

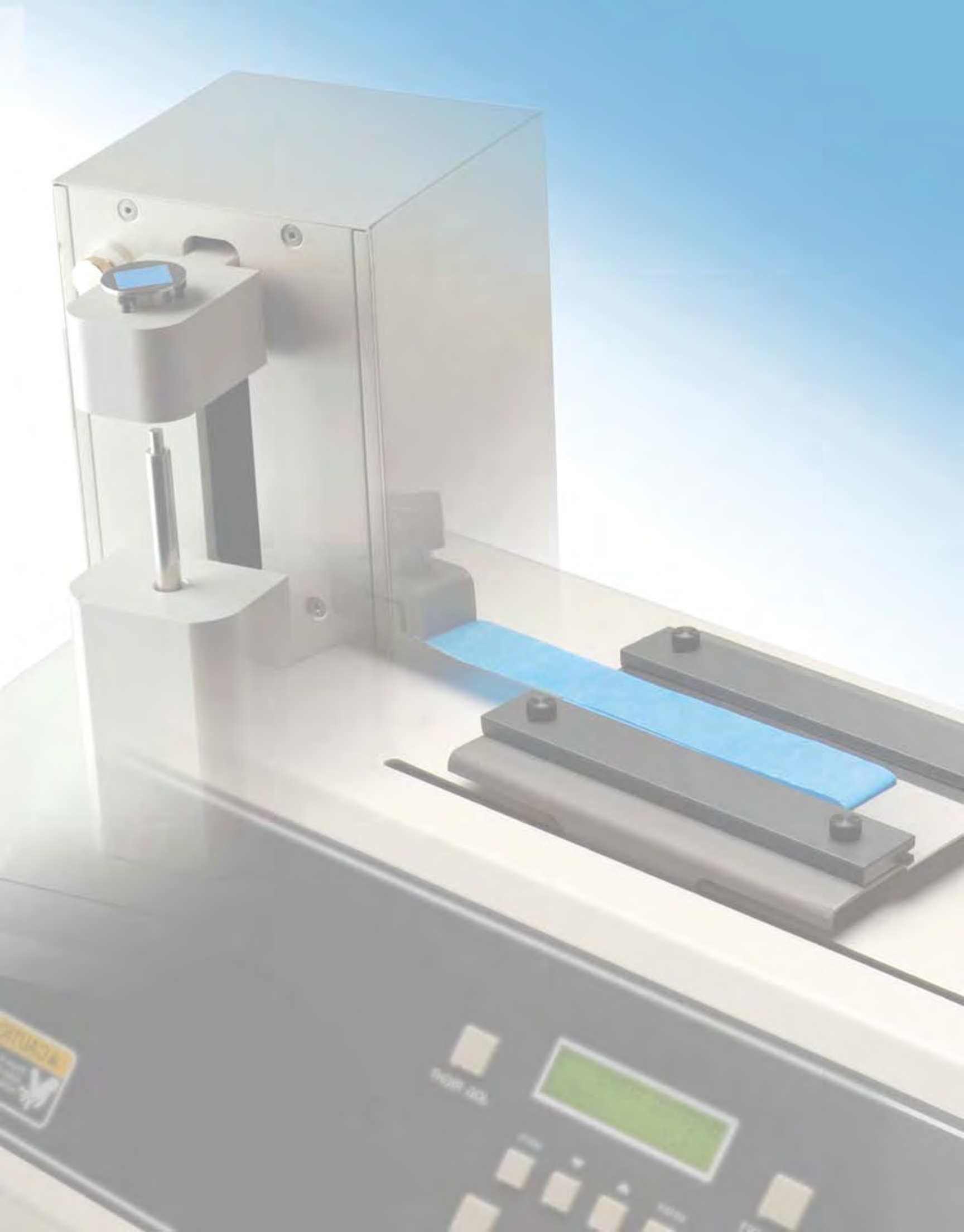


Testing Equipment Catalog



***Tack • Shear • Adhesion
Tensile • Material Analysis
Coaters • Laminators
Sample Preparation
Software***

www.cheminstruments.com



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EZ-Lab System Software

EZ-Lab Data Management software interfaces with all of ChemInstruments' load cell based testing platforms. The software is a very simple and intuitive way to get more out of your testing equipment. EZ-Lab Data Management software provides test data results in report-ready format. This easy to use software provides powerful statistical analysis and reporting capabilities on any Microsoft Windows based personal computer.

EZ-Lab Software Features

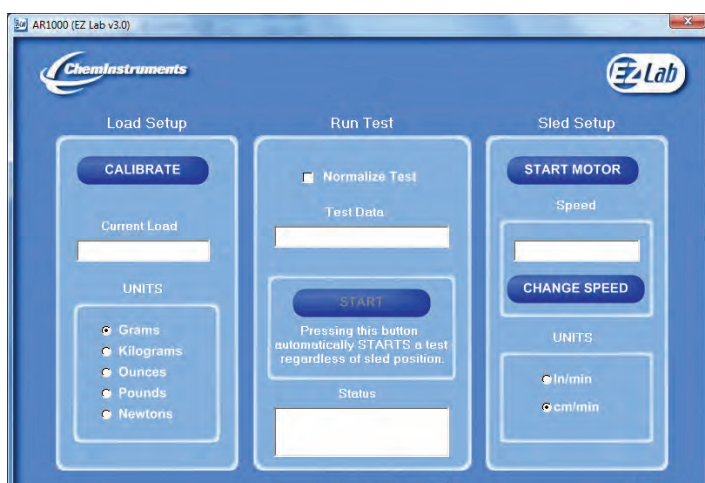
- One main screen contains all commands to easily setup and operate each machine
- Test data is automatically graphed upon test completion
- Pertinent data points are highlighted on the graph page for easy reference
- Files are automatically saved in the root directory for security purposes
- Files may also be saved anywhere on a local network

- Test data files are transferable across networks and the Internet
- Test results can be shared in Adobe .PDF file format.
- Up to 5 graphs can be overlaid for comparison purposes
- Up to 99 tests can be tabulated for statistical analysis
- Convert EZ-Lab files into Microsoft Excel files with one click
- Graph cropping feature provides more detailed analysis and selected views
- Previous tests are always available for review

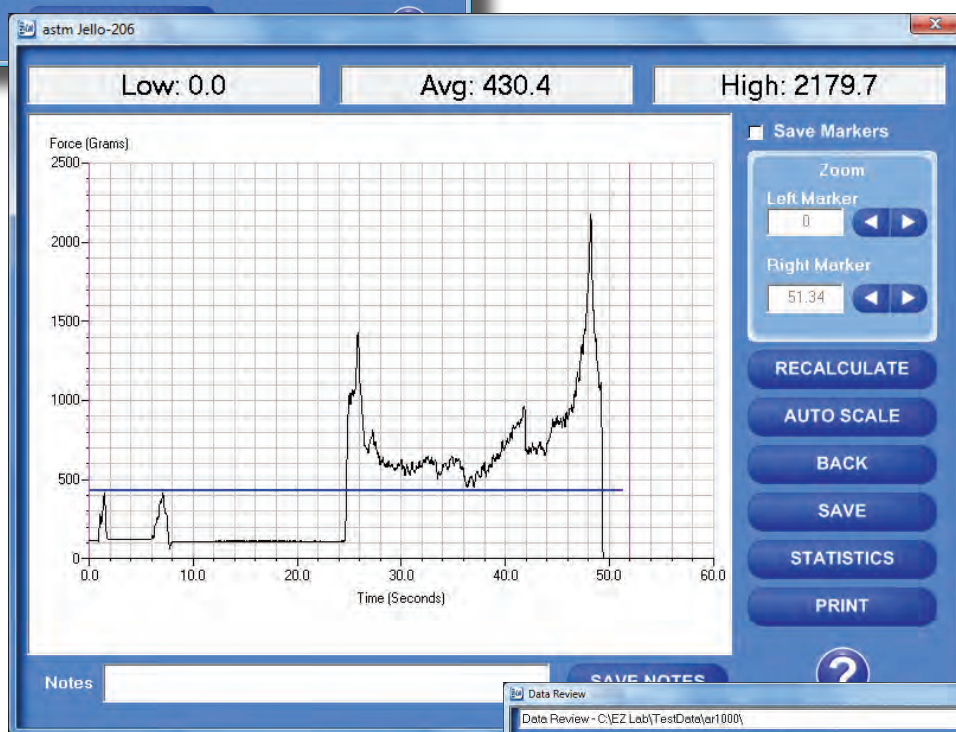
EZ-Lab Data Management software can be used with the following test equipment:

Adhesion / Release, High Speed Release, Probe Tack, Loop Tack, 90° Peel Adhesion, 180° Peel Adhesion, Probe Material Analyzer, Tensile / Compression, Dynamic Shear, High Speed Unwind, Coefficient of Friction and Burst / Perforation.





EZ-Lab Data Management software provides a complete testing and reporting platform for R&D, QC, and shop floor testing and data management. Combined with any of our pieces of testing equipment, this software is a very powerful addition to any lab that requires advanced data management and reporting for traceability or ISO purposes.



File Name	Date	Low	Avg	High
k-001-RevA	01/06/09 03:27 PM	0.2	0.5	0.7
k-001	01/06/09 03:27 PM	0.2	0.5	0.7
k	01/02/09 02:39 PM	0.0	333.5	926.6
edge-tech-003-RevA	12/15/08 03:40 PM	271.3	398.2	1118.5
yy-012	12/15/08 03:24 PM	497.1	499.6	501.1
yy-011	12/15/08 03:24 PM	497.4	499.7	501.5
yy-010-RevA	12/15/08 03:22 PM	497.2	499.5	502.0
yy-010	12/15/08 03:22 PM	497.2	499.6	502.0
yy-009-RevA	12/15/08 02:21 PM	498.7	500.0	501.3
yy-009	12/15/08 02:21 PM	496.4	500.0	505.2
yy-007-RevA	12/15/08 02:18 PM	497.2	500.1	502.6
yy-007	12/15/08 02:18 PM	489.4	500.1	511.8
yy-006-RevA	12/15/08 02:16 PM	498.2	500.0	501.1
yy-006	12/15/08 02:16 PM	498.2	500.0	501.1
yy-005-RevA	12/15/08 02:16 PM	498.0	500.0	502.5
yy-005	12/15/08 02:16 PM	497.7	500.0	502.5
yy-004-RevA	12/15/08 02:15 PM	490.7	500.0	502.5

System Requirements

- Personal Computer operating Microsoft Windows 2000 or newer
- 4 MB of RAM
- Pentium processor, 200 MHZ or higher
- RS-232 COM port or USB with converter to RS-232
- 3MB of hard drive space

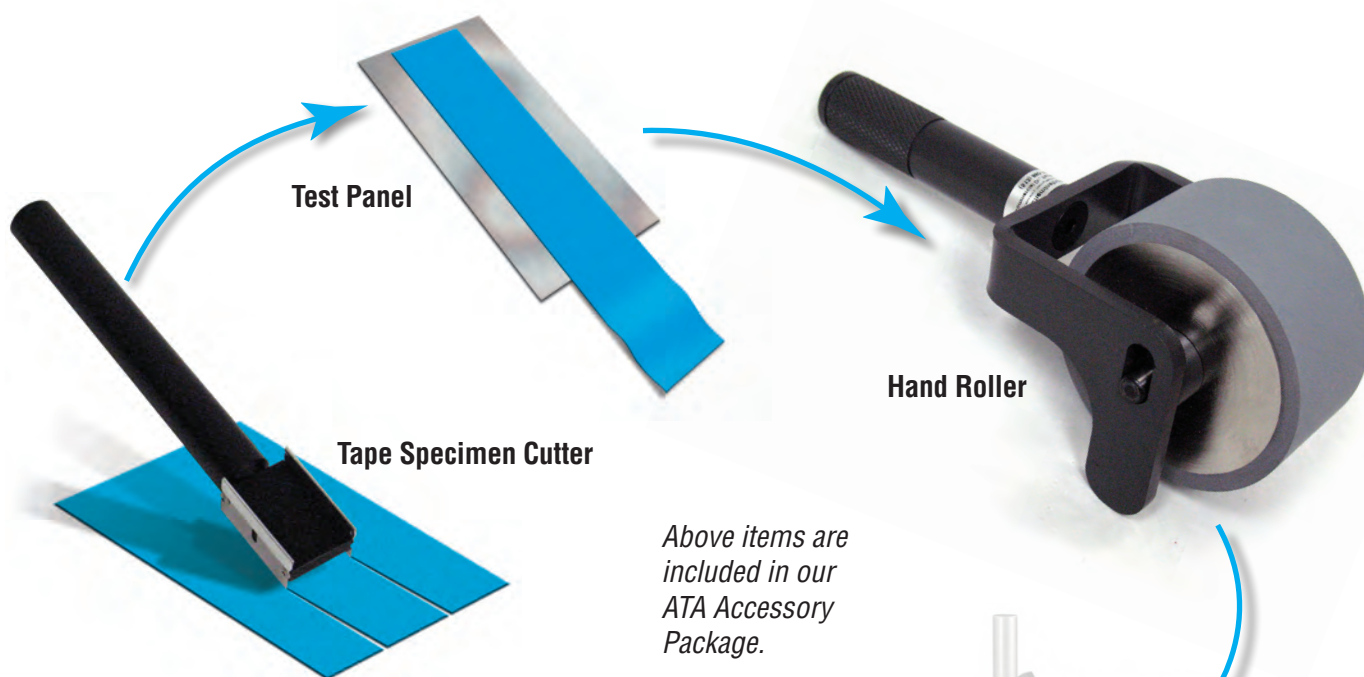
Adhesion / Release

The most versatile peel tester on the market, the ChemInstruments Adhesion/Release testing machine with digital display is designed to perform PSTC, ASTM, TLMI, FINAT and AFERA adhesion and release testing procedures. With its ease of operation, reliability, simplicity and affordable price, the Adhesion/Release Peel tester has quickly become the standard in many plants and laboratories. Coupled with our EZ-Lab data acquisition software, it is an integral part of any R&D or QA laboratory.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speed range from 6 to 1200 ipm (15 - 3048 cpm)
- Test angle is selectable between 90° and 180°

- One load cell is included with the machine (2, 5, 10 or 25 pound capacities available)
- Load cells can easily be changed out
- Test samples as short as ½" to as long as 12" (12mm – 305mm)
- Operating temperature range 32° - 150° F (0° - 70° C)
- Capable of stand-alone operation with integrated digital display
- Data can be acquired to EZ-Lab software for complete data management
- Accurate to ± 0.1% of load cell range
- Capable of pulling up to 25 pounds (12 Kg) (dependent on selected lower speeds)
- Standard input voltage - 120 VAC (50/60hz)





Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Test Panel: Standard for all ChemInstruments Adhesion Testers. Items meet PSTC and ASTM specifications.

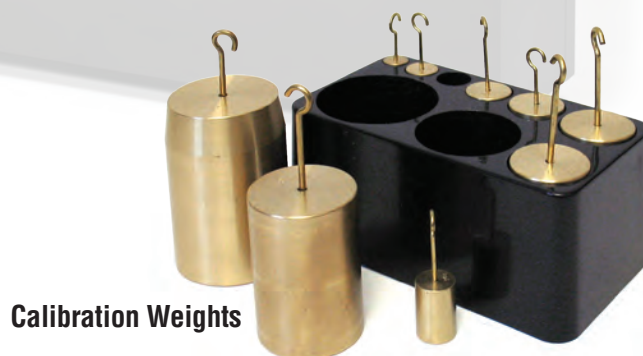
Hand Roller: Used to laminate samples to test panels.

Test Weights: This set includes a selection of weights from 10-1000 grams with NIST traceable certificate.

Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, digitally displays it and also stores that data in its memory.

- Records 400 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Stores data from up to 20 tests, allowing for quick review of previously recorded values
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons



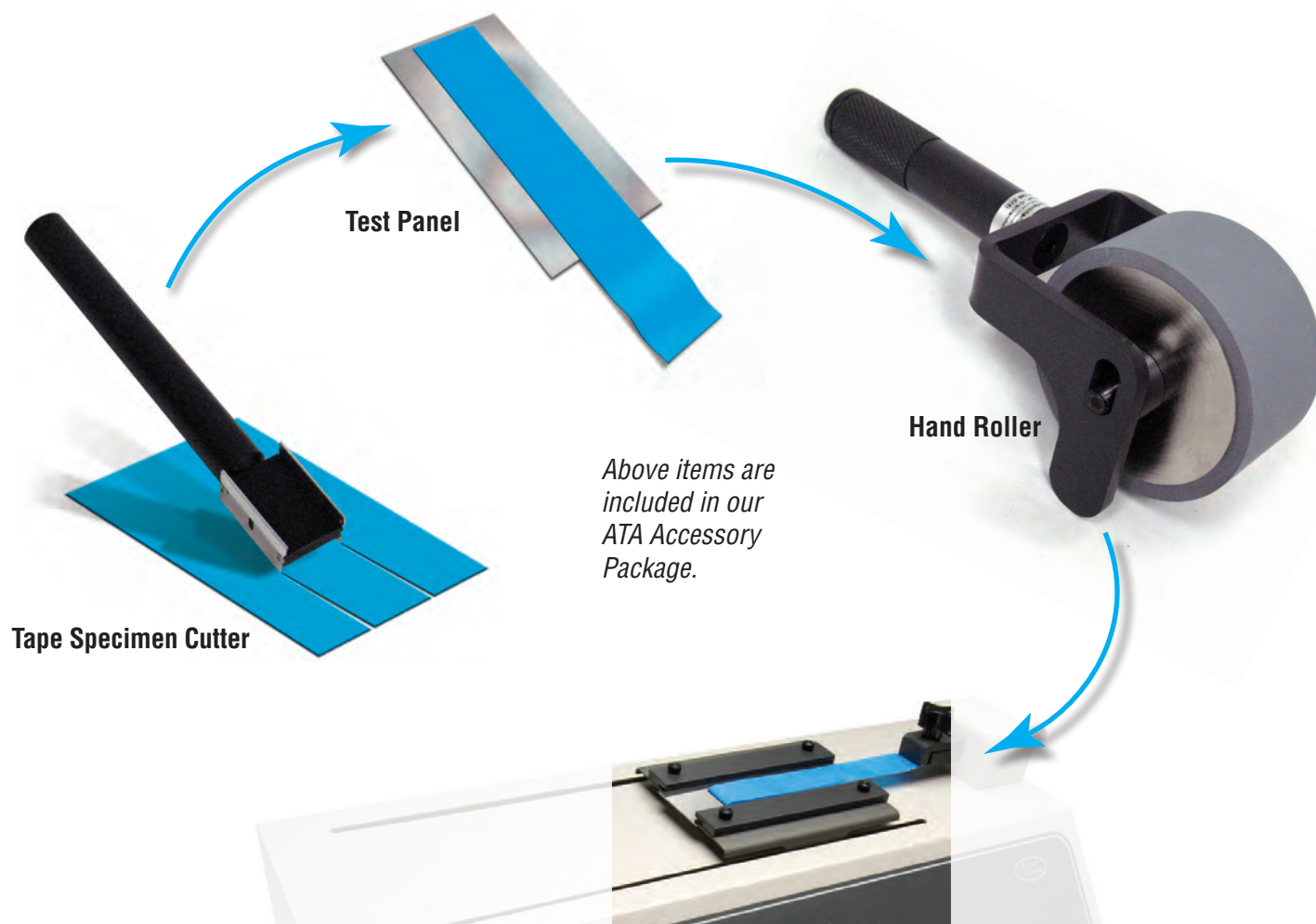
180° Peel Adhesion

For added testing flexibility, the ChemInstruments 180° peel Adhesion testing machine can perform a precision 180° peel test at three different speeds. The 180° peel Adhesion tester offers a number of robust features.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speeds of 6, 12 and 24 ipm (15, 30 and 60 cpm)
- Test angle is permanently set for 180° testing
- 10 pound load cell is included with the machine (other load cell sizes are available)
- Test samples as short as ½" to as long as 5.5" (12mm - 140mm)
- Designed to accept standard 2" x 6" peel panels (50mm x 150mm)
- Operating temperature range 32° - 150° F (0° - 70° C)
- Capable of stand-alone operation with integrated digital display
- Data can be downloaded to EZ-Lab software for complete data management
- Accurate to ± 0.1% of load cell range
- Universal input voltage from 85 - 265 VAC (50/60hz)



EZ Lab compatible
See Page 4-5



Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, digitally displays it and also stores that data in its memory.

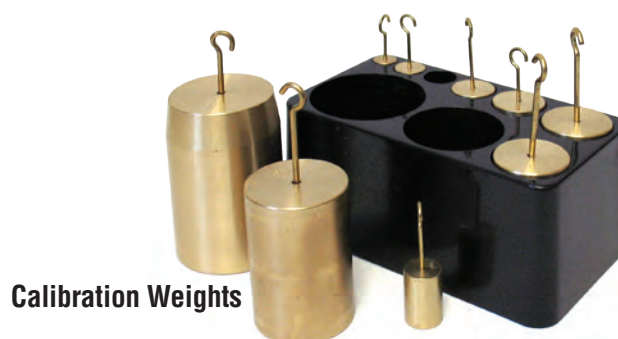
- Records 400 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons

Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Test Panel: Standard size for all ChemInstruments Shear Testers. Items meet PSTC and ASTM specifications.

Hand Roller: Used to laminate samples to test panels.

Test Weights: This set includes a selection of weights from 10-1000 grams with NIST traceable certificate.



90° Peel Adhesion

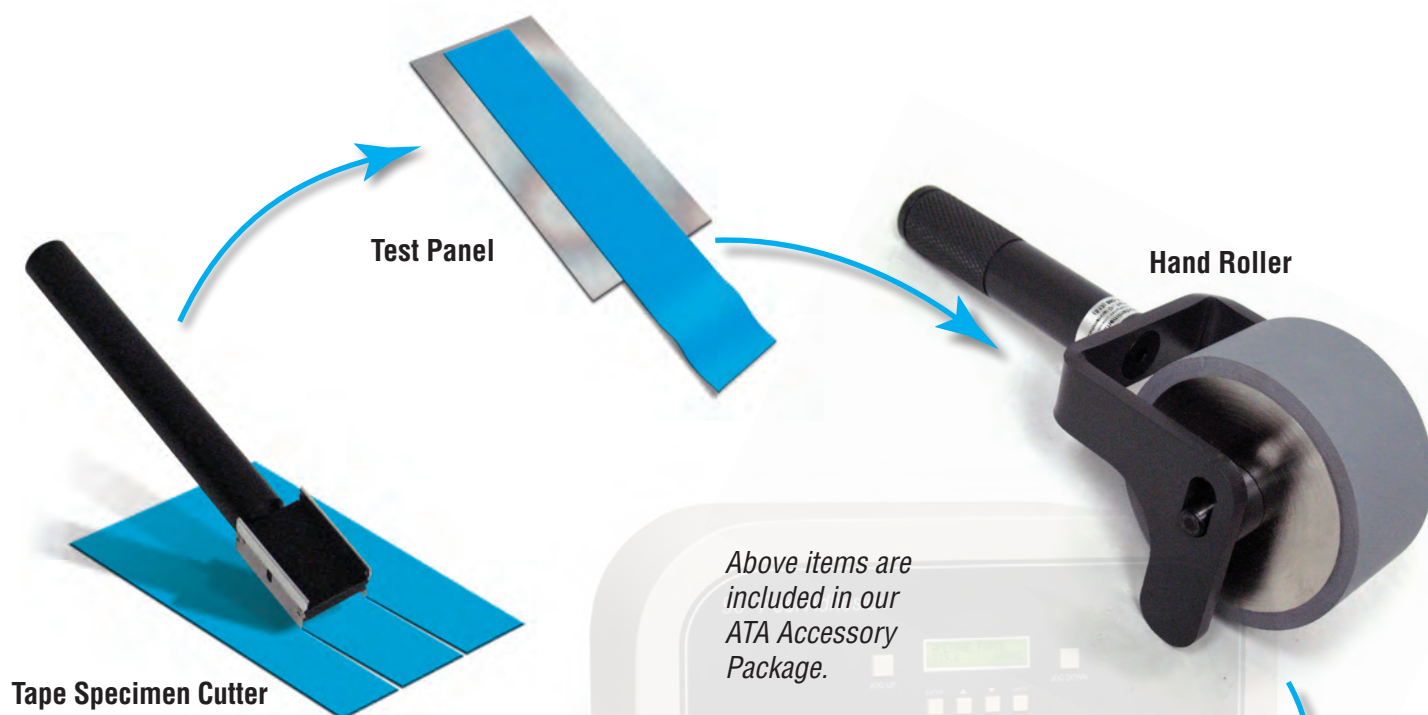
Get precision measurements for 90° peel tests with the ChemInstruments 90° peel Adhesion testing machine. The 90° peel Adhesion tester runs at varying speeds for added flexibility and offers a number of additional features.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speeds of 6, 12 and 24 ipm (15, 30 and 60 cpm)
- Test angle is permanently set for 90° testing
- 10 pound load cell is included with the machine
- Test samples as short as ½" to as long as 5.5" (12mm - 140mm)
- Unique design capable of testing thick samples or setups involving fixtures
- Designed to accept standard 2" x 6" peel panels (50mm x 150mm)
- Operating temperature range 32° - 150° F (0° - 70° C)
- Capable of stand-alone operation with integrated digital display
- Data can be downloaded to EZ-Lab software for complete data management
- Accurate to $\pm 0.1\%$ of load cell range
- Universal input voltage from 85 - 265 VAC (50/60hz)



EZ Lab compatible
See Page 4-5





Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Test Panel: Standard for all ChemInstruments Adhesion Testers. Items meet PSTC and ASTM specifications.

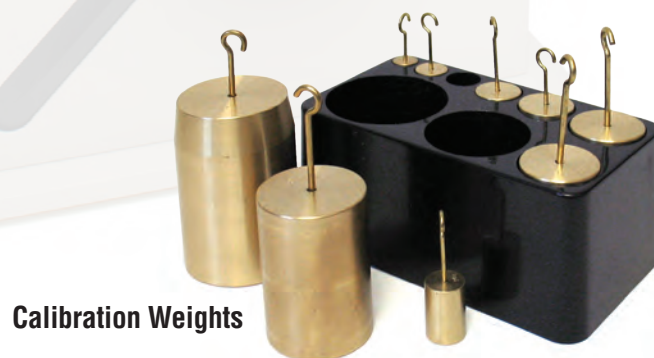
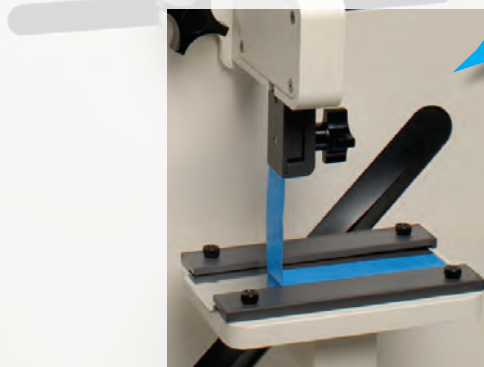
Hand Roller: Used to laminate samples to test panels.

