Tear Tester

INTRODUCTION

Tear testing measures the force required to continue the tearing of initial cut in sheet materials. Models and weights are available to test material with a variety of strengths. This is also useful to evaluate strength of perforated materials such as reply cards.

Also known as the **Elmendorf test**, the **tearing test** has been performed in the paper industry for more than half century in order to measure the mean internal resistance of cellulose or papers to the propagation of a deliberately initiated tear. It enables rapid determination of the dynamic resistance of materials designed to be subjected to strong shearing loads (e.g. newspaper) or liable to be damaged by sharp or heavy objects (e.g. paper bags). Subsequently, the test was naturally adopted for all materials in the form of sheet or films, cardboards, cloth, knitted fabrics, plastic films, aluminum foil, non-woven fabrics, complex flexible packaging etc. for which the service requirements are similar to those for paper.

PRINCIPLE

The test is carried out on a specimen composed of one or more sheets of standard dimensions, usually with a distance of 43mm (1.7 in) remaining to be torn after initiating the tear. The energy of a pendulum of suitable weight is used to completely tear the specimen. The difference in the angle from the vertical of the center of gravity of the pendulum between the downswing and upswing is a measure of the energy absorbed in tearing the sample. This angular movement is measured with a digital encoder and is immediately converted to the mean tearing force for a single sheet by the microprocessor incorporated in the apparatus.

APPLICATIONS

Paper, Foil, Film, Non-woven's, Fabric, Textiles, Flexible packaging

ADVANTAGES

- Auto specimen notching
- Safety Hood
- Automatic pendulum reset with lifting device
- Tearing force displayed digitally
- RS-232 data output
- Mechanical-pneumatic clamping avoids sample slippage to ensure repeatable results

FEATURES

- **Repeatability**: The mechanical-pneumatic specimen gripping system guarantees sufficient clamping pressure to avoid all slipping phenomena, thus ensuring perfect reproducibility of the experimental conditions.
- **Safety Hood**: As soon as the safety hood preventing access of the operator to the swinging pendulum zone is closed, the specimen is pre-notched automatically by a pneumatically driven shear.
- **User-friendliness**: The mean tearing force is indicated on an easy to read alphanumerical liquid crystal display and can also be transferred to a computer, either for additional statistical treatment or for record keeping purposes.
- **Ergonomics**: When the apparatus is equipped with an **automatic pendulum** raising device, after each test, the pendulum is immediately reset in its starting position.

ORDERING INFORMATION:

The models **83-20** and **83-21** offer a combination of technological integration and user comfort unique to this type of instrument.

- Model **83-20-00** is designed for tests on paper, aluminum, plastic films, complex flexible packaging, non-woven fabrics and others low strength materials
- Model **83-21-00** is designed for testing cardboard, natural or synthetic fabrics, coated fabrics and other medium strength materials.

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Technical Characteristics

Specifications	83-20-00	83-21-00
Maximum capacity	64000mN(millinewtons)	100 N
Measurement scales (by adding or removing easily interchangeable weights)	4000-8000-16000-32000-64000mN	50-100 N
Measurement and display units	mN	N
Accuracy of the mean force measurement	+/- 1% of the indicated value or +/- 0.25% of the scale employed	+/- 1% of the indicated value or +/- 0.25% of the scale employed
Computer assisted calibration software & set of weights and accessories	Option	Option
Weights for routine inspection	Option	Option
Automatic pendulum reset	Standard	Standard
Automatic specimen notching	Standard	Standard
Safety Hood	Standard	Standard
Automatic weights recognition	Standard	Standard
Specimen preparation tools supplied with the apparatus	Shear (papers) or punch (plastic films)	Standard punch for use with a hammer or a press
Computer or printer output	RS 232C	
Number of sheet selector	Standard	
Pneumatic grips	Standard	
Measurement and display of the blank upswing angle (zero)	Standard	
Software for PC	Test link 3	
Compressed air	600 kPa (90 psi)	
Electric power supply	Specify voltage requirements when ordering	
Height	500 mm (19.7 in)	
Width	540 mm (21.3 in)	
Depth	500 mm (19.7 in)	
Net Weight	52 kg (115 lb)	

Principal Standards

Papers	Plastic Films	Textiles
NF Q 03.011	NF T 54.141	NF G 07.149
ISO 1974-1974	ISO 6383/2	
CSA D9		
UNI 6444		
SCAN P 11		
TAPPI 414		
APPITA P 400		
ASTM D 689	ASTM D 1922	ASTM D1424
NEN 1760		
BS 4468		

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