

# Material Selection Based on Application

## Selection of materials for Efficient Light Springs

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*Materials for Efficient Light Springs*

Material	$M_2 = \frac{\sigma_y^2}{E\rho}$ (kJ/kg)	Comment
Ceramics	(5 – 100)	Brittle in tension; good only in compression.
Spring steel	2	Poor, because of high density.
Ti alloys	3	Better than steel; corrosion-resistant; expensive.
CFRP	4	Better than steel; expensive.
GFRP	3	Better than steel; less expensive than CFRP
Glass	10	Brittle in torsion, but excellent if protected.
Wood	1 – 2	On a weight basis, wood makes good springs.
Nylon	2	As good as steel, but high loss factor.
Rubber	20 – 50	Outstanding; ten times better than steel, but with high loss factor.

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