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PUMP SELECTION
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1 Abstract

This project introduces in a brief survey the various types of rotodynamic pumps.

The aim of this book is to describe procedures for selecting rotodynamic pumps, and to suggest a practical (self–selecting) method. This method can be used in a variety of applications, including systems for irrigation, pressure boosting, domestic water supply, cooling, air-conditioning, small industrial water supply, etc. In addition, a suitable software application has been developed on Excel 2007 (CD included) for better understanding and automation of most calculations.

2 Introduction

Cut-Water → Impeller → Volute
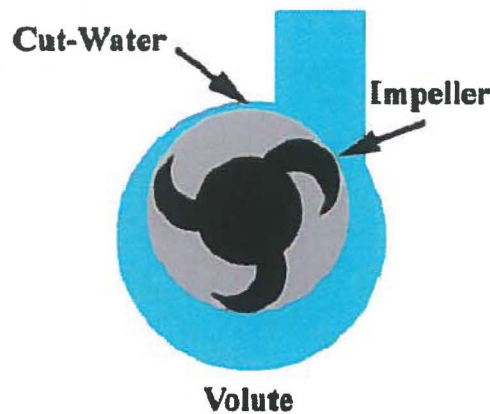
2.1 Definition of a Pump

A pump is a device used to move fluids, such as gases, liquids or slurries. A pump displaces a volume by physical or mechanical action. One common misconception about pumps is the belief that they create pressure. Pumps alone do not create pressure; they only displace fluid; pressure is caused by adding resistance to flow. Pumps fall into two major groups: positive displacement pumps and rotodynamic pumps. Their names describe the method of moving a fluid.

3 Rotodynamic Pumps

Rotodynamic pumps (or dynamic pumps) are those in which kinetic energy is added to the fluid by increasing the flow velocity. This increase in energy is converted to a gain in potential energy (pressure) when the velocity is reduced prior to or as the flow exits the pump into the discharge pipe. This conversion of kinetic energy to pressure can be explained by the First law of thermodynamics or more specifically by Bernoulli's principle. Dynamic pumps can be further subdivided according to the means in which the velocity gain is achieved.

3.1 These types of pumps have a number of characteristics:

3.1.1 Continuous energy

3.1.2 Conversion of added energy to increase kinetic energy (increase in velocity)

3.1.3 Conversion of increased velocity (kinetic energy) to an increase in pressure head