

no foam Superball - Foam vs no Foam

① $v_i = 0$
 $v_f = 0.82$
 $v_i = -1.01$
 $v_f = -4.43$
 $v^2 = 0 + 2(-9.81)(-1)$
 $v_f = 4.43 \text{ m/s}$

② $v_i = 0$
 $v_f = 0.30$
 $v^2 = 2(-9.81)(-0.82)$
 $v_f = 4.01$

no foam Bounce
 $F \Delta t = m \Delta v$
 $F \Delta t = (0.014 \text{ kg})(4.01 - (-4.43))$
 $F \Delta t = 0.118 \text{ kg} \cdot \text{s}$

2 frames
 $\Delta t = \frac{2}{30} \text{ s} = 0.067 \text{ s}$
 $F = \frac{0.118}{0.067} = 1.76 \text{ N}$

7 frames
 $\Delta t = \frac{7}{30} = 0.23 \text{ s}$
 $F \Delta t = 0.096$
 $F = 0.417 \text{ N}$

$\Delta = F \Delta t = m \Delta v$
 $v_f = 2 \frac{(0.014)}{(0.3)} = 0.096$

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