

IMASS TL-2300 Tester

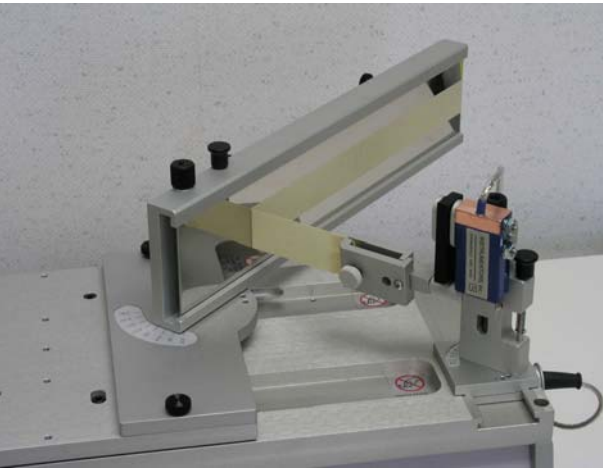
Conforms to TLM1 standards as well as PSTC, ASTM, FINAT, AFERA and TAPPI standards

Speeds 6 to 1500 in/min (15 to 3800 cm/min)

Accommodates longer, wider samples

Successor to TL-2200, keeping its functions and adding more.

- Easy to set up and operate
- 10 Kg (25 Lb) capacity
- Measures Static Peak, Kinetic Peak, Valley, Average and RMS forces
- Easily switched between English, Metric and SI units
- Variable peel angle fixture standard
- Embedded microprocessor provides completely self-contained, stand-alone system
- USB port for transmission of data to a computer
- Running statistics (mean, standard deviation and coefficient of variation) on all parameters



Variable Angle Peel Fixture (above) is easily installed and removed for other fixture installations. Accommodates peel angles from 22 ½° to 180°. Pin-indexed angles are at intervals of 22 ½°, but any other angle in between may be interpolated using the built in scales. This fixture receives panels 2 3/8 inches wide by 12 inches long, accepting tape widths to 2 inches.

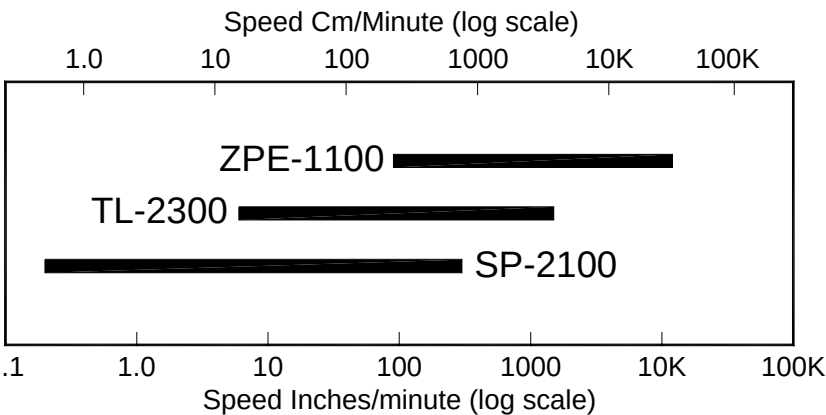
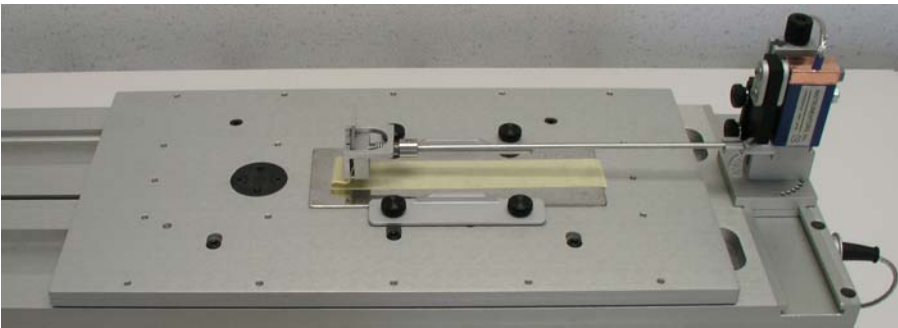
Global adaptability to power source — One model accommodates a world-wide range of power voltages and frequencies. The instrument automatically adapts to any power source from 100 to 240 VAC, 47 to 63 Hz.