Test Weights: This set includes a selection of weights from 10-1000 grams with NIST traceable certificate.

Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, digitally displays it and also stores that data in its memory.

- Records 400 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Stores data from up to 20 tests, allowing for quick review of previously recorded values
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons



High Speed Release

Production speed testing of PSA release liners is simple with the durable, easy-to-use High Speed Release Tester from ChemInstruments. Together with the included EZ-Lab system software, the release tester determines profiles of release liners in a matter of minutes. Whether trying to determine high-speed application characteristics or converting properties, this valuable adhesive testing tool will provide insight into the performance properties of release liners. This machine was designed specifically to comply with the procedures set forth in FINAT test method FTM 4.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speed range from 30 to 1000 fpm (10 - 300 mpm)
- Designed to utilize the sample size indicated in the FINAT FTM 4 test method
- Capable of testing liner from adhesive or adhesive from liner
- 5 pound load cell is included the machine (2 pound load cell is also available)
- Operating temperature range 32° - 150° F (0° - 70° C)
- EZ-Lab data management software is included with this machine
- Accurate to $\pm 0.1\%$ of load cell range
- Standard input voltage - 120 VAC (50/60hz)
- Additional load cell capacities available: 5 and 10 pounds.

Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, digitally displays it and also stores that data in its memory.

- Records 400 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons





Tape Specimen Cutter

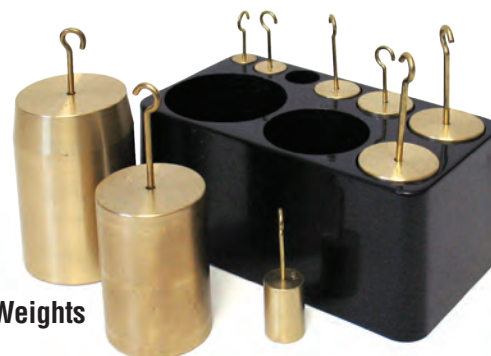


Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 2 inch width. Other sizes available.

Test Weights: This set includes a selection of weights from 10-1000 grams with NIST traceable certificate.



EZ Lab compatible
See Page 4-5



Calibration Weights

Loop Tack

Quickly and efficiently determine the tack or “grab” of an adhesive with the ChemInstruments Loop Tack Tester. This compact tack testing machine meets the ASTM and TLMI specifications.

- Rugged construction, capable of withstanding the abuse of the production environment
- Single speed motion utilizes a cam design for consistent and repeatable testing
- Easy sample setup using a removable grip makes testing quick and consistent
- 10 pound load cell is included with the machine
- Simple one-touch operation delivers information quickly and easily
- Operating temperature range 32° - 150° F (0° - 70° C)
- Capable of stand-alone operation with integrated digital display
- Data can be downloaded to EZ-Lab software for complete data management
- Accurate to $\pm 0.1\%$ of load cell range
- Capable of pulling up to 10 pounds (4.5 Kg)
- Standard input voltage - 120 VAC (50/60hz)



EZ Lab compatible
See Page 4-5

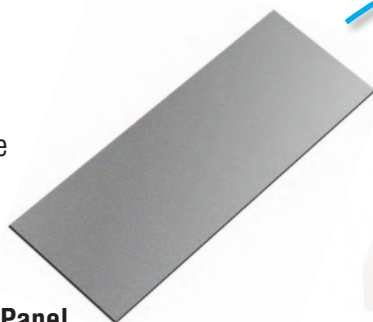


Tape Specimen Cutter

Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Test Panel: Standard size for Loop Tack Tester. Items meet PSTC and ASTM specifications. Other sizes available.

Test Weights: This set includes a selection of weights from 10-1000 grams with NIST traceable certificate.



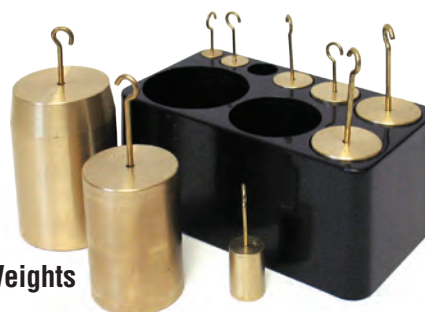
Test Panel



Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, digitally displays it and also stores that data in its memory.

- Records 400 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons



Calibration Weights

Polyken™ Probe Tack

PT-1000

The Polyken™ Probe Tack from ChemInstruments makes it easy to measure the tack of pressure sensitive adhesives. A precision ground 5.0 mm diameter flat probe contacts the adhesive, reverses direction and pulls away from the adhesive. The maximum force required to break the adhesive bond is recorded and displayed.

The Polyken Probe Tack adhesive testing machine meets the standards set forth in ASTM D2979. Machine speed is 24 ipm (61 cpm), with a probe diameter of 5 mm and an annular ring weight that applies 9.79 +/-0.10 kPa of force. An automatic test cycle produces a 1 second dwell time from the beginning of contact to the end of contact.

- Rugged construction, capable of withstanding the abuse of the production environment
- Single speed motion utilizes a cam design for consistent and repeatable testing
- Easy sample setup makes testing quick and consistent
- 5 pound load cell is included with the machine
- Simple one-touch operation delivers information quickly and easily
- Operating temperature range 32° - 150° F (0° - 70° C)
- Capable of stand-alone operation with integrated digital display
- Data can be downloaded to EZ-Lab software for complete data management
- Accurate to ± 0.1% of load cell range
- Capable of pulling up to 5 pounds (2.5 Kg)
- Calibrated weights included
- Standard input voltage - 120 VAC (50/60hz)



EZ Lab compatible
See Page 4-5

Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system

simultaneously controls test motion, reads the force of a test from a load cell, digitally displays it and also stores that data in its memory.

- Records 1,000 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons

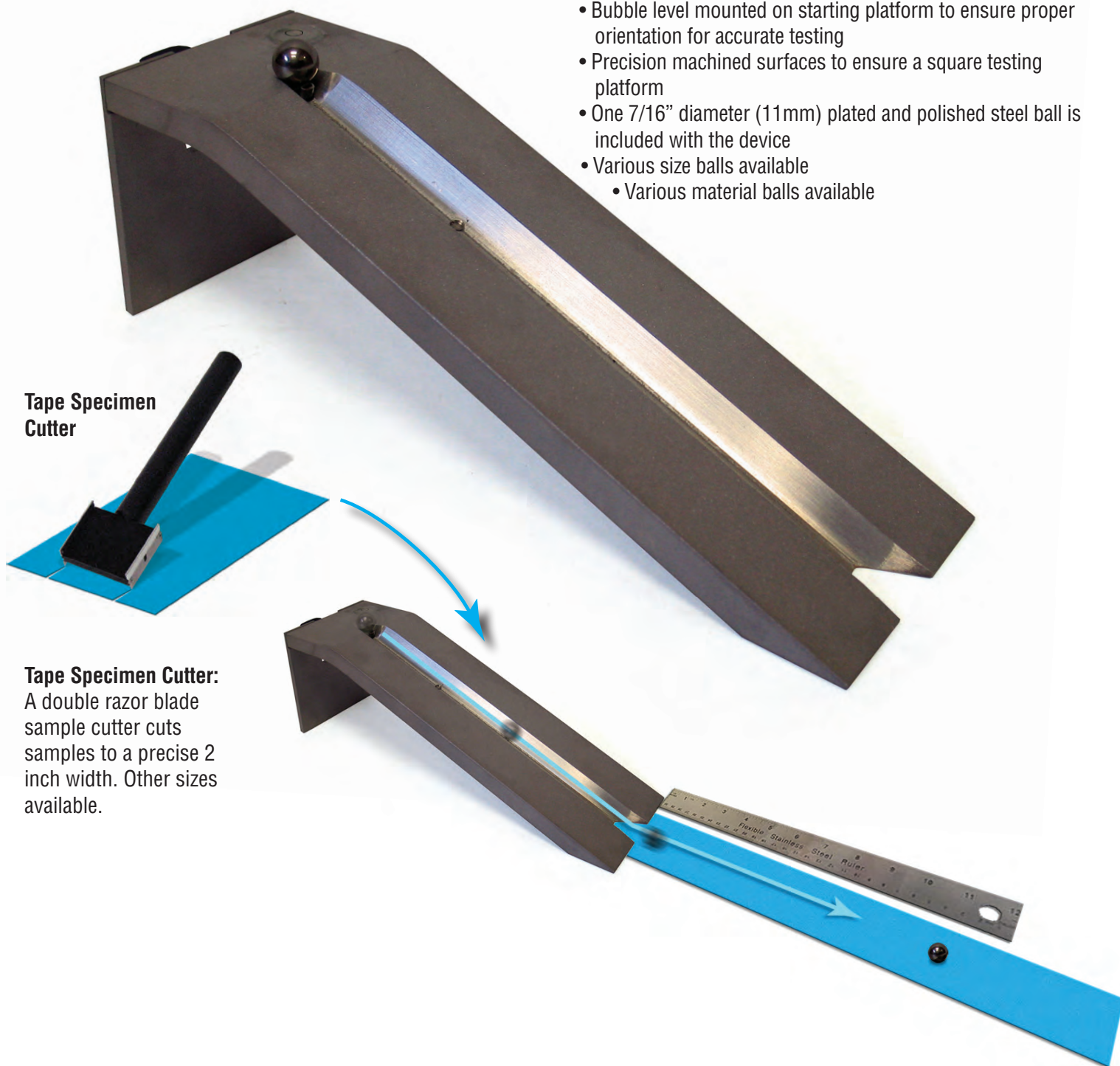


Rolling Ball Tack

RBT-100

Fast and economical, the ChemInstruments Rolling Ball Tack tester provides an easy method of testing the tack of an adhesive. It quantifies the ability of an adhesive to quickly adhere to another surface. The Rolling Ball Tack tester meets the standards set by the Pressure Sensitive Tape Council (PSTC-6) and ASTM (ASTM D3121) for tack testing a pressure sensitive adhesive.

- Solid aluminum construction, made to withstand many years of laboratory use
- CNC machined inclined trough, engineered for a smooth and accurate test
- Designed to minimize a “bounce” at the ball-to-tape interface
- Simple loading of the ball for quick and easy operation
- Spring lever designed to release the ball with minimal user interference
- Bubble level mounted on starting platform to ensure proper orientation for accurate testing
- Precision machined surfaces to ensure a square testing platform
- One 7/16” diameter (11mm) plated and polished steel ball is included with the device
- Various size balls available
 - Various material balls available



**Tape Specimen
Cutter**

Tape Specimen Cutter:
A double razor blade
sample cutter cuts
samples to a precise 2
inch width. Other sizes
available.

Tensile

Ideal for universal tensile tests, the ChemInstruments Tensile Tester is a versatile machine that provides powerful test performance for a variety of materials. It is designed to meet the test method requirements of PSTC, ASTM, TLM1 and more. The compact, single screw Tensile Tester offers a range of capabilities that includes:

- Tensile
- Elongation
- Modulus
- Lap shear
- Peel (180° and 90°)
- Unwind
- Tack
- Cycle
- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speed range from 1 to 25 ipm (2.5 - 64 cpm)
- Maximum testing span is 32" (820 mm) minus the length of the grips
- Throat distance from centerline of grip to mast face is 3.5" (89 mm)
- Return position accuracy is ± 0.005 " (0.125 mm) per test cycle
- One load cell is included with the machine (25, 50, 100 or 200 pound capacities available)
- Operating temperature range 32° – 150° F (0° - 70° C)
- Capable of stand-alone operation with integrated digital display
- Data can be downloaded to EZ-Lab software for complete data management
- Additional features included with EZ-Lab software: modulus, compression, cycle, loop tack
- Accurate to $\pm 0.1\%$ of load cell range
- Capable of pulling up to 250 pounds (110 Kg)
- Universal input voltage from 85 - 265 VAC (50/60hz)
- Grips not included, but optionally available

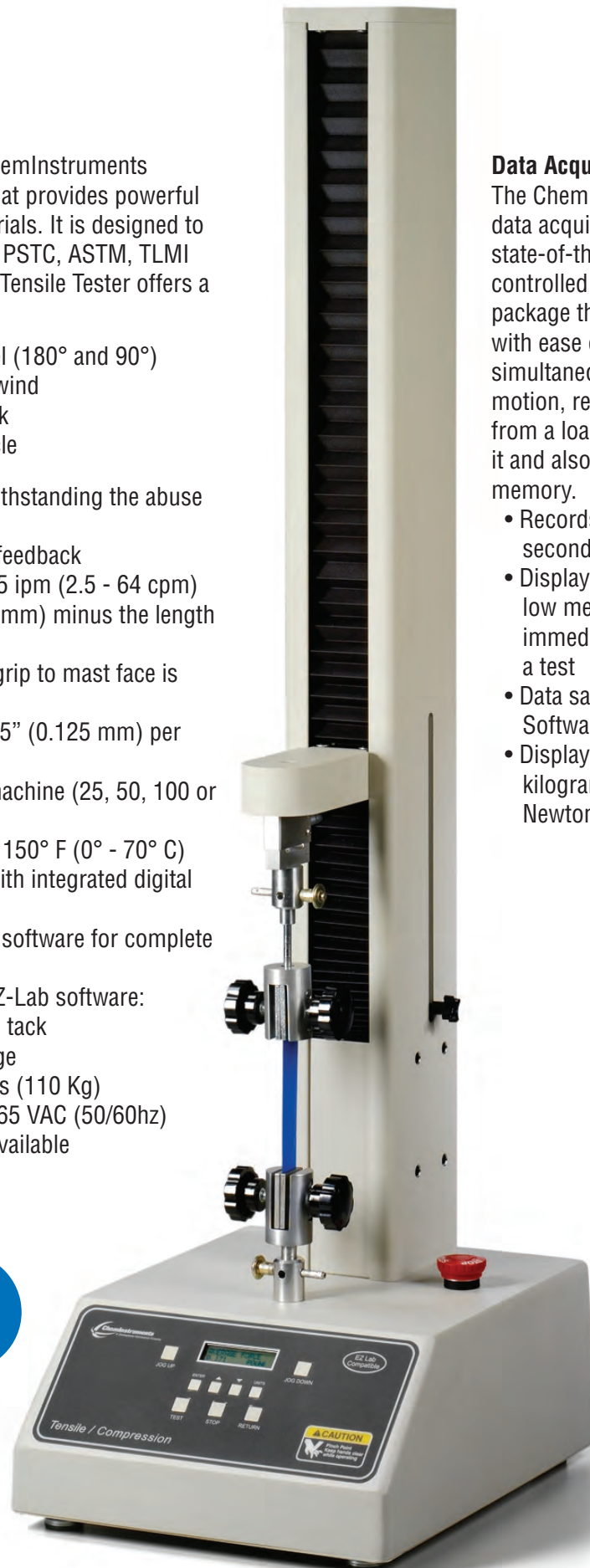
Data Acquisition System

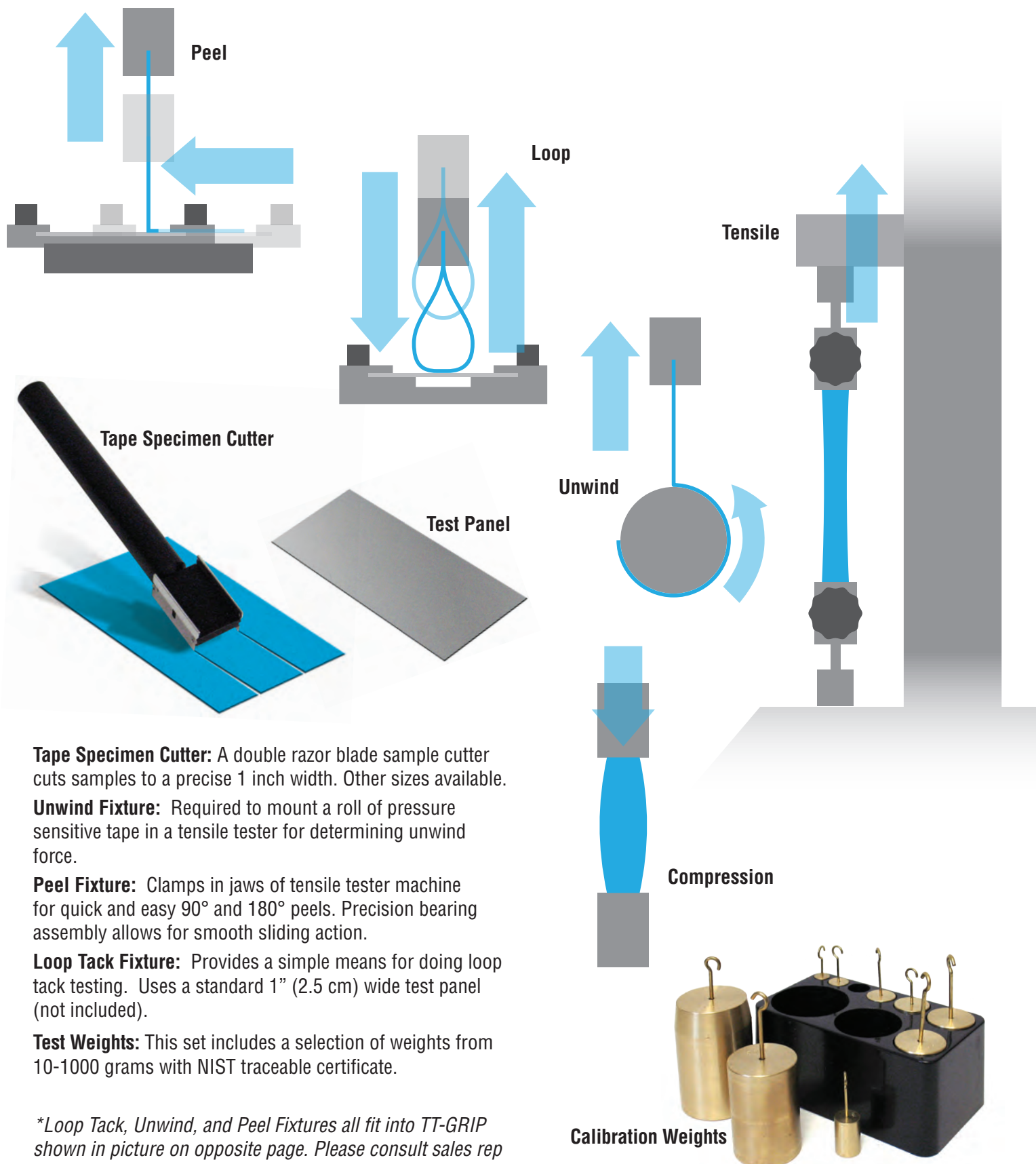
The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, digitally displays it and also stores that data in its memory.

- Records 400 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons



EZ Lab compatible
See Page 4-5





Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Unwind Fixture: Required to mount a roll of pressure sensitive tape in a tensile tester for determining unwind force.

Peel Fixture: Clamps in jaws of tensile tester machine for quick and easy 90° and 180° peels. Precision bearing assembly allows for smooth sliding action.

Loop Tack Fixture: Provides a simple means for doing loop tack testing. Uses a standard 1" (2.5 cm) wide test panel (not included).

Test Weights: This set includes a selection of weights from 10-1000 grams with NIST traceable certificate.

**Loop Tack, Unwind, and Peel Fixtures all fit into TT-GRIP shown in picture on opposite page. Please consult sales rep if using different grips.*

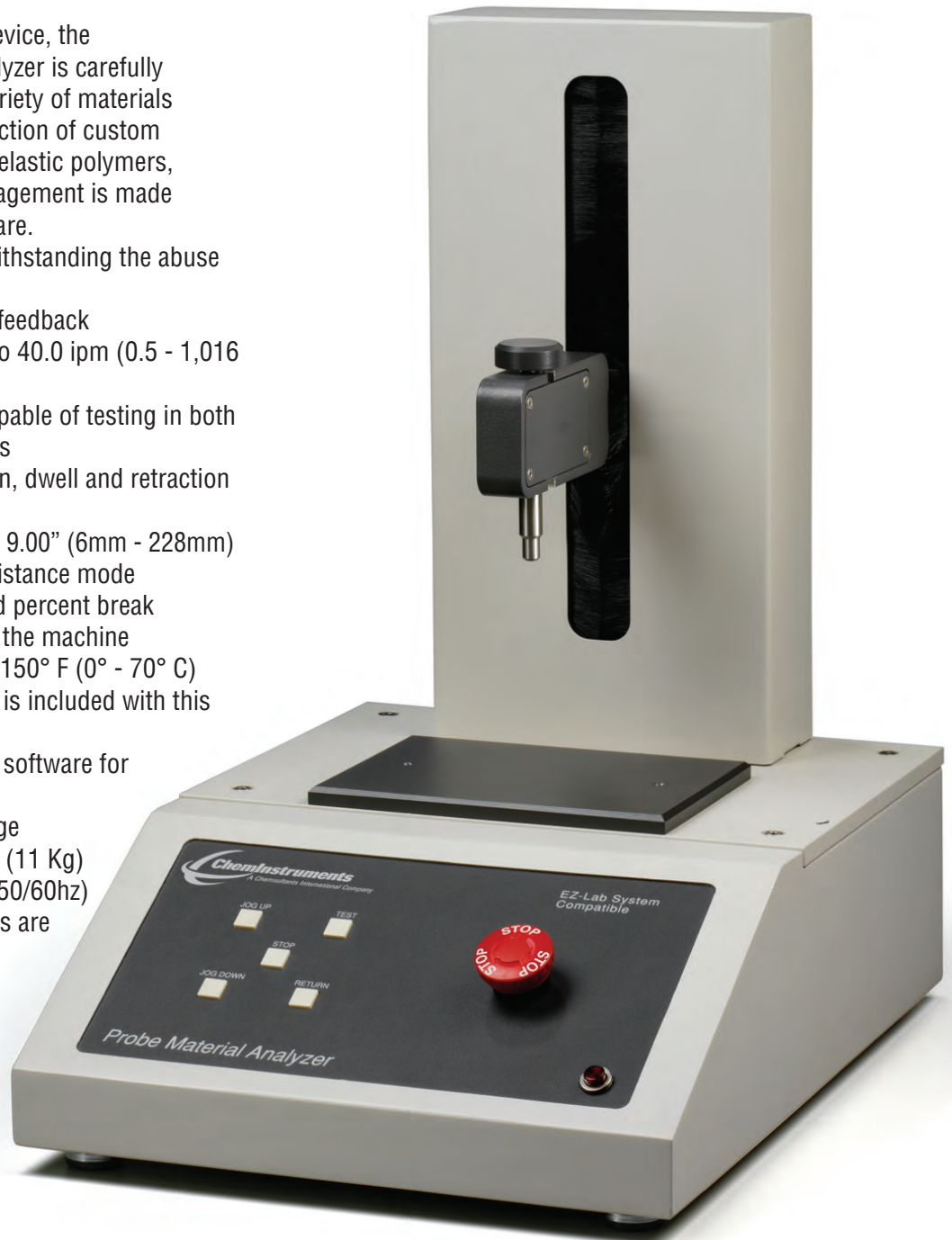
Probe Material Analyzer

A versatile and user-friendly testing device, the ChemInstruments Probe Material Analyzer is carefully designed so you can characterize a variety of materials through the insertion, dwell, and retraction of custom probes. Those materials include viscoelastic polymers, adhesives and compounds. Data management is made easier with the included EZ-Lab software.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speed range from 0.02 to 40.0 ipm (0.5 - 1,016 mmpm)
- Designed as a research tool and capable of testing in both compression and tension directions
- Programmable settings for insertion, dwell and retraction segments of a test
- Selectable test lengths from 0.25" to 9.00" (6mm - 228mm)
- Additional features include: force/distance mode selection, automatic test return and percent break
- 10 pound load cell is included with the machine
- Operating temperature range 32° - 150° F (0° - 70° C)
- EZ-Lab data management software is included with this machine
- Data can be downloaded to EZ-Lab software for complete data management
- Accurate to $\pm 0.1\%$ of load cell range
- Capable of pulling up to 25 pounds (11 Kg)
- Standard input voltage - 120 VAC (50/60hz)
- Fixture not included, several options are available



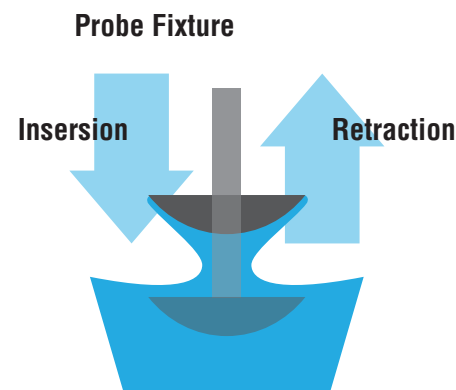
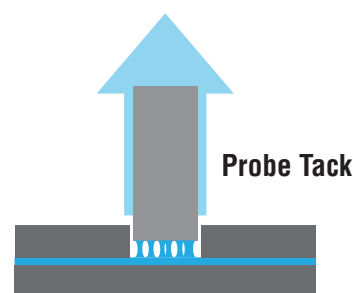
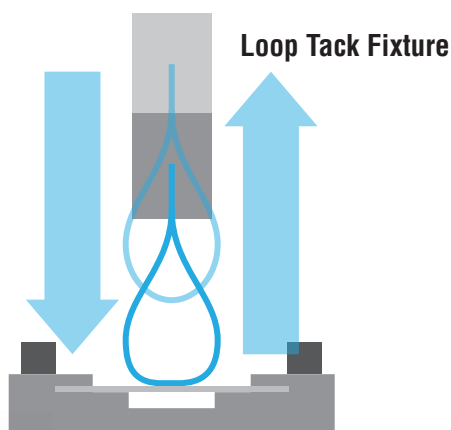
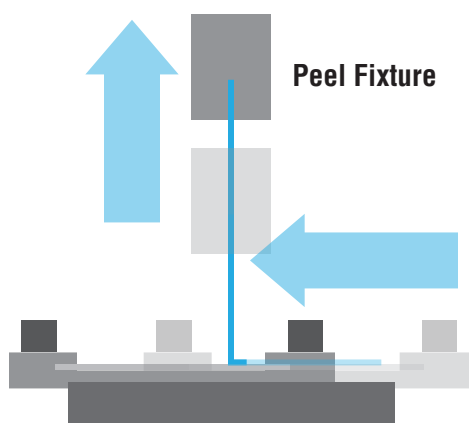
EZ Lab compatible
See Page 4-5



Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, stores that data in its memory and interfaces with EZ-Lab data management software to show the results graphically.

- Records 400 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons



Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Test Panel: Standard size for Loop Tack Tester. Items meet PSTC and ASTM specifications. Other sizes available.

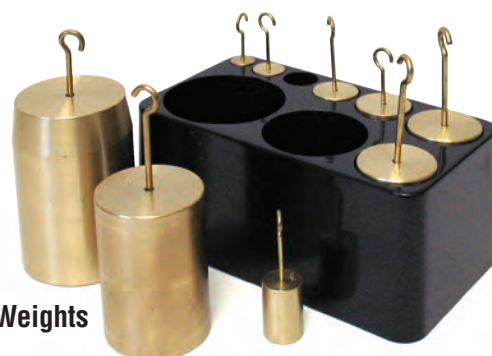
Probe Fixture: Provides the ability to perform probe tack test.

