

ABE 20100

Lab 5

Process Flow Diagrams

and

P&IDs

(Piping and Instrumentation
Diagrams)

PFDs versus P&IDs

- PFD = Process Flow Diagram
 - Purpose is to illustrate processing steps and flows of materials.
 - May include mass flow rates, and stream compositions
- P&ID = Piping and Instrumentation Diagram
 - Purpose is to show specific equipment and measurement devices on a process
 - May include equipment specifications (size, materials of construction, part numbers)
- PFDs and P&IDs often use the same or similar symbols

P&ID Symbols (ISO 10628 & 14617)

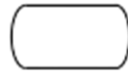
Pipe



Reactors/Vessels



Mixed Reactor



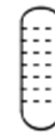
Horizontal
Reactor



Vertical
Reactor



Packed
Column

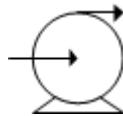


Tray
Column

Fluid Transfer



Pump



Centrifugal
Pump



Compressor



Fan

Heat Exchangers



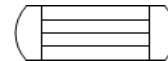
Heat
Exchanger



Heat
Exchanger



Plate &
Frame



Shell &
Tube

Valves



Valve



Control
Valve



Manual
Valve



Needle
Valve



Butterfly
Valve



Diaphragm
Valve



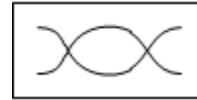
Ball
Valve

Other PFD Symbols

Combining Streams



Mixer



Blender

Separating Streams



**Distillation
Tower**



Cyclone



Filter



Centrifuge

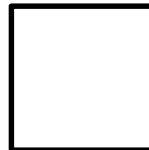


Drier



**Spray
Drier**

Generic



Software for PFDs and P&IDs

- Process Simulators
 - Aspen PLUS
 - SuperPro
- Process Drawing
 - Microsoft Visio
 - Dia (OpenSource: <https://wiki.gnome.org/Apps/Dia>)
- Generic
 - Microsoft PowerPoint, Excel, or Word
 - JPEG or other image files for PFD symbols
 - http://en.wikipedia.org/wiki/Piping_and_instrumentation_diagram
 - http://en.wikipedia.org/wiki/Process_flow_diagram

