

ACCUMULATOR

A vessel in which a gas is trapped and compressed by the liquid in a hydraulic system, thus storing energy to supply liquid under pressure to the system when needed.

ACME THREAD

A flat topped screw thread for power transmission. This thread has a 29° included angle between adjacent thread faces compared with the 60° angle of the U.S. standard “V” thread.

ACTUATOR

Device used to operate a valve using electric, pneumatic or hydraulic means. Often used for remote control or sequencing of valve operations.

ADAPTER SPOOL

An extension which is added to a short face-to-face valve, to conform to standard API 6D face-to-face dimensions.

AGA – AMERICAN GAS ASSOCIATION

A society comprising gas companies set up to achieve common goals.

AISI – AMERICAN IRON AND STEEL INSTITUTE

An association of steel makers which sets standards for the chemical and physical properties of steel and iron in various shapes and forms; pipe, tubing, sheet, strip, wire.

ALL WELDED CONSTRUCTION

Pertains to a valve construction in which the body is completely welded and cannot be disassembled and repaired in the field.

ALLOY STEEL

A steel consisting primarily of iron with some percentage of one or more other elements such as chromium, nickel, manganese, or vanadium deliberately added to enhance its properties.

AMBIENT TEMPERATURE

The prevailing temperature of the environment immediately surrounding an object.

ANCHOR PIN

A pin welded onto the body of ball valves. This pin aligns the adapter plate and restrains the plate and gear operator from moving while the valve is being operated.

ANGLE VALVE

A variation of the globe valve, in which the end connections are at right angles to each other, rather than being inline.

ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE

The principal standards writing organization in the U.S. who sets standards for a wide variety of items, including the design, fabrication, and testing of pressure piping, systems, and components for various pipeline services.

API – AMERICAN PETROLEUM INSTITUTE

The principal U.S. oil company trade association. It has some standards and specification writing functions, such as well head components and pipeline valves.

API – SPEC 6D

An API specification dealing with pipeline valves. Most pipeline valves are manufactured to this specification, and, if so, can be identified with the API 6D monogram.

API – SPEC 6FA

The API specification dealing with the fire testing of pipeline valves. Once a particular size and pressure class valve is tested and passes the API-firetest, like valves can be identified with the above monogram. API-6FA supersedes API-RP-6F.

ASME – AMERICAN SOCIETY OF MECHANICAL ENGINEERS

This professional society publishes many technical books, papers, codes and standards.

ASME BOILER AND PRESSURE VESSEL CODE

A technical standard referenced for many aspects of valve making, although not for the valves themselves.

ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS

A professional society governing detailed physical and chemical analysis of all basic metals and alloys used in construction. The valves of most manufacturers have components whose materials correspond to ASTM standards.

ATMOSPHERIC PRESSURE

The external pressure exerted on a body by the atmosphere: 14.7 psi (absolute) at sea level.

AUSTENITIC STAINLESS STEEL

The common stainless steel, where the primary micro structure is austenite and the composition primarily iron but also includes both chromium and nickel. The steels are designated as 300 series such as 304, 316, CF8M, etc.

AWS – AMERICAN WELDING SOCIETY

A society which sets guidelines and standards for all welds.

B.R.V. – BODY RELIEF VALVE

A relief valve (optional) installed on ball valves used in liquid service to provide for the relief of excess body pressure caused by thermal expansion.

BACK PRESSURE REGULATOR

Regulator designed to control upstream pressure. See “REGULATOR.”

BACKSEAT

A Shoulder on the stem of a valve which seals against a mating surface inside the bonnet to permit replacement, under pressure, of stem seals or packing.

BALL CHECK

A fitting with a small ball that seals against a seat preventing flow in one direction and allowing flow in the other direction.

BALL VALVE

A valve using a spherical closure element (ball) which is rotated thru 90° to open and close the valve.

BALL

The spherical closure element of a ball valve.

BAR

A metric unit of pressure. One bar equals 14.5 psi.

BBL

An abbreviation for “barrel.” Used to express liquid volume. One barrel of oil is equal to 42 U.S. gallons.

