



**GRUNDFOS
ECADEMY**

**PUMP INDUSTRY, GUIDELINES,
STANDARDS AND CODES**

Learning outcome



After this course, you should be able to:

Identify primary guidelines, standards, and codes that may impact the application and use of pumps.

Explain why each type of convention or regulation exists, and how each influences the use of pumps.

Know where to access an expansive listing of such documents.

Note that this course is not intended to provide a comprehensive list of all possible conventions and regulations. It is offered as a guide to help you begin to understand many of them.

Definitions



In the following three slides,
we will define how the following
terms are to be used in this course:

Guidelines

Standards

Codes

Definitions



Guidelines

Standards

Codes

<http://www.merriam-webster.com/dictionary/guideline>:

A rule or instruction that shows or tells how something should be done

Note the use of the word “should” in the definition. You should think of a guideline as a recommendation. Since the recommendation presumably comes from experts you probably want to take them into account.

Definitions



Guidelines

Standards

Codes

<http://www.merriam-webster.com/dictionary/standard>:

Something set up and established by authority as a rule for the measure of quantity, weight, extent, value, or quality

Note that in the definition, there is a mention of authority. The authority may come from a law, or from widely recognized experience, knowledge, or wisdom. A “standard” is more of a “you will” than a “you should.” It goes beyond a mere recommendation or guideline, but it is not a legal requirement unless codified by authorities. Many industry standards are voluntary. When laws are enacted by government entities, standards can become mandatory codes.

Definitions



Guidelines

Standards

Codes

[http://www.merriam-webster.com/dictionary/code:](http://www.merriam-webster.com/dictionary/code)

A set of laws
or regulations

Note that codes are enforceable by legal authorities. The need to follow codes – also known as ordinances – extends far beyond standards and guidelines. Penalties can be imposed for failure to follow codes.

They may be codified by national governments, or by state/provincial/regional authorities, or by local jurisdictions.

Examples of guidelines



Hydraulic Institute:

- Power Plant Pumps: Guidelines for Application and Operation to Maximize Uptime, Availability, and Reliability.
- Variable Frequency Drives: Guidelines for Application, Installation, and Troubleshooting.
- Mechanical Seals for Pumps;
- Wastewater Treatment Plant Pumps: Guidelines for Selection, Application, and Operation

Submersible Wastewater Pump Association (SWPA)

– published guidelines - “Submersible Sewage Pumping Systems Handbook

Sump and Sewage Pump Manufacturers Association (SSPMA)

– “Recommended Guidelines for Sizing a New or Replacement Sewage Pump”

Here are a few guidelines that have a direct impact on how we deal with pumps. The titles are self-explanatory. Note that the Hydraulic Institute – the primary trade association for pumps in North America – has developed a wide array of guidelines, standards, and codes over the last century. They are considered a global authority on pumps and pumping systems.

Examples of guidelines



Hydraulic Institute:

- 1.4 Rotodynamic (Centrifugal) Pumps for Manuals Describing Installation, Operation, and Maintenance
- 14.6 Rotodynamic Pumps for Hydraulic Performance Acceptance Tests
- 9.6.4 Rotodynamic Pumps for Vibration Measurement and Allowable Values

American Bearing Manufacturers Association (ABMA) - ABMA 9-2015 - Load Ratings and Fatigue Life for Ball Bearings

American Bearing Manufacturers Association (ABMA) - ABMA 9-2015 - Load Ratings and Fatigue Life for Ball Bearings

American Society for Testing and Materials (ASTM) - Standards for composition of materials

American Society of Mechanical Engineers (ASME) - ASME EA-2-2009 on Energy for Pumping Assessments

American Water Works Association (AWWA) - AWWA E103-2007 Horizontal and Vertical Line-Shaft Pumps

National Fire Protection Association (NFPA) - Standard 20 [Fire pumps]

These are examples of standards that influence pumps and the pump industry.
They are set by a variety of respected associations, societies and institutes.

Examples of codes



American Society of Mechanical Engineers (ASME) - ASME Boiler & Pressure Vessel Code (BPVC-2015)

National Fire Protection Association (NFPA) 70, National Electrical Code (NEC): 1) Article 430 Motors

National Sanitation Foundation (NSF) - NSF 61 and Annex G [Materials in contact with drinking water]

United States Department of Energy is working on minimum efficiency codes for certain classes of pumps. These may become legal requirements.

