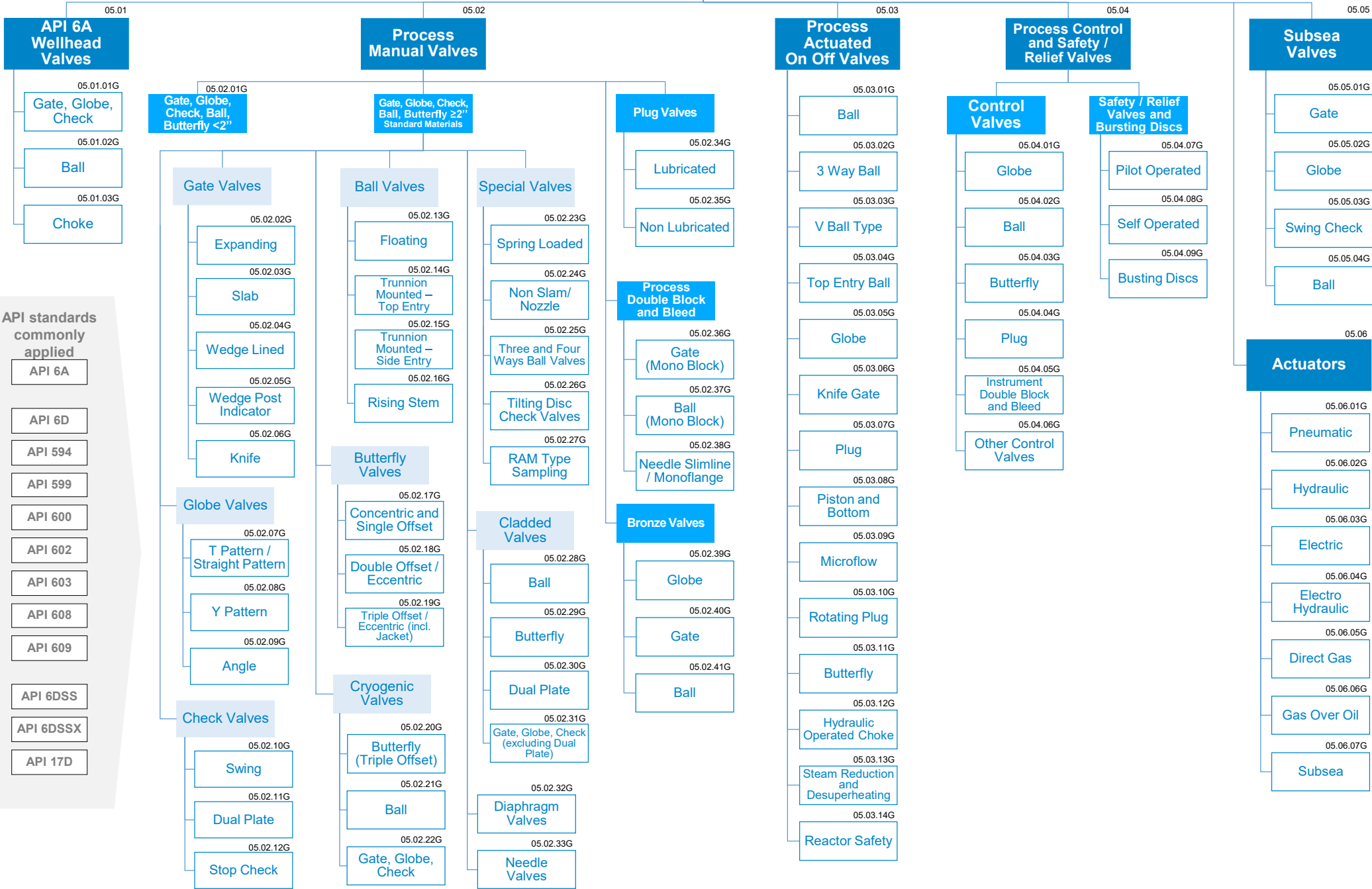


# Valves



### API standards commonly applied

- API 6A
- API 6D
- API 594
- API 599
- API 600
- API 602
- API 603
- API 608
- API 609
- API 6DSS
- API 6DSSX
- API 17D

# Valves

A valve is a mechanical device that regulates, directs or controls the pressure or flow of a fluid within a system or process by opening, closing, or partially obstructing various passageways. Fluids go from gases, liquids, fluidized solids, to slurries, etc.

Valves are fundamental components of piping systems and can have a great variety of designs, models, materials, etc. to cover a wide range of industrial applications. The most common designs of valves include Gate, Globe, Check, Ball, Butterfly and Plug types.

Valves play a large role in most industries and are used in many parts of industrial plants and mechanical devices, going from pipelines to HVAC systems to the gasoline mechanism of an automobile.