BDV – BLOW DOWN VALVE

A small ball valve that is installed on the aboveground end of an extended drain line. This valve also serves to vent body cavity pressure in the “block and bleed” mode. See “Block and Bleed;” “Extended BDV.”

BEARING COPPER-BASED ALLOYS

Often called “yellow brasses”, when in contact with sea water or fresh water that is high in oxygen and carbon dioxide. (ASTM B61 and B62 are “red brasses” and not susceptible to dezincification.)

BELLEVILLE SPRING

A spring resembling a dished washer, used in some ball valves to push the seats against the ball.

BENDING MOMENT

The mechanical bending load produced by a force applied to a part at right angles to its surface or axis. The product of the force times the perpendicular distance to the point of restraint. Usually expressed in pound-feet.

BEVEL GEAR OPERATOR

Device facilitating operation of a gate or globe valve by means of a set of bevel gears having the axis of the pinion gear at right angles to that of the larger ring gear. The reduction ratio of this gear set determines the multiplication of torque achieved.

BEVEL

A chamfer. The angle between two adjacent surfaces (other than 90°). The word “bevel” is used in describing weld end preparations. See “End Bevel.”

BLOCK AND BLEED

The capability of obtaining a seal across the upstream and downstream seat rings of a valve when the body pressure is bled off to atmosphere thru blow down valves or vent plugs. Useful in testing for integrity of seat seals and in accomplishing minor repairs under pressure. See “Double Block and Bleed.”

BODY

The principal pressure containing part of a valve, in which the closure element and seats are located.

BOLT

A fastener having a square or hex head and threaded on the opposite end to receive a nut sometimes used to make up a flanged connection.

BOLTED BONNET

A bonnet which is connected to a valve body with bolts or studs and nuts.

BOLTED CONSTRUCTION

Describes a valve construction in which the pressure shell elements are bolted together, and thus can be taken apart and repaired in the field.

BOLTING SETS

Bolts, or studs, and nuts sometimes supplied with flanged valves to install the valve between line flanges.

BONNET

The top part of a valve, attached to the body, which contains the packing gland, guides the stem, and adapts to extensions or operators.

BORE (OR PORT)

The inside diameter of the smallest opening through a valve, e. g., inside diameter of a seat ring, diameter of hole through ball in a ball valve.

BRINELL HARDNESS NO.

A number indicating metal hardness using the Brinell Scale. Can be converted to Rockwell B and C hardness by reference to conversion tables. See "Rockwell Hardness No."

BS 6755

The British Standard specification dealing with the fire testing of pipeline valves. Once a particular size and pressure class valve is tested and passes the BS 6755 fire test, like valves can be also identified with the BS 6755 standard.

BUBBLE-TIGHT SHUT-OFF

A phrase used in describing the sealing ability of a valve. During air pressure testing of a new valve in the closed position, leakage past the seats is collected and bubbled thru water. To qualify as "bubble tight," no bubbles should be observed in a prescribed time span.

BURIED SERVICE

An application in which valves are installed in lines which are buried below ground level.

BURST PRESSURE

That pressure (PSI) at which rupture of a stressed element or pressure-containing vessel takes place. See "Ultimate Strength."

BUTT WELD END (BWE)

The end connection of a valve suitably prepared for butt welding to a connecting pipe.

BUTTERFLY VALVE

A short face-to-face valve which has a movable vane, in the center of the flow stream, which rotates 90 degrees as the butterfly valve opens and closes.

BVR – BALL VALVE REGULATOR

An automatic throttling valve controlling flow or pressure in a pipeline; comprising a package involving a ball valve actuator, positioner, and controlling instrument.

BYPASS

A system of pipes and valves permitting the diversion of flow or pressure around a line valve.

C.I.F. – COST INSURANCE AND FREIGHT

Shipper pays all freight and insurance charges. Same as F.O.B. Destination.

CAPACITY FACTOR

See "Cv"

CAPSCREW

A fastener having a head and whose shank is normally threaded throughout its entire length. Not used with a nut, but rather engagement is made with a female thread in the piece to be joined.

