Material Properties

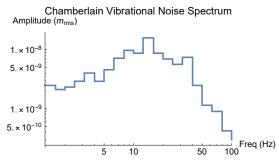
Setup

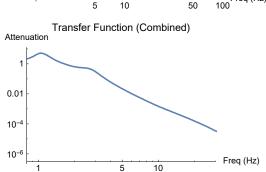
Out[243]=

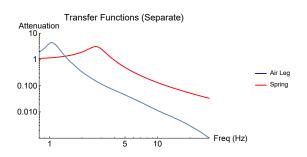
Applications

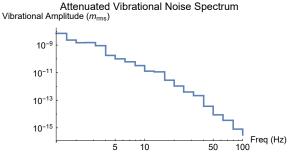
<pre>Material Spring (Music - Wire Steel, 1/2 " unstretched, 5108N176) Spring (Music - Wire Steel, 1 " unstretched, 5108N917 Spring (Music - Wire Steel, 6 * 1/2 " unstretched, 5108N917) Spring (Plastic, 1 " unstretched, 2017N123) Spring (Beryllium Copper, 1 mm wire, 15 mm OD, 15 turns) Spring (Brass, 1 mm wire, 15 mm OD, 15 turns) Spring (Carbon Steel, 0.9 mm wire, 15 mm OD, 15 turns) Hydrogel (acrylamide gel, 15 cm long, 1 cm area)</pre>		
<pre>Spring (Music - Wire Steel, 1 " unstretched, 5108N917 Spring (Music - Wire Steel, 6 * 1 / 2 " unstretched, 5108N917) Spring (Plastic, 1 " unstretched, 2017N123) Spring (Beryllium Copper, 1 mm wire, 15 mm OD, 15 turns) Spring (Brass, 1 mm wire, 15 mm OD, 15 turns) Spring (Carbon Steel, 0.9 mm wire, 15 mm OD, 15 turns)</pre>	♯	Material
<pre>3 Spring (Music - Wire Steel, 6 * 1 / 2 " unstretched, 5108N917) 4</pre>	1	Spring (Music – Wire Steel, 1/2 " unstretched, 5108N176)
Spring (Plastic, 1" unstretched, 2017N123) Spring (Beryllium Copper, 1 mm wire, 15 mm OD, 15 turns) Spring (Brass, 1 mm wire, 15 mm OD, 15 turns) Spring (Carbon Steel, 0.9 mm wire, 15 mm OD, 15 turns)	2	Spring (Music - Wire Steel, 1" unstretched, 5108N917
5 Spring (Beryllium Copper, 1 mm wire, 15 mm OD, 15 turns) 6 Spring (Brass, 1 mm wire, 15 mm OD, 15 turns) 7 Spring (Carbon Steel, 0.9 mm wire, 15 mm OD, 15 turns)	3	Spring (Music – Wire Steel, $6 * 1 / 2$ " unstretched, 5108N917)
6 Spring (Brass, 1 mm wire, 15 mm OD, 15 turns) 7 Spring (Carbon Steel, 0.9 mm wire, 15 mm OD, 15 turns)	4	Spring (Plastic, 1 " unstretched, 2017N123)
7 Spring (Carbon Steel, 0.9 mm wire, 15 mm OD, 15 turns)	5	Spring (Beryllium Copper, 1 mm wire, 15 mm OD, 15 turns)
7 Spring (carbon sceer, 0.5 mm wire, 15 mm ob, 15 curns)	6	Spring (Brass, 1 mm wire, 15 mm OD, 15 turns)
8 Hydrogel (acrylamide gel, 15 cm long, 1 cm area)	7	Spring (Carbon Steel, 0.9 mm wire, 15 mm OD, 15 turns)
	8	Hydrogel (acrylamide gel, 15 cm long, 1 cm area)

Spring (Music-Wire Steel, 1/2" unstretched, 5108N176)





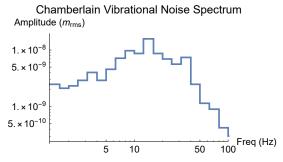


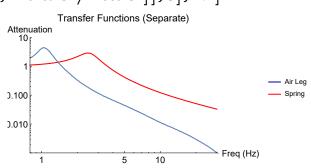


Out[79]=

Out[244]=

Spring (Music-Wire Steel, 1" unstretched, 5108N917)



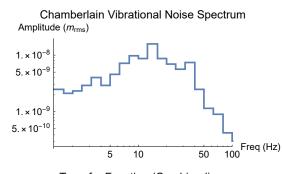


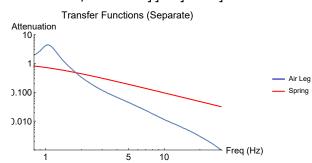
Transfer Function (Combined)
Attenuation

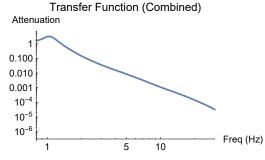
1
0.01
10⁻⁴
10⁻⁶
Freq (Hz)

