

Coefficients of Friction "f"

Material	Static		Sliding	
	Dry	Lubri- cated	Dry	Lubricated
Aluminum on aluminum	1.35	.....	.....	.....
Canvas belt on rubber lagging	0.30	.....	.....	.....
Canvas belt, stitched, on steel	.....	.....	0.20	0.10
Canvas belt, woven, on steel	.....	.....	0.22	0.10
Cast iron on asbestos, fabric brake material	.....	.....	.....	.....
Cast iron on brass	.....	.....	0.35-0.40	.....
Cast iron on bronze	.....	.....	0.30	.....
Cast iron on cast iron	.....	.....	0.22	0.07-0.08
Cast iron on copper	1.10	.....	0.15	0.06-0.10
Cast iron on lead	1.05	.....	0.29	.....
Cast iron on leather	.....	.....	0.43	.....
Cast iron on oak (parallel)	0.60	.....	.....	0.13-0.36
Cast iron on magnesium	.....	.....	0.30-0.50	0.07-0.20
Cast iron on steel, mild	.....	0.18	0.25	.....
Cast iron on tin	.....	.....	0.23	1/0/00 3:11
Cast iron on zinc	.....	.....	0.32	.....
Earth on earth	0.85	.....	0.21	.....
Glass on glass	0.25-1.0	.....	.....	.....
Hemp rope on wood	0.94	.....	0.40	.....
Nickel on nickel	0.50-0.80	.....	0.40-0.70	.....
Oak on leather (parallel)	1.10	.....	0.53	0.12
Oak on oak (parallel)	0.50-0.60	.....	0.30-0.50	.....
Oak on oak (perpendicular)	0.62	.....	0.48	0.16
Rubber tire on pavement	0.54	.....	0.32	0.07
Steel on ice	0.8-0.9	0.6-0.7*	0.75-0.85	0.5-0.7*
Steel, hard, on babbitt	0.03	.....	0.01	.....
Steel, hard, on steel, hard	0.42-0.70	0.08-0.25	0.33-0.35	0.05-0.16
Steel, mild, on aluminum	0.78	0.11-0.23	0.42	0.03-0.12
Steel, mild, on brass	0.61	.....	0.47	.....
Steel, mild, on bronze	0.51	.....	0.44	.....
Steel, mild, on copper	.....	.....	0.34	0.17
Steel, mild, on steel, mild	0.53	.....	0.36	0.18
Stone masonry on concrete	0.74	.....	0.57	0.09-0.19
Stone masonry on ground	0.76	.....	.....	.....
Wrought iron on bronze	0.65	.....	.....	.....
Wrought iron on wrought iron	0.19	0.07-0.08	0.18	.....
	.....	0.11	0.44	0.08-0.10

* Wet pavement