

Roughness Co-efficient (for new pipes)

Material	ks (mm)	
Riveted Steel	0.9 - 9.0	
Concrete	0.3 - 3.0	
Wood Stave	0.18 - 0.9	
Cast Iron	0.26	
Galvanized Iron	0.15	
Asphalted Cast Iron	0.12	
Commercial Steel / Wrought Iron	0.046	
Drawn Tubing	0.0015	
Plastic / Glass	0.003-0.015	Check AS2200
PE(Vinidex)	0.007	

Table 11.1 Values of Manning's n for various channel surfaces (uncertainty of values approximately 20%)

Channel Surface	n	Channel Surface	n
Artificial lined channels		Excavated earth channels	
Glass	0.010	Clean	0.022
Brass	0.011	Gravelly	0.025
Steel, smooth	0.012	Weedy	0.030
Painted	0.014	Stony, cobbles	0.035
Riveted	0.015	Natural channels	
Cast iron	0.013	Clean and straight	0.030
Cement, finished	0.012	Sluggish, deep pools	0.040
Unfinished	0.014	Major rivers	0.035
Planed wood	0.012	Floodplains	
Clay tile	0.014	Pasture, farmland	0.035
Brickwork	0.015	Light brush	0.05
Asphalt	0.016	Heavy brush	0.075
Corrugated metal	0.022	Trees	0.15
Rubble masonry	0.025		