length: 1570mm

Width: 580mm

Height: 3640mm

Weight: 68Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The machine comprises of a test chamber fitted with a motorised fan to provide air flow over the sample during the test. The sample is fitted to a suspended foot form which comprises of four temperature sensors, a heater element and eight sweat zones. The sample can either be tested for its ability to maintain a comfortable temperature or its ability to disperse sweat. A known amount of water is pumped into the foot over a period of time. The sample, standard sock and standard hose are weighed before and after the test to examine whether the moisture is dispersed or retained in any of the components. Bespoke software is supplied to record and calculate the energy required to maintain the foot temperature

- **Time:** Cold Rating: 3 x 3 Hours tests run consecutively overnight. Moisture management: 3 x 3.5 Hour separate tests

Machine features

- Programmable 7-day timer
- Logging software
- Adjustable flow rate water pump
- Interchangeable foot forms
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 567 Endofoot machine
- Water pump
- Water flasks x 2
- Foot skin x 2
- Standard sock
- Heating sock
- Size 9 UK foot form
- UK, US or European power cable
- 12-month warranty

STM 601

Vamp flexing machine

The STM 601 is designed to flex and crease materials in a way that accurately simulates normal wear in footwear uppers.

The test is applicable to upper materials and also clothing, upholstery, leather, plastic coated fabrics, polymeric and woven fabrics. An essential piece of equipment for any footwear laboratory.

Applicable testing standards

TM25:2020 - Vamp flex test - Resistance to Flexing Damage
EN ISO 5402-2:2015 – Leather. Determination of flex resistance - Vamp flex method

Weight and dimensions

Length: 530mm
Width: 770mm
Height: 530mm
Weight: 45Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC
The Low Voltage Directive (LVD) 2006/95/EEC
The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

Samples are mounted in an inverted v-shape in order to form the diamond shaped crease typical in footwear uppers during normal wear. The samples are flexed at a defined rate and inspected at intervals for any damage, salt spue or permanent marking.

- **Time:** Up to 2.5 days (standard test not including preparation time)
- **Variations:** Low temperature STM 101F, Wet test

Machine features

- Auto stop counter
- Simple mounting
- Door safety interlocks
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 601 Vamp flexing machine
- UK, USA or European power cable
- 12-month warranty

Consumables and accessories

- STD 405 Chisel holding jig
- STD 405A Chisel for ASTM test
- STD 405M x10 Measuring magnifier
- STD 405S Chisel for SATRA/ISO Test

STM 602

Soling materials abrasion machine

The STM 602 Soling materials abrasion machine is designed to evaluate the abrasion resistance of footwear outsole materials. Applicable for testing most outsole materials including leather.

Applicable testing standards

TM174:2016 – Abrasion resistance - rotating drum method

TM193:2004 - Abrasion resistance of leather

ISO 4649:2017 - Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device

DIN ISO 4649:2021 - Rubber, vulcanized or thermoplastic - Determination of abrasion resistance using a rotating cylindrical drum device

Weight and dimensions

Length: 1165mm

Width: 440mm

Height: 335mm

Weight: 70Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The test uses a travelling sample holder to run a test material sample button along a rotating drum fitted with abrasive paper. The test incorporates a known load, surface area, roughness of surface, distance and mass. Weight loss is measured which can be converted to volume loss by measuring the samples density (using a density balance). Control samples are used to measure the roughness of the surface. A vacuum cleaner and brush follow the sample to remove excess debris during testing.

- **Time:** 25 minutes per test (standard test not including preparation time)

Machine features

- Triple head design to save time
- Integrated brush
- Automatic lowering and raising of sample
- Rotating abrasion head for leather testing
- Door safety switches
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 602 Soling materials abrasion machine
- UK, USA or European power cable
- STM 469A Standard abrasive paper
- STM 469CA Certified abrasive paper
- DTM 469CR Certified rubber
- 16mm Diameter metal disc blunting tool
- STM 602TAPE Double sided tape
- 602055 Test piece cutter
- 304881 Vacuum adaptor tool
- UK, USA or European power cable
- 12-month warranty

Consumables and accessories

- STM 469A Standard abrasive paper
- STM 469CA Certified abrasive paper
- DTM 469CR Certified rubber
- STM 602TAPE Double sided tape

STM 603

Slip resistance tester

The STM 603 Slip resistance tester is designed to simulate the point of slip during normal walking. The test is applicable to all types of footwear and outsole materials. The machine can also be used to test flooring surfaces and footwear for traction properties.

