GLOSSARY

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Bingham plastic	A fluid that behaves in a Newtonian fashion but requires a certain level of stress to set it in motion (see Appendix A).
Best Efficiency Point (B.E.P.)	The point on a pump's performance curve that corresponds to the highest efficiency.
Casing	The body of the pump, which encloses the impeller, syn volute (see Figure 1-12).
Cavitation	The sudden collapse of gas bubbles due to the pressure increase (see chapter 3).
Centrifugal force	A force associated with a rotating body. In the case of a pump, the rotating impeller pushes fluid on the back of the impeller blade, imparting circular and radial motion. A body that moves in a circular path has a centrifugal force associated with it (see Figure 1-12).
Control volume	An imaginary boundary used to identify the system and in particular locate all the inlets, outlets and energy sources.
Delta (Δ)	A Greek symbol used to express a difference between two terms. For example, ΔH means that the variable H is the difference of two other terms such as H_1 and H_2.
Dilatant	The property of a fluid whose viscosity increases with strain or displacement (see Appendix A).
Discharge Static Head	The difference in elevation between the liquid level of the discharge tank and the centerline of the pump. This head also includes any additional pressure head that may be present at the discharge tank fluid surface (see chapter 3).
Enthalpy	A thermodynamic property of a fluid. The enthalpy of a fluid is the sum of the internal energy of the fluid plus the pressure energy in its environment.
Equipment	Refers to any device in the system other than pipes, pipe fittings and isolation valves.
Equipment pressure head difference	The difference in pressure head between the outlet and inlet of an equipment (see section 3-6).

Friction	The force produced as reaction to movement. All fluids are subject to friction when they are in motion. The higher the fluid viscosity, the higher the friction force for the same flow rate. Friction is produced internally as one layer of fluid moves with respect to another and also at the fluid wall interface (see chapter 3).
Friction head difference	The difference in head required to move a mass of fluid from one position to another at a certain flow rate within a piping system.
Head	Specific energy or energy per unit weight of fluid, the unit of head is expressed in feet or meters (see chapter 1).
Heat loss	In this book, refers to the heat loss to the environment due to friction.
Heat transfer	The heat lost or gain by a system.
Impeller	The rotating element of the a pump which consists of a disk with curved vanes. The impeller imparts movement and pressure to a fluid (see Figure 1-12).
Internal energy	A thermodynamic property. The energy associated with a substance at a molecular level (see chapter 2).
Iteration	A method of solving an equation by trial and error. An iteration technique is used to solve equations where the unknown variable cannot be explicitly isolated. A frequently used technique is the Newton-Raphson method (see Appendix B).
Kinetic energy	A thermodynamic property. The energy associated with the mass and velocity of a body (see chapter 2).
Laminar	A distinct flow regime that occurs at low Reynolds number (Re <2000). It is characterized by fluid particles in layers moving past one another without mixing.
Mercury (Hg)	A metal that remains liquid at room temperature. This property makes it useful when used in a thin vertical glass tube since small changes in pressure can be measured as changes in the mercury column height. The inch of mercury is often used as a unit for negative pressure (see chapter 1).
Moody diagram	A graphical representation of the laminar and turbulent (Colebrook) flow equations (see chapter 3).
Negative pressure	Pressure that is less than the pressure in the local environment, syn vacuum.

Net Positive Suction Head Available (N.P.S.H.A.)	The head or specific energy at the pump suction flange less the vapour pressure head of the fluid (see chapter 3).
Net Positive Suction Head Required (N.P.S.H.R.)	The head or specific energy at the pump suction flange less the vapour pressure head of the fluid specified by the pump manufacturer for a given impeller diameter, speed and flow rate(see chapter 3).
Newtonian	A fluid whose viscosity is constant and independent of the rate of shear. For Newtonian fluids, there is a linear relationship between the rate of shear and the tangential stress between layers (see Appendix A).
Operating point	The point which is located at the intersection of the system curve and the performance curve of a pump. It corresponds to the flow and head required for the process (see chapter 4).
Performance curve	A plot of Total Head vs. flow for a specific pump model, impeller diameter and speed (see chapter 4, syn characteristic curve, water performance curve).
Pipe roughness	A measurement of the average height of peaks producing roughness on the internal surface of pipes. Roughness is measured in many locations and then averaged. It is usually defined in micro-inches RMS (root mean square).
Potential energy	A thermodynamic property. The energy associated with the mass and height of a body above a reference plane (see chapter 2).
Pressure	The application of external or internal forces to a body producing tension or compression within the body.
Pressure head	The specific energy due to pressure.
Pseudoplastic	The property of a fluid whose viscosity increases slowly with rate of shear (see Appendix A).
Rheopectic	The property of a fluid whose viscosity increases with time (see Appendix A).
Shut-off head	The Total Head corresponding to zero flow on the pump performance curve (see chapter 4).
Specific gravity	The ratio of the density of a fluid to that of water at standard conditions (see chapter 1).
Strain	The ratio between the absolute displacement of a reference point within a body to a characteristic length of the body.

Stress	In this case refers to tangential stress or the force between the layers of fluid divided by the surface area between them.
Submergence	Submergence as used here is the height between the free surface of a suction tank and the pump intake pipe.
Suction Static Head	The difference in elevation between the liquid level of the fluid source and the centerline of the pump. This head also includes any additional pressure head that may be present at the suction tank fluid surface (see chapter 3).
Suction Static Lift	The same definition as the Suction Static head. This term is only used when the pump centerline is above the suction tank fluid surface.
Siphon	A system of piping or tubing where the exit point is lower than the entry point and where some part of the piping is above the free surface of the fluid source (see chapter 1).
System	The system as referred to in this book includes all the piping with or without a pump, including the equipment, starting at the inlet point (often the fluid surface of the suction tank) and ending at the outlet point (often the fluid surface of the discharge tank).
System Curve	A plot of Total Head vs. flow that satisfies the system requirements (see chapter 4).
System equation	The equation for Total Head vs. flow for a specific system (syn system curve).
System requirements	The parameters that determine Total Head, that is: friction and the system inlet and outlet conditions (i.e. velocity, elevation and pressure).
Thixotropic	The property of a fluid whose viscosity decreases with time (see Appendix A).
Total Dynamic Head	Identical to Total Head. This term is no longer used and has been replaced by the shorter Total Head.
Total Head	The difference between the pressure head at the discharge and suction flange of the pump (see chapter 2, syn Total Dynamic Head. pump head, system head).
Total Static Head	The difference between the discharge and suction static head including the difference between the surface pressure of the discharge and suction tanks (see chapter 3).
Turbulent	The behavior of fluid articles within a flow stream characterized by the rapid movement of particles in many directions as well as the general direction of the overall fluid flow (see chapter 3).

Vacuum	(see chapter 1, syn negative pressure).
Vapour pressure	The pressure at which a liquid boils at a specified temperature (see chapter 3).
Velocity Head difference	The difference in velocity head between the outlet and inlet of the system (see chapter 3).
Viscosity	A property from which a fluid's resistance to movement can be evaluated. The resistance is caused by friction between the fluid and the boundary wall and internally by the fluid layers moving at different velocities (see chapter 3 and Appendix A).
Volute	See Figure 1-12, syn casing.
Work	The energy required to drive the fluid through the system (see chapter 2).
Yield Dilatant	(see Appendix A).