TOPIC

Fluids – Section X – Question 10

QUESTION

It is desired to transport 1 kg/s of a viscous liquid (μ = 0.01 kg/m s, ρ= 950 kg/m^3) from one location to another through a round pipe. To not mechanically degrade the fluid, it is desirable to maintain the flow as laminar. In order not to exceed a Reynolds number of 2000, the minimum pipe diameter (m) is most nearly

(A) 0.020
(B) 0.064
(C) 0.24
(D) 2.2

HINTS

- Use the definition of the Reynolds number
- Relate the velocity to the volumetric flow rate and pipe diameter
- Relate the volumetric flow rate to the mass flow rate

CONTRIBUTOR

Scott Campbell