Paper Tensile, Burst and Tear Indices

Tensile, burst and tear indices that normalise paper strength by grammage, from tensile strength per width, burst pressure and tearing resistance (Smook ch. 22).

Method: Smook; Handbook for Pulp & Paper Technologists; ...

Input parameters

Unit system: SI

Parameter	Value	Unit
Grammage	80.000	g/m²
Tensile strength (force per width)	5.5000	kN/m
Burst pressure	250.00	kPa
Tearing resistance In newtons: 650 mN = 0.65 N.	0.65000	N

Calculated results

Parameter	Value	Unit
Tensile index, N·m/g	68.750	
Burst index, kPa·m²/g	3.1250	
Tear index, mN·m²/g	8.1250	
Breaking length	7.0105	km

Notes for this case

- Tensile index in N·m/g, burst index in kPa·m²/g, tear index in mN·m²/g.

Formula and method

$$TI = \frac{T\ [\mathrm{N/m}]}{G\ [\mathrm{g/m^2}]}, \quad BI = \frac{p_b\ [\mathrm{kPa}]}{G\ [\mathrm{g/m^2}]}, \quad TrI = \frac{F_t\ [\mathrm{mN}]}{G\ [\mathrm{g/m^2}]}, \quad BL = \frac{T}{Gg}$$

Variables

G	Grammage	kg/m²
T	Tensile strength (force per width)	N/m
p_b	Burst pressure	Pa
F_t	Tearing resistance	N
TI	Tensile index, N·m/g	-
BI	Burst index, kPa·m²/g	-
TrI	Tear index, mN·m²/g	-
BL	Breaking length	m

Method and standards

Index definitions.

Assumptions and limits

- Conditioned samples (23 °C, 50 % RH).
- The indices use T in N/m, p_b in kPa, F_t in mN and G in g/m², giving N·m/g, kPa·m²/g and mN·m²/g; breaking length is in SI.

References

- Smook
- Handbook for Pulp & Paper Technologists
- 3rd ed. (Angus Wilde, 2002)
- ch. 22 (strength properties and indices)

Report details

Report reference	FCC-WV77-BBF5 (the same inputs always give the same reference)
Generated	17 November 2026, 19:49 UTC
Calculator	Paper Tensile, Burst and Tear Indices
Method last reviewed	13 November 2026
Software release	FireCAD Calc, release of 17 November 2026
Release checks	2 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/chemical/pulp-paper/paper-strength-indices

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.