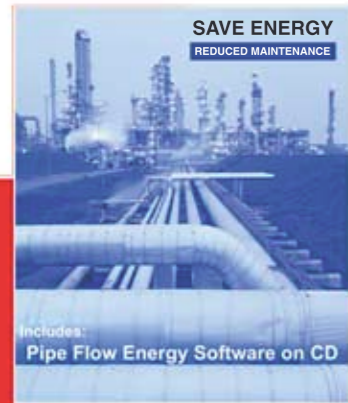


SYSTEM EFFICIENCY

A GUIDE FOR ENERGY EFFICIENT
ROTODYNAMIC PUMPING SYSTEMS



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FOR ENERGY EFFICIENT SYSTEMS
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"...the guide appears to cover every aspect of system and pump efficiency and will be a valuable addition to any technical library."

Larry Bachus

"The Pump Guy" author and columnist for World Pumps magazine, Nashville, Tennessee, USA



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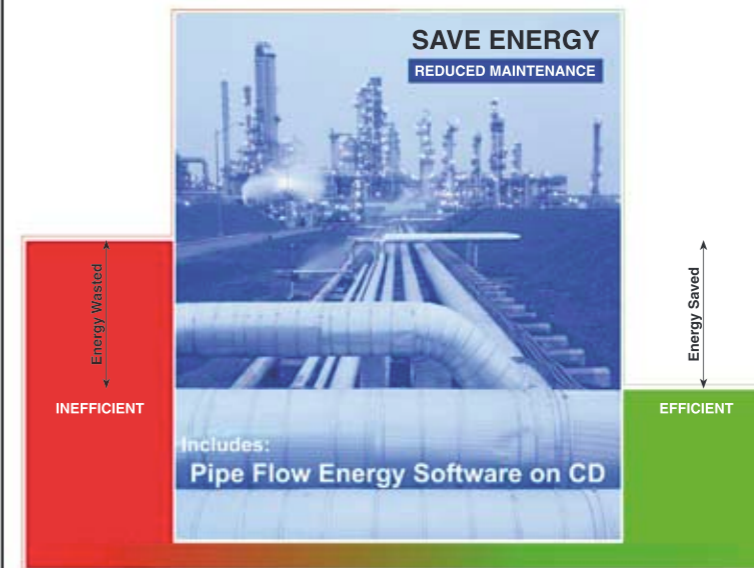
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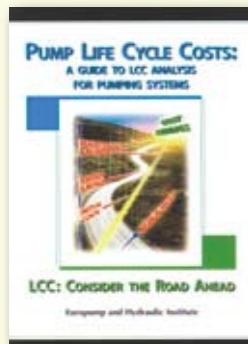
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livre VSP !!!**

The new Europump guide on System Efficiency gives clear and authoritative data on how to optimise Energy Consumption within Rotodynamic Pumping Systems

TOPICS COVERED

- Basic Plant layout
- Pipework configuration and restrictions
- Liquid Velocity in pipework
- System Characteristics and pump selection
- Pump /system control

ALSO INCLUDES "NEW" EUROPUMP PIPE FLOW ENERGY SOFTWARE

Written and Published by Europump

This Guide should be purchased because energy inefficient pump systems are commonplace.

One major factor why energy inefficient pump systems are commonplace is the incorrect selection of pipework diameter. Bad plant layout and the consequent inefficient routing of pipe runs also often exacerbate the situation. These elements increase frictional resistance, which necessitates the selection of larger pumps to push liquid to the required service.

Inefficient pipework sizing is caused by two major criteria.

- The initial capital cost of the pipework and associated fittings.
- Designers who commonly use pipework to match pump branches rather than using optimum liquid velocities to select the correct pipework diameter.

The capital cost of pipework systems will always be a major issue but, in these days when energy and environmental issues are increasingly important, we must design for our children's future rather than for today's capital costs. Therefore, this guide is focusing on the energy aspect of the system design and does not cover the procurement of the system or its components.