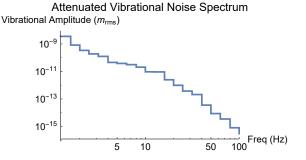
Attenuated Vibrational Noise Spectrum Vibrational Amplitude (m_{rms}) 10^{-9} 10^{-13} 10^{-15} 5 10Freq (Hz)

Spring (Zinc-Plated Steel, 6 1/2" unstretched, 9654K563)



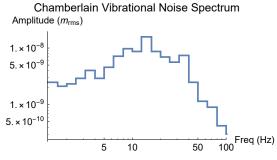






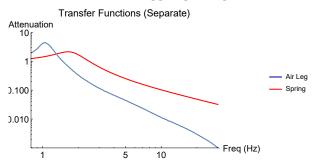
Spring (Plastic, 1" unstretched, 2017N123)

In[106]:= plt4 = Magnify[outputTransferFunction[QuantityMagnitude [UnitConvert [23.98 lbf/ft , "Newtons" / "Meters"]], 3], 1.1]

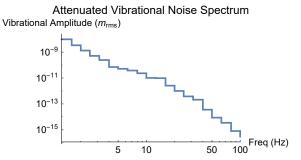


Out[106]=

Out[107]=

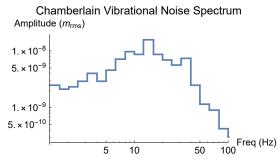


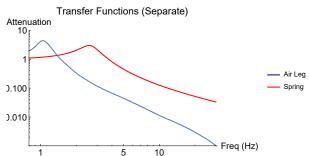
Transfer Function (Combined) Attenuation 0.01 10⁻⁴ 10⁻⁶ Freq (Hz)

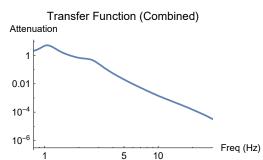


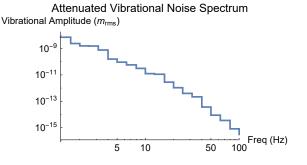
Spring (Beryllium Copper, 1 mm wire, 15 mm OD, 15 turns)

ln[107] = plt5 = Magnify[outputTransferFunction[kS[10⁻³, 1 * 10⁻², 15, 48 * 10⁹], 3], 1.1]







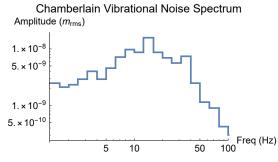


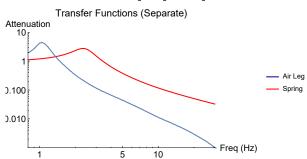
Out[108]=

Out[109]=

Spring (Brass, 1 mm wire, 15 mm OD, 15 turns)

ln[108]:= plt6 = Magnify outputTransferFunction [kS[10⁻³, 1 * 10⁻², 15, 40 * 10⁹], 3], 1.1]



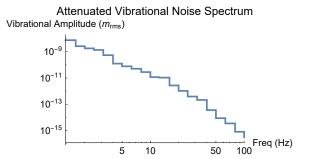


Transfer Function (Combined)
Attenuation

1
0.01
10⁻⁴
10⁻⁶

5

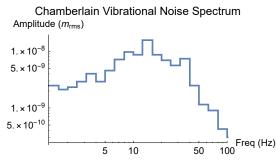
10

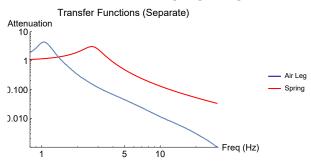


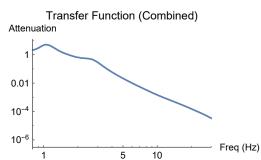
Spring (Carbon Steel, 0.9 mm wire, 15 mm OD, 15 turns)

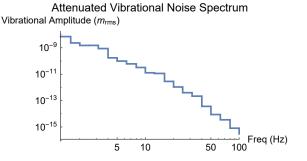
 $ln[109] = plt7 = Magnify[outputTransferFunction[kS[0.9 * 10^{-3}, 1 * 10^{-2}, 15, 78 * 10^{9}], 3], 1.1]$

Freq (Hz)



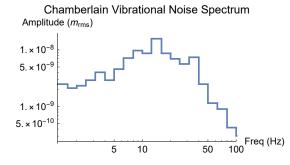


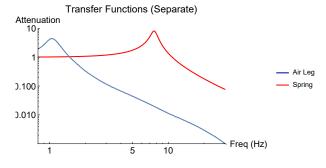




Hydrogel (acrylamide gel, 15 cm long, 1 cm area)

ln[110]:= plt8 = Magnify[outputTransferFunction[konst[1*10⁻⁶, 1, 15], 3], 1.1]





Out[110]=

Transfer Function (Combined)