English, Metric or SI units — The system accepts set up commands and produces data in operator-selected units of force and platen speed. This further extends the global adaptability of the instrument and assures freedom from obsolescence. You can even mix units (e.g. grams with inches per minute)

Static Peak, Kinetic Peak, Valley, Average and RMS force data — The figure at right is a schematic representation of a typical friction or peel force trace plotted as a function of time or platen travel. Period T1 (Delay Time) allows the test force to come to some sort of dynamic equilibrium. The only property measured during this period is the Static Peak. This is of primary importance in COF characterization since it represents the Static Coefficient of Friction. Period T2 (Averaging Time) is where the Kinetic Peak, Valley, Average and RMS forces are determined. The Average relates to kinetic COF values and average peel strengths. Most all properties of interest in the characterization of PSAs occur in the T2 period. Time T1 and Time T2 are individually selectable by the operator, and their optimum values will vary with testing speed, available sample length, and allotted test time. RMS (root-mean-square) force data, unique to IMASS instruments, quantifies random force variation about the average, within a test. It can be related to “zippering”, “shockiness” or “stick-slip”.

Set Up Memory — On power-up, system remembers the last selections of units, speed and functions. (Standard Setup Saver can save and quickly recall up to 7 different setups)

A USB port permits connection of the TL-2300 to a computer using IMASS’ DataLink software. The software is included as standard along with a USB cable.



180° Peel Setup



Coefficient of Friction Setup

Automatic balance and calibration relieve TL-2300 operators of time-consuming calibration and balance procedures. The touch of a pushbutton implements the balance (zeroing) and checks calibration (span) of the force system. It is required on power-up and can be invoked by the operator at any time.

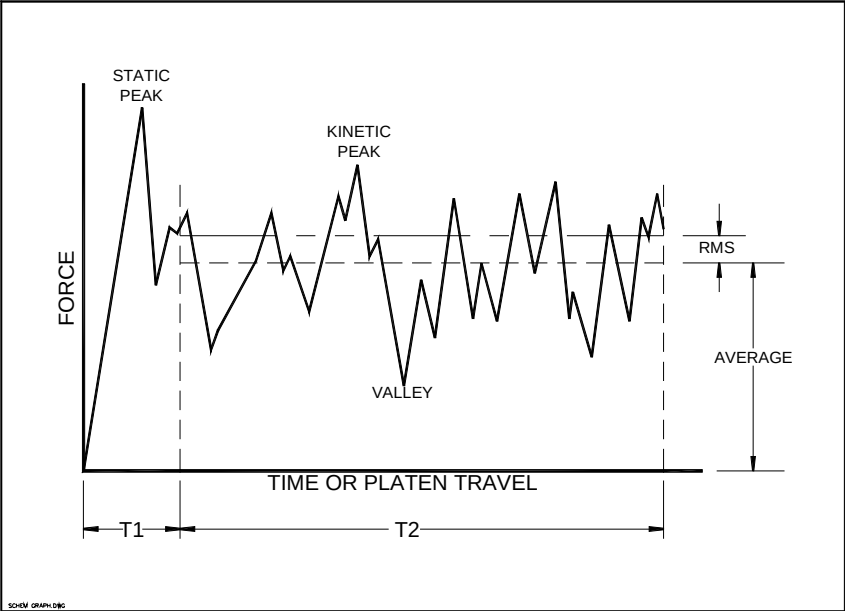
Load Cell technology Load cells for the TL-2300 make use of digital self-ranging and calibration features of IEEE 1451d4 (otherwise known as the “TEDS” protocol). This system recognizes the capacity of the connected load cell as well as its exact output and factors those parameters into the test data.