Cup Holder: Liquids, semi solids and other container held materials can be analyzed.

Peel Fixture: Precision bearing assembly allows for smooth 90° peel.

Loop Tack Fixture: Provides a simple means for doing loop tack testing. Uses a standard 1"(2.5cm) wide test panel (not included).

Test Weights: This set includes a selection of weights from 10-1000 grams with NIST traceable certificate.



Calibration Weights

Contact Angle Meter

Reliable surface energy measurement and a number of easy-to-use features make the ChemInstruments CAM-Plus Contact Angle Meter an ideal testing machine. A patented “half angle” measurement method eliminates the difficulties associated with tangent angle measurement methods. With simple, reliable and consistent functions, coating operations of all types can quickly determine surface energy measurements.

- Easy “half angle” determination
- Operator independent consistent measurements
- Dyne level readings from 10 to 70
- Simple finite liquid dispensing that employs delicate liquid placement (sessile drop)
- Bright, clear image on a large screen for display
- A remote light source keeps heat away from the sample
- Platform configurations for small samples, films, printed circuit boards (PCB), plastic ball grid array (PBGA), round samples (spherical and tubular)
- Standard input voltage - 120 VAC (50/60hz)

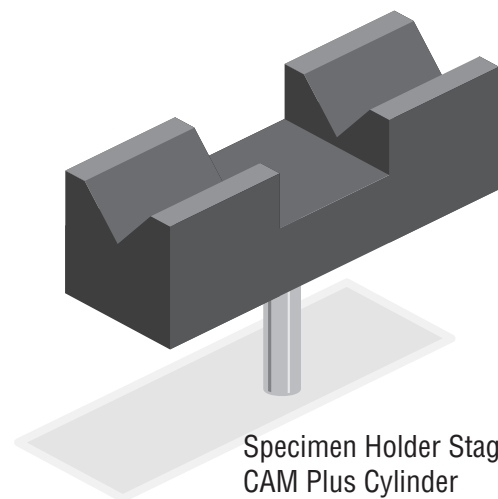


What is Surface Energy?

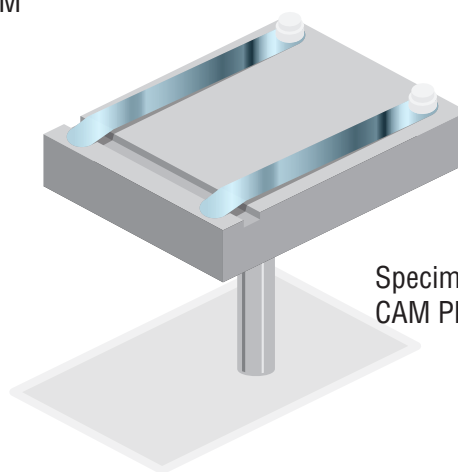
Surface energy is most evident in how a surface interacts with an applied liquid. Like color and texture, surface energy is a physical property. When paint is applied to a sheet of glass, it will typically “ball up” because it does not stick well to the surface. This is surface energy in action. Conversely, when liquid is applied to a different material and disperses, this is also surface energy.

Patented Measurement Method

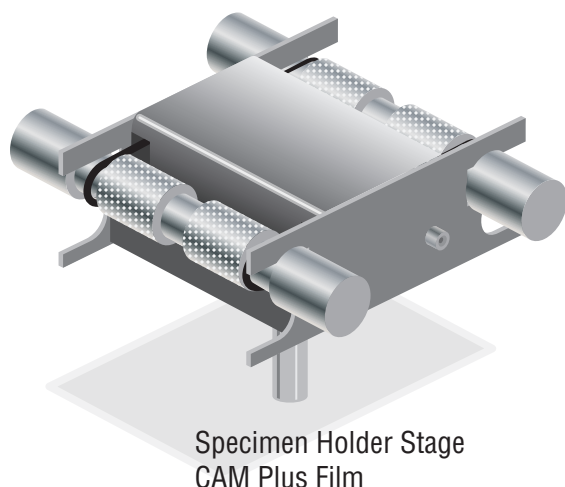
The CAM-Plus contact angle meter provides a patented method (“half angle”) for quantifying surface energy relative to other measurements on other surfaces. This information makes it possible for accurate prediction of a surface reaction to coatings, eliminating costly trial-and-error methods. CAM-Plus is designed for test methods ASTM D20.19, D724, D5946 and TAPPI T458 cm-94.



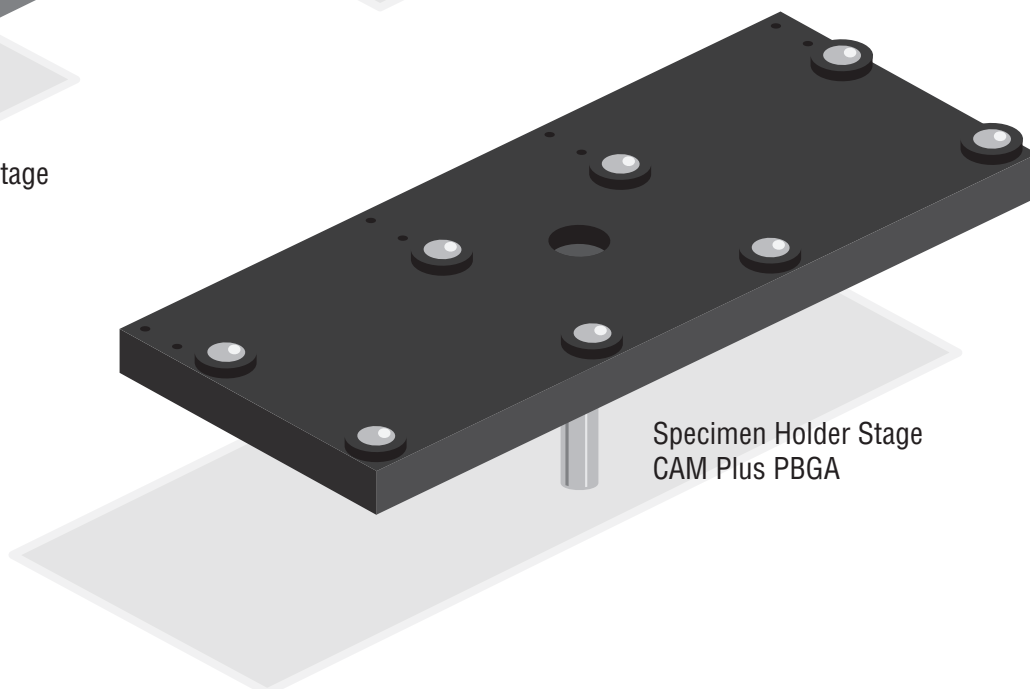
Specimen Holder Stage
CAM Plus Cylinder



Specimen Holder Stage
CAM Plus Micro



Specimen Holder Stage
CAM Plus Film



Specimen Holder Stage
CAM Plus PBGA

Burst / Perforation

BP-1000

Quickly and accurately measure the burst strength of die cut label stock with the Burst/Perforation testing machine. The burst strength tester meets the standards specified in TLMI Test L-1G for die cut burst ratio. The included EZ-Lab software makes data acquisition and data management easier and provides more powerful analysis capabilities.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speed range from 0.5 to 25.0 ipm (12 - 635 mmpm)
- Designed specifically to perform the TLMI L-1G test method for die cut burst ratio
- Selectable test lengths from 0.25" to 1.5" (6mm – 38mm)
- Additional features include: automatic test return, tension relief and percent break
- 50 pound load cell is included with the machine
- Operating temperature range 32° - 150° F (0° - 70° C)
- EZ-Lab data management software is included with this machine
- Data can be downloaded to EZ-Lab software for complete data management
- Accurate to $\pm 0.1\%$ of load cell range
- Capable of pulling up to 50 pounds (22 Kg)
- Standard input voltage - 120 VAC (50/60hz)

Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, stores that data in its memory and interfaces with EZ-Lab data management software to show the results graphically.

- Records 1,000 to 5,000 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons



EZ Lab compatible
See Page 4-5

Coefficient of Friction

COF-1000

Perform one-step testing for static and kinetic coefficient of friction values with the ChemInstruments Coefficient of Friction machine. This easy-to-setup and easy-to-use test platform provides automatically calculated results at the completion of each test. The Coefficient of Friction machine is designed to meet or exceed numerous coefficient of friction test methods, including ASTM D1894.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speeds of 6, 12 and 24 ipm (15, 30 and 60 cpm)
- Static and kinetic COF results displayed immediately upon test completion
- 5 pound (2.3kKg) load cell is included with the machine
- 2.5" (6cm) square, rubber covered, 200 gram sled is included with the machine
- Quick and easy setup and operation for reliable results
- Operating temperature range 32° - 150° F (0° - 70° C)
- Capable of stand-alone operation with integrated digital display
- Data can be downloaded to EZ-Lab software for complete data management
- Accurate to $\pm 0.1\%$ of load cell range
- Universal input voltage from 85 - 265 VAC (50/60hz)



Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, digitally displays it and also stores that data in its memory.

- Records 400 data points per second during a test interval
- Displays the average, high, low, first peak, static COF, and kinetic COF measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons

Micrometer

MI-1000

Ideal for any number of industries, the ChemInstruments Micrometer accurately measures the thickness of a variety of substrates. The standard unit meets or exceeds numerous test methods, including ASTM D645, D374, D3652, PSTC 133 and TLMI T-411. It can measure paper, tissue, corrugated paperboard, carton board, fiberboard, felt, film, foil, plastic and rubber.

This versatile micrometer unit features three modes of operation: single, continuous and batch. In the single test mode, the presser foot cycles with each press of the start button. In the continuous mode, the presser foot cycles continuously. In the batch mode, the micrometer can be set to run a series of measurements. The number of cycles can be set from one to 50 with a pause between each measurement. In all modes, the presser foot travels and pauses per ASTM D645 method.

- Rugged construction, capable of withstanding the abuse of the production environment
- Scale of measurement is 0-50 mils (0-0.050000" or 0-1.270mm)
- Switch from mils to millimeters with the push of a button
- Accurate to $\pm 0.1\%$ of full scale
- Three modes of operation: single, continuous, batch

- All test results can be exported to an optional printer
- Optional printer can print continuously measured test results or an individual test upon operator command
- The printer can also batch tests and give statistical information on a group of data
- Compact design with carrying handle allows for easy and safe transport
- Automatic calibration sequence built into the operating program
- NIST traceable 0.040" (1 mm) gauge block for calibration is included with the machine
- Simple one-touch operation with integrated digital display
- Operating temperature range 32° - 150° F (0° - 70° C)
- Standard input voltage - 120 VAC (50/60hz)



High Speed Unwind

HSU-1100

Accurately measure the unwind force of a roll of tape with the ChemInstruments High Speed Unwind Machine. The High Speed Unwind Machine meets the standards specified in ASTM D 1000 and AFERA 4008 for unwind force at a fast rate of removal. It will also test the unwind force of pressure sensitive tapes according to Test Methods PSTC-8 and PSTC-13.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control ensures a constant speed regardless of wind-up roll diameter
- Selectable speed range from 1 to 400 fpm (1 – 120 mpm)
- Accepts rolls up to 3" wide (75mm) x 12" OD (300mm) on standard 3" cores (75mm)
- Length counter incorporated into controller to record in either inches, feet, centimeters, or meters

- Operating temperature range 32° – 150° F (0° - 70° C)
- Capable of stand-alone operation with integrated LCD display
- Data can be downloaded to EZ-Lab software for complete data management
- Accurate to $\pm 0.1\%$ of load cell range
- Capable of pulling up to 10 pounds (4.5 Kg)
- Standard input voltage – 120 VAC (50/60hz)



Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, stores that data in its memory and interfaces with EZ-Lab data management software to show the results graphically.

- Records 400 data points per second during a test interval
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons

Temperature Control System

Now you can perform heated or cooled adhesion / release testing using the patented TC-1000, Temperature Control System. This compact portable device allows you to control the temperature of your sample in any environment. Simply attach the platen to your Adhesion / Release or Tensile Tester, insert your sample, and watch as your sample is brought to the desired temperature almost instantly.

- Holds standard stainless steel test panels
- Test samples up to 1.25" (3 cm) wide and 5.5" (14 cm) long
- Temperature range: -10°C to 80°C (14°F to 176°F)
- 4.2" (10.5 cm) touch screen monitor
- Water Tank: approximately 2.5 gallons (9.5 L)
 - distilled water only
- Circulating tubing length: approximately 5.5 feet (1.6 M)
- Test platen: 4" x 7" (10 cm x 18 cm)



Control Unit:

- Monitor: 4.2" (10.5 cm) HMI (PLC microprocessor)
- Temperature Control Mode: PID (pt-100)
- Peltier (TEC): 3 pieces, 12V/18A/ 216W

Water Circulation Unit:

- Cooling Fan: 12V/15W (3 pieces) = 45W
- Water Pump: 12V/10W
- Circulating Tubing: Silicone tube with insulated foam
 - inside diameter 9 mm
 - outside diameter 12 mm

Shown mounted to the AR-1000



Easily Mounts to:

- AR-1000
- PA-1000-180
- PA-1000-90
- TT-1100
- PMA-1000

Shown mounted to the TT-1100 & TT-PF-90



SUTHERLAND® Ink Rub Tester

SR-500

An affordable and proven abrasion testing instrument, the SUTHERLAND® Ink Rub tester has been the industry standard for decades. It is designed to evaluate the scuffing or rubbing resistance of the printed or coated surface of paper, paperboard, film and other materials. The SUTHERLAND® Ink Rub tester features a digital counter with a fiber optic sensor for accuracy and is compatible with the requirements of the ASTM D-5264 test method.

The SUTHERLAND® Ink Rub Tester performs five different tests: dry rub, wet rub, wet bleed or transfer, wet smear, and functional rub.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control
- Selectable speeds of 21, 42, 85 and 106 cycles per minute
- Programmable from 1 to 999 cycles
- Automatic shut off upon completion of a test
- Sample preparation fixture is included with the machine
- 2 lb. and 4 lb. test weights are included with the machine
- Operating temperature range 32° – 150° F (0° - 70° C)
- Standard input voltage – 120 VAC (50/60hz)



HarperScientific Precision Hand Proofer

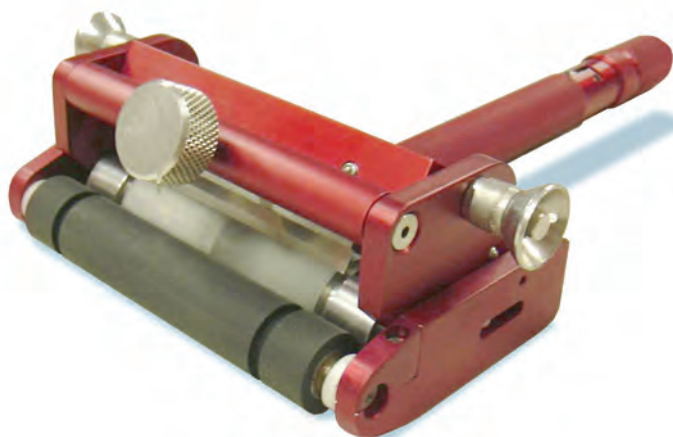
ChemInstruments is proud to provide the full line of HarperScientific Precision Hand Proofer for the printing industry. Hand proofers provide the ability to produce reliable, production-like coatings on a laboratory scale. All proofers use HarperScientific's Platinum® XLT™ laser-engraved Anilox rolls. With HarperScientific's doctor blade metering and rubber transfer roll, you can accurately match colors and produce precision coating samples in your lab.

Echocel Junior™ Hand Proofer

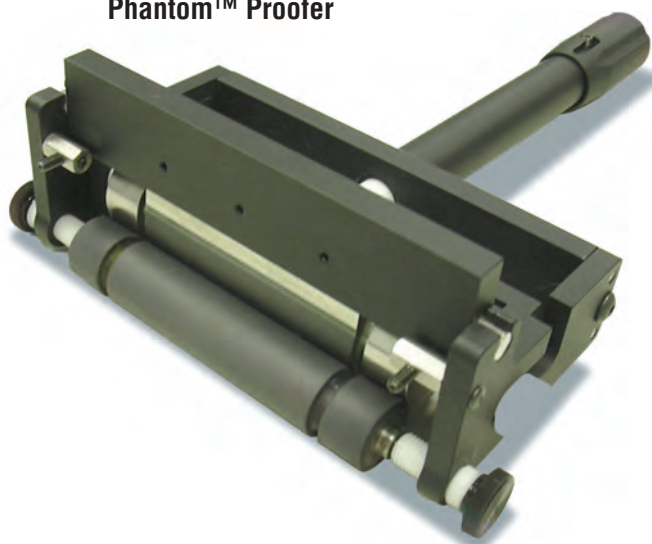
Echocel Junior™ Hand Proofer are flexographic proofing systems that incorporate Platinum XLT laser engraved ceramic Anilox technology, steel doctor blades and solvent resistant rubber rolls. These systems have been in the field for many years and have saved users millions of dollars. The Echocel Junior™ Hand Proofer come in two versions based on type and viscosity of intended use.

- **Traditional Junior Hand Proofer** – for water/solvent inks
- **Viscous Junior Hand Proofer** – for metallic/viscous inks

Echocel Junior™ Hand Proofer



Phantom™ Proofer



Phantom™ Hand Proofer

The Phantom™ Hand Proofer is the ultimate hand-held ink proofing tool and will help to increase press room efficiencies. Its simplicity and ease of assembly make it a critical tool in any QC laboratory to ensure accurate raw materials ready for printing or coating. The Phantom™ Hand Proofer is very light in weight. Its unique design is made with very few parts. This makes for ease of operation, cleaning, and changeover.

- Quick and accurate production of adhesive and ink coatings
- Simple doctor blade change over
- Quick and easy clean up
- Multiple coating thicknesses
- Platinum XLT laser-engraved Anilox rolls
- Solvent resistant rubber transfer roll
- Quick Anilox roll change
- Lightweight aluminum frame and construction

Motorized Drawdown Coaters

EC-100
EC-200

Motorized Drawdown Coaters are precision sample preparation machines. They are designed to provide both large and small laboratories with an affordable tool to make consistent, repeatable, coated samples. The lab coater features a coating bed that uses a sheet of float plate glass to provide consistent, smooth coatings. The simple bar loading slots and swing arm design makes easy use of the machine and cleanup a snap. Additionally, foam sheets are provided to accommodate various coating needs.

The Fixed Speed Wire Bar Drawdown Coater & Variable Speed Wire Bar Drawdown Coater provide machine-controlled preparation of laboratory samples for adhesive, coating, ink and sealant testing. Its simple operation and lack of adjustments makes it the perfect shop floor tool to create consistent samples as well as greatly reducing the "human" interface for improved repeatability.

Accessories

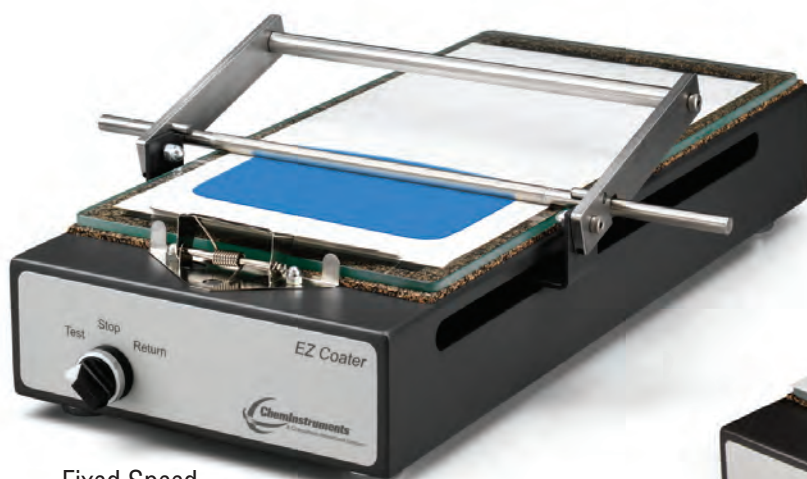
- Bird Style Coating Bar

Fixed Speed Drawdown Coater

- Rugged construction, capable of withstanding the abuse of the production environment
- Fixed speed of 47 ipm (119 cpm)
- Coating area is 8½" wide x 13½" long (22 cm x 34 cm)
- Coating load weight is 600 grams
- Rod size is 3/8" diameter x 12" long (0.9 cm x 30 cm) with 9" (23 cm) coating width
- Coating Rods not included, but a wide range of wire sizes are available
- Operating temperature range 32° - 150° F (0° - 70° C)
- Standard input voltage - 120 VAC (50/60hz)

Variable Speed Drawdown Coater

- Rugged construction, capable of withstanding the abuse of the production environment
- Selectable speed range from 15 to 450 ipm (38 - 1143 cpm)
- Coating area is 12" wide x 13½" long (30 cm x 34 cm)
- Coating load weight is 600 grams
- Rod size is 1/2" diameter x 16" long (1.3 cm x 41 cm) with 12½" (32 cm) coating width
- Coating Rods not included, but a wide range of wire sizes are available
- Operating temperature range 32° - 150° F (0° - 70° C)
- Universal input voltage from 85 - 265 VAC (50/60hz)

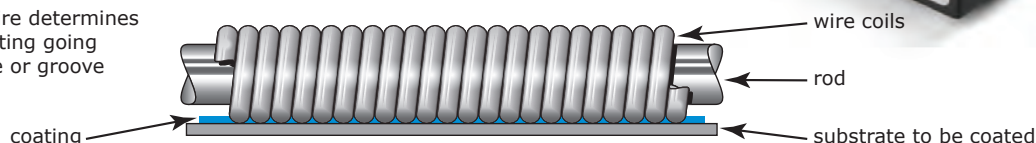


Fixed Speed
Drawdown Coater



Variable Speed
Drawdown Coater

Diameter of wire determines amount of coating going thru this space or groove



Wire Wound Rods

Rod Size Wire #	Wet Thickness		Grams Dry Per Square Meter Percent Solids				Pounds Dry Per 3000 Sq. Ft. Percent Solids			
	Mils	Microns	30%	40%	75%	100%	30%	40%	75%	100%
#2.5	.25	6.4	1.82	2.42	4.54	6.05	1.12	1.49	2.79	3.72
#3	.3	7.6	2.18	2.91	5.47	7.29	1.34	1.79	3.36	4.48
#4	.4	10.2	2.91	3.88	6.83	9.11	1.79	2.39	4.47	5.96
#5	.5	12.7	3.64	4.85	9.11	12.14	2.24	2.98	5.60	7.46
#6	.6	15.2	4.38	5.82	10.93	14.58	2.69	3.58	6.72	8.96
#7	.7	17.8	5.09	6.80	12.74	16.99	3.13	4.18	7.83	10.44
#8	.8	20.3	5.82	7.78	14.58	19.43	3.58	4.78	8.96	11.94
#9	.9	22.9	6.56	8.34	16.40	21.87	4.03	5.37	10.08	13.44
#10	1.0	25.4	7.28	9.71	18.21	24.28	4.48	5.97	11.19	14.92
#11	1.1	27.9	8.00	10.69	20.04	26.72	4.92	6.57	12.32	16.42
#12	1.2	30.5	8.74	11.65	21.87	29.16	5.37	7.16	13.44	17.92
#13	1.3	33.0	9.47	12.63	23.71	31.60	5.82	7.76	14.57	19.42
#14	1.4	35.6	10.20	13.60	25.51	34.00	6.27	8.36	15.68	20.90
#15	1.5	38.1	10.93	14.58	27.32	36.41	6.72	8.96	16.79	22.38
#16	1.6	40.6	11.65	15.54	29.14	38.85	7.16	9.55	17.91	23.88
#17	1.7	43.2	12.38	16.51	30.99	41.29	7.61	10.15	19.04	25.38
#18	1.8	45.7	13.11	17.49	32.78	43.70	8.06	10.75	20.15	26.86
#19	1.9	48.3	13.85	18.45	34.61	46.14	8.51	11.34	21.27	28.36
#20	2.0	50.8	14.58	19.43	36.41	48.55	8.96	11.94	22.38	29.84
#22	2.2	55.9	16.03	21.36	40.07	53.43	9.85	13.13	24.63	32.84
#24	2.4	61.0	17.49	23.31	43.72	58.28	10.75	14.33	26.87	35.82
#26	2.6	66.0	18.94	25.25	47.38	63.16	11.64	15.52	29.12	29.82
#28	2.8	71.1	20.40	27.20	51.04	68.04	12.54	16.72	31.37	41.82
#30	3.0	76.2	21.85	29.14	54.65	72.86	13.43	17.91	33.59	44.78
#32	3.2	81.3	23.31	31.09	58.28	77.72	14.33	19.11	35.82	47.76
#34	3.4	86.4	24.76	33.04	61.62	82.55	15.22	20.31	38.06	50.74
#36	3.6	91.4	26.23	34.96	65.55	87.40	16.12	21.49	40.29	53.72
#38	3.8	96.5	27.60	36.92	69.21	92.28	17.01	22.69	42.54	56.72
#40	4.0	101.6	29.14	38.85	72.86	97.13	17.91	23.88	44.78	59.70
#42	4.2	106.7	30.60	40.79	76.49	101.98	18.81	25.07	47.01	62.68
#44	4.4	111.8	32.07	42.74	80.15	106.86	19.71	26.27	49.26	65.68
#46	4.6	116.8	33.53	44.67	83.79	111.70	20.61	27.46	51.50	68.66
#48	4.8	121.9	34.96	46.62	87.42	116.56	21.49	28.66	53.73	71.64
#50	5.0	127.0	36.43	48.57	91.06	121.40	22.39	29.85	55.97	74.62
#52	5.2	132.1	37.88	50.50	94.72	126.29	23.28	31.04	58.22	77.62
#54	5.4	137.2	39.34	52.45	98.38	131.17	24.18	32.24	60.47	80.62
#56	5.6	142.2	40.79	54.39	102.00	135.98	25.07	33.43	62.69	83.58
#58	5.8	147.3	42.25	56.34	105.62	140.83	25.97	34.63	64.92	86.56
#60	6.0	152.4	43.70	58.28	109.29	145.71	26.86	35.82	67.17	89.56
#62	6.2	157.5	45.17	60.22	112.93	150.56	27.76	37.01	69.41	92.54
#64	6.4	162.6	46.63	62.16	116.56	155.41	28.66	38.21	71.64	95.52
#66	6.6	167.6	48.08	64.12	120.20	160.26	29.55	39.41	73.88	98.50
#68	6.8	172.7	49.54	66.07	123.86	165.86	30.45	40.61	76.13	101.50
#70	7.0	177.8	50.99	67.99	127.49	169.99	31.34	41.79	78.36	104.48
#72	7.2	182.9	52.45	69.93	131.14	174.84	32.24	42.98	80.60	107.46
#74	7.4	188.9	53.90	71.88	134.76	179.69	33.13	44.18	82.83	110.44
#76	7.6	193.0	55.37	73.82	138.43	184.57	34.03	45.37	85.08	113.44
#78	7.8	195.1	56.81	75.77	142.07	189.42	34.92	46.57	87.32	116.42
#80	8.0	203.2	58.28	77.71	145.73	194.30	35.82	47.76	89.57	119.42
#82	8.2	208.3	59.74	79.66	149.34	199.11	36.72	48.96	91.79	122.38
#84	8.4	213.4	61.19	81.59	153.00	203.99	37.61	50.15	94.04	125.38
#86	8.6	218.4	62.66	83.53	156.63	208.84	38.51	51.34	96.27	128.36
#88	8.8	223.5	64.12	85.48	160.28	213.69	39.41	52.54	98.51	131.34
#90	9.0	228.6	65.58	87.42	163.90	218.53	40.31	53.73	100.74	134.32

Percent Solids = 100 x Dry Coating Weight (or Volume)/Wet Coating Weight (or Volume)

*8lb/gallon coating weights assumed

All coating amounts are theoretical. Actual amounts may vary depending upon characteristics and rheology of the coatings

Laboratory Drawdown Coater

For the quick and easy application of emulsion and solvent coatings, the Laboratory Drawdown Coater creates consistently coated samples from roll stock. The heart of this coater is its two precision ground, 303 stainless steel rolls, which provide for a precise knife-over-roll coating method. The Laboratory Drawdown Coater simplifies producing an accurate coating on longer webs for product development or QC applications. Paired up with our Benchtop Laboratory Laminator, this coater is the starting point to creating high quality label samples.

