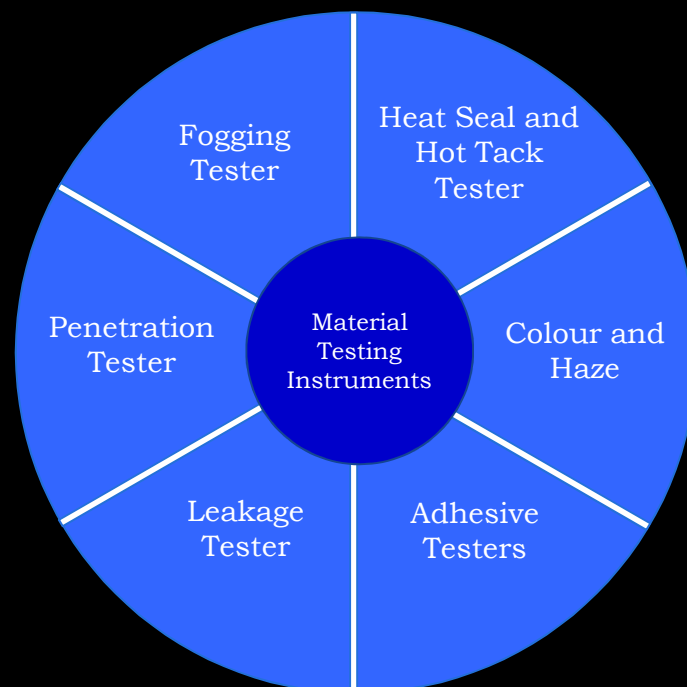


# OTHER MATERIAL TESTING INSTRUMENTS



**TIEDEMANN**

## Further Testing Instruments

In addition to the catalogues for permeation, mechanical, tensile and compression testers, Tiedemann presents in this 4th catalogue further material testers from the Chinese partners Pubtester, SolidNDT and Hangzhou CHNSpec Technology Co. Ltd.

The heat-seal and hot-tack testers determine the optimum sealing parameters such as temperature, duration and pressure for heat-seal seams of films.

Furthermore, the heat-shrink testers can determine the shrinkage, contraction force and shrinkage ratio of films.

Packaging materials with weak points such as seal seams, products or bottles that are exposed to a pressure difference can be tested by the leak testers for their sealing qualities and durability, failure and creep limits as well as compression resistance.

Other devices measure the condensation and turbidity of materials under temperature differences or the adhesion and bonding properties of material samples under load.

In addition, we can test the penetration and filtering properties of fabrics, especially medical ones.

Furthermore, we present some examples from the product category of colour and haze measurements.

The high-precision devices mostly work with an integrated microcomputer. Some devices require a computer connection. The data evaluation is done by software and allows the user different display options as well as comparison, search and help functions and an automated status query of the device with regular calibration reminders.

For all units, the standard package includes all necessary accessories except for a PC or notebook system (unless otherwise specified in the unit's individual brochure). Additional accessories or customisations are available on request.

# Heat Test Methods

The **HSR-01, HSR-05 and HTT-01** heat seal testers determine the optimum sealing parameters such as temperature, duration and pressure for the different film materials.

The **HSR-05** heat seal tester allows simultaneous testing of 5 material samples independently of each other.

The **HTT-01** hot-tack and seal property tester can additionally measure the peel force, tension and shear force of adhesive bonds.

The **RSY-01 and Thermotek 2720** models are suitable for determining the heat shrinkage properties of films and foils made of polyethylene, ethylene and copolymers as well as their blends. The shrinkage, contraction force and shrinkage ratio of shrink films under specified test conditions can be determined.

In an oil bath, the **RSY-01** unit tests the films without clamping. The **Thermotek 2720** is also used to measure the shrinkage ratio and shrinkage force simultaneously in a freely suspended position. This device was developed in cooperation with Kronos AG.

## Overview of Heat Testers

Device	Measuring points	Temperature (°C)	Pressure (MPa)	Duration (s)	Test Area (mm)	Heated sides
<b>HSR-01</b>	1	Roomtemp. – 300°C	0,05 – 0,7	0,1 - 999,9	330 x 10	Single or double
<b>HSR-05</b>	5	Roomtemp. – 300°C	0,05 - 0,7	0,1 - 999,9	40 x 10	Single or double
<b>HTT-01</b>	1	Roomtemp. – 300°C	0,05 - 0,7	0,1 - 999,9	100 x 5	Single or double
<b>RSY-01</b>	1	Roomtemp. – 200°C	-		<140 x 140	Oilbath
<b>Thermotek 2720</b>	2	Roomtemp. – 210°C	-	adjustable		Hot air