Pumps designed to the latest ISO technical specifications for centrifugal pumps have relatively small branch sizes and high liquid terminal velocities. Therefore the bad but common practice of matching pipework to branch size means that the resultant system frictional resistances are high. If pipework is selected using the simple liquid velocity criteria detailed in this guide, using increasers / decreasers on the pump branches to join to correctly selected pipework, lower frictional heads will be applicable and low head pumps using less energy will suffice.

NOTE:

If pump systems are initially designed on an energy efficient basis and then pumps are correctly applied and sized, up to 40%¹ of the energy consumed by current practice could be saved.

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“.....Another excellent Europump Guide: readable, clear diagrams and easy to understand. It brings together in one place useful and usable information for the pump user. The related software is also excellent. Pump users everywhere will find it a boon.”

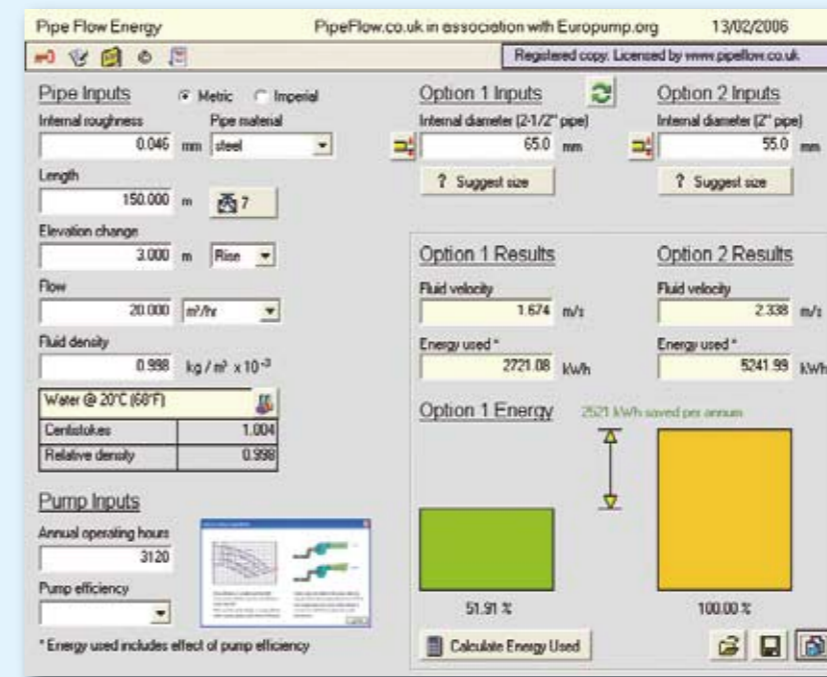
Ray Beebe
Senior Lecturer, maintenance and reliability engineering at Monash University, Australia

System efficiency software

For the first time Europump has created a guide which includes software to enable the user to optimise pipe sizing and subsequently increase energy efficiency and reduce Life Cycle Costs.

The Pipe Flow Energy software included with this guide can be used to estimate the energy used in a pumping system when selecting different pipe sizes.

Choosing pipe sizes that give fluid velocities within the recommended range is important to produce a more efficient system that will save energy usage.



“.....the book is a great complement to the two earlier books (LCC & VSP) regarding efficient design of pumping systems.

It fills a void that was left open. It gives good information to both designers and users of pumping systems on how to minimise energy consumption from the start by choosing the right size pipes.”

Gunnar Hovstadius
Director Technical Services, Pumps
Industrial Efficiency Alliance
Oregon, USA

Example of pipe diameter selection and energy consumption taken from the guide

	DN 100	DN 125	DN 150	DN 200
Head loss	11.2 m	4.6 m	1.8 m	0.5 m
Flow velocity	2.8 m/s	1.8 m/s	1.3 m/s	0.7 m/s
Required hydraulic pump power	2.4 kW	1.0 kW	0.4 kW	0.10 kW
Efficiency of the pump (approx.)	70	70	70	70
Required pump power	3.5 kW	1.4 kW	0.6 kW	0.14 kW

Table showing the influence of pipe diameter for a flow rate of 80 m³/h

¹ SAVE Pump study EC