



Paper tensile test

Tensile test according to ASTM-D 828, EN ISO 1924-2 or TAPPI T-494.

Purpose and Definition:

Tensile tests are a fundamental test within material science and is performed on more or less all materials including paper. Within the paper industry it is very important to know the tensile properties. Paper products are for example often printed in automated machines where the paper is run through big rolls over large distances and at very high speeds. Also in the packaging industry the paper is delivered on big rolls which are then fed into machinery which produce different types of cartons for a great variation of applications and rely on high tensile quality during production.

Equipment used:

Testing machine: EZ-LX Table top
Load cell: 1000N, 1/500 Class 1
Jig: PFG-1kN Pneumatic grips.
Software: Trapezium-X Single / Tensile.
Environment: Room temp 21° +/- 2°C, humidity ca. 50 +/- 5% RH





MATERIAL TEST

SEG0214b

Test execution:

5 sets of samples was prepared.

Sample length is 250mm +/- 5mm.

Width is 25mm +/-0,4mm according to ASTM D828, (EN ISO1924 width shall be 15 +/-0,1mm)

The sample length has to be long enough to allow for 180mm gauge length, grip separation, and still have enough sample for correct clamping.

A method is prepared according to ASTM D828.

Test type is single and tensile.

Test speed is set to 20mm/min (25 +/-5mm/min is required according to ASTM and

20 +/-5mm/min according to EN ISO 1924).

Some data points which may be requested for in this test are

Tensile strength, kN/m,

Elongation, %,

Tensile energy absorption, J/m²,

Tensile stiffness, kN/m,

Breaking length, m,

Tensile index, N·m/g.

With the help of TrapeziumX and the calculator in the data processing menu it's easy to create data points like the ones requested in the paper industry.

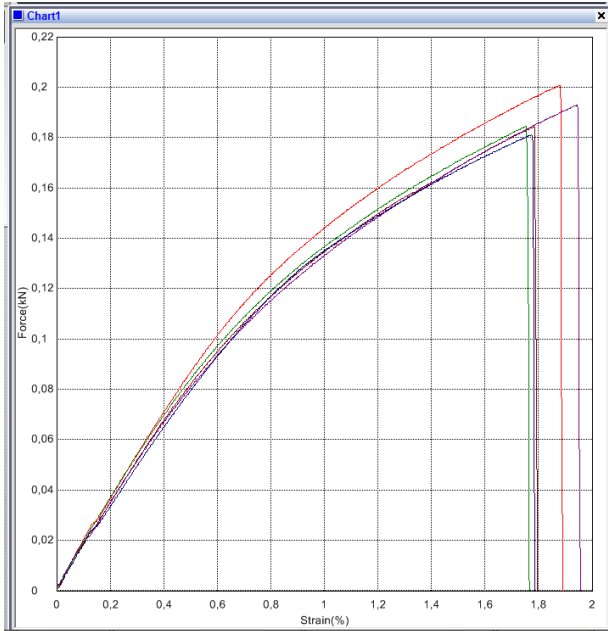




MATERIAL TEST

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Test Results:



Tensile properties are always important in most materials and is the most common test made in universal testing machines. Generally a customer is looking for elastic, maximum and break properties.

Results in this case are presented according to the requirements in ASTM D828.

To obtain this result we have a great help from the calculator in TrapeziumX / data processing to present the results in a correct way.

Please refer to ASTM D828 for details.

Results(Batch)						
Name	Max_Force	Tensile strength	Tensile index	Break_Strain	A	TEA
Parameter	Calc. at Entire Areas			Sensitivity: 1	Calc. at Entire Areas	
Pass/Fail						
Unit	kN	kN/m	Nm/g	%	J	J/m ²
Print	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
80g/m ² _1	<input checked="" type="checkbox"/> 0,20073	10,0365	100,365	1,87989	0,43186	94,7594
80g/m ² _2	<input checked="" type="checkbox"/> 0,18411	9,20550	92,0550	1,78297	0,36799	81,7715
80g/m ² _3	<input checked="" type="checkbox"/> 0,19289	9,64450	96,4450	1,94483	0,42123	93,3916
80g/m ² _4	<input checked="" type="checkbox"/> 0,18449	9,22450	92,2450	1,75497	0,36492	81,0084
80g/m ² _5	<input checked="" type="checkbox"/> 0,18095	9,04750	90,4750	1,77312	0,36157	80,3079
Average	0,18863	9,43170	94,3170	1,82716	0,38951	86,2478
Standard Deviation	0,00808	0,40397	4,03972	0,08172	0,03409	7,18074
Range	0,01978	0,98900	9,89000	0,18986	0,07029	14,4515

Examples of applicable standards:

Determination of tensile properties – ISO 1924-2

Tensile Properties of Paper and Paperboard Using ASTM D828

Tensile properties of paper and paperboard TAPPI T-494

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