## MAIN RATIONALES BEHIND THE STANDARD CATEGORIZATION

### API 6A Wellhead Valves

- The Categories in this Group are organized in Families according to the typical structure of the procurement organization of a Buyer: wellhead; process; instrumentation
- API 6A is the most relevant standard for wellhead valves, applied to Gate, Globe, Check, Ball and Choke Valves

### Process Manual and Actuated On-Of Valves

- Process Valves is the family that has the highest number of sub-categories in most Buyers' category trees, and where there is the highest difference in nomenclatures and definitions also on the Vendors side
  - Valves can be differentiated by material (Carbon Steel, Stainless Steel, ...), manufacturing method, size, certification standard, pressure range / rating class, specific applications (for pipelines, for critical service, cryogenic, ...), valve design (top vs. side entry for ball valves, wafer vs. lug type for butterfly, etc.)
  - The choice was to differentiate by valve design, which is the strongest differentiating factor in the competitive market (the same producer often covers more sizes, pressure ranges, ...)
  - The choice of material, sizing and API standard can be specified on SupplHi.com by the Vendor when uploading the references
    - Some players specialize in valves made of a specific material (e.g. Bronze Valves, Titanium Valves, Plastic Valves, ...)
  - This family includes both Manual and Actuated On Off Valves (large valves e.g. 48" that are actuated by an actuator due to their size)
- Common standards applied to process valves are API 6D, API 6A, API 594 (check), API 599 (Plug) and the API 600 series
- The 2-inches size is a common breakdown used in Buyers' vendor lists to mark the limit for "bulk" valves. This distinction can be found also when looking at the Vendors side. While most manufacturers of large valves can also produce small sizes, the opposite is not true
  - The distinction was applied to the most common types of valves: Gate, Globe, Check, Ball, Butterfly, Plug
- Ball Valves: entry types (side, top or fully welded), and body types (e.g. split body) have not been differentiated, as they have a lower relevance to differentiate the competition of ball valves producers
- Plug Valves: the differential is marked among lubricated and non-lubricated valves, the latter being an older fabrication style

- Butterfly Valves: biggest differential in the competition is marked for players who can deliver double or triple offset valves. Most players do not see concentric vs. single offset as a relevant differentiating factor (both on the Vendor and Buyer side)
  - Wafer vs. Lug style have not been differentiated
- Cryogenic Valves have been listed under the Process Valves Family
  - Main application for Cryogenic Valves in Oil&Gas is LNG capital projects
  - The most commonly accepted definition of Cryogenic Valves in the Oil&Gas industry applies to valves that can operate at temperatures below -150° C (-238° F)
  - The most common Cryogenic Valves in Oil&Gas are Triple Offset Butterfly (above 8") and Ball (below 8"), however, the most critical are Rising Stem Valves, which allow switching from one process to another
  - Producers of Gate, Globe and Check Cryogenic Valves are often able to supply all these three kinds of valves, the three designs were therefore consolidated in one category
- Double Block and Bleed Valves categories in this family need to be distinguished from the instrumentation Double Block and Bleed (which are also typically smaller, <4")

### Process Control and Safety / Relief Valves

- This family includes valves that are actuated and typically connected to the plant's SCADA. For these types of valves, the actuator tends to be "the core" while the valve body is almost an accessory
- Control valves could have been classified under the "Control Systems and Instrumentation" Group of categories, as it is often the case in Buyers' category trees and vendor lists. However, looking at the competitive market, it is clear that producers of control valves are often producers of other types of valves and more rarely supply instrumentation equipment
- Producers of Desuperheaters are usually also producers of control valves (Desuperheaters are often classified under "control valves" according to the vendors) – they were therefore listed under this family

- Safety valves have the function of releasing a gas or a liquid from a system (e.g. a boiler), when it exceeds a pre-defined pressure or temperature limit
  - The main differentiation in the competition is between producers of self-operated valves (which are usually actuated by a spring) and pilot-operated valves (remotely commanded by a pilot)
- Bursting Discs are sometimes called rupture discs, the predominant nomenclature in the market has been adopted. While their technology is different from Safety / Relief Valves, they were classified under the same family because they serve similar purposes and are sometimes seen by vendors as business adjacencies

### Subsea Valves

- Subsea valves, especially for ultradeepwater applications, require specific knowledge and therefore need to be detailed separately from the other valves categories
  - Key players for these categories include both large conglomerates (which often deliver other subsea equipment as well), as well as very focused players that specialize for example in Subsea Ball Valves
- Ball valves are most commonly used for subsea applications, followed by GGC
- Check Valves for subsea applications tend to be Swing Check
- The Actuator for these valves is generally a choice of the valves manufacturer

### Actuators

- Actuators are usually applied to control valves that need a high level of precision or in conditions where manned operation is extremely difficult (e.g. subsea)
- Subsea actuators, even if not mutually exclusive with the other categories, were detailed because they require special designs to operate in environments with very high pressure and low temperature and therefore require specific competences
  - The product itself is sometimes different (e.g. pneumatic actuators are generally not used subsea due to the high pressure)