

71. The magnitude of the impulse exerted by the gunner on the gun per minute is $J = F_{\text{avg}}\Delta t$, where $F_{\text{avg}} = 180\text{ N}$ and $\Delta t = 60\text{ s}$. The impulse exerted on the gun by each bullet of mass m and speed v is $J' = mv$. The maximum number of bullets N that he could fire per minute satisfies $J = NJ'$. Thus

$$N = \frac{J}{J'} = \frac{F_{\text{avg}}\Delta t}{mv} = \frac{(180)(60)}{(50 \times 10^{-3})(1000)} = 216 .$$