Filtration: A process for separating s_____ and c_____ impurities from water by passage through a porous medium, usually a bed of sand. Most particles removed in filtration are much smaller than the pore size between the sand grains, and therefore, adequate particle d_____ (coagulation) is extremely important.

The influent t_____ ranges from 1 - 10 NTU (nephelometric turbidity units) with a typical value of 3 NTU. Effluent turbidity is about _____ NTU.

Medium	SG
sand	2.65
anthracite	1.45 - 1.73
garnet	3.6 - 4.2

History:

S_____ s_____ filters were introduced in 1804:

sand diameter	0.2 mm
depth	1 m
loading rate	3 - 8 $m^3/d \cdot m^2$

R_____ sand filters were introduced about 1890:

effective size	0.35 - 0.55 mm
uniformity coef.	1.3 - 1.7
depth	0.3 - 0.75 m
loading rate	120 - 240 $m^3/d \cdot m^2$

D_____ m_____ filters introduced about 1940:

Depth:	
anthracite (coal)	0.45 m
sand	0.3 m
loading rate	300 $m^3/d \cdot m^2$

M_____ (deep bed) filters in 1980's:

effective size	1.0 - 1.5 mm
anthracite depth	1.5 - 2.5 m
loading rate	800 $m^3/d \cdot m^2$