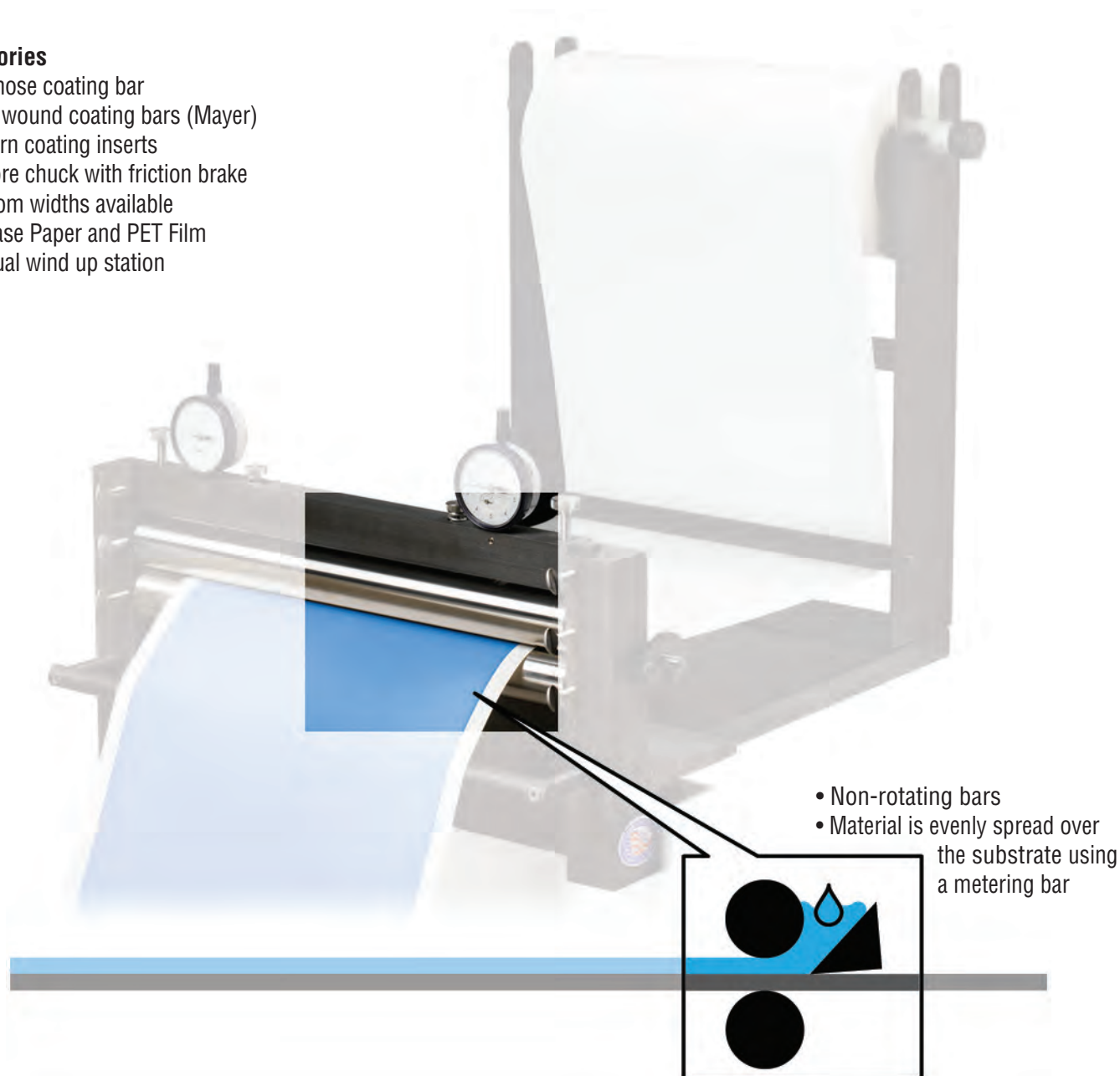
- Quickly disassembles with a minimum of parts for easy cleaning
- Constant angle bar allows for a consistent drawdown angle
- Unwind stand is capable of holding roll stock up to 12" (30 cm) diameter by 12" wide (30 cm)
- Steel base plate firmly supports the coating head and unwind stand
- Adjustable nylon side dams allow for coating control from ½" to 12" in width

- Rugged construction, capable of withstanding the abuse of the production environment
- Aluminum frame, hard coat anodized and Teflon coated
- Precision ground, 303 stainless steel coating bars for highly accurate cross web coating
- Dial indicators for fast, accurate and reproducible gap settings
- Set the gap range from 0.0001" to 0.0500" (0.1 – 50.0 mils, 0.025 – 1.270 mm)
- Adhesive reservoir capacity up to 125 grams
- Coating range capable of producing samples under 1 mil thick
- Produce samples of 12" (30 cm) in width



Accessories

- Bull nose coating bar
- Wire wound coating bars (Mayer)
- Pattern coating inserts
- 3" core chuck with friction brake
- Custom widths available
- Release Paper and PET Film
- Manual wind up station



Release Paper: 6" (15cm) wide by 500 yards (480m) long and 12" (30cm) wide by 500 yards (480m) long.



Film: 1 mil by 12" (30cm) wide by 1600 yards (1500m) long and 2 mil by 12" (30cm) wide by 800 yards (750m) long.

Hot Melt Coater

For the quick and easy application of elevated-temperature or hot melt coatings, the Hot Melt Laboratory Drawdown Coater creates consistently coated samples from roll stock. The heart of this coater is its two precision ground, 303 stainless steel rolls, which provide for a precise knife-over-roll coating method. The Hot Melt Laboratory Drawdown Coater simplifies producing an accurate hot melt coating on longer webs for product development or QC applications. Paired up with our Benchtop Laboratory Laminator, this coater is the starting point to creating high quality hot melt label samples.

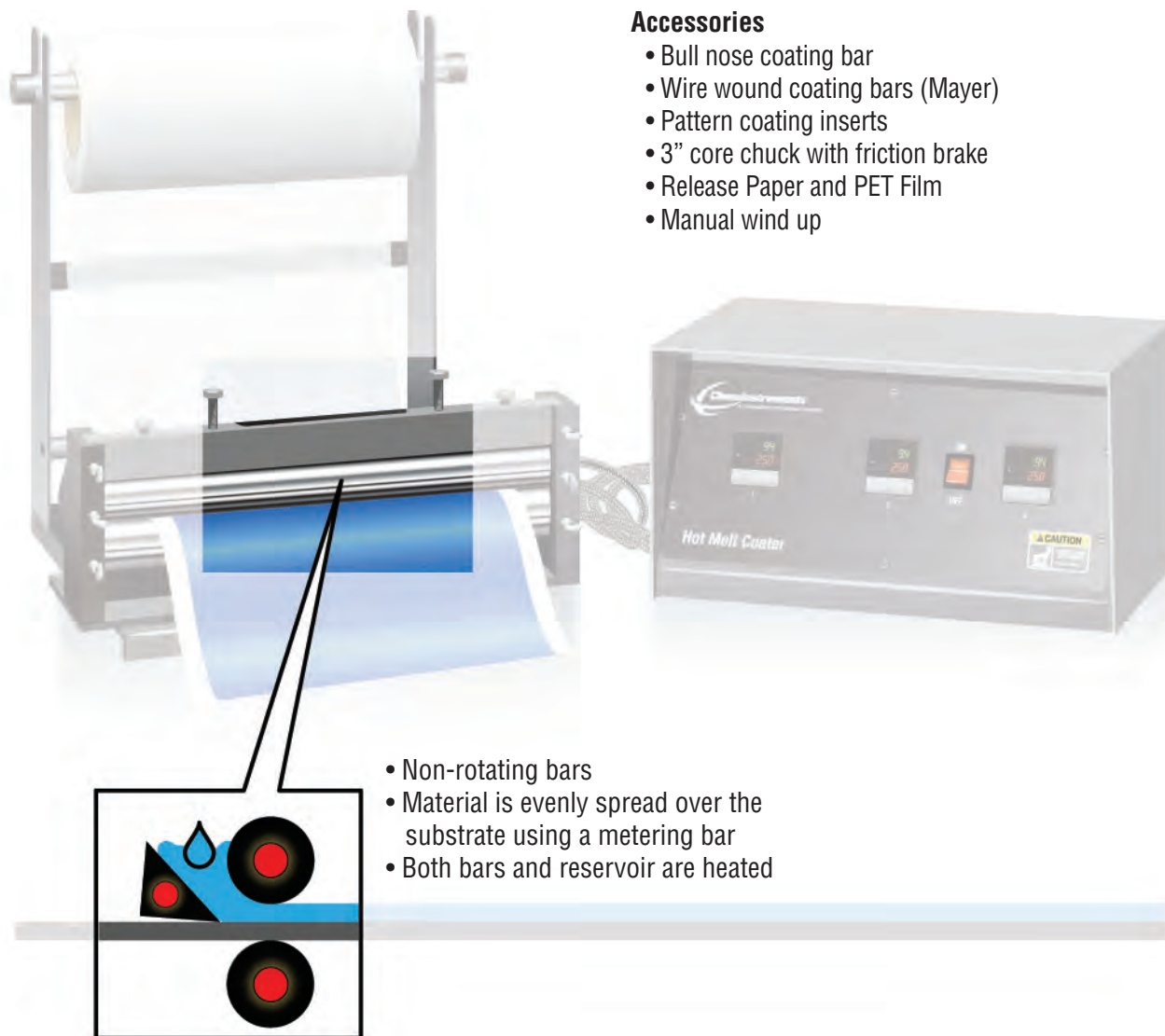
- Rugged construction, capable of withstanding the abuse of the production environment
- Aluminum frame, hard coat anodized and Teflon coated
- Precision ground, 303 stainless steel coating bars for highly accurate cross web coating
- Set the gap quickly with two feeler gauge sets, included with the machine

- Adhesive reservoir capacity up to 125 grams
- Reservoir is capable of maintaining temperatures up to 400°F (204°C)
- Coating range capable of producing 25 gsm to 1,500 gsm samples
- Produce samples of 12" (30 cm) width
- 500-watt heating rods provide heating capacity to the reservoir and two coating bars
- J-type thermocouple is an integral part of each heating rod
- Reservoir and coating bar temperatures are accurately maintained by individual digital PID controllers
- Temperature controllers, and electronics are housed in a separate steel enclosure
- Heating elements connect to the control box with individual 36" (1 m) stainless steel armored cables
- Controllers are capable of maintaining temperatures to a tolerance of +/- 2°F (1°C)
- Quickly disassembles with a minimum of parts for easy cleaning
- Unwind stand is capable of holding roll stock up to 12" (30 cm) diameter by 12" wide (30 cm)
- Steel base plate firmly supports the coating head and unwind stand
- Adjustable Teflon side dams allow for coating control up to 12" in width
- Standard input voltage - 120 VAC (50/60hz)



Accessories

- Bull nose coating bar
- Wire wound coating bars (Mayer)
- Pattern coating inserts
- 3" core chuck with friction brake
- Release Paper and PET Film
- Manual wind up



- Non-rotating bars
- Material is evenly spread over the substrate using a metering bar
- Both bars and reservoir are heated



Release Paper: 6" (15cm) wide by 500 yards (480m) long and 12" (30cm) wide by 500 yards (480m) long.

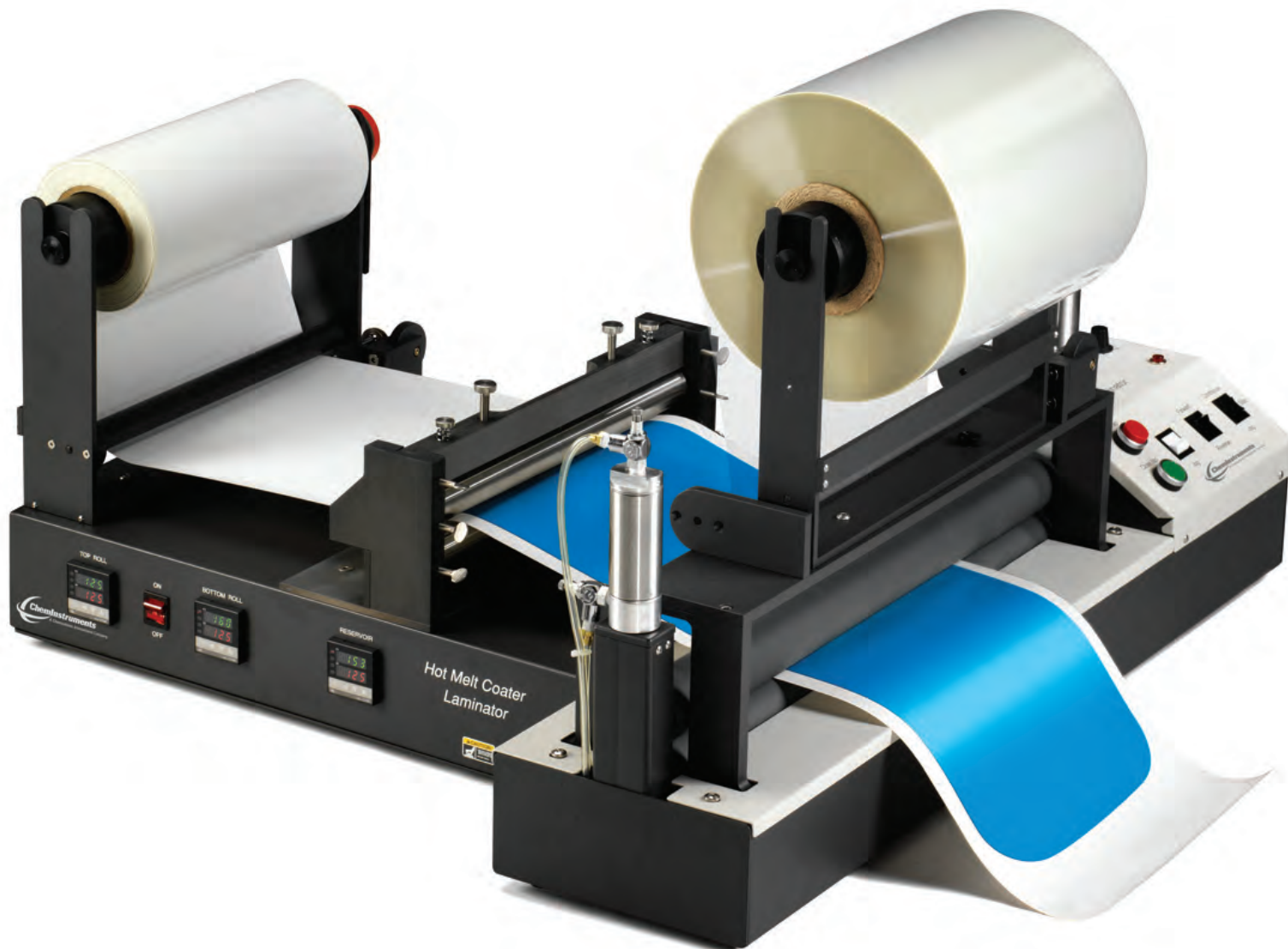


Film: 1 mil by 12" (30cm) wide by 1600 yards (1500m) long and 2 mil by 12" (30cm) wide by 800 yards (750m) long.

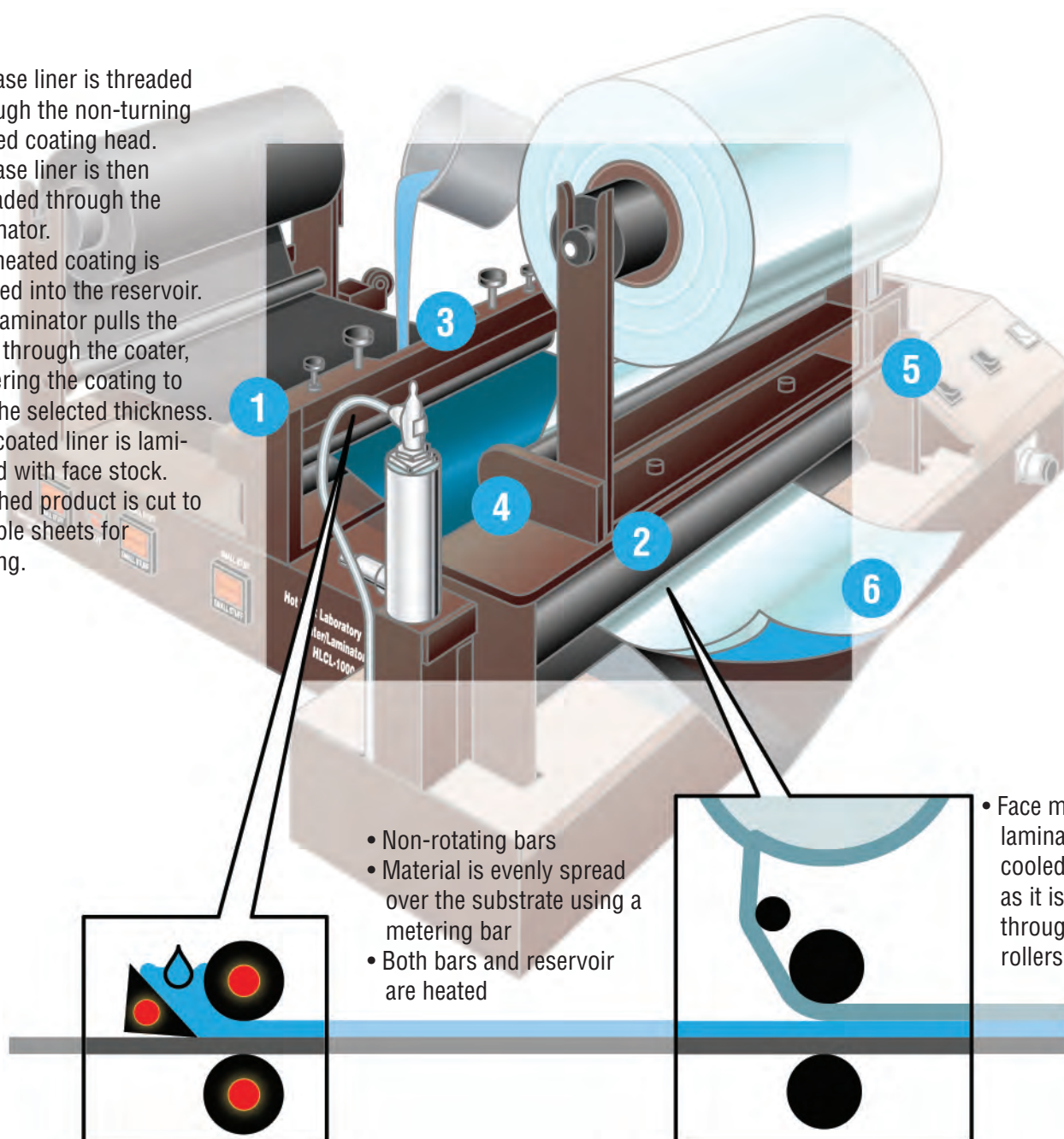
Hot Melt Coater/Laminator

The precision laboratory benchtop Hot Melt Coater/Laminator is capable of producing coated samples of hot melt adhesives, and then laminating to a variety of foils, films, papers, and other web based material. Lab scale simulations of production processes can be easily set up and studied. The Hot Melt Coater/Laminator is designed to consistently coat hot melt formulations with the following features:

- Self contained brake unwinds for adhesive carrier and facstock
- Requires a 110V/20A circuit and compressed air source
- Pivot control on adhesive carrier and facstock to control web alignment
- Laminating speed and pressure are controllable
- Coater reservoir capacity up to 125 grams
- Maximum operating temperature 400° F (204° C)
- Clean up is easily accomplished through quick, uncomplicated disassembly
- Generates sample laminates as long as needed
- Precision ground coating bars
- Both coating bars and the back reservoir are heated independently
- Width of coating can be controlled by teflon insert side dams
- Durable aluminum and steel construction means a long machine life with consistent performance
- Variable speed controller can be adjusted to laminate up to 7.5 fpm (2.25 mpm)



- 1 Release liner is threaded through the non-turning heated coating head.
- 2 Release liner is then threaded through the laminator.
- 3 Pre-heated coating is poured into the reservoir.
- 4 The laminator pulls the liner through the coater, metering the coating to the selected thickness.
- 5 The coated liner is laminated with face stock.
- 6 Finished product is cut to sample sheets for testing.



Release Paper: 6" (15cm) wide by 500 yards (480m) long and 12" (30cm) wide by 500 yards (480m) long.



Film: 1 mil by 12" (30cm) wide by 1600 yards (1500m) long and 2 mil by 12" (30cm) wide by 800 yards (750m) long.

Benchtop Laboratory Laminator

Compact and simple to operate, the Benchtop Laboratory Laminator is durable enough for laboratory or production use. The Benchtop Laboratory Laminator can consistently reproduce laminated samples ready for testing day after day. The simple controls allow for quick work and can accommodate a wide range of materials to be laminated including papers, films, foils, and many other materials. This laminating system is very versatile and is one of a handful of devices that are a must for any development or QC laboratory.

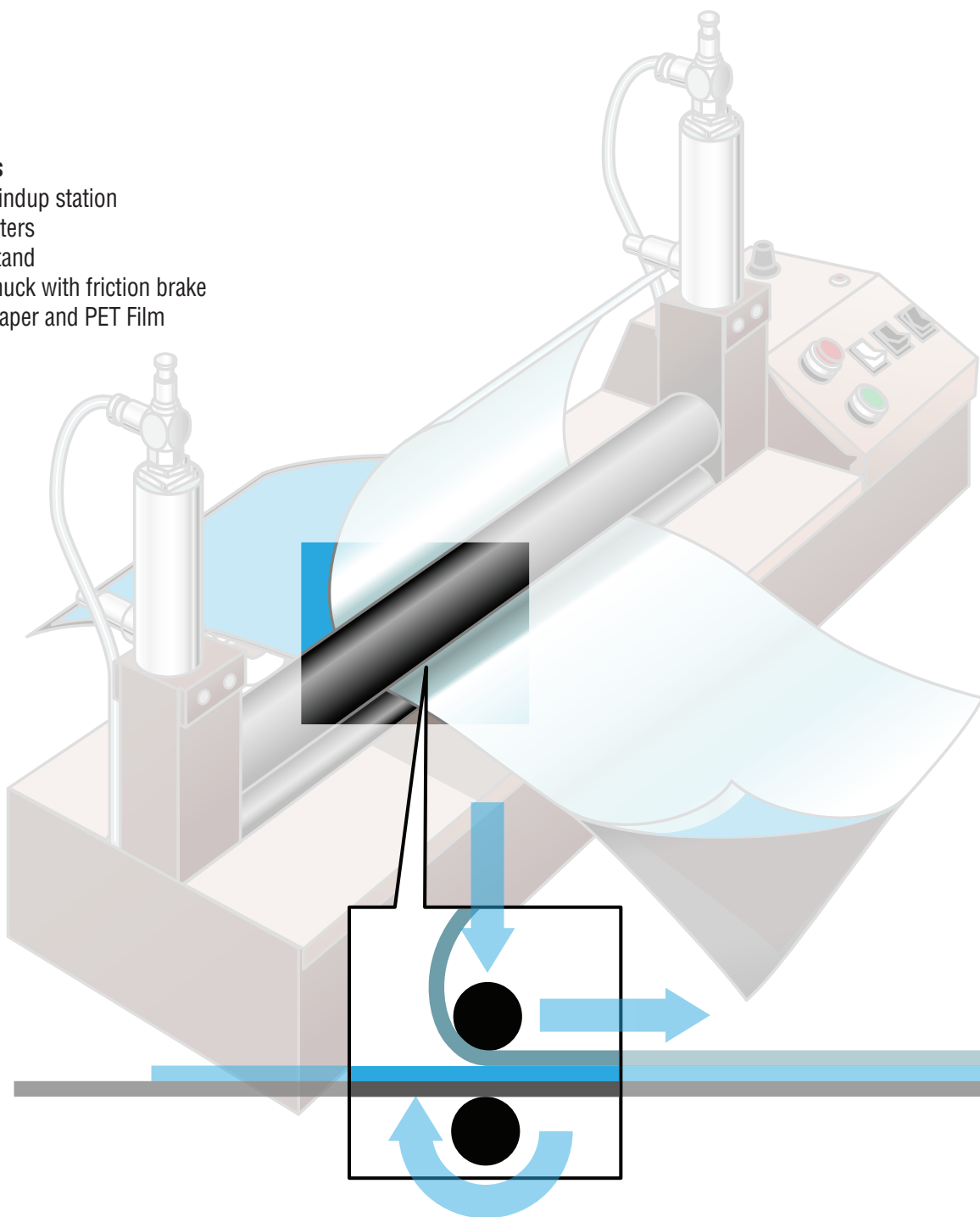
- Rugged construction, capable of withstanding the abuse of the production environment
- Produce laminated samples of unlimited length up to 23" (58 cm) in width

- Variable speed motor allows laminating speeds from 0.5 to 15.0 fpm (0.15 - 4.50 mpm)
- Modes of operation, simply selected from the front panel: forward, reverse, continuous, jog
- Top and bottom rolls are 2" (5 cm) diameter by 24" (61 cm) face width
- Top and bottom rolls have a steel core and are covered with 80 durometer silicone rubber
- Bottom roll is driven, top roll idles
- Requires compressed air - max pressure 90 PSI (6 bar)
- Air pressure is adjustable for differing levels of laminating pressure
- Laminating pressure (LP) can be approximated using the following formula:
 - $LP = (3.4 \times \text{line pressure}) / \text{sample width}$
- Flow controls are included on both laminator cylinders to allow for smooth, safe operation
- Safety features include appropriate guarding and an emergency stop switch
- Standard input voltage - 120 VAC (50/60hz)



Accessories

- Manual windup station
- Gap adjusters
- Unwind stand
- 3" core chuck with friction brake
- Release Paper and PET Film



Release Paper: 6" (15cm) wide by 500 yards (480m) long and 12" (30cm) wide by 500 yards (480m) long.



