Answer on Question #42751 – Physics – Acoustics

In 100 seconds a smoke alarm emits 1 000 000 sound waves. What is the frequency of the sound waves?

Solution:

$\mathrm{t} = 100\ \mathrm{s} - \text{time of the measurement};$

$\mathrm{N} = 1\ 000\ 000 - \text{number of oscillations};$

Formula for the frequency ($\mathrm{T} - \text{period}$):

$$\mathrm{f} = \frac{1}{\mathrm{T}} = \frac{1}{\frac{\mathrm{t}}{\mathrm{N}}} = \frac{1}{\frac{100\ \mathrm{s}}{1\ 000\ 000}} = 10\ 000\ \mathrm{Hz}$$

Answer: frequency of oscillation of a smoke alarm is equal to $10\ 000\ \mathrm{Hz}$.