Applicable testing standards

- TM144:2021 - Friction (slip resistance) of footwear and floorings
- EN ISO 13287:2019 – Personal protective equipment. Footwear. Test method for slip resistance
- ASTM F2913 – 19 – Standard Test Method for Measuring the Coefficient of Friction for Evaluation of Slip Performance of Footwear and Test Surfaces/Flooring Using a Whole Shoe Tester,
- GB/T 3903.6-2017 - Footwear -- Test methods for whole shoe -- Slip performance
- CSA Z195:14 (R2019) - Protective footwear

Weight and dimensions

- Length:** 1900mm
- Width:** 700mm
- Height:** 1020mm
- Weight:** 362Kg

General specification

- Compliance:** CE Marking

In accordance with the following directives

- The Machinery Directive 2006/42/EC
- The Low Voltage Directive (LVD) 2006/95/EEC
- The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

SATRA STM 603 reproduces the underfoot dynamics at the moments during a step when slip is most likely to occur. Dynamic coefficient of friction is measured at a moderate speed, indicating the resistance to slip acceleration which might lead to a fall in real life. Unlike some other methods, it is usual with STM 603 to carry out both dry and wet tests, which enables a more complete evaluation of tread efficiency. Heel and forepart are assessed separately. Samples are mounted on shoemaking lasts or, for material plaques and top-pieces, onto a metal block

- **Time:** Approximately 1 hour per pair of samples (standard test not including preparation time)
- **Variations:** Any surface, any lubricant, frosted ice, smooth ice

Machine features

- Integrated PC for accurate results and control
- Simple saving and printing of results
- Flexibility to modify test conditions (load, speed, distance, result type)
- Dynamic nature of test does not allow for high static friction
- Realistic simulation based on biomechanical studies
- Automatic encryption of results to prevent unauthorised changes
- Compliance with most related methods with scope for research
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 603 Slip resistance tester
- STM 603R calibrated standard rubber
- 155T008 8mm Diameter PU tubing
- 306311 Standard quarry tiles x 3
- 603052 7 degree setting wedge
- 603152 Sanding block
- 603226 Sample mounting block
- UK, USA or European power cable
- 12-month warranty

Consumables and accessories

- STM 603AC Calibrated quarry tiles (pack of 20)
- 603018 10° Top piece setting block

STM 606D

Water resistance tester

The STM 606D Water resistance tester for upper leather is designed to measure the water resistance of upper materials, under conditions of flexing similar to those produced in the vamp of a shoe during walking. The test is applicable to all upper outer materials but can be used for any flexible sheet material.

Applicable testing standards

TM34:2019 - Resistance to water penetration Maeser test

Weight and dimensions

Length: 505mm

Width: 520mm

Height: 370mm

Weight: 34Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC)
2014/30/EU



Functionality

The sample is mounted in the machine between two 'v' clamps with the surface finish down. The sample is then filled with ball bearings to retain shape and for conductivity of water detection. After being submerged in water to a level just above the upward fold the sample is repeatedly flexed, the machine will sound an alarm when leaking is detected.

- **Time:** Up to 24 hours depending on resistance of sample (standard test not including preparation time)
- **Variations:** Water absorption

Machine features

- Auto stop counter
- Multiple counts
- Auto individual count stop on water detection
- Auto test stop when all samples fail
- Water penetration detection alarm
- Multiple resistance settings
- Removable water tray for ease of cleaning
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 606D Water resistance tester
- UK, USA or European power cable
- W-10630 Vee moulding
- W-606F107 Vee moulding leads
- 304413 Stainless steel ball bearings (1Kg)
- 304470 Magnet
- 304414 Scoop
- 12-month warranty

Consumables and accessories

- 304413 Stainless steel ball bearings (1Kg)

STM 609

Impact tester for safety footwear

The STM 609 impact tester is designed to test the impact resistance of toe caps in safety footwear. The test can indicate the effect of impact as well as measuring toe cap compression from impact. The machine is applicable to all steel and composite toe caps, whole safety footwear as well as metatarsal protection.

Applicable testing standards

EN ISO 20344:2021 - Personal protective equipment. Test methods for footwear

EN ISO 22568-1:2019 - Foot and leg protectors. Requirements and test methods for footwear components - Metallic toecaps

ASTM F2412 - 18a - Standard Test Methods for Foot Protection

CSA Z195:14 (R2019) - Protective footwear

AS 2210.2:2019 - Personal protective equipment, Method 2: Test methods for footwear

Weight and dimensions

Length: 850mm

Width: 600mm

Height: 2400mm

Weight: 396Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The machine drops a standard striker from a known height onto a toe cap. Either foreparts from whole shoes or individual toe caps can be tested. Requires 80 psi pneumatic air supply.

