Motion equation: $\rho \frac{\partial \mu}{\partial t} = -\nabla p$

Continuity equation: $-\rho \nabla \mu = \frac{\partial \rho'}{\partial t}$

Conservation equation: $p = c_0^2 \rho'$

Wave equation: $\nabla^2 p = \frac{1}{c^2} \frac{\partial^2 p}{\partial t^2}$

Particle velocity and pressure: $\mu = \frac{p}{z}$

Acoustic impedance: $z = \rho \cdot c$

Kinetic energy: $E_k = \frac{1}{2} \rho_0 \mu^2 V$

Potential energy: $E_p = -\frac{p^2}{2\rho_0 c^2} V$

Hooke's Law: T = C : S

Elastic Energy: $W = \frac{1}{2} T : S$

Poisson's ratio: $\sigma = \frac{\lambda}{2(\lambda + \mu)} = -\frac{S_{12}}{S_{11}}$

Longitudinal wave velocity:

$$c_L = \sqrt{\frac{\lambda + 2\mu}{\rho}}$$

Shear wave velocity:

$$c_S = \sqrt{\frac{\mu}{\rho}}$$

Reflection of pressure:

$$\gamma_p = \frac{p_R}{p_i} = \frac{z_2 \cos\theta_i - z_1 \cos\theta_t}{z_2 \cos\theta_t + z_1 \cos\theta_t}$$

Transmit coefficient of pressure:

$$\tau_p = \frac{p_t}{p_i} = \frac{2 z_2 \cos\theta_i}{z_2 \cos\theta_t + z_1 \cos\theta_t}$$

Reflection coefficient of intensity:

$$\gamma_I = \frac{I_R}{I_i} = \left(\frac{z_2 \cos\theta_i - z_1 \cos\theta_t}{z_2 \cos\theta_t + z_1 \cos\theta_t}\right)^2$$

Transmission of intensity:

$$\tau_I = \frac{I_t}{I_i} = \frac{4 z_1 z_2 \cos^2\theta_i}{(z_2 \cos\theta_t + z_1 \cos\theta_t)^2}$$

At normal incident:

$$\gamma_p = \frac{z_2 - z_1}{z_2 + z_1}$$

$$\tau_p = \frac{2 z_2}{z_2 + z_1}$$

$$\gamma_I = \left(\frac{z_2 - z_1}{z_2 + z_1}\right)^2$$

$$\tau_I = \frac{4 z_1 z_2}{(z_2 + z_1)^2}$$