Comparison of Materials

To minimize elastic deflection, we seek materials of high elastic constant *E*. Similar to density, we usually do not select a material solely because of stiffness. This is because we can often change the geometry of our part to keep elastic deformation within design limits. We will investigate an example of this in sub-subunit 3.3.4.

The units of the following table are gigapascals (GPa). The prefix giga is the SI multiplier of 10^9. For conversion to the traditional units of this country:

1 psi = 6895 Pa (pounds per square inch to pascals)

Elastic Constant (GPa)

100 – 1000	METALS		CERAMICS	COMPOSITES
10 – 100	METALS		(porous) (glasses)	
1 – 10		PLASTICS		(woods)
0.1 – 1		PLASTICS		
0.01 – 0.1		(elastomers)		
0.001 – 0.01		(foams)		

Key:

CERAMICS	Engineering Ceramics
PLASTICS	Engineering Polymers
COMPOSITES	Engineering Composites
(porous)	Porous Ceramics
(foams)	Foamed Polymers