

Module 2 Activity 2-3

Friction Uncertainty Activity

A force sensor is connected through a data-logging interface to a computer. Force as a function of time is recorded. The force sensor is used to drag (horizontally) a brick across a tabletop. The pulling force starts at zero and is gradually increased until the brick starts to move, then the force is reduced in order to keep the brick moving at more or less constant speed.

You are to determine the coefficients of static and kinetic friction and appreciate errors and uncertainties. You should note any systematic errors, random errors and experimental errors.

The brick's weight was recorded on a digital scale to be $F_{\text{Weight}} = F_{\text{Normal}} = (18.20 \pm 0.01)\text{N}$

The coefficient of static friction (while the brick is stationary) is $\mu_{\text{Static}} = \frac{F_{\text{Maximum Static Friction}}}{F_{\text{Normal}}}$

The coefficient of kinetic friction (while the brick is moving) is $\mu_{\text{Kinetic}} = \frac{F_{\text{Friction}}}{F_{\text{Normal}}}$

Here is the raw data. Determine experimental values and corresponding uncertainties for both static and kinetic coefficients of friction and share these in the workshop forum along with any concerns or observations.

