The chart plots Friction factor f (vertical axis, from 0.001 to 0.035) against Reynolds number N_{Re} (horizontal axis, from 1×10^3 to 1×10^8), with ϵ/D values on the right axis.

Labels on chart: $f = \dfrac{16}{N_{Re}}$, points A, B, C, D, and "Smooth tubes".

Table 5-7. Values of Surface Roughness for Various Materials*

Material	Surface roughness	
	ϵ, ft.	ϵ'', in.
Drawn tubing (brass, lead, glass, and the like)	0.000005	0.00006
Commercial steel or wrought iron	0.00015	0.0018
Asphalted cast iron	0.0004	0.0048
Galvanized iron	0.0005	0.006
Cast iron	0.00085	0.010
Wood stave	0.0006–0.003	0.0072–0.036
Concrete	0.001–0.01	0.012–0.12
Riveted steel	0.003–0.03	0.036–0.36

FIG. 5-26. Fanning friction factors. Reynolds number $N_{Re} = DV\rho/\mu$, where D = pipe diameter, ft.; V = velocity, ft./sec.; ρ = fluid density, lb./cu. ft.; μ = fluid viscosity, lb./(ft.)(sec.) = cp./1488. [*Based on Moody, Trans. Am. Soc. Mech. Engrs., 66, 671 (1944).*]