

**Answer on Question #72158-Physics-Other**

A cup of coffee on a horizontal board of a car slides forward when the driver decelerates from 45km/h to rest in 3.5s or less. However, it does not slip if it decelerates in a longer time. What is the coefficient of static friction between the cup and the board? Suppose the path and the board are horizontal.

**Solution**

It does not slip if the friction force is greater or equal to the pushing force:

$$F_{fr} \leq ma.$$

$$\mu mg \leq ma.$$

$$\mu g \leq a.$$

The minimum coefficient of static friction between the cup and the board is

$$\mu = \frac{a}{g} = \frac{v}{gt}$$

$$\mu = \frac{45}{9.8 \cdot 3.5} = 0.36.$$

**Answer: 0.36.**

**Answer provided byAssignmentExpert.com**