A dedicated, embedded microprocessor for all controls and functions is contained within the single, stand-alone tester module. The miniaturized microprocessor is equivalent in speed and capability to many PCs. It has been interfaced to the platen drive, to the force measuring system, to the front panel display and to its USB port. This system can save hours a day in setting up, running, scaling, calculating and recording tests. It also removes many of the possibilities of human error occurring during those tasks.

Precise platen drive and powered return —The microprocessor controls a positional servo drive to provide user-selectable travel limits and wide testing speed range. This is a screw-driven system with no chain to cause cogging or flutter. Speeds are digitally selected and controlled for the utmost in accuracy. In addition to the standard speeds, there are preselected speeds that provide standard peel front velocities when performing 90 degree tests on the Variable Angle Accessory (whose geometry requires a different platen speed). Any single special platen speed may also be selected throughout the rated speed spectrum.

Vacuum fluorescent display is adjustable to any of eight levels of brightness for comfortable viewing at any ambient lighting level. This 4 line by 20 character display is the medium through which the tester communicates with the operator. It displays instructions, data and statistics, and warns of potential problems. Beginning right from start up, the conversational style set up and operation instructions are easy to learn and to follow. The display has an autodimming screen saver.

PC interfaces — standard software can connect the instrument to your PC computer. One program accepts data and statistics in a rigid format.(typical for medical product applications.) An alternative accepts data from a mixed sequence of tests and samples. Data and graphs are captured by either. including direct loading into an Excel spreadsheet. Please refer to the specification section at the end of this data sheet for more details.



The chart at left compares the speed ranges for various model IMASS testers. The TL-2300 and SP-2100 have driven platens which can accommodate variable angle, unwind, and T- Peel fixtures as well as the conventional 180 degree set up. To attain the high speeds on the ZPE-1100 it was necessary to use a nip roll drive which is intrinsically limited to 180 degree test geometry. Separate data sheets cover the SP-2100 and ZPE-1100 in detail.

In checking these ranges, remember that speed is shown on a log scale and that TL-2300 speeds fall in a very broad intermediate range.

All of these systems come with an interface to a separate PC computer. They all use strain gage type load cells and their A/D systems have been selected for optimum resolution and accuracy.

Easily adaptable to different test geometries — Change from coefficient of friction to peel measurements quickly, without tools. Change to Variable Angle using a single hex key.

Specifications - IMASS Slip/Peel Tester Model TL-2300

Platen Drive System — Positively driven from a dc positional servo motor with encoder feed-back. Powered return. Operator choice of speed units: inches/minute, centimeters/minute, millimeters/second. Platen speed range 6 to 1500 inches/minute (15 to 3800 centimeters/minute)(2.5 to 635 millimeters/second). Any speed within that span may be selected. Preselected fixed platen speeds of 6, 12, 17, 90, 127, 300, 600, 1200 and 1500 in/min (15, 30, 43, 229, 323, 762, 1524, 3048, and 3810 cm/min) (2.5, 5, 7.2, 38.1, 53.8, 127, 254, 508, and 635 mm/sec). Each control and set up pushbutton is clearly labeled as to its function. A jog capability permits fast and accurate repositioning of the platen. Right and left soft limits can be set anywhere within the available travel, which is 18.1 inches (46 cm).

Drive Capacity — 25 lb (10 kg) at speeds up to 750 in/min and 10 lb (5 kg) over 750 in/min.

Typical applications for preset speeds

- 6 in/min is an ASTM standard speed for COF testing.
- 12 in/min is a PSTC standard for pressure sensitive adhesion testing.
- 17 in/min provides a peel front speed of 12 in/min when used for 90 degree settings with the Variable Angle Peel Fixture.
- 90 in/min is a 3M Company* standard.
- 127 in/min provides a peel front speed of 90 in/min when used for 90 degree settings with the Variable Angle Peel Fixture.
- 300, 600 and 1200 in/min are TLMI standard speeds
- 1500 in/min is an extension exclusive to IMASS' design.
- Corresponding Metric and SI units follow this same relationship.