These are examples of codes that influence our use of pumps. These are codified into law by different legal authorities and must be followed or risk prosecution under the law. Many started out as standards and became codified into law.

Key reference documents

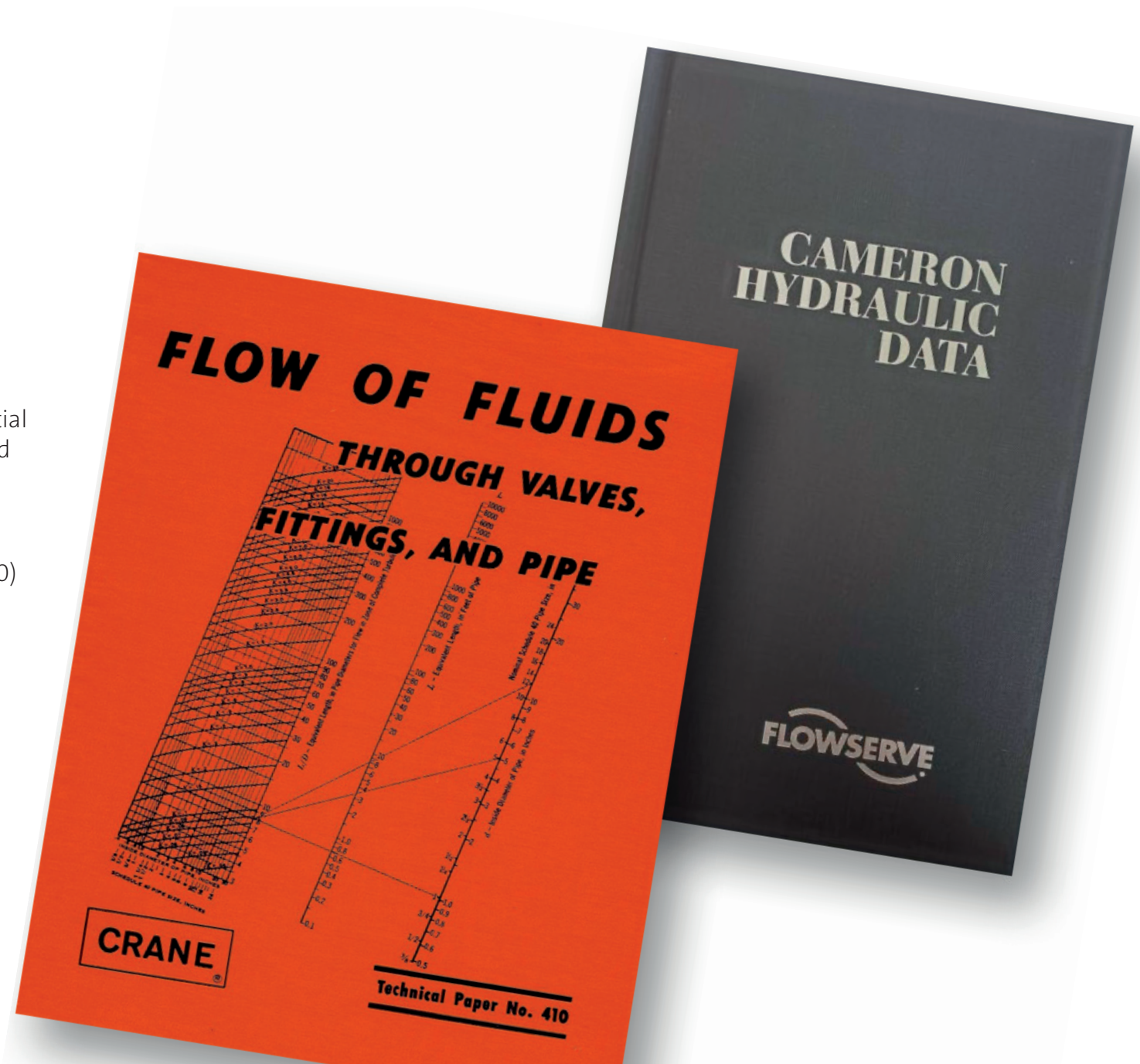


Technical Paper 410
**Flow of Fluids Through Valves,
Fittings and Pipes (Crane Co).**

Cameron Hydraulic Data
(Flowserve Corporation)

Cameron Hydraulic Data is an essential reference for calculating pressure and flow of water and pumping systems.