- **Time:** 3 minutes per sample (standard test not including preparation time)
- **Variations:** Low temperature

Machine features

- Automated operating system
- Interchangeable strikers to comply with a number of national standards
- Additional mass option to comply with national standards
- Simple drop height adjustment
- Automatic generation of speed result and impact energy
- Door safety interlocks
- Automatic integrated anti-bounce to prevent false results
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 609 impact tester for safety footwear
- STM 609WS Wedge striker
- 609160 ISO Clamping fixture
- STM 609AC ANSI Cylinder striker
- STM 609AB ANSI Metatarsal striker
- STM 609MET ANSI Metatarsal plate
- STM 609AW Additional weight
- 609203 Toe cap clamp
- 609204 Thin fork clamp
- 308187 Thick fork clamp
- 308180 35mm Adjusting screw
- 308181 50mm Adjusting screw
- 308182 65mm Adjusting screw
- 609137 Speed flag (2 spares)
- 609104 Safety pin
- 155T008 8mm Pneumatic pipe
- 384151 Torque spanner
- 383906 5mm Allen key
- 383907 6mm Allen key
- 386464 14mm Allen Key
- 386034 3/8"sq.Drive x 8mm hex. Socket
- 388188 20mm Plasticine former
- 388191 25mm Plasticine former
- 304976 Pack of plasticine
- 305358 Tool box
- 12-month warranty

Consumables and accessories

- STD 405 Chisel holding jig
- STD 405A Chisel for ASTM test
- STD 405M x10 Measuring magnifier
- STD 405S Chisel for SATRA/ISO Test

STM 610

Cut resistance evaluator

The STM 610 Cut resistance evaluator is designed to evaluate the level of cut resistance of protective materials. This includes leather, textile, rubber, composites and reinforced materials. This would include gloves and protective clothing.

Applicable testing standards

EN ISO 13997:1999

ANSI/ISEA 105-2016 - American National Standard For Hand Protection Classification

ASTM F2992 – 23 - Standard Test Method for Measuring Cut Resistance of Materials Used in Protective Clothing with Tomodynamometer Test Equipment

Weight and dimensions

Length: 330mm

Width: 820mm

Height: 540mm

Weight: 87Kg

General specification

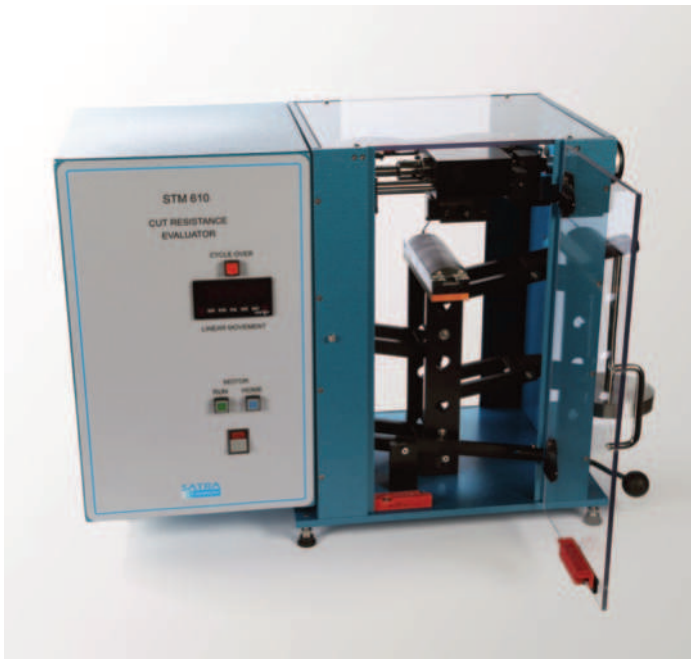
Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

Samples are clamped in the flexing mechanism of the machine and repeatedly flexed over a mandrel of defined diameter.

- **Time:** Around 45 minutes for full test (not including preparation time)
- **Variations:** Cantilever lift system

Machine features

- Auto stop cut through detection
- Auto end of travel stop
- Simple blade mounting and alignment
- Digital distance count
- Simple load adjustment and application
- Safety door switch
- Simple positioning adjustment
- End of cycle notification
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 610 Cut resistance evaluator
- UK, USA or European power cable
- 610046 50N weight x3
- 610041 10N weight x5
- 610042 4N weight x1
- 610043 2N weight x2
- 610044 1N weight x1
- 305837 Uncalibrated knife blades (200)
- STM 611FOIL Aluminium foil sample
- STM 610CT Copper tape
- STM 610NEOPRENE2 Standard neoprene
- STM 611FP Filter paper
- STM 610Tape 50mm wide double-sided tape

Consumables and accessories

- STM 610K Calibrated knife blades (box of 100)
- STM 611FOIL Aluminium foil sample
- STM 610CT Copper tape
- STM 610NEOPRENE2 Standard Neoprene
- STM 611FP Filter paper
- STM 610Tape 50mm wide double-sided tape

STM 611

Circular blade cut resistance tester

The STM 611 Circular blade cut resistance tester is designed to test the cut resistance of materials, however it is not designed to test hard materials such as chain mail. The number of cycles displayed during the test can be used to generate a cut index for the materials cut resistance. Applicable to all cut resistant gloves.