Force Measuring System — Precision strain gage type load cell, stationary mount to avoid inertial effects. Choice of 3 cell capacities- 2 kg (5 lb), 5 kg (10 lb) or 10 kg (25 lb). One included with each system. Unless otherwise specified, 5 kg (10 lb) will be furnished. System automatically recognizes cell capacity and scales it into results. Selectable force units are Grams, Ounces, Pounds, Newtons and COF (unitless ratio).

Analog signal conditioning electronics — Special low-noise linear circuits feed a high resolution A/D which performs real time conversions on the analog force signal. Delay time (T1) selectable at 0.1, 0.2, 0.5, 1, 2 or 4 seconds. Averaging time (T2) selectable at 0.1, 0.2, 0.5, 1, 2, 5, 10, 20, or 50 seconds. The force signal is measured continuously during both the T1 and T2 (Delay and Averaging) times at a maximum **rate** of 4000 samples per second. The maximum **number** of samples within T1 is 800, while the maximum number of during T2 is 4000. Based on the operator's selection of T1 and T2 the sampling rates are automatically set to stay within those limits.

DataLink Data interface and programs Included as standard:

ExLink program — A summary of test conditions and the tabulated data automatically upload to user's PC where it occupies the next row in an Excel® spreadsheet. Excel® graphs of each test are produced on successive pages in the spreadsheet (book). Operator can tag data (from panel controls) for rejection if necessary. Because it was designed to handle a sequential mix of test types and specimens, internally-generated statistics are not available in ExLink. The spreadsheet file is the total digital record.

StatsLink program — Produces statistics in lots determined by the operator: Mean, Standard Deviation and Coefficient of Variation for all five test parameters. Thumbnail graphs monitor each test and can consolidate all test graphs in one print out sheet. Tabulated data can be directly loaded into Excel®. Produces an Archive file for each lot that may be reloaded into the program for re-analysis at any time. Provides access to raw graphic digitized data pairs for external analysis. Print out and data saving may be completely automated. Data files of 4 different types may be directed to any Windows designated file directory or folders. This simplifies connection to LIM or central server.

Standard Accessories — 200 gm friction sled per ASTM D1894. Quick-release Tape Grip for horizontal 180° Peels. One test panel for COF, 6 x 12 in (15.2 x 30.5 cm) type 304 stainless steel with 2B finish. Variable angle peel fixture with selectable preset peel angles of 22.5, 45, 67.5, 90, 112.5, 135, 157.5 and 180°. Two test panels, 2 x 6 in (5.08 x 15.2 cm) for PSTC 180° peel plus two test panels 2 3/8 in x 12 in (6.03 x 30.5 cm for variable angle test. All four panels are stainless steel with 2 microinch finish.

Electrical Requirements — Instrument automatically adapts to any power source from 100 to 240 vac, 47 to 63 Hz. 5 amps maximum current consumption.

Platen dimensions — 13 inches long x 7 inches wide (33 cm x 17.8 cm.) 45 lb net weight (20.5 kg).55 lb shipping weight (25 kg.)

Approximate overall dimensions and weight — 33 inches long, 9 inches high, 9 inches deep (84 cm long, 23 cm high, 23 cm deep). net weight —45 lb (20.5 kg) shipping weight 55 lb (25 kg)

Optional Accessories (installable at any time and covered in separate data sheets) — Other capacity load cells, Autoroll Sample Preparation Accessory, T-Peel Fixture, Roll-Unwind Fixture, Temperature-controlled Platen.

*3M Company is a registered trademark of the Minnesota Mining and Manufacturing Company, and the use of their name is not intended to imply their endorsement of our product.



INSTRUMENTS FOR THE MATERIALS AND SURFACE SCIENCES

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TL2300 DS 0211.PMD

TL-2300 Tester for Peel, Release and COF



Covers entire range of **TLMI** speeds and beyond
6 to 1500 in/min (15 to 3800 cm/min)
Now includes PC software in base price.



- Longer stroke - **18.1 inches** (46 cm)
- High-performance servo / screw drive for smooth platen motion
- Statistics, running and lot
- Easy to set up, operate
- Globally oriented
- PC compatible
- Stores 7 test Setups for instant recall
- Extended data handling and archiving