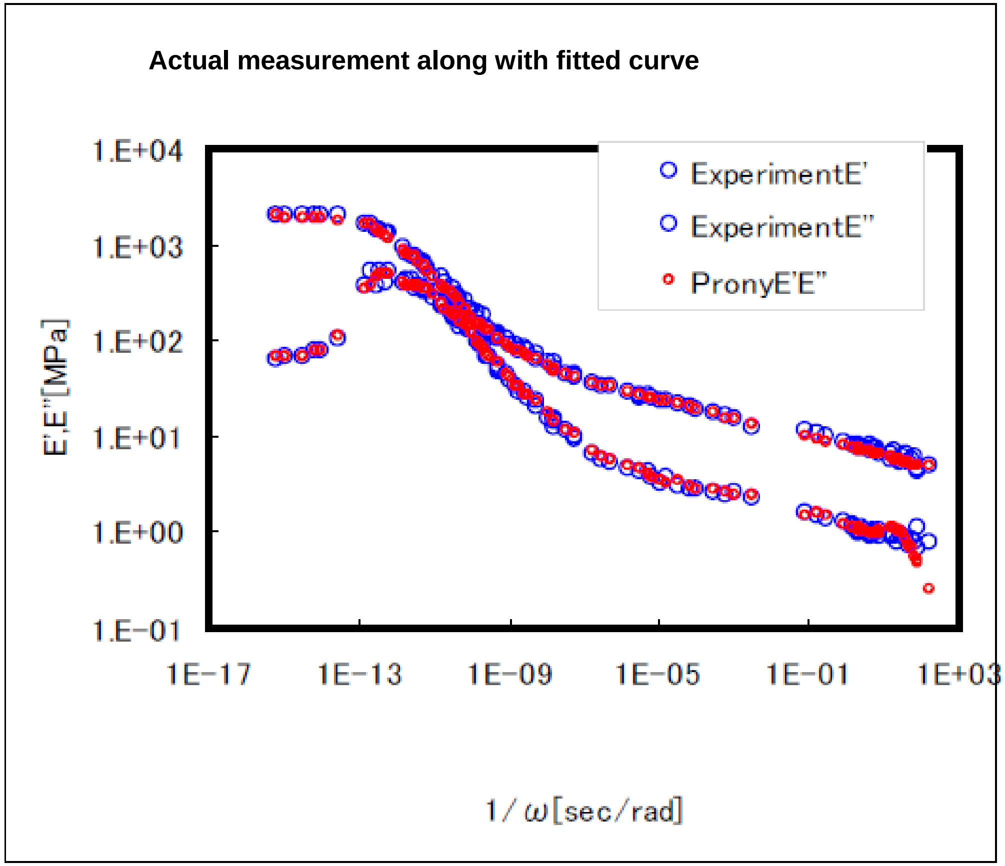
Identification of material property
Hardness (65), Damping (Large)

ANSYS 10.0

Young's Modulus[MPa]	Poisson's Ratio[-]
1.96987E+03	4.99000E-01
$\bar{g}_i^P$ [MPa]	τ_i^G [sec]
5.41226E-02	6.36620E-16
4.68481E-02	6.36620E-15
1.14031E-01	1.59155E-13
3.67385E-01	5.30516E-13
2.52517E-01	5.30516E-12
9.86886E-02	5.30516E-11
2.88483E-02	5.30516E-10
1.36523E-02	5.30516E-09
6.30405E-03	5.30516E-08
3.05870E-03	5.30516E-07
2.71341E-03	3.18310E-06
2.27589E-03	3.18310E-05
1.98587E-03	0.00031831
1.92663E-03	0.003183099
8.44767E-04	0.079577472
8.27627E-04	0.265258238
6.04085E-04	1.989436788
9.44875E-04	19.89436788

Prony series

$$G(\tau) = G_0\left\{1 - \sum_{i=1}^{N} \bar{g}_i^P \left(1 - e^{-\tau/\tau_i^G}\right)\right\}, \quad K(\tau) = \infty$$