Applicable testing standards

EN 388:2016+A1:2018 - Protective gloves against mechanical risks

Weight and dimensions

Length: 360mm

Width: 185mm

Height: 165mm

Weight: 8.5Kg

General specification

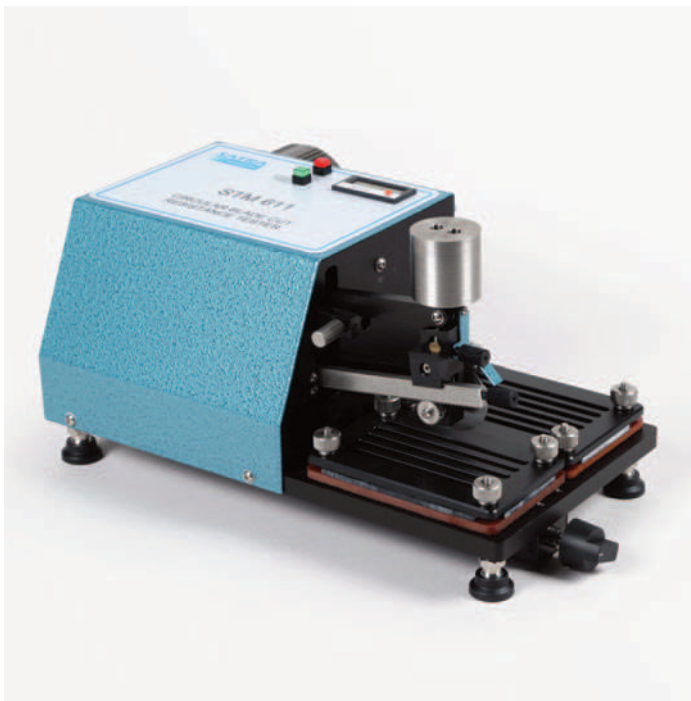
Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC

The Low Voltage Directive (LVD) 2006/95/EEC

The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

A test sample is clamped in an easily removeable holder. The holder is then placed onto the machine. The circular blade is gently lowered so that it touches the test sample. With the counter set to zero the 'Start Test' button is pressed to initialise the test. When the rotating blade penetrates the test sample the machine will automatically stop.

Machine features

- Auto stop test and counter
- Easy set up of control sample and test sample
- Simple sample mounting
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 611 Circular blade cut resistance tester
- UK, USA or European power cable
- 611049 Conductive rubber pad
- STD 611K Cutting blades (pack of 10)
- STM 611FOIL Aluminium foil (Roll)
- STM 611FP Filter papers (100 sheets)
- STM 611CANVAS Canvas sheets
- 12-month warranty

Consumables and accessories

- 611049 Conductive rubber pad
- STD 611K Cutting blades (pack of 10)
- STM 611FOIL Aluminium foil (Roll)
- STM 611FP Filter papers (100 sheets)
- STM 611C Canvas sheets (EN388:2003)
- STM 611CANVAS Canvas sheets (EN388:2018)

STM 612

Bata belt sole flexing machine

The STM 612 Bata belt sole flexing machine is designed to flex whole outsoles with their tread pattern still intact similar to flexing in wear. The test can be used to assess spontaneous cracking and initiated crack growth, it is applicable to footwear outsoles and some flexible materials. Particularly applicable to heavily patterned outsoles, outsoles with deep cleats or prototype compounds.

Applicable testing standards

TM133:2017 - Resistance to crack initiation and growth - belt flex method

Weight and dimensions

Length: 600mm
Width: 1400mm
Height: 500mm
Weight: 100Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC
The Low Voltage Directive (LVD) 2006/95/EEC
The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

Samples are mounted to a continuous belt which is driven around two rollers subjecting the samples to brief rapid flexing. Followed by a longer period of unflexing. This process simulates the wear conditions of footwear outsoles. Any cracks or crack growth is recorded at various inspection intervals.