Film: 1 mil by 12" (30cm) wide by 1600 yards (1500m) long and 2 mil by 12" (30cm) wide by 800 yards (750m) long.

Hot Roll Laminator

Compact enough for a laboratory bench top, but durable enough for production, the Hot Roll Laminator can consistently reproduce hot laminate product samples that are ready for testing or small-scale production. With flexible controls, the Hot Roll Laminator allows for a wide range of materials to be laminated including papers, films, foils, and many other materials. The heated laminating system is designed to be very versatile and can be modified for a multitude of variations.

- Rugged construction, capable of withstanding the abuse of the production environment
- Produce laminated samples to 18" (45 cm) in width
- Variable speed motor allows laminating speeds from 0.5 to 20.0 fpm (0.15 - 6.00 mpm)
- Top and bottom rolls are 4" (10 cm) diameter by 18½" (47 cm) face width
- Top roll is heated by a 1500-watt heating rod inserted through the full width of the roll axis
- Capable of maintaining temperatures up to 400°F (204°C)
- J-type thermocouple is an integral part of the heating rod
- Heating rod designed with a 35-30-35 heating profile to more evenly distribute heat across width
- Roll temperature is accurately maintained by a digital PID

controller

- Controller is capable of maintaining temperatures to a tolerance of +/- 2°F (1°C)
- Choose top roll material from:
 - Aluminum – hard coat anodized with Teflon coating
 - Steel – chrome plated and precision ground to 8 RMS
- Bottom roll material is aluminum and covered with 80 durometer silicone rubber
- Bottom roll is driven, top roll idles
- Requires compressed air – max pressure 90 PSI (6 bar)
- Air pressure is adjustable for differing levels of laminating pressure
- Laminating pressure (LP) can be approximated using the following formula:
 - $LP = (6.28 \times \text{line pressure}) / \text{sample width}$
- Flow controls are included on both laminator cylinders to allow for smooth, safe operation
- Safety features include trip wire, appropriate guarding and an emergency stop switch
- Unwind stand is capable of holding roll stock up to 12" (30 cm) diameter by 18" wide (45 cm)
- Standard input voltage – 120 VAC (50/60hz)

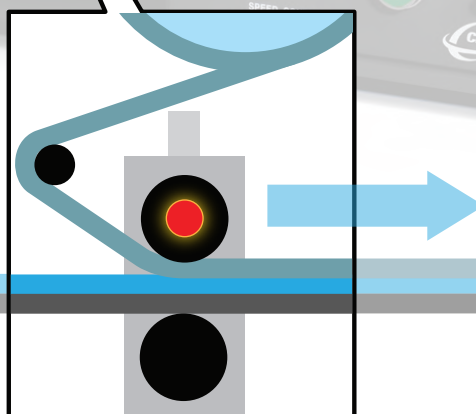




Accessories

- Gap adjustment
- 3" core chuck with friction brake
- Dual unwind
- Manual windup station
- Release Paper and PET Film

• Top roll is heated



Release Paper: 6" (15cm) wide by 500 yards (480m) long and 12" (30cm) wide by 500 yards (480m) long.



Film: 1 mil by 12" (30cm) wide by 1600 yards (1500m) long and 2 mil by 12" (30cm) wide by 800 yards (750m) long.

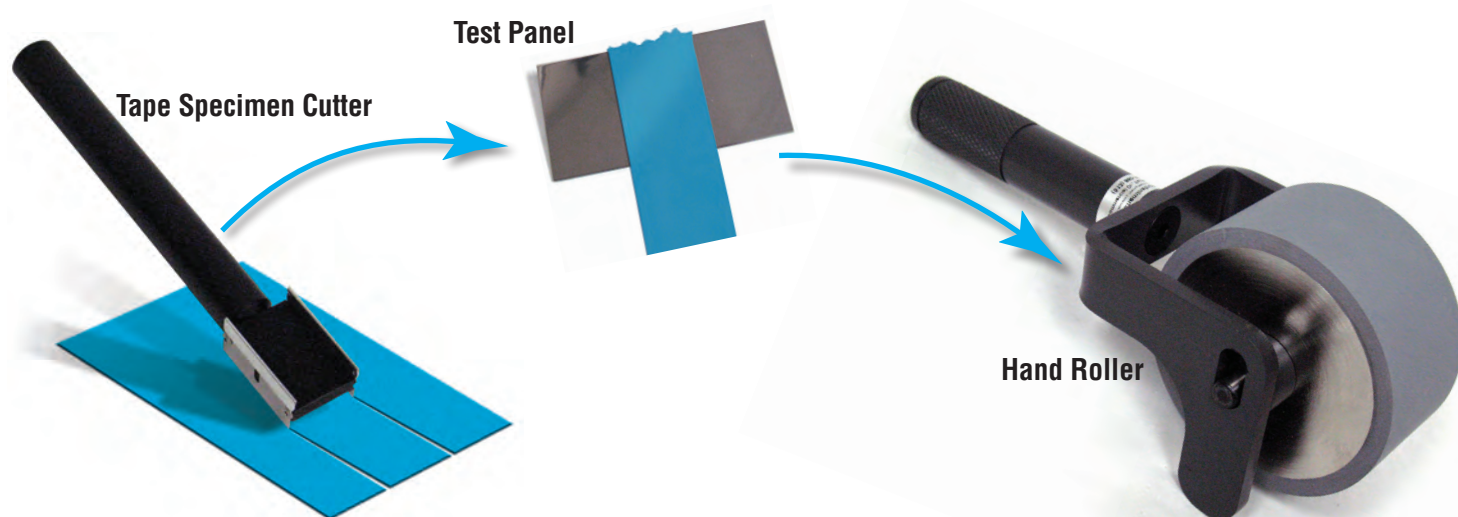
Dynamic Shear

Quickly measure shear resistance by force rather than time and get a clearer understanding of your adhesive's chemistry. Dynamic shear testing offers a faster, more accurate representation of an adhesive's ability to resist polymer disentanglement. Using the ChemInstruments Dynamic Shear, you can graph the actual holding power with one simple test instead of running multiple hang tests and plotting their statistical time-to-fail. The time to collect the data and the integrity of that collected data is considerably better using this device as compared to typical shear testing methods. The Dynamic Shear meets the standards specified in ASTM and FINAT test methods. The included EZ Lab software makes data acquisition and data management easier and provides more powerful analysis capabilities.

- Rugged construction, capable of withstanding the abuse of the production environment
- Digital speed control with encoder feedback
- Selectable speed range from 0.05 to 2 ipm (2 - 50 mm/min)
- Selectable test lengths from 0.25" to 1.5" (6mm - 38mm)
- Additional features include: automatic test return, tension relief, and percent break
- 100 pound load cell is included with the machine
- Operating temperature range 32° - 150° F (0° - 70° C)
- EZ-Lab data management software is included with this machine for complete data management
- Accurate to $\pm 0.1\%$ of load cell range
- Capable of pulling up to 100 pounds (45 Kg)
- Standard input voltage - 120 VAC (50/60hz)



EZ Lab compatible
See Page 4-5



Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Test Panels: Standard size for all ChemInstruments Shear Testers. Items meet PSTC and ASTM specifications.

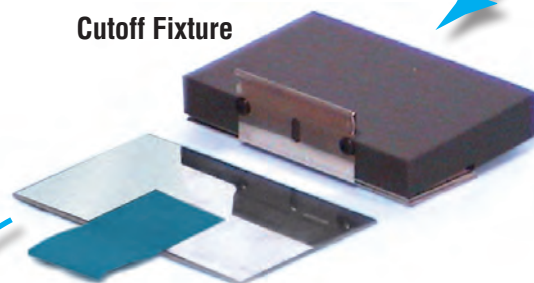
Hand Roller: Used to laminate samples to test panels.

Cutoff Fixture: Used to quickly and consistently create 1" x 1" sample for testing. Other sizes available.

Data Acquisition System

The ChemInstruments electronic data acquisition system is a state-of-the-art microprocessor controlled force measurement package that combines accuracy with ease of use. This system simultaneously controls test motion, reads the force of a test from a load cell, stores that data in its memory and interfaces with EZ-Lab data management software to show the results graphically.

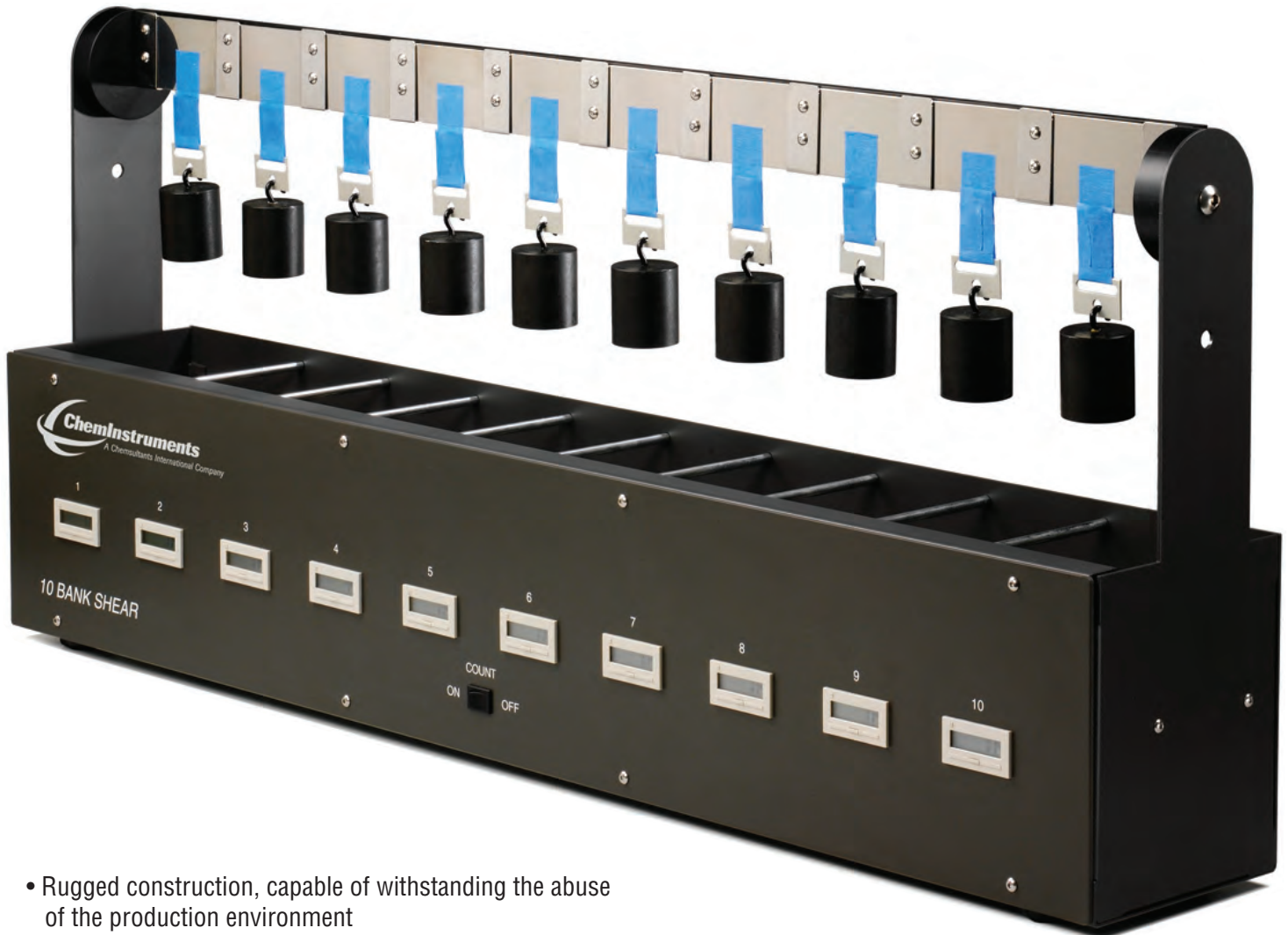
- Records 400 data points per second during a test interval based on selected test speed
- Displays the average, high and low measured force results immediately upon completion of a test
- Data saved through EZ-Lab Software
- Displays test values in grams, kilograms, ounces, pounds or Newtons



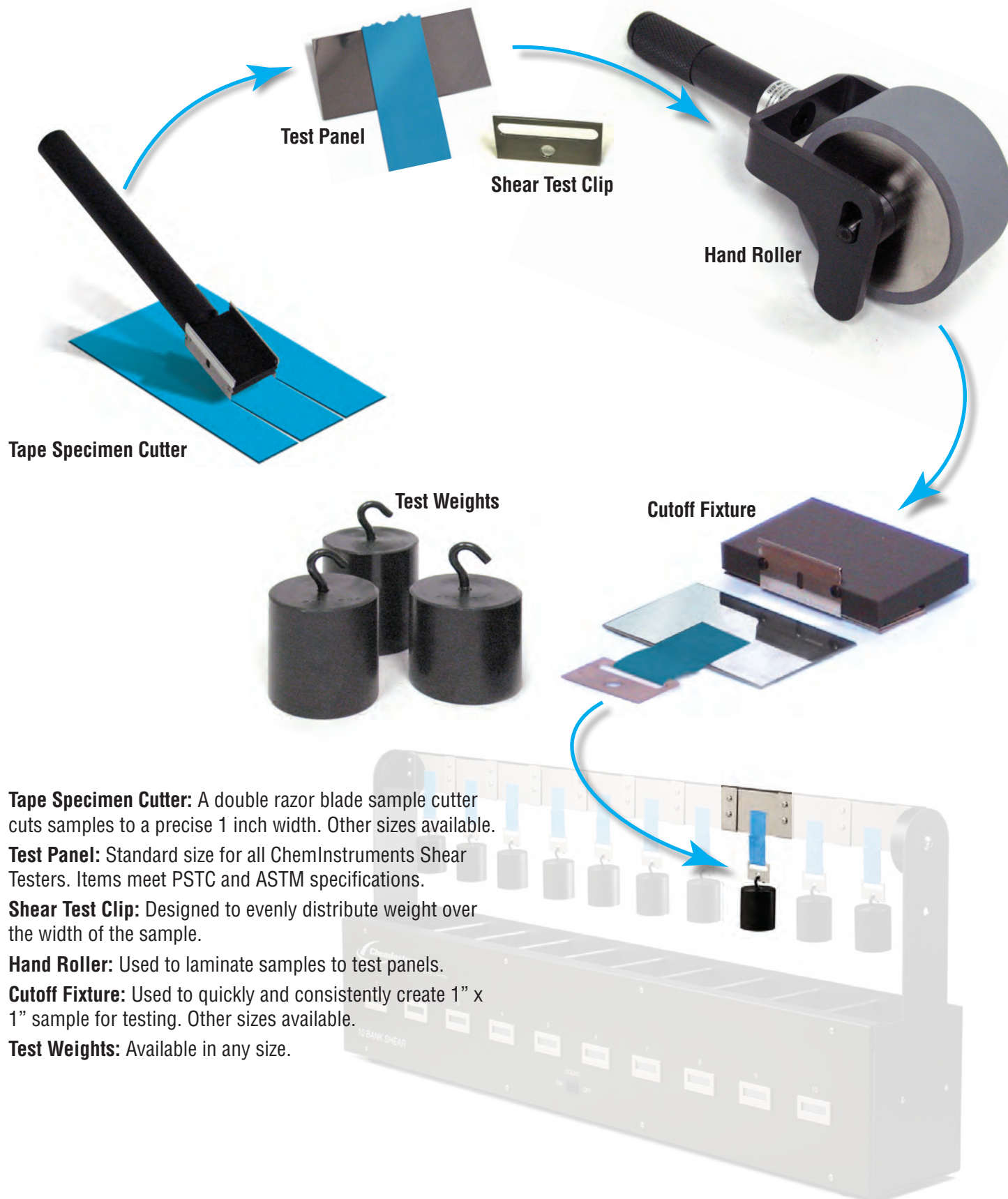
Room Temperature 10 Bank Shear

Precise room temperature shear tests are made easier with the ChemInstruments Room Temperature 10 Bank Shear Tester. It performs shear tests according to PSTC-7 Procedure A, TLMI Test No. 7, and ASTM D 3654, Procedure A for holding power of pressure sensitive tapes. It can also

be used for PSTC-14, adhesion of pressure sensitive tape to fiberboard at 90° angle and constant stress, and PSTC-7 Procedure B.



- Rugged construction, capable of withstanding the abuse of the production environment
- Compact and easy to use
- Easy-to-read, 0.5" (1cm) LCD timer display is set to time in increments of 1/10 of a minute
- Designed to use standard 2" x 3" (50mm x 75mm) format test panels
- Capable of holding panels of various thicknesses, up to 1/4" (6mm)
- Mechanical switches can be calibrated to trip when using weights as low as 100 grams
- Adjustable feet allow the user to level the testing plane
- Panel rack is marked for the standard 178° back tilt, as specified by most shear test methods
- Adjustable angle panel rack allows the user to easily change the test angle from 178° to 90°
- Foam covered weight landing platforms absorb the impact of falling test weights
- Fully battery powered, batteries on individual timers are replaceable, no AC power necessary
- Operating temperature range 32° - 150° F (0° - 70° C)



Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Test Panel: Standard size for all ChemInstruments Shear Testers. Items meet PSTC and ASTM specifications.

Shear Test Clip: Designed to evenly distribute weight over the width of the sample.

Hand Roller: Used to laminate samples to test panels.

Cutoff Fixture: Used to quickly and consistently create 1" x 1" sample for testing. Other sizes available.

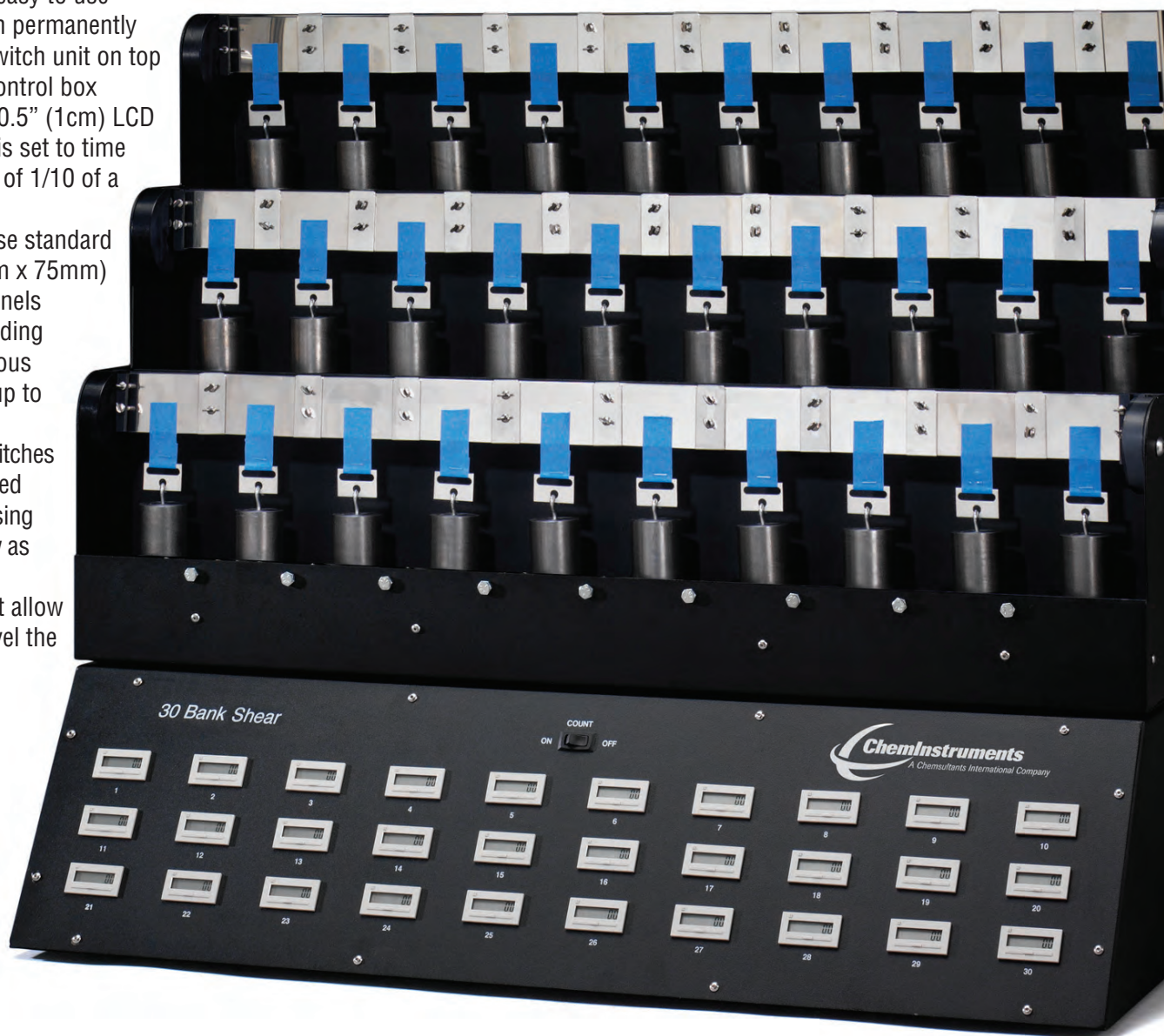
Test Weights: Available in any size.

Room Temperature 30 Bank Shear

For performing room temperature shear tests according to a number of procedures, the ChemInstruments Room Temperature 30 Bank Shear Tester is an ideal solution. It performs shear tests according to PSTC-7 Procedure A, TLM Test No. 7, and ASTM D 3654, Procedure A for holding power of pressure sensitive tapes. It can also be used for PSTC-14, adhesion of pressure sensitive tape to fiberboard at 90° angle and constant stress.

- Rugged construction, capable of withstanding the abuse of the production environment
- Compact and easy to use
- Integral design permanently mounts the switch unit on top of the timer control box
- Easy-to-read, 0.5" (1cm) LCD timer display is set to time in increments of 1/10 of a minute
- Designed to use standard 2" x 3" (50mm x 75mm) format test panels
- Capable of holding panels of various thicknesses, up to 1/4" (6mm)
- Mechanical switches can be calibrated to trip when using weights as low as 100 grams
- Adjustable feet allow the user to level the testing plane

- Panel rack is marked for the standard 178° back tilt, as specified by most shear test methods
- Adjustable angle panel rack allows the user to easily change the test angle from 178° to 90°
- Foam covered weight landing platforms absorb the impact of falling test weights
- Fully battery powered, batteries on individual timers are replaceable, no AC power necessary
- Operating temperature range 32° - 150° F (0° - 70° C)





High Temperature 8 Bank Shear

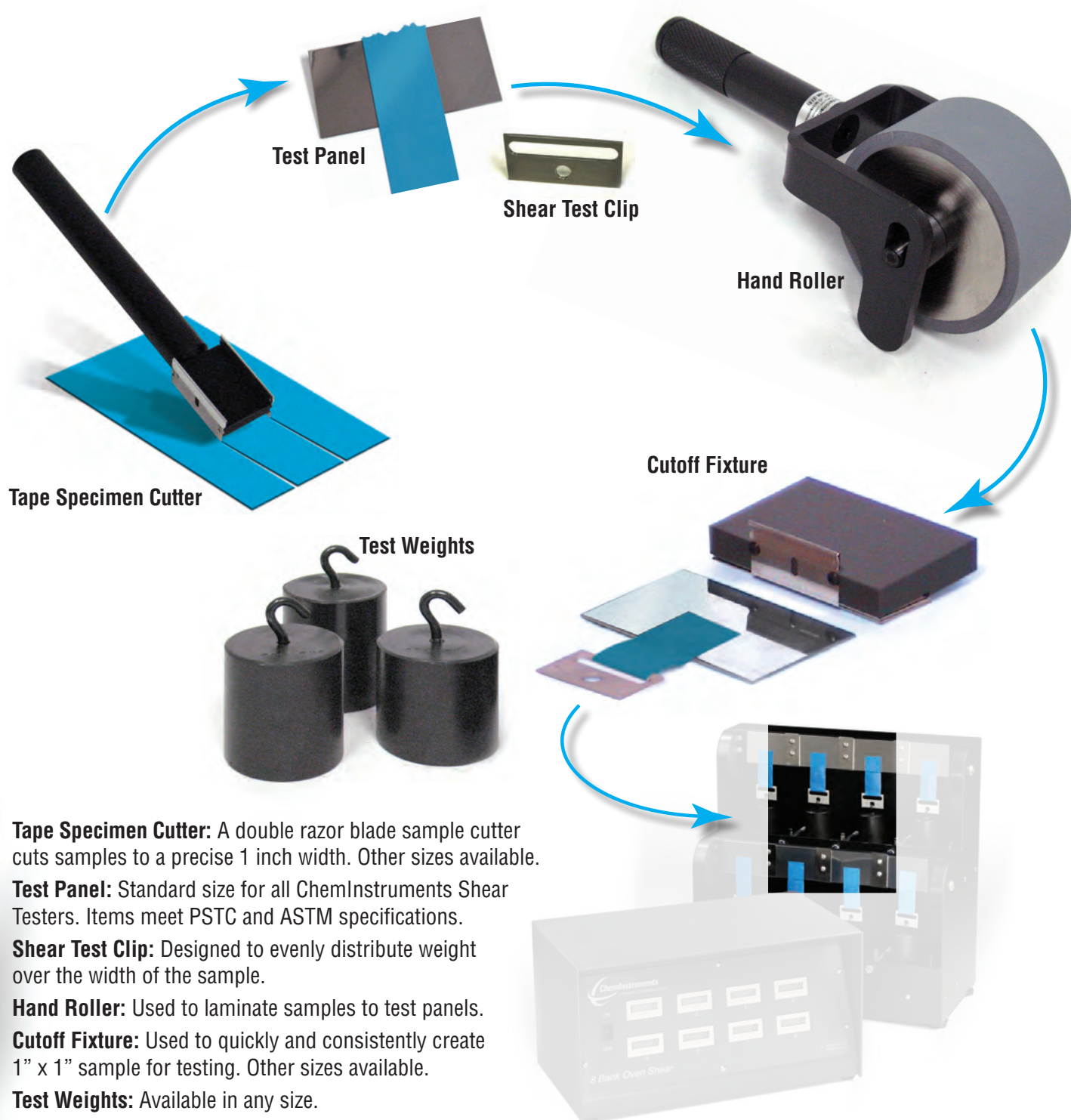
Getting precise measurements every time with high temperature shear tests is easy with the ChemInstruments High Temperature 8 Bank Shear Tester. It performs a wide variety of shear tests, including PSTC-7 Procedure A & C, TLMI Test No. 7, FINAT test No. 8, and ASTM D 3654. The Shear Tester also performs Procedure C for holding power of pressure sensitive tapes.

Switches on the standard model can withstand temperatures up to 400°F (204°C). It can also perform shear tests in humidity chambers or freezers.