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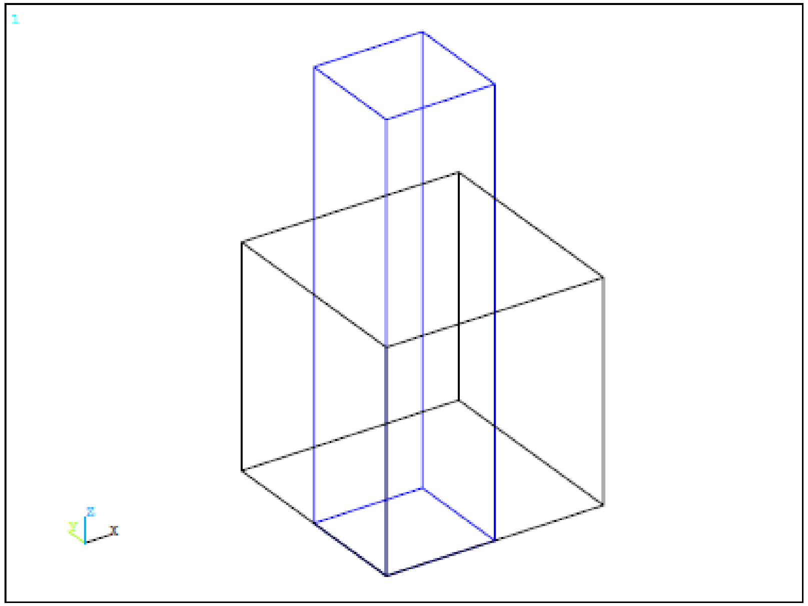
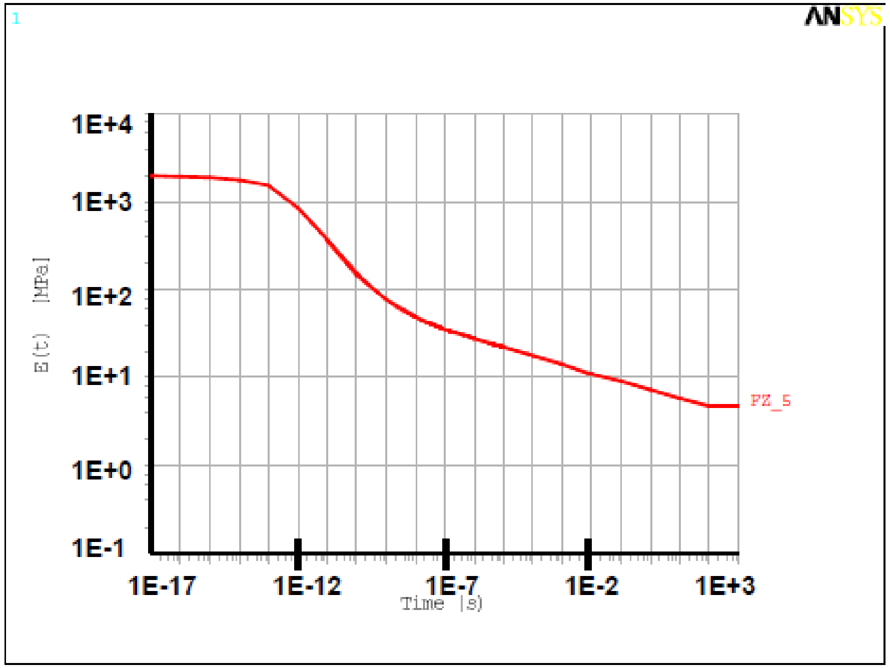
Stress-relaxation analysis : mat2_hs65_relax_ansys.dat
Hardness (65), Damping (Large)