- **Time:** Up to 9.5 hours (standard test not including preparation time)
- Various roller diameters
- **Variations:** Low temperature STM 612F

Machine features

- Auto stop counter
- Multiple diameter rollers
- Simple mounting
- Door safety interlocks
- Simple belt adjustment
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM612 Bata belt sole flexing machine
- 60mm Mandrel 612018
- 90mm Mandrel 612017
- 120mm Mandrel 612016
- Depth gauge 612028
- 3 X Machine belts STM459BELT
- UK, USA or European power cable
- 12-month warranty

Consumables and accessories

- Flexing belt STM 459BELT

STM 633

Martindale abrasion machine

The STM 633 Martindale abrasion machine has been designed to test the abrasive wear resistance and colour fastness of materials. The test is applicable to fabrics, coated fabrics, leathers, protective clothing, gloves and any flexible material.

Applicable testing standards

- TM31:2021 - Abrasion resistance - Martindale method
- EN ISO 12945-2:2020 – Textiles. Determination of fabric propensity to surface pilling, fuzzing or matting - Modified Martindale method
- EN 388:2016+A1:2018 - Protective gloves against mechanical risks
- EN ISO 12947-1:1998 - Textiles. Determination of the abrasion resistance of fabrics by the Martindale method - Martindale abrasion testing apparatus
- EN ISO 12947-2:2016 - Textiles. Determination of the abrasion resistance of fabrics by the Martindale method - Determination of specimen breakdown
- EN ISO 12947-3:1998 - Textiles. Determination of the abrasion resistance of fabrics by the Martindale method - Determination of mass loss
- EN ISO 12947-4:1998 - Textiles. Determination of the abrasion resistance of fabrics by the Martindale method - Assessment of appearance change

Weight and dimensions

- Length:** 510mm
- Width:** 610mm
- Height:** 300mm
- Weight:** 56Kg

General specification

- Compliance:** CE Marking

In accordance with the following directives

- The Machinery Directive 2006/42/EC
- The Low Voltage Directive (LVD) 2006/95/EEC
- The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The Martindale machine provides a mild form of abrasion using a standard wool fabric as an abradant. Some test methods require alternative abradants to adjust the severity of the test. The test pieces are clamped flat and rubbed under a constant load over the abradant in a Lissajous figure to produce wear in all directions.

- **Time:** 20s/full revolution (standard test not including preparation time)
- **Rub variations:** Wet, perspiration, pilling, high abrasion

Machine features

- Auto stop counter
- Easily removable sample holders
- Two sets of different weights
- Smart drive control system
- 110V/60Hz and 240V/50Hz versions available

Purchase includes

- STM 633 Martindale abrasion machine
- UK, USA or European power cable
- Specimen holder spanner
- Rep discs (pack of 50)
- Felt discs (pack of 50)
- Sample holders (standard)
- 9kPA Weights (standard)
- Specimen holder spindles (standard)
- 12kPA weights
- Specimen holder spindles
- 2.5kg weight with handle
- 12-month warranty

Consumables and accessories

- Rep discs STM 105RD
- Felt discs STM 105FD

STM 701

Bally flexometer

The STM 701 Bally flexometer is the internationally accepted method for the assessment of the flexing endurance of light leathers and their surface finishes. Used to assess creasing and cracking caused by walking as well as pre-conditioning for water vapour permeability testing for safety footwear. Applicable to all flexible materials, in particular leathers, coated fabrics and textiles used in footwear uppers.

Applicable testing standards

TM55:1999 - Flexing resistance of upper materials - Bally Flexometer
EN ISO 20344:2011
EN ISO 5402:2011

Weight and dimensions

Length: 550mm
Width: 380mm
Height: 590mm
Weight: 20Kg

General specification

Compliance: CE Marking

In accordance with the following directives

The Machinery Directive 2006/42/EC
The Low Voltage Directive (LVD) 2006/95/EEC
The Electromagnetic Compatibility Directive (EMC) 2014/30/EU



Functionality

The machine is designed to form a traveling crease during flexing to replicate the type of creasing in footwear uppers during normal walking. The samples can then be assessed for permanent creasing and cracking of finish.

- **Time:** 17 hours (standard dry test not including preparation time)
- **Variations:** Wet, Low temperature (STM 701F)

Machine features

- Auto stop counter
- 110V/60Hz and 240V/50Hz versions available
- 12 sample capacity
- Easy access and sample mounting
- Predetermined counter
- Auto stop at count.
- Jog function

Purchase includes

- STM 701 Bally flexometer
- 383906 5mm Allen key
- STM 407K Press knife to TM 55
- UK, USA or European power cable
- 12-month warranty

SATRA CONTACT DETAILS

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