- Rugged construction, capable of withstanding the abuse of the production environment
- Compact and easy to use
- Two component design allows the switch unit to be separated from the timer control box
- High temperature, 8' long (2.5m), cable interfaces the two components
- Easy-to-read, 0.5" (1cm) LCD timer display is set to time in increments of 1/10 of a minute
- Designed to use standard 2" x 3" (50mm x 75mm) format test panels

- Capable of holding panels of various thicknesses, up to ¼" (6mm)
- Switch unit components capable of withstanding temperatures up to 400° F (204° C)
- Mechanical switches can be calibrated to trip when using weights as low as 100 grams
- Adjustable feet allow the user to level the testing plane
- Panel rack is marked for the standard 178° back tilt, as specified by most shear test methods
- Adjustable angle panel rack allows the user to easily change the test angle from 178° to 90°
- Fully battery powered, batteries on individual timers are replaceable, no AC power necessary
- Operating temperature range 32° - 400° F (0° - 204° C)





8 Bank Shear Test Oven

S-0-8

Consistent results when performing heat-fail temperature shear testing of hot melt and pressure sensitive adhesives with the ChemInstruments Shear Test Oven. This forced-ventilation shear test oven includes a ramping controller that complies with the SAFT test method ASTM D4498. The variability of SAFT tests depends on the mass in the oven, specific heat factors, wattage of the heating system, fan speed, program, and operator technique.

The Shear Test Oven is the result of ChemInstruments' development of a standard rack, controller and oven combination, which greatly aids in producing uniform results between laboratories using the system.

- 3 pattern, 30 step programmable controller, capable of performing SAFT ramped temperature testing
- Controller is capable of maintaining up to 10 different programs
- Maximum oven operating temperature of 500°F (260°C)
- Temperature control accuracy of oven $\pm 0.5^{\circ}\text{F}$ at 410°F (1°C at 210°C)
- Temperature distribution accuracy of oven $\pm 1.5^{\circ}\text{F}$ at 500°F (2.8°C at 260°C)

- Oven is capable of achieving a temperature rise of 2°F (1°C) per minute (dependent on thermal mass)
- The switch unit of the 8 Bank Shear fills approximately 50% of the interior volume in the oven
- Easy-to-read, 0.5" (1cm) LCD timer display is set to time in increments of 1/10 of a minute
- Timers: Fully battery powered, batteries on individual timers are replaceable, no AC power necessary
- Two connection points on the oven are wired for either internal or external use of the switch unit
- Stainless steel interior construction of the oven
- Forced-air circulation type oven (convection)
- Vent hole in oven for accessory access
- Oven includes 2 stainless steel shelves with 12 possible positions
- Viewing window in the door
- Easy-open oven door latch minimizes disruption of testing
- Over-temperature protection and other safety features designed into oven electronics
- Standard oven input voltage - 120 VAC (50/60hz)



Integrated 8 Bank Shear and Oven ^{S-OSI-8}

Combining the benefits of a proven shear tester and a powerful shear test oven in one convenient package is the Integrated 8 Bank Shear Tester and Oven.

- Rugged construction, capable of withstanding the abuse of the production environment
- Compact and easy to use
- High temperature, 8' long (2.5m), cable interfaces the switch unit to the oven
- Designed to use standard 2" x 3" (50mm x 75mm) format test panels
- Capable of holding panels of various thicknesses, up to 1/4" (6mm)
- Switch unit components capable of withstanding temperatures up to 400° F (204° C)
- Mechanical switches can be calibrated to trip when using weights as low as 100 grams
- Adjustable feet allow the user to level the testing plane in the switch unit
- Panel rack is marked for the standard 178° back tilt, as specified by most shear test methods
- Adjustable angle panel rack allows the user to easily change the test angle from 178° to 90°
- Operating temperature range of switch unit 32° - 400° F (0° - 204° C)
- 3 pattern, 30 step programmable controller, capable of performing SAFT ramped temperature testing
- Controller is capable of maintaining up to 10 different programs
- Maximum oven operating temperature of 500°F (260°C)
- Temperature control accuracy of oven +/- 0.5°F at 410°F (1°C at 210°C)
- Temperature distribution accuracy of oven +/- 1.5°F at 500°F (2.8°C at 260°C)
- Oven is capable of achieving a temperature rise of 2°F (1°C) per minute (dependent on thermal mass)
- The switch unit fills approximately 50% of the interior volume in the oven
- Timer controls are mounted and wired permanently into the face of the oven
- Easy-to-read, 0.5" (1cm) LCD timer display is set to time in increments of 1/10 of a minute
- Timers: Fully battery powered, batteries on individual timers are replaceable, no AC power necessary
- Two connection points on the oven are wired for either internal or external use of the switch unit
- Stainless steel interior construction of the oven
- Forced-air circulation type oven (convection)
- Vent hole in oven for accessory access
- Oven includes 2 stainless steel shelves with 12 possible positions
- Viewing window in the door
- Easy-open oven door latch minimizes disruption of testing
- Over-temperature protection and other safety features designed into oven electronics
- Standard oven input voltage - 120 VAC (50/60hz)



High Temperature 30 Bank Shear

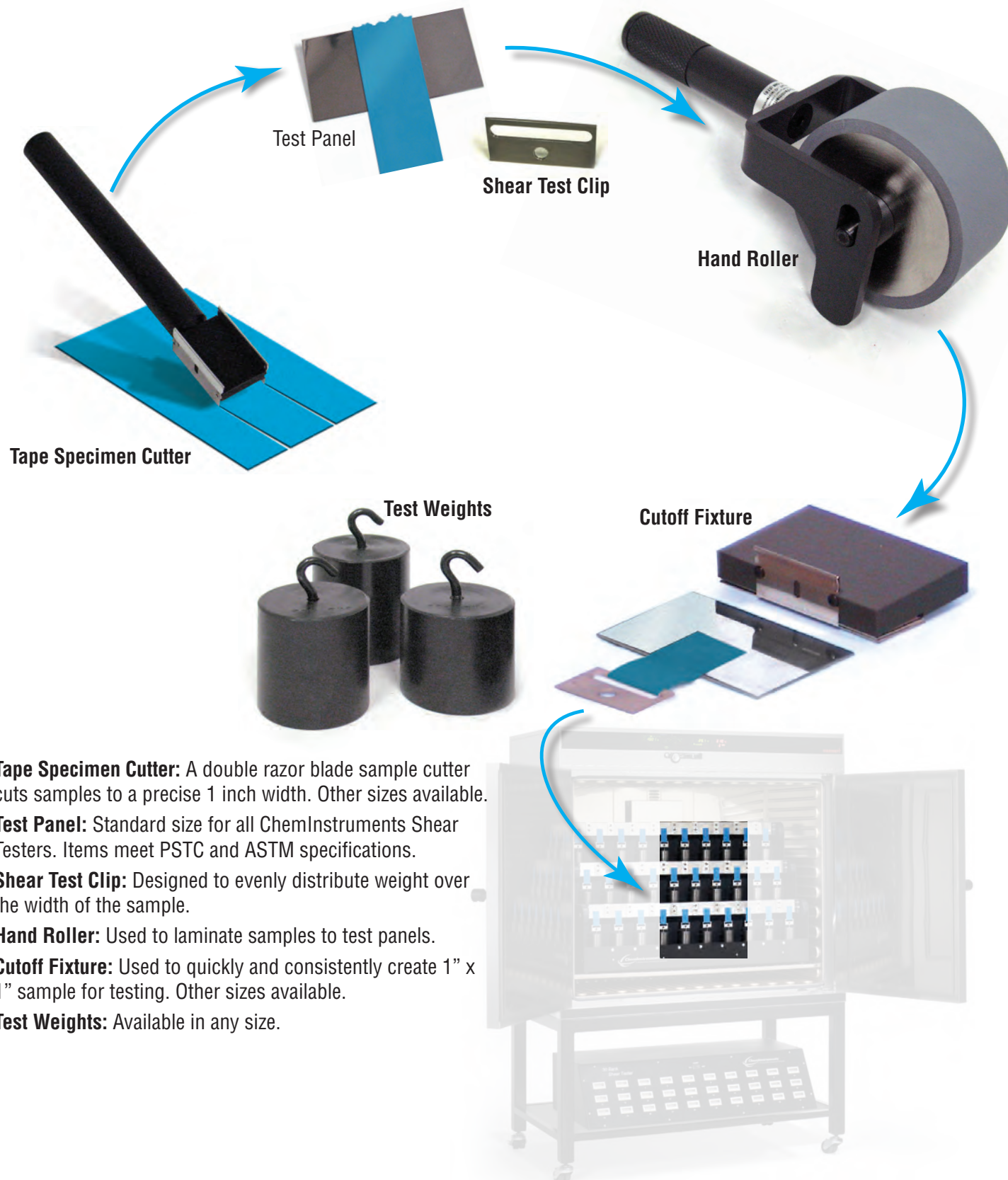
Getting precise measurements every time with high temperature shear tests is easy with the ChemInstruments High Temperature 30 Bank Shear Tester. It performs a wide variety of shear tests, including PSTC-7 Procedure A & C, TLMI Test No. 7, FINAT test No. 8, and ASTM D 3654. The Shear Tester also performs Procedure C for holding power of pressure sensitive tapes.

Switches on the standard model can withstand temperatures up to 400°F (204°C). It can also perform shear tests in humidity chambers or freezers.

- Rugged construction, capable of withstanding the abuse of the production environment
- Compact and easy to use
- Two component design allows the switch unit to be separated from the timer control box
- High temperature, 8' long (2.5m), cable interfaces the two components

- Easy-to-read, 0.5" (1cm) LCD timer display is set to time in increments of 1/10 of a minute
- Designed to use standard 2" x 3" (50mm x 75mm) format test panels
- Capable of holding panels of various thicknesses, up to 1/4" (6mm)
- Switch unit components capable of withstanding temperatures up to 400° F (204° C)
- Mechanical switches can be calibrated to trip when using weights as low as 100 grams
- Adjustable feet allow the user to level the testing plane
- Panel rack is marked for the standard 178° back tilt, as specified by most shear test methods
- Adjustable angle panel rack allows the user to easily change the test angle from 178° to 90°
- Fully battery powered, batteries on individual timers are replaceable, no AC power necessary
- Operating temperature range 32° - 400° F (0° - 204° C)





Tape Specimen Cutter: A double razor blade sample cutter cuts samples to a precise 1 inch width. Other sizes available.

Test Panel: Standard size for all ChemInstruments Shear Testers. Items meet PSTC and ASTM specifications.

Shear Test Clip: Designed to evenly distribute weight over the width of the sample.

Hand Roller: Used to laminate samples to test panels.

Cutoff Fixture: Used to quickly and consistently create 1" x 1" sample for testing. Other sizes available.

Test Weights: Available in any size.

30 Bank Shear Test Oven

S-O-30

- 4 segment programmable controller, capable of performing SAFT ramped temperature testing
- Maximum oven operating temperature of 500°F (260°C)
- Temperature control accuracy of oven +/- 0.5°F at 410°F (1°C at 210°C)
- Temperature distribution accuracy of oven +/- 1.5°F at 500°F (2.8°C at 260°C)
- Oven is capable of achieving a temperature rise of 2°F (1°C) per minute (dependent on thermal mass)
- The switch unit of the 30 Bank Shear fills approximately 50% of the interior volume in the oven
- Stainless steel interior construction of the oven
- Forced-air circulation type oven (convection)
- Vent hole in rear of oven for accessory access
- Easy-open oven door latch minimizes disruption of testing
- Over-temperature protection and other safety features designed into oven electronics
- RS-232 serial interface to controller, includes programming and data-logging software
- 4,000 watt heating capacity
- Standard oven input voltage - 240 VAC, 3-Phase, (50/60hz)
- Includes stand and shelf



Oven plus 30 Bank Shear

S-OS-30

Combine the benefits of a proven shear tester and a powerful shear test oven in one convenient package.

- Rugged construction, capable of withstanding the abuse of the production environment
- Compact and easy to use
- Two component design allows the switch unit to be separated from the timer control box
- High temperature, 8' long (2.5m), cable interfaces the two components
- Easy-to-read, 0.5" (1cm) LCD timer display is set to time in increments of 1/10 of a minute
- Designed to use standard 2" x 3" (50mm x 75mm) format test panels
- Capable of holding panels of various thicknesses, up to 1/4" (6mm)
- Switch unit components capable of withstanding temperatures up to 400° F (204° C)
- Mechanical switches can be calibrated to trip when using weights as low as 100 grams
- Adjustable feet allow the user to level the testing plane
- Panel rack is marked for the standard 178° back tilt, as specified by most shear test methods
- Adjustable angle panel rack allows the user to easily change the test angle from 178° to 90°
- Timers: Fully battery powered, batteries on individual timers are replaceable, no AC power necessary
- Operating temperature range 32° - 400° F (0° - 204° C)
- Includes oven, stand and shelf



Rolldown Machines

RD-1000
RD-3000

The Rolldown laminates an adhesive coated material to a test substrate. The prepared sample can then be used in a number of differing test procedures. The mechanics of the Rolldown ensures that test samples are prepared at a stable laminating speed and with consistent pressure. The Rolldown comes in two versions. The single roll version prepares one sample at a time. The triple roll version reduces sample preparation time by accommodating three samples at a time. Both machines meet the requirements of PSTC Appendage B, Section 2.7 and ASTM D 3330 Section 5.4. The Rolldown is one of a handful of devices that are a must for any development or QC laboratory that wishes to ensure the highest quality data. Properly prepared samples help create accurate and credible data.

- Rugged construction, capable of withstanding the abuse of the production environment
- Simple, one-touch operation creates very repeatable test samples
- 4.5 lb (2 Kg) steel roll with Shore A scale 80 durometer rubber covering
- Steel roll is nickel plated to eliminate corrosion
- Thickness of rubber covering is 1/4" (6 mm)
- Finished roll dimensions are 1.78" (4.5 cm) wide and 3.75" (9.5 cm) in diameter
- Maximum roll 10 lb (4.5Kg)
- Selectable set speeds include:
 - Older laminating speed of 12 ipm (30 cpm)
 - Newer "harmonized" speed of 24 ipm (60 cpm)
- Accepts test panels up to 2" x 8" (5 cm x 20 cm)
- Adjustable stroke length from 1" to 10" (2 cm - 25 cm)
- Capable of selecting from 1 to 9 repeat cycles
- Continuous cycling mode selectable
- Operating temperature range 32° - 150° F (0° - 70° C)
- Standard input voltage - 120 VAC (50/60hz)



Hand Rollers

HR-100
HR-102

4.5 pound Hand Roller & 10 pound Hand Roller

- 4.5 pound (2045g) roller features a steel core with a Shore scale A 80 durometer silicone rubber cover
 - Diameter of 3.75" (95 mm) and a width of 1.75" (45 mm)
- 10 lb (4540 g) roller features a solid steel core with an 8 RMS polished surface
 - Diameter of 5.00" (127 mm) and a width of 1.75" (45 mm)
- Legs on handle extend beyond the circumference of the roller to protect roller surface
- Slots on handle allow roller axles to "float" only the weight of the roller during operation
- Meets the requirements of PSTC Appendage B, 2.8 and other industry standards

FINAT Hand Roller

- 2 Kg (4.4 pound) roller features a steel core with a Shore scale A 80 durometer silicone rubber cover
- Diameter of 85 mm (3.34") and a width of 50 mm (1.97")
- Legs on handle extend beyond the circumference of the roller to protect roller surface
- Slots on handle allow roller axles to "float" only the weight of the roller during operation
- Meets the requirements of FINAT standard 2.1

Custom design rollers made to nearly any customer specification



Optional Certification Available

Rotary Die Slitter

RDS-100

Quickly produce consistent and accurately cut samples with the Rotary Die Slitter. The hand-operated Rotary Die Slitter safely cuts multiple straight and even samples quickly and easily. Make this tool an integral part of your sample preparation for plants and laboratories.

- Rugged construction, capable of withstanding the abuse of the production environment
- Uses a hardened rotary die for accuracy and long life
- Fully guarded with a narrow nip opening for safe handling
- Maximum width of 9" (22.8 cm) of material can be slit
- Suitable for slitting material up to 0.060" (1.5 mm) thick
- Suitable for slitting paper, film, foil, and laminates
- Produce samples of unlimited length
- Produces 6 samples at 1" (25 mm) and 6 samples at ½" (12mm) wide
- Custom slit sizes available
- Custom width slitting units available



Swing Arm Sample Die Cutter

DC-500

The Swing Arm Sample Die Cutter is ideal for producing samples from paper, film, foil, label, tape and a wide variety of other materials. The Die Cutter employs a safe, manually operated, cam actuated cutting stroke to produce samples with standard Steel Rule and Clicker dies. It is simple to use and eliminates the risk of injury associated with hammering hand held dies when making samples.

- Rugged construction, capable of withstanding the abuse of the production environment
- Quick and easy to operate and maintain
- Upper platen dimensions of 8" x 8" (20 cm x 20 cm)
- Lower platen dimensions of 9" x 11" (23 cm x 28 cm)
- Long-life and replaceable lower platen cutting pad made of nylon
- Easy adjustment for stroke and height changes

- Upper platen and leverage arm swing away for easy access during setup
- Mounts to work table for hazard free operation
- Dies available on request, but not included with the unit
- Single cavity Clicker dies available in standard and custom shapes
- Multiple cavity Clicker dies available in custom shapes
- Various tolerance dies available from $\pm 0.005"$ (0.127 mm) to $\pm 0.015"$ (0.381 mm)



Sample Cutters

SC-100
SCF-100

These specimen tape cutters simplify cutting samples for ASTM, FINAT, PSTC Appendage B, 2.4, AFERA and TLMI procedures. Extra blades and custom sample cutters are available. Contact ChemInstruments for more information about custom design specimen tape cutters.

Specimen Tape Cutters

- 1" Specimen tape cutter
- 1/2" Specimen tape cutter
- 24 mm Specimen tape cutter
- 12 mm Specimen tape cutter

Shear Cutoff Fixture

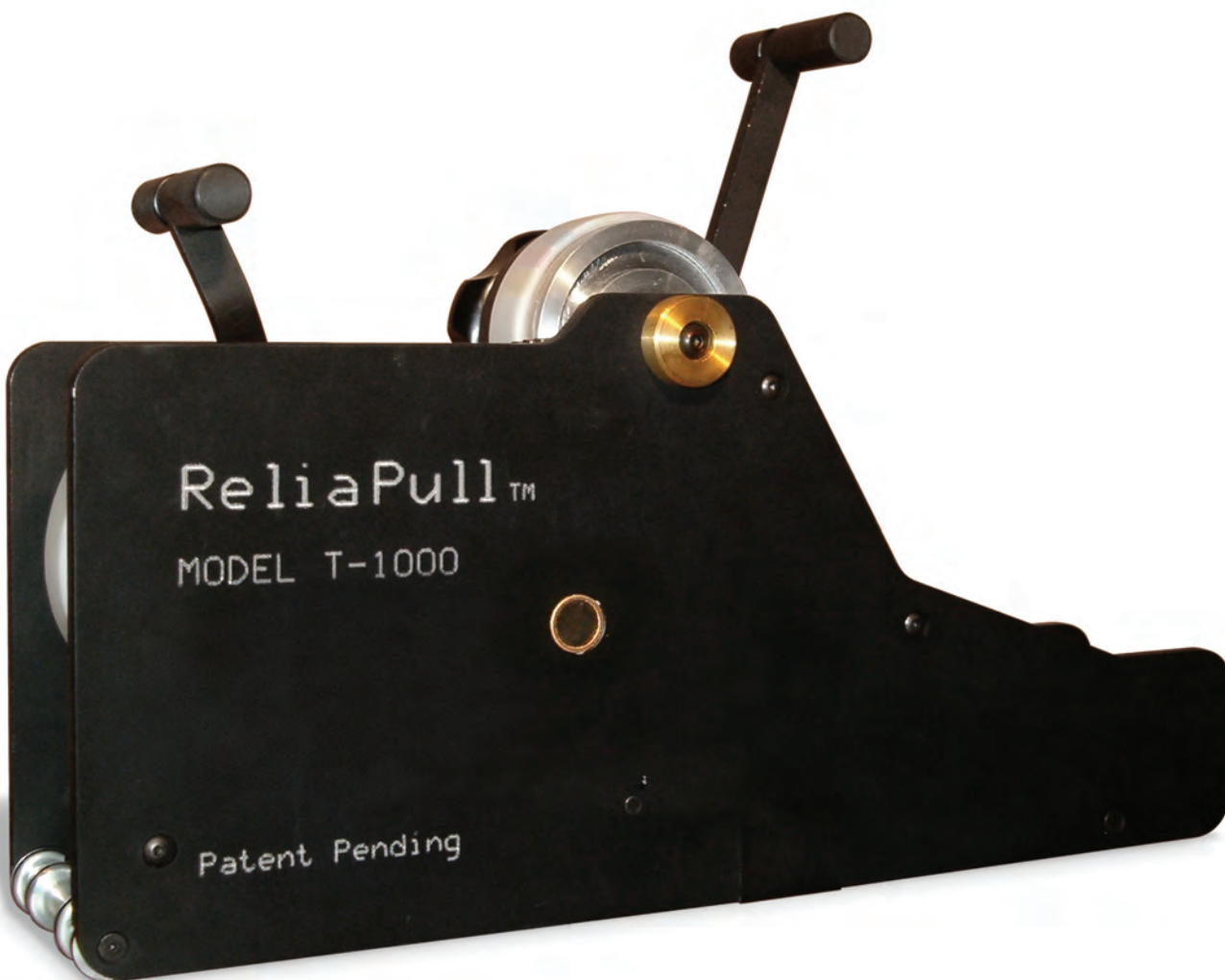
- Quickly and accurately cut a shear sample to a 1" x 1" (2.5 cm x 2.5 cm) contact area
- Meets the requirements of ASTM, FINAT, PSTC, AFERA and TLMI standards
- 1/2" x 1/2" (1 cm x 1 cm) fixture is also available upon request



ReliaPull®

The ReliaPull Adhesion Test Equipment was built to help reduce the human variation imposed on the results of Tape Tests performed manually. This equipment mechanizes the test. Tape tests are performed in many industries requiring a quick check on the adhesion of inks, paints or coatings to a surface. There are multiple standards written to describe consistent ways to perform the tape test, however, experience has proven it is very difficult for one operator to perform the test the same way each time, much less for multiple operators to duplicate the method. ReliaPull® gives you results you can rely on.

- Conforms to ASTM D 3359
- Removes tape at constant, repeatable angle
- Ensures fresh tape for each test
- Provides consistent application of tape to substrate
- Helps control speed of tape removal



Test Method Manuals

PSTC

The PSTC test method manual was created to provide the industry with standardized test methods for pressure sensitive adhesive (PSA) tape testing.

The PSTC instructional DVD was created to provide for further education and instructions on performing PSTC test methods.

- Demonstrates 12 of the most common PSTC test methods
- Narration is available in English, Spanish or Chinese
- Test manual and DVD can be purchased separately or as a set

TLMI

Tag and Lab Manufacturers Institute's manual of recommended standard test methods for pressure sensitive labels.



Custom Design Services

Let ChemInstruments work with your team to develop a complete testing platform for your unique needs. We can build a simple fixture to help secure your specific sample in the proper orientation or we can design an entire product system for your worldwide manufacturing needs. You can count on our experience to build you a highly functional and precise platform at a reasonable cost and all in a timely manner. We have been helping our customers think outside the box for decades. The next time you have a difficult process to test and can't figure how to get out of the box, think of us. We'll help get you a custom designed and built device that will exceed your expectations.

Areas of expertise:

- Test fixtures
- Modifications to our standard products
- Coating machines
- Laminating machines
- Sample preparation devices
- Material testing designs
- Custom software development associated with our equipment
- Custom developed circuit boards associated with our equipment

Installation Qualification/ Operation Qualification (IQ/OQ)

ChemInstruments is proud to offer equipment validation services for our full line of testing equipment including IQ/OQ. This on-site service includes documentation of the

IQ/OQ procedure, certificate of conformance, and certificates for all tools used in the validation.

Accessories

Adhesive Remover

A unique water-soluble solvent-based cleaner of exceptional dissolving power.

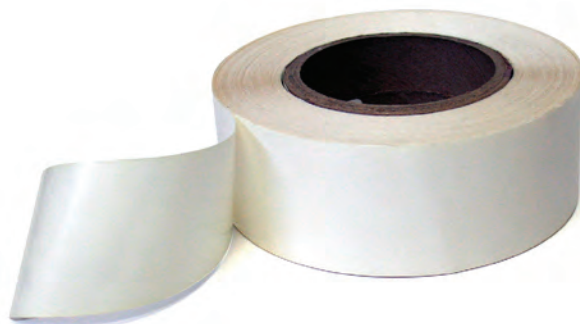
ADH-REM



Double Sided Tape

A versatile 2 sided tape used in conducting release and coefficient of friction testing.

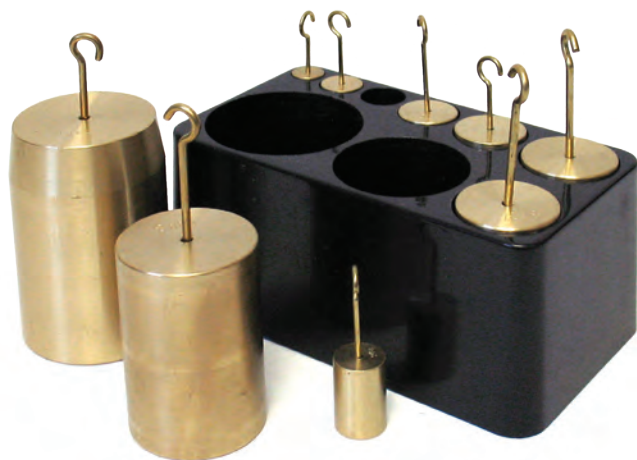
DS Tape



Calibration Weights

TW-CAL Test Weight Calibration Set: Brass calibration weight set with hooks. This set includes a selection of weights from 10-1000 grams with NIST traceable certificate.

TW-CAL SET



Water Vapor Cup

The sturdy cast aluminum WV-100 Water Vapor Cup is used in the test methods PSTC-34 and ASTM D 3833 water vapor transmission and PSTC-35 and ASTM D 3816 water penetration tests.

WV-100



Test Panels

The 304 stainless steel meets the requirements set forth in ASTM A666. The panels comply with PSTC Appendage B 2.6. The 18 gauge panels have the Bright Annealed finish and are cut to size for use in various test methods. All Stainless steel panels are 0.047" (1.2mm) thick.