ANSYS 10.0



Hexahedron (1mmx1mmx1mm)
Keeping 1mm enforced displacement

Analysis model



Stress-relaxation curve

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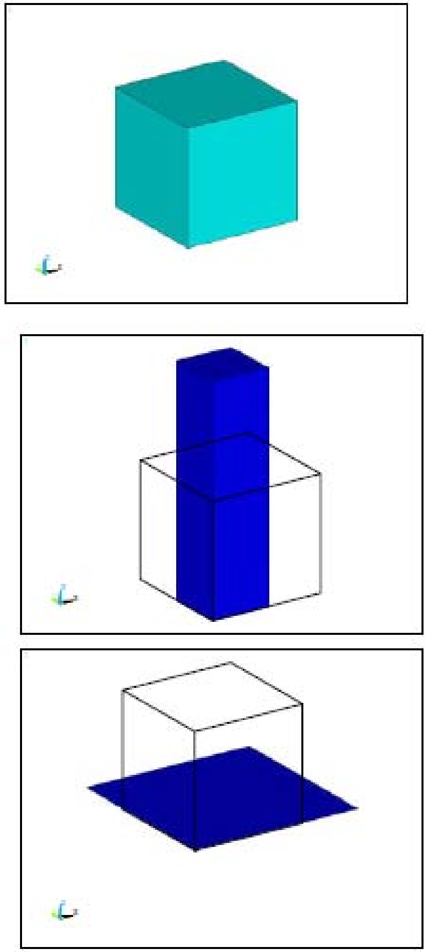
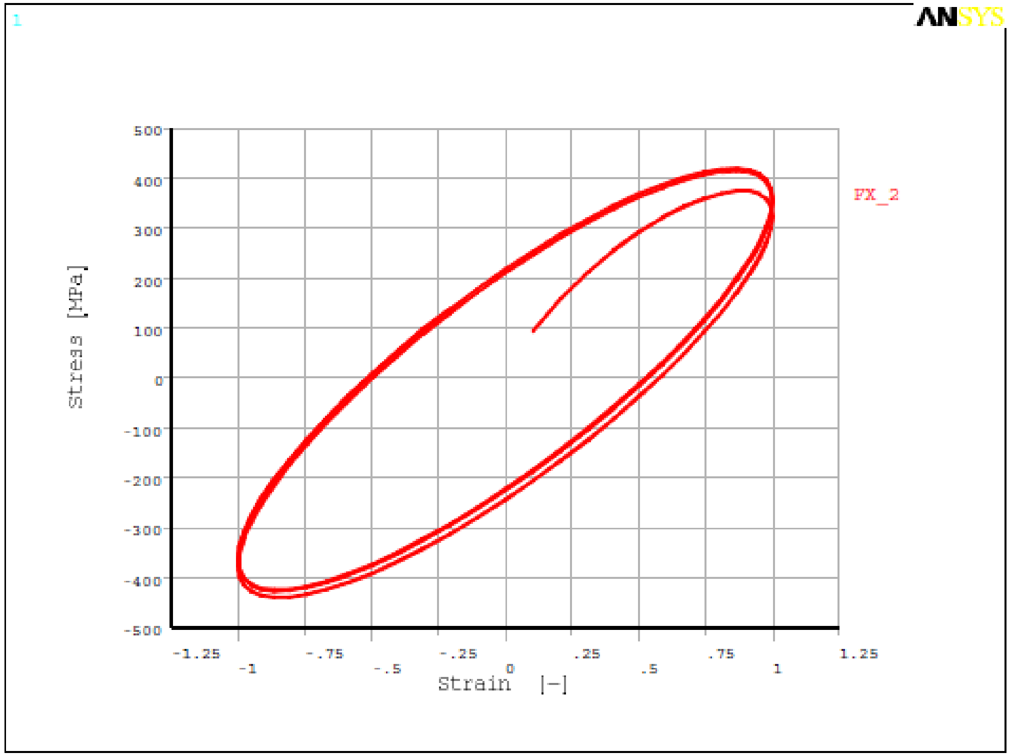
Harmonic vibration analysis (mat2_hs65_freq_ansys.dat) Hardness (65), Damping (Large)

ANSYS 10.0



Analysis model

Amplitude A = 1mm
Frequency f=10^{10}Hz
Displacement δ= Asin2 πf



10^{10}Hz hysteresis curve