CARBON STEEL (CS)

Iron containing carbon in the form of carbides, about 0.1 to 0.3 percent carbon with no other alloying elements other than the sulfur, phosphorus, and other elements present in almost all steels.

CAST IRON

The common term for cast gray iron or iron containing flake carbon in the range of 0 % to 2 %. Cast iron is brittle, exhibiting very little ductility before fracturing.

CAST

The form of a particular part of a valve, where the basic shape is formed by molding rather than fabricating.

CASTING

A product or the act of producing a product made by pouring molten metal into a mold and allowing it to solidify, thus taking the shape of the mold.

CAVITATION

The rapid formation and collapse of vapor pockets in a flowing liquid in localized regions of very low pressure; often a cause of erosive damage to pumps, throttling type valves, and to the piping itself. Can be the cause of excessive noise.

CERTIFYING AUTHORITY (CA) (CERTIFICATION AUTHORITY)

An independent body appointed by the purchaser to carry out a survey of the equipment and/or materials that they are buying. It is the responsibility of the supplier to provide the C.A. with information, documents, access to works and personnel to enable the survey to be carried out.

CHAIN WHEEL OPERATED VALVE

An overhead valve operated by a chain drive wheel instead of a handwheel.

CHARACTERIZED GATE OR BALL

A ball or gate, the shape of whose port has been specially altered to provide a specific throttling capability.

CHARPY IMPACT TEST

A destructive mechanical test conducted on a precisely machined coupon of steel to be tested. The coupon is clamped in a special machine and subjected to lateral hammer blow. The test provides a relative measure of the toughness of the steel or its resistance to shock or impact loads and is usually required for material used in low temperature applications.

CHECK VALVE

A one-directional valve which is opened by the fluid flow in one direction and closed automatically when the flow stops or is reversed.

CHEVRON PACKING

A type of packing used in packing boxes consisting of a nest of "V" cross-section rings.

CITY GATE – CITY GATE STATION

The metering and pressure reducing station where gas is transferred from a high pressure cross-country transmission line to a low pressure distribution piping system within a city.

CLADDING

A method of coating metals by which the coating becomes an integral part of the material. This can be done by casting or hot working. It is generally done on valves where special trims are required for difficult applications.

CLAPPER

The hinged closure element of a swing check valve.

CLASS

A designation of pressure capability. See “ASME,” “MWP.”

CLEVIS

A “U” shaped connecting yoke at the end of a stem or rod, between the ends of which a gate or other part may be pinned or bolted.

CLOSURE ELEMENT

The moving part of a valve, positioned in the flowstream which controls flow thru the valve. Ball, Gate, Plug, Clapper, Disc, etc., are specific names for closure elements.

CLOSURE

The ends of a ball valve, bolted to the body, which often contain the seat rings. Often referred to as part of the body.

COAL GASIFICATION

The process of manufacturing natural gas from coal.

COMPRESSOR

A device which converts mechanical energy into gas pressure.

CONCENTRIC

Having the same centers.

CONTAMINANT

A particle or material which is foreign to the fluid media.

CONTROL VALVE

A valve that controls a process variable, such as pressure, flow or temperature by modulating its opening in response to a signal from a controller. See “Controller”

CONTROLLER

A device that measures a controlled variable, compares it with a predetermined setting and signals the actuator to read just the opening of the valve in order to re-establish the original control setting.

CORROSION

The deterioration of a material due to chemical action.

COULISSE

Of or using runners or slides as a guiding mechanism; as in a “Coulisse” style gate valve.

CRUDE OIL

Unrefined oil. Oil as it comes directly from the well.

CRYOGENIC TEMPERATURE

Any temperature below about -240°F.

CRYOGENIC VALVE

A valve capable of functioning at cryogenic temperatures.

CV

Flow coefficient expressed as the number of gallons of water that would flow through an opening, such as a valve port, in 1 minute under a differential pressure of 1 psi. CWP: Cold working pressure – the maximum allowable pressure under non-shock conditions at ambient temperature (-20° F to +100° F).