Crane Technical Paper No. 410 (TP-410) is the quintessential guide to understanding the flow of fluid through valves, pipe and fittings, enabling you to select the correct equipment for your piping system.



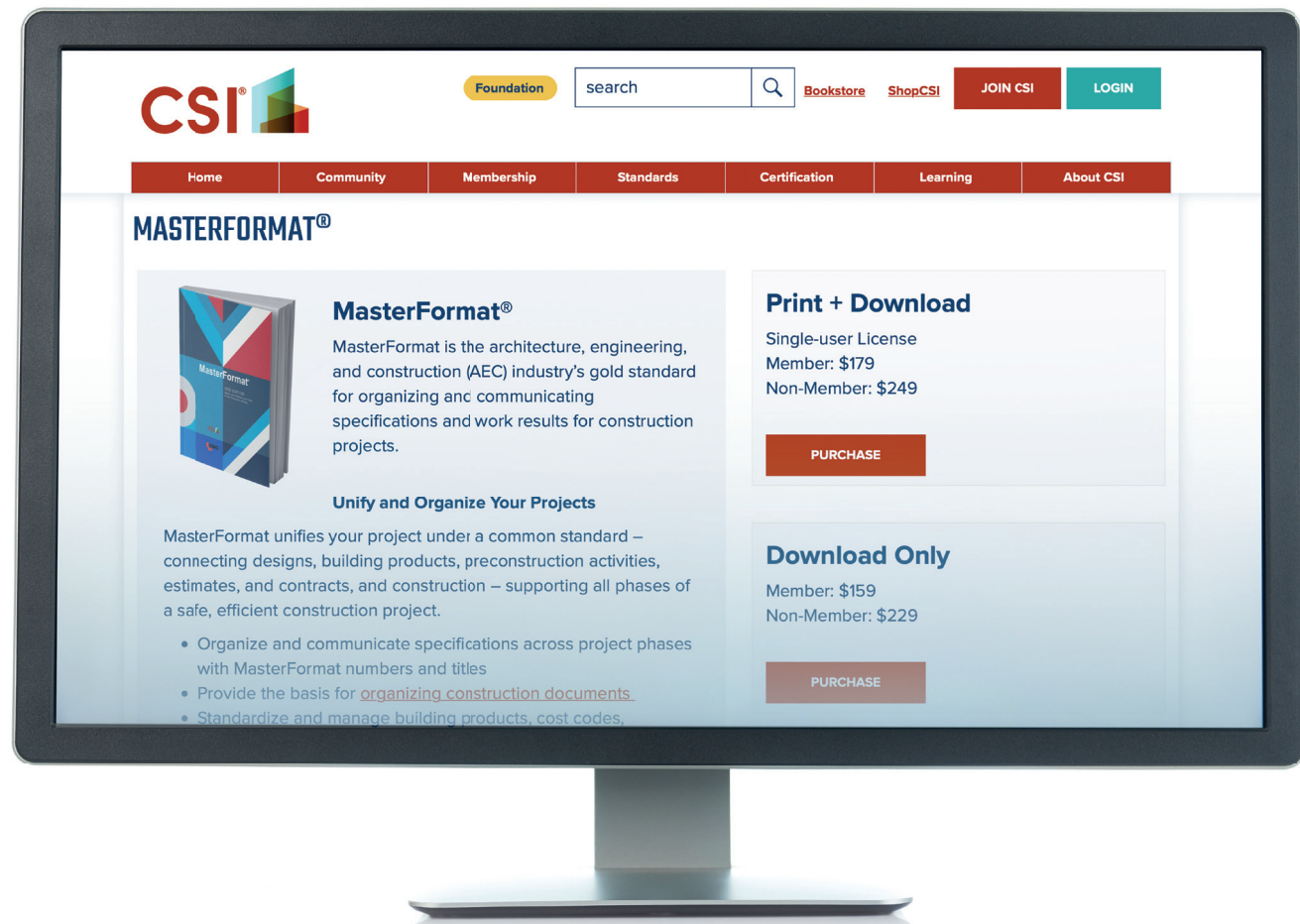
Standardized Specification Formatting



- Provides guidance to specifying engineers on standardization of section, division, page, and paragraph numbering, etc.

Visit the MasterFormat® area of the website for: csinet.org.

- This standard was developed collaboratively by the Construction Specifications Institute and Construction Specifications Canada.



Following this formatting ensures that there is mutual understanding across tenders and projects and helps ensure adherence to guidelines, standards and codes.



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