Standard sizes include:

Loop Tack

TP-16 (1"x6") (2.5cm x 15cm)

TP-13 (1"x3") (2.5cm x 7.5cm)

Shear

TP-23 (2"x3") (5cm x 7.5cm)

Adhesion

TP-25 (2"x5") (5cm x 13cm)

TP-26 (2"x6") (5cm x 15cm)

TP-28 (2"x8") (5cm x 20cm)

TP-39 (3"x9") (7.5cm x 23cm)

Specialized Panels*

Glass: 1/8" (0.3cm) thick

Plastics: 1/8" (0.3cm) thick

High Density Polyethylene (HDPE)

Low Density Polyethylene (LDPE), 1/4" (0.5cm) thick

Co-Polyester (PETG)

Polypropylene (PP)

Polycarbonate(PC)

Polyvinylchloride (PVC)

Polystyrene(PS)

ABS Plastic

Acrylic

Aluminum: 1/16" (0.15cm) thick

AFERA Stainless Steel Panels

**Specialized Panels do not meet ASTM D 3330 Specs.*

Standard panel sizes as well as custom dimensions are available in the above materials.



Test Panel Holder – Wooden holder with 22 angled slots to hold panels between tests. Dimensions: 16" (41cm) long x 3.5" (9cm) wide.

Equipment Specifications

Model number	Height	Width	Depth	Weight
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Adhesion/Release

AR-1000	24" (61 cm)	36" (91 cm)	13" (33 cm)	92 lbs (42 Kg)
PA-1000-180	8" (20 cm)	23" (58 cm)	12" (30 cm)	29 lbs (13 Kg)
PA-1000-90	25" (63 cm)	18" (46 cm)	10" (25 cm)	45 lbs (20 Kg)
HSR-1000	14" (35 cm)	21" (53 cm)	11" (28 cm)	30 lbs (14 Kg)

Tack

LT-1000	16" (40 cm)	12" (30 cm)	15" (38 cm)	37 lbs (17 Kg)
PT-1000	16" (40cm)	12" (30 cm)	15" (38 cm)	37 lbs (17 Kg)
RBT-100	2.5" (6.5 cm)	9" (23 cm)	2.5" (6.5 cm)	1 lb (0.5 Kg)

Material Analysis

TT-1100	48" (122 cm)	13" (33 cm)	16" (41 cm)	54 lbs (25 Kg)
PMA-1000	22" (56 cm)	14" (36 cm)	18" (46 cm)	55 lbs (25 Kg)
CAM-Plus (main body)	15" (38 cm)	8" (20 cm)	18" (45 cm)	28 lbs (12.7 Kg)
CAM-Plus (light source)	5" (12.7 cm)	7" (18 cm)	8" (20 cm)	12 lbs (5.4 Kg)
BP-1000	11" (28 cm)	14" (36 cm)	18" (46 cm)	29 lbs (13 Kg)
COF-1000	8" (20 cm)	23" (58 cm)	12" (30 cm)	29 lbs (13 Kg)
MI-1000	12" (30 cm)	8" (20 cm)	10" (25 cm)	17 lbs (8 Kg)
HSU-1100	15" (38 cm)	25" (63 cm)	18" (45 cm)	59 lbs (26 Kg)
TC-1000	11" (28 cm)	14" (36 cm)	23" (58 cm)	46 lbs (21 Kg)
SR-500	13" (33 cm)	11" (28 cm)	8" (20 cm)	45 lbs (20 Kg)

Coaters & Laminators

EC-100	7" (18 cm)	12" (30 cm)	22" (56 cm)	18 lbs (8 Kg)
EC-200	7" (18 cm)	15" (38 cm)	22" (56 cm)	30 lbs (13 Kg)
LC-100	18" (46 cm)	19" (48 cm)	22" (56 cm)	55 lbs (25 Kg)
HLC-101 (coating head)	18" (46 cm)	16" (41 cm)	18" (46 cm)	42 lbs (19 Kg)
HLC-101 (control box)	9" (23 cm)	16" (41 cm)	9" (23 cm)	17 lbs (8 Kg)
HLCL-1000	22" (56 cm)	33" (84 cm)	37" (94 cm)	160 lbs (73 Kg)
LL-100	18" (46 cm)	37" (94 cm)	11" (28 cm)	64 lbs (29 Kg)
HL-100	30" (76 cm)	39" (99 cm)	14" (36 cm)	185 lbs (84 Kg)

Model number	Height	Width	Depth	Weight
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Shear				
DS-1000	9" (23 cm)	14" (36 cm)	18" (46 cm)	29 lbs (13 Kg)
S-RT-10	18" (46 cm)	39" (99 cm)	7" (18 cm)	43 lbs (19 Kg)
S-RT-30	31" (79 cm)	38" (96 cm)	18" (46 cm)	150 lbs (68 Kg)
S-HT-8 (oven unit)	16" (41 cm)	16" (41 cm)	9" (23 cm)	28 lbs (13 Kg)
S-HT-8 (timer box)	9" (23 cm)	16" (41 cm)	11" (28 cm)	14 lbs (6 Kg)
S-O-8 (exterior)	34" (87 cm)	28" (71 cm)	25" (65 cm)	143 lbs (65 Kg)
S-O-8 (interior)	19" (48 cm)	23" (58 cm)	19" (48 cm)	NA
S-OSI-8 (exterior)	34" (87 cm)	28" (71 cm)	25" (65 cm)	143 lbs (65 Kg)
S-OSI-8 (interior)	19" (48 cm)	23" (58 cm)	19" (48 cm)	NA
S-OSI-8 (oven unit)	16" (41 cm)	16" (41 cm)	9" (23 cm)	28 lbs (13 Kg)
S-HT-30 (oven unit)	22" (57 cm)	38" (96 cm)	13" (32 cm)	90 lbs (41 Kg)
S-HT-30 (timer box)	9" (23 cm)	38" (96 cm)	18" (46 cm)	60 lbs (27 Kg)
S-O-30 (exterior)	43" (108 cm)	47" (119 cm)	25" (65 cm)	295 lbs (134 Kg)
S-O-30 (interior)	31" (80 cm)	40" (104 cm)	19" (50 cm)	NA

Sample Preparation				
RD-1000	9" (23 cm)	19" (48 cm)	13" (33 cm)	37 lbs (17 Kg)
RD-3000	9" (23 cm)	19" (48 cm)	13" (33 cm)	47 lbs (21 Kg)
RDS-100	8" (20 cm)	20" (51 cm)	9" (23 cm)	35 lbs (16 Kg)
DC-500	31" (79 cm)	12" (30 cm)	14" (36 cm)	104 lbs (47 Kg)

Test Matrix

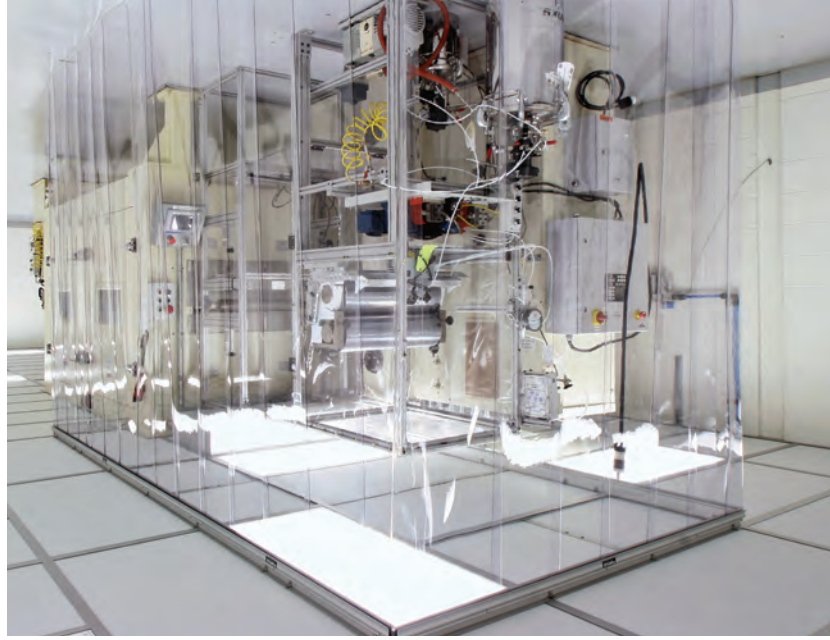
TYPE	DESCRIPTION	TEST METHOD					EQUIPMENT	ACCESSORIES
		PSTC	TLMI	ASTM	AFERA	FINAT		
Peel & Release	90° & 180° Peel/Release	101 (A,B,C, D,E,F) 4B	L-IA1 L-IA2 L-IA3	D3330 (A,B,C, D,E,F) D5375 (A&B) D6252	4001 P11	1, 2, 3, 5, 10, 11	AR-1000 PA-1000-90 PA-1000-180 or TT-1100	RD-3000 HR-100 TP-26 SC-100
	Oil Resistance	55					S-O-8 TT-1100 AR-1000	TP-26 HR-100 PF-90
	Wet Spread	15					LC-100 S-OSI-8 TT-1100 AR-1000	
High-Speed Release	Release Force of Liner at High Speed		L-1A3			4	HSR-1000	NA
Tack	Loop Tack	16	Yes	D6195 (A)		9	TT-1100 LT-1000	TP-13/16 SC-100 LTF-100
	Probe Tack			D2979			PT-1000	NA
	Rolling Ball	6		D3121			RBT-100	NA
	Quick Stick	5			4015		TT-1100	PF-90
Dynamic Shear	Shear at Ambient Temperature	14, 107 (A,B,C,D, E, F)	7	D6463 (B) D3654 (A)	4012	8	S-RT-10 S-RT-30	HR-100 TP-23 SC-050 SC-100 TW-500 TW-1000
Heated Shear	Shear at Elevated Temperatures	53, 107 (G)	Yes	D6463 (A) D4498			S-HT-30 & S-HT-8 or S-O-8	
	Shear After Solvent Temperatures	50					TT-1100 S-O-8	HR-100
Thickness	Thickness Measurement	33	T-411	D3652 D645 D374	4006		MI-1000	NA
Unwind	High Speed Unwind Force	8, 13		D1000	4008		HSU-1100	NA
	Unwind Force	8			4013		TT-1100	UWF-100
Tensile	Tensile Strength of Material	31 & 39	L-1A1 II-E III-A T4940M	D928 D903 D3330 D882 1004 D3759	4004		TT-1100	NA
	Elongation				4005			
Burst	Burst Strength of Perforated Material		Yes				BP-1000	NA
COF	Coefficient of Friction			D1894			COF-1000	NA
Rub	Scuffing or Rubbing Resistance			D-5264			Sutherland® Rub Tester	NA



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www.chemsultants.com

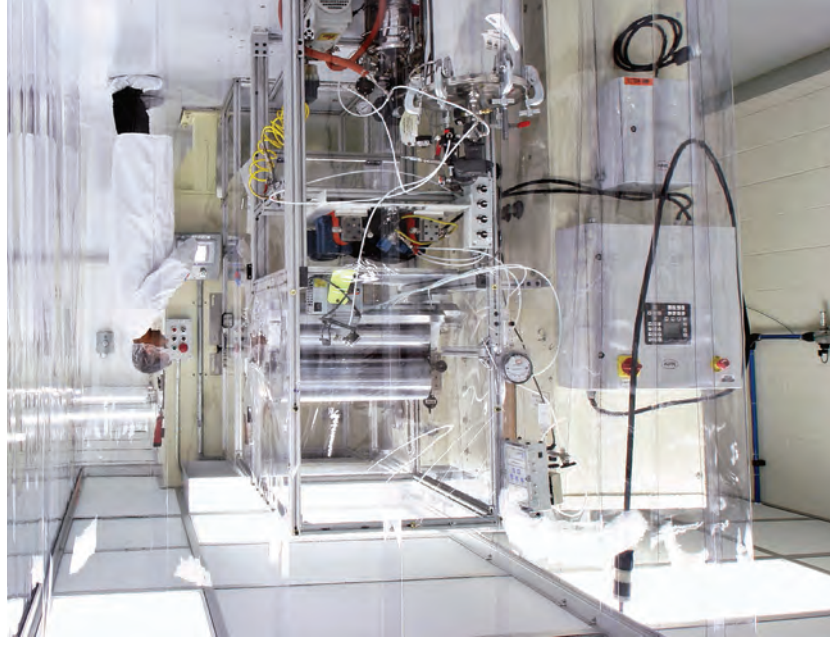
Our latest investment in growth... Class 10,000 Clean Room Coating capabilities

Chemsuitants International is pleased to announce the addition of a Class 10,000 / Class 1000 Clean Room to its Product and Process Development operation. The new upgrade houses the company's TPC-2 Pilot Coating line which offers multiple coating capabilities.



This capability is designed to complement the capabilities of Chemsuitants other Pilot Coating line, TPC-1. The new upgrade features GMP and clean room capabilities with segregated manufacturing areas for mixing, coating and finishing processes. Other diverse coating capabilities include web cleaning, online coating and substrate measurement, and multiple coating methods including slot die and roll coating.

The TPC-2 Clean Room facility was designed to produce custom PSA and other coated materials Chemsuitants develops for its clients manufacturing medical diagnostics and devices, wound care, pharmaceuticals / transdermals, as well as in, the electronics and energy industries.



Partial List of Production Materials

Max line speed

Wet laminated products	(fpm)	(mpm)
Paper/paper	95	30
Paper/aluminum	75	23
Paper/carton	35	10
Paper/PVC	35	10
Paper/cloth	50	15
Carton/carton	35	10
Paper/PE	95	30

Dry laminate products	(fpm)	(mpm)
Aluminum/cellophane	75	23
Cellophane/cloth	50	15
Polyester/PE	75	23
Polyester/PE	50	10
PP/aluminum	75	23
Nylon/PE	50	15
Cello/cello	95	30
Polyester/aluminum	95	30
Cello/aluminum	75	23
Acetate foil/carton	50	15
Polyamide foil/PE	50	15

Re-moisturizable papers	(fpm)	(mpm)
Gummed tapes	50	15
Stamped papers	50	15
Sticker	50	15
Lay-ll at papers (water based)	50	15
Wallpaper	(fpm)	(mpm)
Base color coating	75	23
PVA coating for printed wallpaper(washable)	75	23
Wallpaper backside-coating (pre-pasting)	50	15

Max line speed

Upgraded papers	(fpm)	(mpm)
Chrome poster papers	35	10
Lacquered papers	50	15
Gloss lacquered paper	75	23
Art print paper (china clay)	35	10
Bronze coating	40	12
OVDC/PVA coated papers	35	10
PCDC/PVA coated paperboard	20	6
Silicone release paper	50	15
Heat seal paper	20	6
Diagram paper	50	15

Repro products	(fpm)	(mpm)
Non-carton copy paper	50	15
Zinc-oxide photocopy paper	75	23
Photocopy paper	50	15
Carbon paper	95	29
Correspondence copy paper	30	10

Special products	(fpm)	(mpm)
Primer coating of cellophane, PU & PVC	30	10
Heat seal lacquer on films	75	23

Wax coatings	(fpm)	(mpm)
One side wax coating	50	15
Wax lamination	50	15
Paper / paper	50	15
Paper / aluminum	50	15
Paper / cellophane	50	15
Paper / PE	50	15
Self Adhesive products	(fpm)	(mpm)
Stickers	50	15
Rigid PVC tapes	50	15
Textile tapes	50	15

Addendum

Pilot, Toll and Contract Coating Services Detail

TPC-2 Coating Line

Coating Methods

Gravure, direct & reverse, wire rod, knife-over-roll, slot die, Hot Melt die

Line speed range

1 - 40 fpm (1.5 - 12mpm)

Drying ovens

one zone, gas fired, 10' (3.0 m) air flotation, 400° F (205°C)

Web widths

4" - 24" (10-60cm)

Maximum roll diameter

24" (60cm) or 200#

Materials

papers, films, foils, non-wovens, synthetics

Technologies

solvent, emulsion, hot melt, 100% solids

Other capabilities

White room coating



Production Services

Core Capabilities

- Coating widths: 4" to 24" (10cm to 60 cm),
- Line speeds from 1 fpm - 95 fpm (0.3mpm to 30 mpm)
- Coating weights: 0.1 - 8.0 mils dry
- Viscosities from 100 to several thousand cP's
- Web handling paper from 20 -120# basis weight films from 0.3 -10.0 mil, foils up to 12 gauge foams from 1/16" - 5/32" (1.6 mm - 4.0mm) non wovens from 1.0 mil and up

Other Capabilities

- Formulating, mixing, compounding batches: 1 – 50 gallons (5 - 200 L), 20/ 10 hp dual shaft dispersion mixer, electric and air driven mixers
- Pressure vessels
- Quality lab with ovens, electronic balances, mixers, coat weight analyzer, and test instrumentation
- White room coating
- Hot and cold laminating
- Slitting and converting off-line



Services

- Adhesive and coating formulating, compounding, mixing rheology modifications
- Technical product consulting and evaluation
- Quality and performance dedicated QA laboratory on site
- Product development experimental coating trials and pilot/sampling coating
- Process development coating method selection and process optimization
- Drying/curing optimization and web treatment to optimize coating
- Toll coating services and contract manufacturing



Production Services

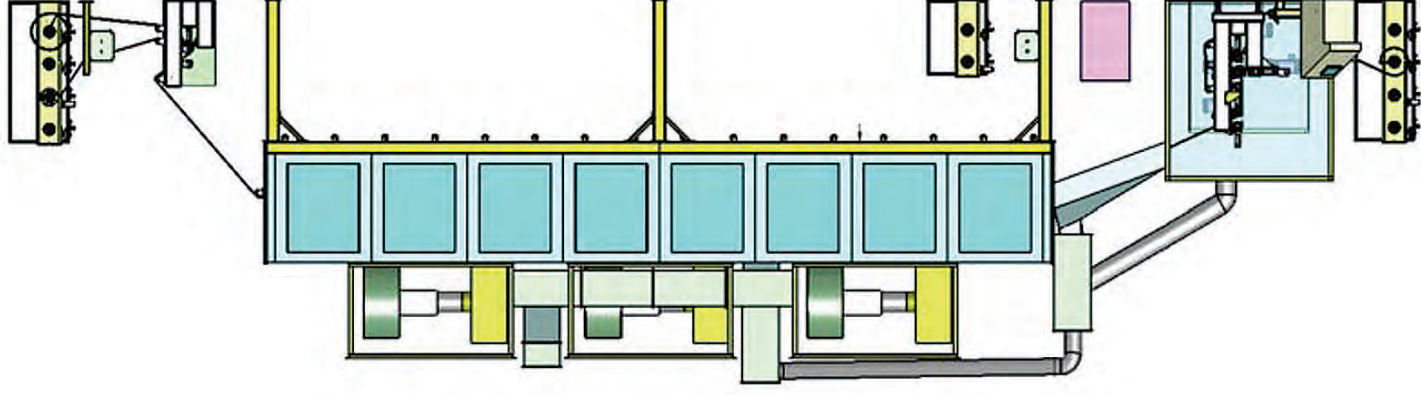
Coating Processes and Production

Chemsubtants offers a broad range of capabilities and services designed to address the most difficult and demanding coating related issues. Our approach is to provide far more than just simply a pilot coating line - we are a full service coating and process development facility and more. We offer Pilot Coating services for industrial coatings to the most demanding medical adhesives and materials under one roof.

Chemsubtants' unique blend of new product development expertise and custom coating capabilities can streamline your development efforts to help take products to market faster as well as help improve existing product performance to meet critical market needs.

We provide:

- An expert staff of chemists and scientists to assist in the product development process including formulation, compounding, mixing and the rheology modification of adhesives and coatings
- Custom coating expertise using one of multiple coating method capabilities that optimize your production process
- Pilot coating services for experimental, prototype and contract manufacturing - available on three multifunction coating lines
- Contract manufacturing or toll coating of specialty or low volume coated products
- An A2LA accredited laboratory to assist in the development, testing and analysis of coatings and adhesives related to your product



Laboratory Testing Services Detail

Analytical Testing

FTIR
FTNMR
GC
GC-MS
TGA
DSC
TMA
GPC
XPS/ESCA
SEM
UV-VIS
HPLC



Compounding:

Lab Sample Coating:

Stability testing:

UV exposure:

Accelerated Aging:

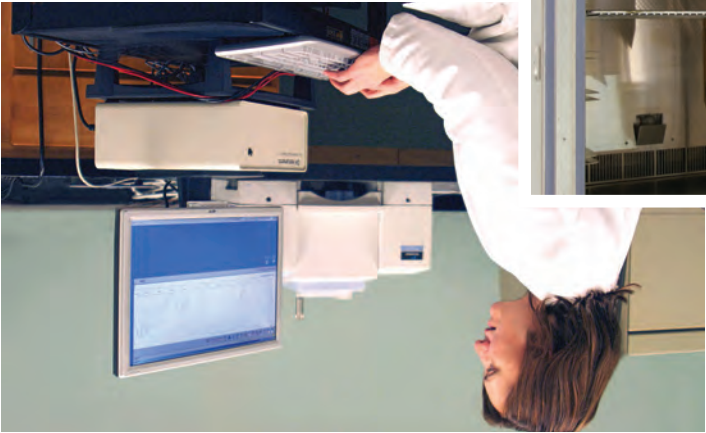
Other Services

Heat aging,
Heat/humidity aging
Medical product criteria
QUV, outdoor exposure
Solvent, emulsion,
hot melt, 100% solids
Solvent, emulsion,
hot melt / warm melt,
100% solids systems,
UV cure systems

Custom test development

Bulk Adhesive Testing

pH
Total Solids
Viscosity (room temperature)
Viscosity (hot melt)
ASTM E 70
ASTM D489
ASTM D2556
ASTM D3236



Addendum

Laboratory Testing Services Detail

TPC-1 Coating Line

Coating Methods

Direct & reverse gravure, offset gravure, wire rod, 3 roll differential, 3 roll reverse, pan fed, knife-over-roll, kiss, squeeze and dip

Line speed range

5 - 95 fpm (1.5 - 30 mpm)

Drying ovens

three zone (individual zone controls), 30' (18m) gas fired air flotation, 400 ° F (205 ° C)

UV Curing

4- 20" wide" (5-25cm), 6 lamp setup, Fusion units with inerting capability, D and H bulbs

Web widths

4" - 24" (10-60cm)

Maximum roll diameter

24" (60cm) or 200#

Materials

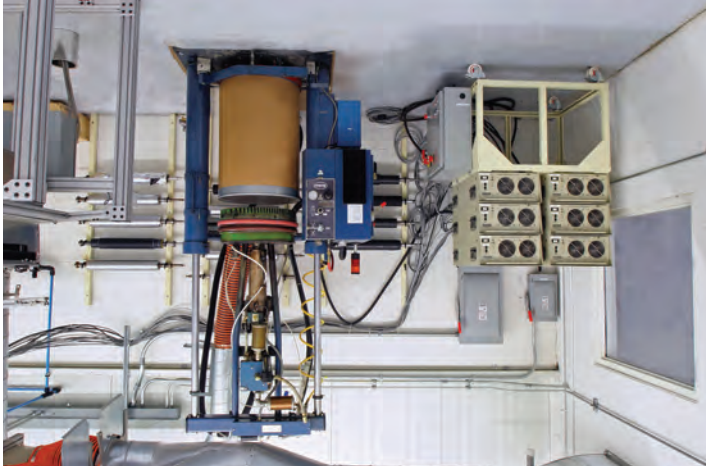
papers, films from 0.5 mil, foils up to 12 mil aluminum, non-wovens, synthetics

Technologies

solvent, emulsion, hot melt, warm melt 100% solids

Other capabilities

corona treating, hot lamination, remoisturization, chill roll



Laboratory Testing Services Detail

Liner / Face stock Testing

Abrasion (Sutherland rub)	ASTM D 5264
Abrasion (Tabor)	TAPPI T-476
Brightness	TAPPI T-452
Caliper	TAPPI T-411
Coefficient of Friction	ASTM D 1894, 4917
Hunter color	TAPPI T-524
Opacity	TAPPI T-425
pH (surface)	TAPPI T-529
Porosity (Sheffield)	TAPPI T-460
Release	ASTM D 3330 and
Smoothness (Beck)	TAPPI T-479
Smoothness (Sheffield)	TAPPI T-538
Stiffness (Gurley)	TAPPI T-543
Surface Energy (dyne test)	ASTM D 2578



Coat weight (solvent wash)	ASTM F 2217
Coat weight (caliper)	ASTM D 3652, PSTC-33
Dynamic Shear	ASTM D 1002, D 3163
and D 3164	
Peel Adhesion	ASTM D 3330 and D 6252,
and PSTC-101	
SAFT	ASTM D 4498
Static Shear	ASTM D 3654 and D 6463,
and PSTC-107	
T Peel	ASTM D 1876
Tack (loop)	ASTM D 6195, PSTC-16
Tack (probe)	ASTM D 2979
Tack (rolling ball)	ASTM D 3121, PSTC-6
Tear Resistance	ASTM D 1004, PSTC-38
and 39	
Tensile & Elongation	ASTM D 882 and D 3759,
and PSTC-131	
Unwind	ASTM D 3811, PSTC-8
WVTR / MVTR	ASTM E 96, D3833 and D3816,
PSTC-34 and 35	



The Chemsitants laboratory meets the testing and test method standards of a number of internationally recognized organizations including:

American Society for Testing and Materials (ASTM)



Pressure Sensitive Tape Council (PSTC)



Tag and Label Manufacturers Institute (TLMi)



Technical Association of Pulp & Paper Industry (TAPPI)



Afera
(The European Association for the Self Adhesive Tape Industry)



FINAT

(Fédération Internationale des fabricants et transformateurs d'Adhésifs et Thermocollants)



We are accredited by the American Association for Laboratory Accreditation (A2LA)
Certificate No. 1629.1.



Development

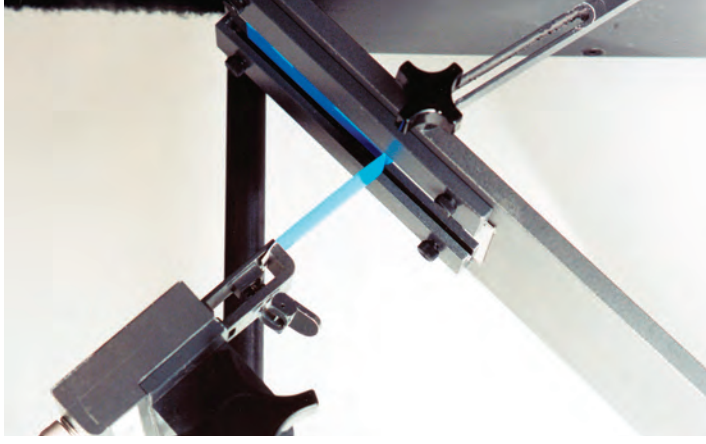
Testing Services

We specialize in, but are not limited to, physical and analytical testing of pressure sensitive adhesives. In addition, we provide a number of services related to performance testing of a wide variety of liquid adhesives, coatings, sealants, specialty inks, polymers, films, foils, non-wovens and papers including:

- *Benchmark testing of new or modified products to identify their competitive strengths and weaknesses*
- *Quality control monitoring, including the testing of incoming raw materials and outgoing products against established performance specifications, eliminating the additional expense of similar company lab operations*
- *Comparative testing of products to existing specifications or product-to-product comparisons*



Chemsubtants is able to provide testing services to standardized methods, or a customer's proprietary test procedures. We also work with clients to develop custom test procedures for new products applications requiring specialized performance criteria. We specialize in the characterization of a wide variety of materials typically employed in the development of adhesives, tags, labels and other coated product components for the purpose of identifying cost savings, alternate sources or performance enhancement opportunities.