**HSR-01**

Features:

- Determines optimum sealing temperature, time and pressure of films.
- Integrated microcomputer
- Test temperature is reached quickly and without fluctuation

Advantages:

- Double heating surface
- Sealing area 330 x 10 mm



Heat Seal Temperature	Room Temperature – 300°C
Sealing Pressure	0,05 – 0,7 MPa
Sealing Duration	0,1 – 999,9 s
Standards	ASTM F2029, QB/T 2358, YBB 00122003

**HSR-05**

Features:

- Determines the optimum sealing temperature, time and pressure of films
- 5 independent sealing jaws for simultaneous testing
- Integrated microcomputer and printer

Advantages:

- Test temperature is reached quickly and without fluctuation
- Simultaneous test of 5 material pairs at 5 different temperatures possible



Heat Seal Temperature	Room Temperature – 300°C
Sealing Pressure	0,05 – 0,7 MPa
Sealing Duration	0,5 – 999,9 s
Standards	ASTM F2029, QB/T 2358, YBB 00122003

## HTT-01

### Features:

- Hot-tack and seal seam property tester and measurement of peel force, tension and shear force of adhesive tapes.
- For any packaging film
- 4 test modes
- Integrated microcomputer



### Advantages:

- Test temperature is reached quickly and without fluctuation

Prüfbereich	0 – 200 N, 30 N , 50 N, 100 N or 500 N optional
Heat Seal Temperature	Room Temperature – 300°C
Sealing Width	15, 25 or 25,4 mm
Sealing Pressure	0,05 - 0,7 MPa
Test Speed	0,05 - 3000 mm/min
Sealing/Hot Tack Duration	0,1 – 999,9 s
Stroke	500 mm
Standards	GB/T 34445, ASTM F1921, ASTM F2029, YBB 00122003 u.ä.

Shrinkage Testers

**RSY-01**

Features:

- Heat shrinkage tester for foils
- in an oil bath
- Foil is freely movable in the bath
- Integrated microcomputer

Advantages:

- Test temperature is reached quickly and without fluctuation



Sample Size	max. 140 mm x 140 mm
Temperature Range	Room Temperature - 200°C
Accuracy	±0.3°C
Standards	GB/T 13519, ASTM D2732

**Thermotec 2720**

Features:

- 2 test modes simultaneously (shrinkage ratio and shrinkage force).
- The complete test takes only a few minutes
- Scope of delivery: software, monitor, mouse, keyboard, printer, cutting mat, sample template and sample holder set

Advantages:

- Results are displayed in real time displayed on the screen
- Developed in cooperation with Kronos AG



Force Range	0,02 - 6 N
Accuracy	0,2% FS
Temperature	Room Temperature - 210°C
Standards	ISO 14616-1997 and DIN 53369-1976

# Leakage Tester

In the field of leak testing, we offer three different leak testers: **LEAK-01**, **LEAK-01H** and **LSST-01**.

Packaging materials with weak points such as seal seams or products that are exposed to a pressure difference can be tested for their sealing qualities and durability, failure and creep limits as well as compression resistance. The devices can be used for a wide range of packaging forms.

The **LEAK-01** model tests the tightness of seals of various packages by the differential pressure method in water and thus detects leakage and deformation in vacuum due to bubble leakage.

The **LEAK-01H** does the same in air and measures the pressure rise of the vacuum due to escaping gases.

The sealing quality of stronger bags, bottles, tubes, caps and other packaging is checked by the **LSST-01** device. With the overpressure method, the creep and failure limits as well as the compression resistance can be measured quantitatively. In addition, the volume flow can be precisely adjusted and recorded. Numerous accessories are available for this device, e.g. for testing bags that are open on one side.

For stronger and larger packages, we recommend our noise protection chamber.

## Overview of Leakage Tester

Device	Measuring Points	Test Range	Method	Quantitative / Qualitative	Integrated Computer
<b>LEAK-01</b>	1	0 to -90 kPa	Difference Pressure in Water	Qualitative	
<b>LEAK-01H</b>	1	0 to -90 kPa	Difference Pressure in Air	Quantitative	X
<b>LSST-02</b>	1	0-600kPa	Difference positive Pressure	Quantitative, Qualitative	X

Leakage Tester

**LEAK-01/-01H**

Properties:

- Differential pressure method with negative pressure
- Any packaging can be checked for leakage and seal strength
- LEAK-01 offers qualitative test, search for bubble leakage under water
- LEAK-01H offers quantitative test in air. The pressure rise of the vacuum reveals leaks



Advantages:

- Versatile accessories
- Easy to use

Size of Vacuum Chamber	Φ270 mm x 210 mm (H) (standard) Φ360 mm x 585 mm (H) (optional) Φ460 mm x 330 mm (H) (optional)
Vacuum Level	0 to -90 kPa
Standards	GB/T 15171, ASTM D3078

**LSST-01**

Features:

- Overpressure method
- Bottles, tubes, etc. can be tested quantitatively for leakage, Compression resistance, failure and creep limits
- Connection to a PC necessary



Advantages:

- Versatile test possibilities
- Volume flow setting and recording
- Optional: noise protecting chamber
- Numerous accessories e.g. for bags open on one side

Test Pressure	0-600 kPa; 0-87.0 psi
Standards	ISO 11607-1, ISO 11607-2, GB/T 10440, GB 18454, GB 19741, GB 17447, ASTM F1140, ASTM F2054, GB/T 17876, GB/T 10004, BB/T 0025, QB/T 1871, YBB 00252005, YBB 00162002



# Fogging Tester

The **FT-01** condensation and fogging measurement device is mainly used in the paint and automotive industries to prevent fogging of materials such as plastic, rubber or leather under temperature differences. The model is also suitable for analysing the fogging properties of e.g. leather, fabric, plastic parts, xenon lights, etc.

## FT-01

### Properties:

- 3 methods: gloss level method, optional haze measurement, weight measurement.
- 6 measuring points for simultaneous testing of 6 samples
- All necessary accessories w/o liquids incl.

### Advantages:

- Very precise temperature control also for non-standardised tests



High Temperature Bath	Room Temperature – 150°C (optional – 280°C)
Low Temperature Bath	0 – 100°C
Accuracy	±0.1°C
Standards	ISO 6452, DIN 75201, SAE J1756, QB/T 2728, BS EN 14288, PV 3920, PV 3015, ES-X83231, NES M0161, D45 1727, GM 9305P, TSM 0503G

# Adhesive Tester

The **PAT-01A, -02** and **LAT-06** devices test the adhesion and bonding properties of test samples such as pressure-sensitive tape, plasters, adhesive labels and protective films.

While the **PAT-01 and -02** model uses the rolling ball method, the **LAT-06A** can test six samples simultaneously under the influence of weight. This model is controlled by a microcomputer.

Further test devices, e.g. for peel forces of adhesive tapes, can be found in the catalogue "Mechanical Testing Instruments".

## Adhesive Tape Tester

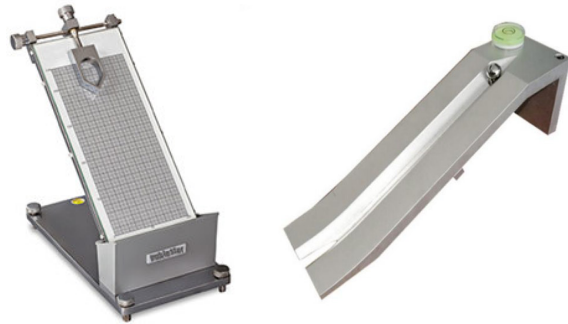
### PAT-01A, -02

Features:

- Rolling ball method
- Testing the adhesive properties of samples such as adhesive tape, sellotape, plasters, adhesive labels etc.

Advantages:

- Standardised



Angle	0 – 60°, PAT-02: 21,5°
Steel Ball Diameter	1/32" to 1"; PAT-02: 14 mm
Length	165 mm, 6.5"
Standards	GB/T 4852, JIS Z0237

### LAT-06A

Properties:

- Test of permanent adhesive properties and adhesive failure of tapes, adhesive labels, plasters etc. under the influence of weight.
- 6 material test points for simultaneous testing
- Integrated microcomputer

Advantages:

- Standardised



Standard Roller	2000g ±100 g
Weight	1000 g ±5 g
Time Interval	0 - 10000 h (standard)
Standards	GB/T 4851, ASTM D3654, JIS Z0237

# Penetration – Filtration

The **BPT-02** and **PFT-02** devices test the penetration and filtering properties of fabrics, filters and face masks.

## Test of Fabrics, Filters and Face Masks

### BPT-02

- Penetration of blood into medical tissue
- Immigration of synthetic blood through negative pressure into the fabric
- For flat fabrics such as mask gowns, surgical gowns, etc.
- Advantages:
  - Easy to perform



Pressure Difference	0 – 40 kPa
Test Area	28,,26 cm <sup>2</sup>
Standards	ASTM F 1670, ASTM F 1671, ISO 16603:2004, GB19082, YY/T 0700

### PFT-02

- Particle -filtration efficiency test of fabrics, such as workwear, med. protective clothing, respiratory masks , filters, etc.
- Set amounts of cold aerosol are blown through the fabric.
- With salt or oil aerosol generator, as well as aerosol neutraliser
- Incl. laser-controlled particle counter
- Pneumatic clamping

Advantages:

- Simple implementation



Flow	10 – 100 l/min
Particle Diameter	Salt Particle (0.075±0.02) µm Oil drops (0.185±0.02) µm
Measurement Range	0.001-100 mg/m <sup>3</sup>
Standards	GB24539, GB 19082

# Colour and Haze

We offer two main groups of testers for measuring colour and haze of materials, surfaces or liquids. They are the ideal instruments for laboratory and on-site use.

