

Can Crush Equations

$$P = \frac{F}{A}$$

$$P_{in} = P_{out}$$

$$\frac{F_{in}}{A_{in}} = \frac{F_{out}}{A_{out}}$$

$$\frac{A_{out}}{A_{in}} = \frac{F_{out}}{F_{in}} = MA$$

$$\text{Target Mechanical Advantage: } TMA_{can} = \frac{F_{can}}{F_{finger}}$$

$$\text{Ideal Mechanical Advantage: } IMA_{syringe} = \frac{A_{out}}{A_{in}}$$

$$\text{Ideal Number of Syringes: } INS = \frac{TMA_{can}}{IMA_{syringe}}$$

$$F_{out\ total} = F_{can} + INS * F_{syringe\ out}$$

$$F_{in\ total} = F_{finger} - F_{syringe\ in}$$

$$AMA = \frac{F_{out\ total}}{F_{in\ total}}$$

$$\text{Actual Number of Syringes ANS} = \frac{AMA}{IMA_{syringe}}$$

$$\% \text{ Efficiency} = \frac{\text{Final AMA}}{IMA_{syringe}}$$