Development

A partial list of our areas of market expertise includes:

Markets

Adhesive Manufacturers • Appliance • Aerospace • Automotive • Chemical • Construction • Converting • Digital Printing • Electrical and Electronics • Food & Beverage • Graphics • Health & Beauty • Medical • Packaging • Pharmaceutical • Printing

Products

Labels • Tapes • Adhesives and Coatings • Sealants • Specialty Inks • Heat Seals and Cold Seals • Hard Coats and Topcoats • Varnishes • Assemblies • Fixatives Hydrogels • Hydrocolloids • Polymers • Additive Packages • Colorants

Technologies

Silicone Polymers & Release Systems • Acrylic Copolymers • Block Copolymers (including SBS, SIS, SEBS etc.) Natural Rubbers • Polyesters Polyamides • CAP • PVA • PVP • Epoxies • Melamine • Polyurethanes • CAB



Development

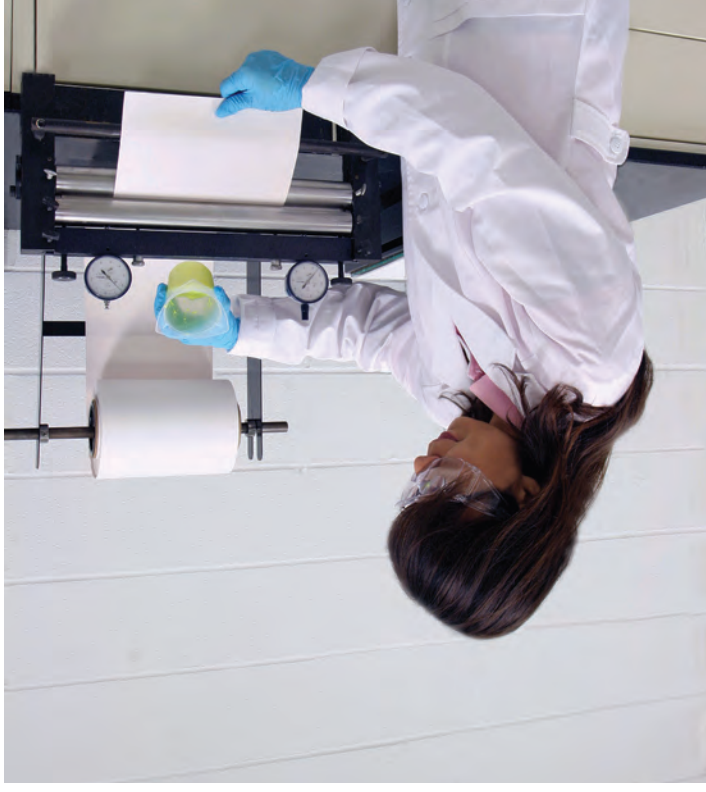
Chemsulitants develops products based on various technologies such as solvent, emulsion, hot melt, and 100% solids systems.

Other chemistries include:

- Silicone polymers / release agents
- Heat seals / heat-activated adhesives
- Acrylic copolymers
- Block copolymers of styrene-butadiene and isoprene
- Urethanes
- Epoxies



After the initial lab scale development and testing stages, new products can be trial produced in house on pilot scale coating equipment. This ensures that new products developed by Chemsulitants meet defined product targets, as well as performance targets – and are commercially viable. This approach of product development through coordinated project management has earned us worldwide recognition as a premier contract research and development facility. Chemsulitants has successfully provided a broad range of product and process development services to an extensive list of markets in an array of technologies.

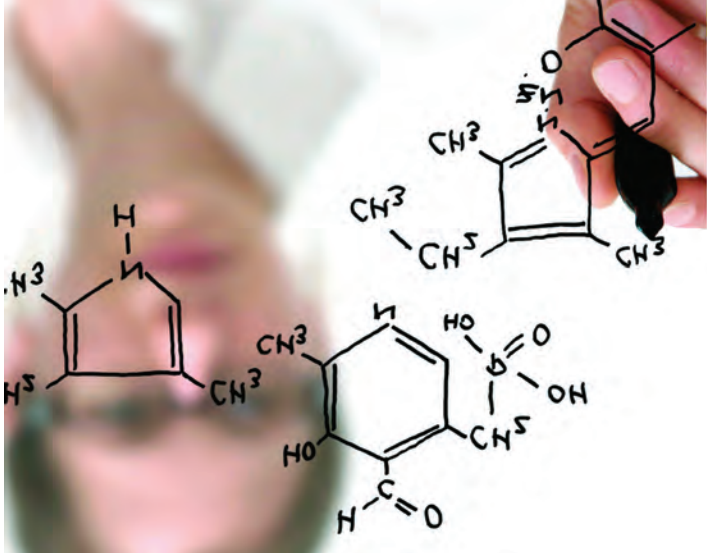


Development

Product Development

One of the most difficult challenges for most companies is the management of a complex product development project in a way that generates the desired results in a predictable time frame at a reasonable, manageable cost. The Chemultants philosophy is based on a concise approach: Product requirements including performance, application and cost are fully defined through an interactive dialog with the client. Our comprehensive product development services are proven, time and again, to reduce the time and cost needed for development of:

- Adhesives
- Tapes
- Label Products
- Specialty Coatings
- Packaging Applications and much more



We formulate, compound and prepare lab-scale drawdown products for labels, tapes and laminates for applications in numerous markets. Our pilot coating facility provides exceptional precision and versatility and is supported by an on-site, fully A2LA accredited lab. Once lab development and testing is complete, Chemultants can produce your new products on commercial-scale coating equipment at our state of the art facility for further market evaluation and development. This process validates that your products meet all performance requirements and ensures that they are reproducible and commercially viable.

Technical Workshops

Technical Workshops

Chemsubitants International presents several technical training workshops during the year in conjunction with key industry associations and service provider.

The Pressure Sensitive Tape Council (PSTC) is the North

American trade association comprised of world-class Pressure Sensitive Tape manufacturing companies, adhering to the highest standards for producing quality products in an environmentally, socially responsible environment.

PSTC has, since 1990, offered key educational workshops as part of its Tape University Program. In 2007, Chemsubitants and the Pressure Sensitive Tape Council established the Alliance for Excellence in Tape Testing to provide critical skills to the pressure sensitive tape industry. In doing so, PSTC chose to partner with Chemsubitants International as its teaching resource. And in 2010, Chemsubitants expanded its partnership with PSTC by hosting 2 workshop sessions a the Chemsubitants Technical Training facility.

- **PSTC Tape Manufacturing & Testing** – learn how pressure sensitive tape is manufactured and finished into rolls, and how to test tape for performance properties during development and after production.
- **PSTC Tape Advanced Technology** – learn about the technology of pressure sensitive tape including polymers, adhesion science, adhesives, backings, liners and analytical testing.

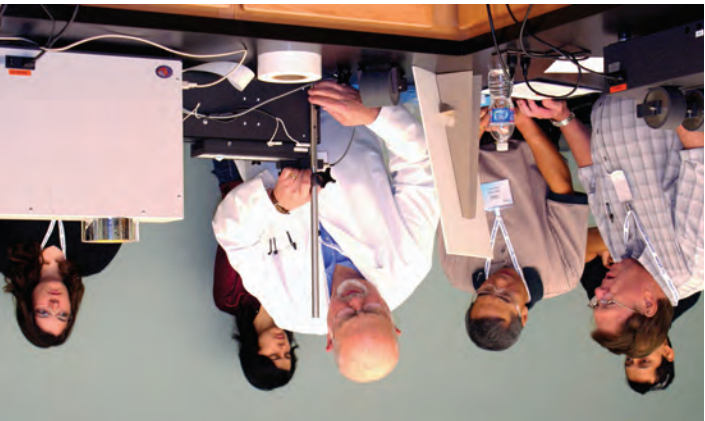
- **Introduction to Pressure Sensitive Adhesive Technology Workshop** – a 2 day workshop covering a variety of topics related to pressure sensitive adhesive products. The curriculum includes: market overview, product and adhesive types, face and liner stocks, adhesive formulating, coating/ drying/ curing of adhesives, physical and analytical testing and a demonstration of laboratory testing.

Industry Education and Training

Chemsultants International provides hands-on, technical training to those interested in learning more about adhesives, coating technology, and testing. Members of our professional staff of adhesive consultants and scientists have years of combined experience in a wide variety of disciplines including adhesion theory, formulating, product development and applications, web coating and product testing.

Over the years, Chemsultants International has consulted with and provided seminar and hands-on workshop training to QA, QC, R&D and Production staff members of industry participants worldwide on topics that include:

- Developing pressure sensitive adhesive, tape and label products
- Applications and uses for specialty adhesives and specialty coated products
- Testing pressure sensitive tapes, labels, liquid adhesives, specialty coatings and sealants to the requirements of ASTM, PSTC, TLMi, AFERA, and FINAT test methods



Market Research

At Chemsultants, we actively conduct private market research studies for our clients to enable them to better identify market trends, emerging market opportunities and new product needs.

Past research has included work to evaluate:

- New plasticizers and diluents used in adhesives and sealants
- Adhesive industry market trends
- Adhesive and Sealant product developments
- Fluor surfactants in pressure sensitive adhesives

We put the focus on your unique application and develop the essential market information you need to succeed.

Our research includes critical data regarding:

- Key industry players
- Cutting edge technologies
- Future growth opportunities
- Critical market drivers
- Industry competition

Chemsultants is fully staffed to provide customized private client market research studies that address the information needs of our clients. Our work in this area is focused on specific product or market applications identified by the client. We develop essential market reports containing key industry information such as share positions, growth trends, competitor outlines, market drivers and information to identify growth opportunities. In addition, we can assist in the developing business strategies for marketing, selling, product development and manufacturing operation upgrades and improvements.

Chemsultants works with you to develop application oriented recommendations that generate revenue and build sales. Call today and ask how we can help you develop product business strategies for new or existing products.



Product and Process Evaluation

Chemists conduct consultative evaluations of existing products and processes for the purposes of product or process improvement, raw material and component modification or replacement, performance enhancement, and competitive evaluations. Our basic consulting services are designed to address specific client needs on a product by product, product line, program or retainer basis for more complex issues.

Materials Information

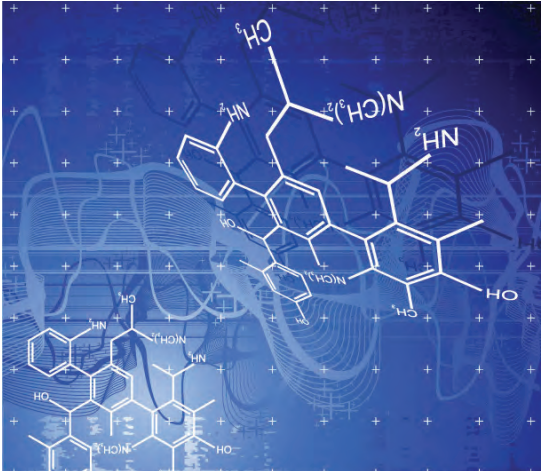
We routinely conduct vendor searches and raw material evaluations. We provide information related to component raw materials of labels, tapes, coatings, adhesives, sealants, inks, and laminates. Included is technical data and material specification development for the purposes of identifying replacement raw materials, improving product performance, and cost reduction programs.

Quality Systems Management

We are actively involved in a product's life cycle from development through production and as a result are intimately familiar with the many issues related to quality assurance and quality control in both laboratory and manufacturing. Chemists, an A2LA accredited laboratory operating under ISO 17025, can assist in the development of an internal quality system and the implementation of protocols and statistical techniques to maintain control of your laboratory, and manufacturing testing processes.

Expert Witness / Conflict Resolution

As a respected independent, third party laboratory in a specialized field, Chemists has the experience to provide expert witness testimony and assist in conflict resolution. We have utilized our experience in a number of expert witness / conflict resolution areas including product failure, liability, effectiveness and patent infringement.



Consulting



Consulting

Chemsultants' professional scientists routinely provide adhesive consulting services in a wide variety of areas that include:

- Product performance issues
- Problem solving
- New product idea brainstorming
- Web coating issues
- Market and product opportunity analysis

An integral part of the capabilities of Chemsultants is providing clients with consultative services. Our staff of highly qualified professional scientists and industry professionals has over 250 years of combined experience in a number of key disciplines.

Our practical and applied expertise includes areas of laboratory services, coating, production and finishing, product and process development, engineering, printing, and converting, marketing and business management.



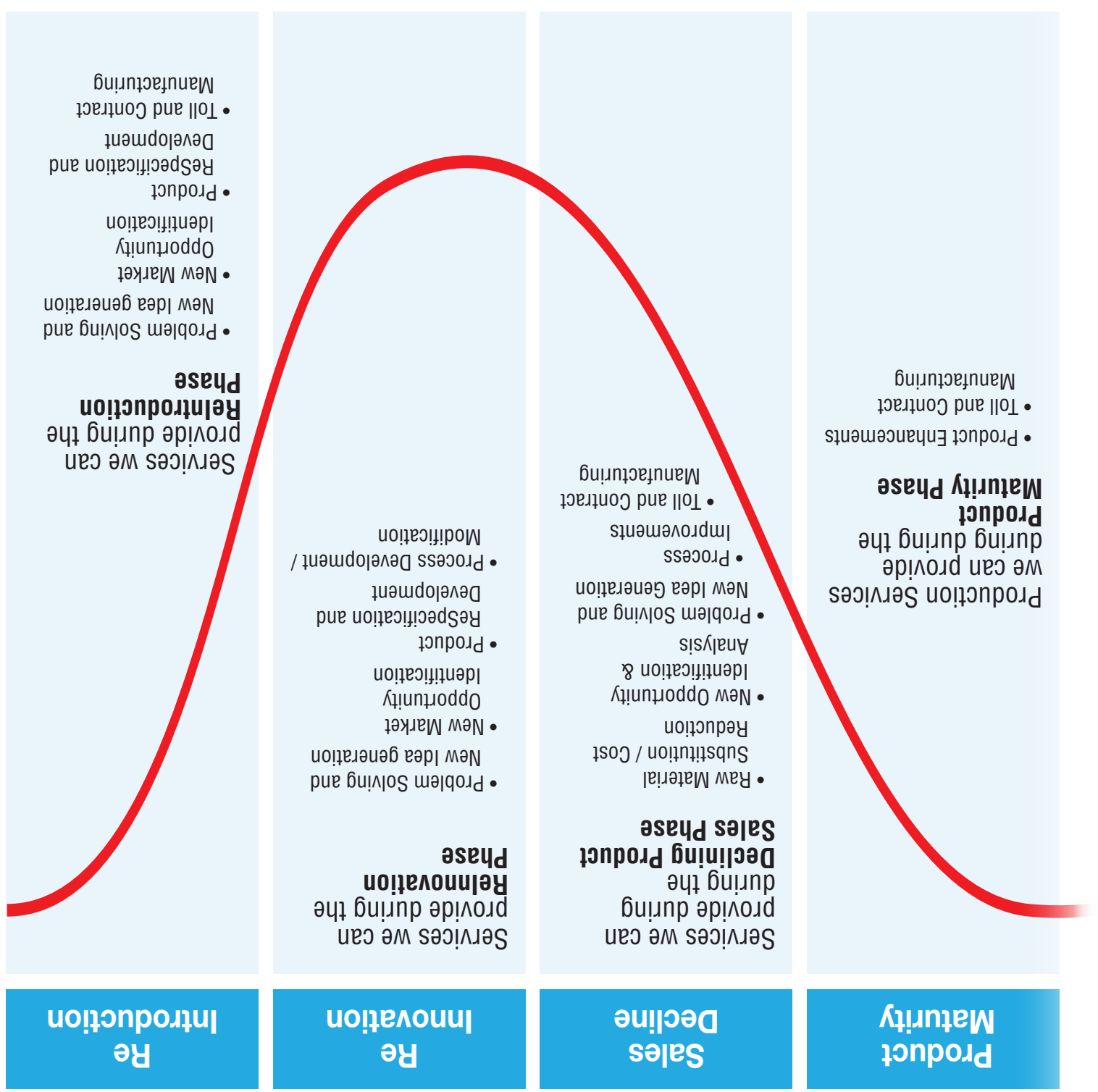
Fact: You Get Complete Support for Your Business from the Most Extensive Range of Services provided by a World Renowned Adhesive Consultant Team.

Thanks to our extensive industry expertise, companies around the world trust Chemsultants for:

- Product application and development recommendations
- Quality control and assurance programs
- Management of private client market studies
- Consultation on new laboratory facility planning, and quality system development
- Expert witness testimony service

For your convenience, our consulting services are available on an hourly or daily rate basis and can be scheduled either at the Chemsultants facility or at your location.





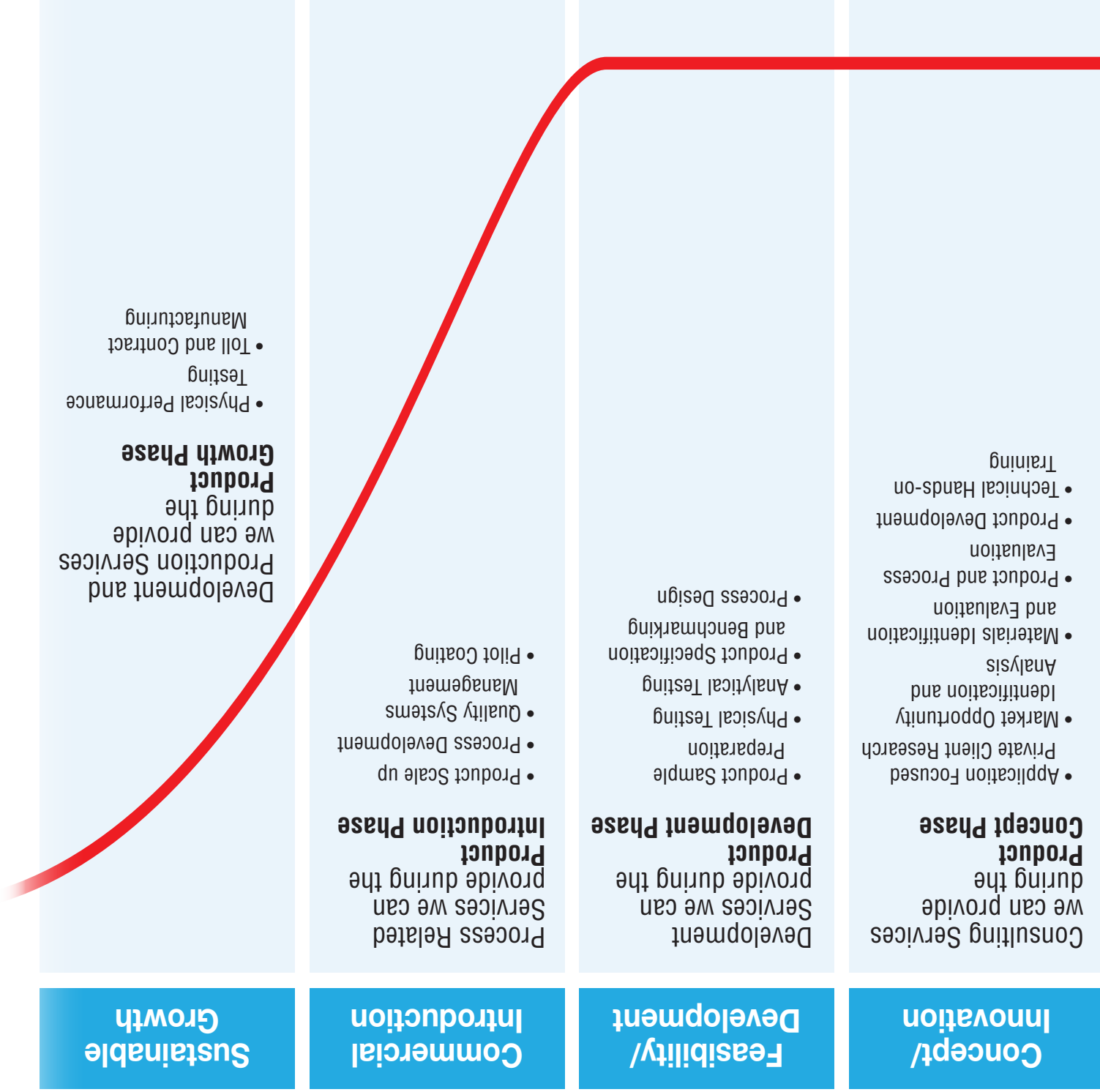
all the way through PRODUCT MATURITY and beyond, Chemisultants provides the right combination of services, at the right time, to help insure that your products are successful for the long run.

Providing a full range of services to our clients over the complete cycle of product life stages is our forte. As your products move from the initial CONCEPT or idea stage through DEVELOPMENT and GROWTH,

Product Life Stages: The Chemsubtants Service Package

Good product ideas can often be improved upon or modified to extend their life through a process of REINNOVATION and REINTRODUCTION.

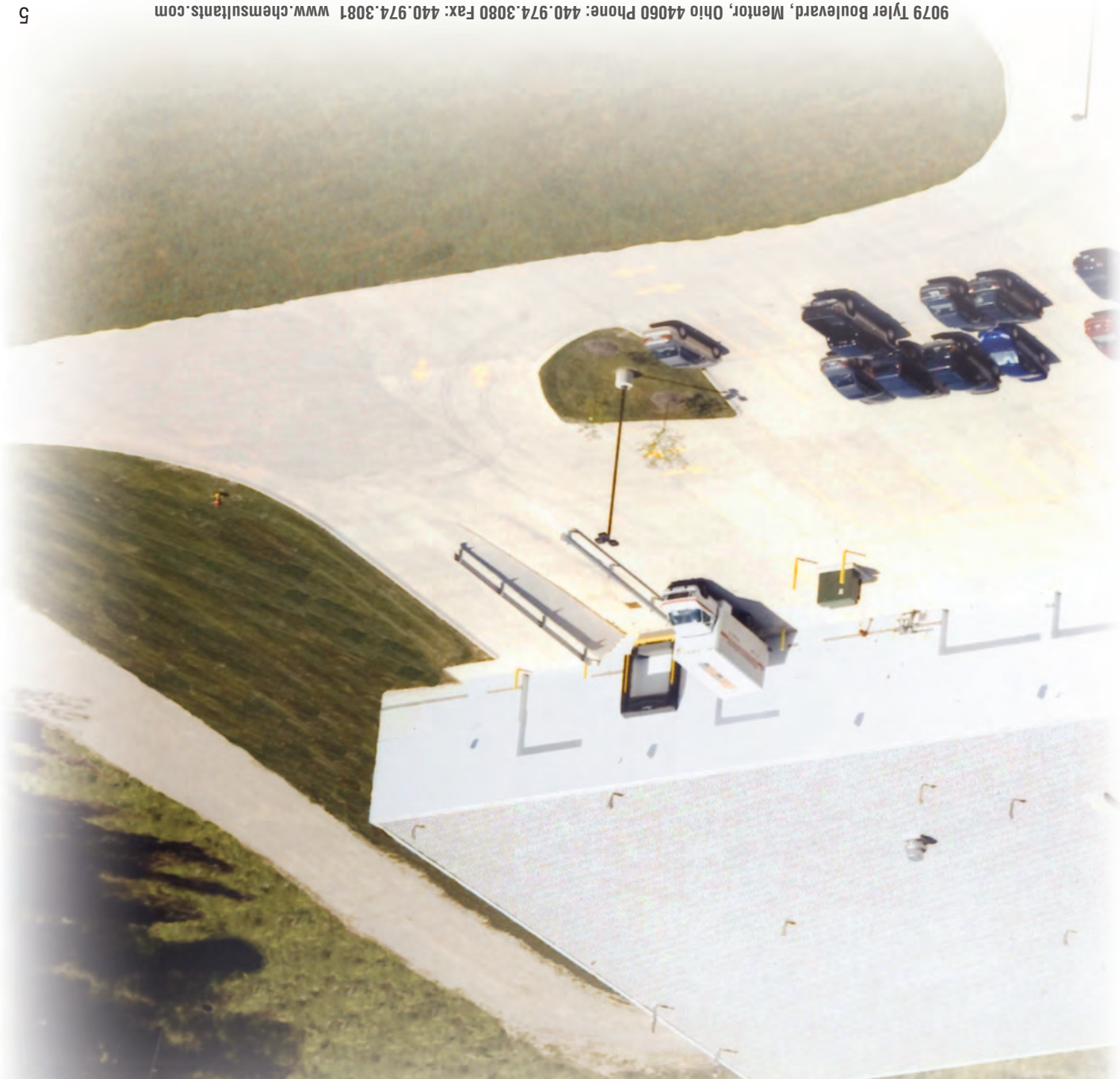
Products typically start out as an idea and grow from there. Most products experience periods of sales growth, maturity and eventual decline.



Introduction

We are experts in a wide variety of technologies including pressure sensitive label and tape products, liquid adhesives and sealants, heat seal adhesives, specialty coatings, printing inks and packaging materials. Companies in industries as widely varied as electronics, medical, pharmaceutical, aerospace, packaging, fuel cell energy and graphics have trusted the development and improvement of their products to Chemsultants.

Our clients have valued our practical and applied knowledge for over 25 years. From product concept to process development to production and beyond, let Chemsultants be your partner in success.



Introduction

Breakthrough Creativity

Chemsubsultants International is an ever growing and innovating company dedicated to employing cutting edge technology to develop unique product solutions for its clients.

Chemsubsultants is different than other contract research, product development or testing labs. The Chemsubsultants team helps accelerate development and manufacture of new products, reduce product costs and improve product performance every day.

Located in a 40,000 square foot facility on a 10 acre technology campus in Mentor, Ohio, Chemsubsultants continually makes significant investments in new research, production facilities, and equipment. With the addition of our two newest pilot coating lines, we've increased our ability to provide comprehensive, state-of-the-art pilot coating and contract manufacturing services.

- contract research
- market research
- new product development
- product prototyping
- pilot and contract manufacturing
- product benchmarking
- performance and analytical testing

Our staff of highly qualified professional scientists has decades of combined experience working with adhesives, coatings and specialty materials and they use this experience to assist clients every day. Our team of scientists, engineers and technicians is focused on providing service excellence in a variety of areas including:

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Chemsuitants International..... a company on the move for over 25 years

We've recently celebrated the 25th Anniversary of the founding of Chemsultants International. Started as a one man pressure sensitive adhesive consulting firm by Richard P. Munny in 1986, Chemsultants International is a family owned and operated business.

The company has grown to become a premier provider of products and services to industries worldwide. Chemsultants International is involved in testing and development of adhesives, specialty coatings, coated materials, sealants, polymers, inks and packaging materials.

With a solid history of double-digit growth based on a strong entrepreneurial spirit, we anticipate the next 25 years and beyond.



**Consulting
Development
Production
Testing**

*Feasibility/
Development*

*Concept/
Innovation*

*Commercial
Introduction*

*Sustainable
Growth*

*Product
Maturity*

*Sales
Decline*

Re Innovation

Re Introduction