CYCLE TEST

A procedure whereby a product is put through an interval of time during which a phenomena is completed. This can be a set number of events or it can be a continuous operation until something in the product fails.

CYCLE

A single complete operation or process returning to the starting point. A valve, stroked from full open to full close and back to full open, has undergone one cycle.

CYLINDER OPERATOR

A power-piston valve operator using either hydraulic or pneumatic pressure. A sealed piston converts applied pressure into a linear piston rod (stem) motion. See “Power Operators.”

DELTA P (^P)

See “Differential Pressure,” “Pressure Drop.”

DESIGN APPRAISAL

A procedure by which a certifying authority, appointed by the purchaser, appraises the design parameters of the equipment and/or materials they are buying. The supplier shall submit drawings, calculations, and documents as required to the C.A., in conjunction with those normally required for review and acceptance by the purchaser.

DEZINCIFICATION

A form of pitting corrosion which attacks certain zinc.

DIAPHRAGM

A round, thin flexible sealing device secured and sealed around its outer edge – and sometimes around a central hole in the diaphragm – with its unsupported area free to move by flexing.

DIFFERENTIAL PRESSURE

The difference in pressure across a valve in a pressurized line. The difference in pressure between any two points in a pressurized system under flowing conditions.

DIP TUBE

Extending the blow down valve on large gate valves requires a tube which is located inside of the valve. The tube is called the “dip tube” and extends through the bonnet to the bottom of the body cavity.

DISC

The closure element of a globe angle or small regulator valve. The disc (sometimes referred to as “valve,” “poppet” or “plug”) moves to and from the seat in a direction perpendicular to the seat face. Depends on stem force for tight shutoff.

DISTRIBUTION LINE

A pipeline which distributes gas to the service lines of individual consumers. Most generally it is small in diameter (6 inch and under) and low pressure (under 150 psi).

“DOUBLE” PISTON EFFECT PRINCIPAL (DPE)

The sealing principal of a ball valve whereby line pressure is used on both the upstream and downstream floating seats to effect a dead-tight seal simultaneously on both sides of the ball. With the DPE seat configuration when the upstream seat leaks, the pressure entering into the body cavity acts on the down stream seat, which being of the PPE design, is then pushed against the ball and the valve seals in both directions.

DPST

Double-pole single-throw, as related to electrical switches. See definition of “SPST.”

DRAIN PLUG

A fitting at the bottom of a valve, the removal of which permits draining and flushing the body cavity.

DRIVE PINS

The two pins which fit into the bottom of a ball valve stem and engage corresponding holes in the ball. As the operator turns the stem, the drive pins turn the ball.

DROOP

A drop in set (outlet) pressure of a regulator or control valve due to the travel of its valve or poppet, as the required flow increases from low to maximum. A slight change in the control spring length due to the valve travel, will result in spring force variations, translating into a change of set (outlet) pressure.

“DU” BEARING

A bearing consisting of bonze, impregnated with TFE (Teflon) resin and lead powder – bonded to a low carbon steel backing

DUROMETER

An instrument for determining the hardness of synthetic rubber or elastomeric materials, usually on the “Shore A” scale. Also the unit of hardness: – i.e., “90 Durometer Shore A.”

ECCENTRIC

Not having the same center.

ELASTOMER

A natural or synthetic elastic material, often used for o-ring seals. Typical materials are viton, buna-n, EPDM (ethylene propylene dimonomer), etc.

ELBOW

A female threaded or socket fitting used for changing direction in a run of pipe or tubing. See “ELL,” “Street Ell.”

ELECTROLESS NICKEL PLATING

A plating process which requires no external electrical power and is the result of a chemical reaction between the part and the plating solution. A uniform consistent deposit and plating rate can be produced by controlling and adjusting the chemistry of the plating bath.

ELL

A pipe or tubing fitting that has the shape of an “L.” See “Elbow.”

EMERGENCY SEAT SEAL

To obtain tight shut off in an emergency situation, a sealant can be injected into a specially designed groove in the seat rings. Available for most ball valves and gate valves.

EMO – ELECTRIC MOTOR OPERATED

The acuation of a valve by electric motor. See “Power Operator.”