Since our large product range includes a variety of similar instruments, we present the leading products in their class below. These are colourimeters for simple colour determination, spectrophotometers for high-precision colour determination and one for haze and transmission measurement.

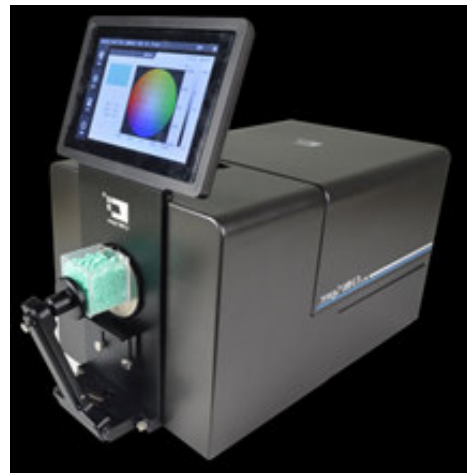
## Spectro-Photometer

### C-820N

- Precision tester for measuring colour
- Measurement of light intensity relative to wavelength
- Samples: Plastics, paper, paints, fabrics, liquids, metal, screens, etc.
- Spherical geometry measurement
- Max. Sample thickness 50 mm
- Two light sources, xenon and LED

#### Advantage

- Unit can stand horizontally or vertically
- Very high accuracy



Measurement Principle	Reflection: d/8 (Diffused Illumination, 8 degree viewing); Sphere Diameter 152 mm
Kind of Measurements	Reflection, Transmission, SCI, SCE and SCI/SCE simultaneously
Wave Length Range	360-780 nm
Wave Length Pitch	10 nm
Resolution	0,01%
Standards	SCI/SCE (DIN 5033/7, ISO 7724/1, CIE Nr. 15, ASTM E1165, JIS Z8722

Mobile Spectrophotometer and Colorimeter

**C-520**

- Mobile spectrophotometer for measuring colour
- Measurement of light intensity relative to wavelength
- Samples: Plastics, paper, paints, fabrics, liquids, metal, screens, etc.
- Measurement under two angles
- 29 colour databases stored
- Automatic calibration, bluetooth



Principle	Two Measurement Angles 2° and 10°
Type of Measurement	D/8, SCI/SCE (diffuse illumination, 8° spectral illumination included), sphere diameter 40 mm
Wave Length Range	400-780 nm
Wave Length Pitch	10 nm
Accuracy	0,01
Standards	DIN 5033-7, ISO 7724-1, ASTM E1164

**CS-288 and Colorimeter Pro**

- Mobile test equipment for measuring colour
- Measurement of light intensity relative to wavelength
- Samples: Plastics, paper, paints, fabrics, metal, screens, etc.
- Wavelength 400-700 nm
- Bluetooth
- Automatic calibration
- More than 20 colour databases stored



CS-288



Colorimeter Pro

	<b>Spectro-Colorimeter CS-288</b>	<b>Colorimeter Pro</b>
Principle	2 Measurement Angles 2°, 10°	
Type of Measurement	D/8, SCI/SCE (diffuse illumination, 8° spectral illumination included), sphere diameter 40 mm	D/8, SCI
Weight	550 g	90 g
Standards	DIN 5033-7, ISO 7724-1, ASTM E1164	ASTM E313-00/73, ASTM D1925

## Haze and Transmission Tester

### TH-100 / 110

- Laboratory test equipment for measuring haze and transmission.
- For measurements of transparent materials such as films, packaging, foils, glass panes, LCD screens etc. as well as through liquids such as drinking water, beer or milk
- Horizontal or vertical alignment
- Self-calibrating
- The TH-100 was developed to meet industry requirements
- With 5" monitor or 7" monitor (TH -110)
- Many accessories



Measurement	Haze and Transmission
Illuminated Area	15 x 21 mm, unlimited
Sample Thickness	Max. 120 mm
Light Source	CIE-A, CIE-C und CIE-D65
Measurement Duration	< 3 s
Standards	ISO 14782, ISO 13468, ASTM 1003

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