END BEVEL

Weld end preparations for butt welding. Governed by ASME B16.25.

END CONNECTION

The type of connection supplied on the ends of a valve which allows it to be installed in a pipeline. Weld end (WE), raised face flange (RF), ring type joint (RTJ), screwed end (SC).

EROSION

The mechanical wearing away of a metal surface or part due to fluid impingement. The presence of entrained solid particles accelerates this process.

ESDV – EMERGENCY SHUT DOWN VALVES

A valve or a system of valves which, when activated, initiate a shut-down of the plant, process, or platform they are tied to.

EXPANDING GATE VALVE

A gate valve that is comprised of a separate gate and segment that as the valve operates the gate and segment move without touching the seats, permitting the valve to be opened and closed without wear. In the closed position the gate and segment are forced against the seat. Continued downward movement of the gate causes the gate and segment to expand against the seats. When the valve reaches its full open position, the gate and segment seal off against the seats while the flow is isolated from the valve body.

EXPLOSION PROOF

The prevention of explosion, triggered by electrical components, through containment in special housings. A requirement for electrical devices, such as solenoids and switches, when exposed to a potentially explosive environment.

EXPORT PACKING

Special packing and crating that is required for export shipping. Includes sealing against a salt atmosphere (sea air).

EXTENDED BDV (BLOW DOWN VALVE)

Used on buried valves where the drain plug is inaccessible. Instead, a line is piped above grade, terminating in a small valve. Line pressure is used to blowout condensates and other material which settles out in the bottom of the body cavity. See “BDV.”

EXTENSIONS

The equipment applied to buried valves to provide above grade accessibility to operating gear, blowdown and seat lubrication systems.

EXTERNAL COATING

Coating applied to protect valves against various environments – sea air, salt water, earth buried, normal air exposure.

F.A.S. – FREE ALONG SIDE

Term used for ocean shipment. Vendor pays transportation only to shipping dock alongside vessel.

F.E. – Flanged End

See “R.F.” and “RTJ”

F.E.R.C. – FEDERAL ENERGY REGULATORY COMMISSION

A United States government agency which has the final approval of new pipelines, right of ways, etc.

F.O.B. – FREE ON BOARD

Transportation charges are absorbed by vendor to the F.O. B. point. Usually shipment is F.O.B. factory. In which case, title and transportation charges pass to the customer when shipment leaves the factory.

F.P.C. – FEDERAL POWER COMMISSION

The United States government agency which governs and regulates the natural gas and pipeline industry, as well as other energy industries.

FABRICATED VALVE

One in which the body and hub parts are not cast – but rather are formed from plate or pipe and then welded, or bolted together.

FACE-TO-FACE

The overall dimension from the inlet face of a valve to the outlet face of the valve (one end to the other). This dimension is governed by ASME B16.10 and API-6D to ensure that such valves are mutually interchangeable, regardless of the manufacturer.

FACING

The finish of the contact surface of flanged fittings.

FAIL SAFE VALVE

A valve designed to fail in a preferred position (open or closed) in order to avoid an undesirable consequence in a piping system.

FATIGUE ASSESSMENT

Fatigue resistance verification of a component subjected to a number of operating cycles.

FEA – FINITE ELEMENT ANALYSIS

A state of the art method of analyzing complex shapes by organizing the shapes into a series of smaller elements which can be more accurately analyzed to determine whether or not components are suitable for their intended purpose.

FEMALE THREAD

An internal screw thread designed to mate with a component having male (external) threads of the same size and type.

FIELD SERVICEABLE

A statement indicating that normal repair of the valve or replacement of operating parts can be accomplished in the field without return to the manufacturer.

FIRE GATE

A gate or ball valve which is positioned in a pipeline at the entrance to a compressor station. This valve is closed in case of fire in the compressor station. Closing the valve prevents the gas in the pipeline from feeding the fire.

FIRE SAFE

A statement associated with a valve design which is capable of passing certain specified leakage and operational tests after exposure to fire. Must be referenced to a particular specification. See API Spec. 6FA and BS Spec 6755.

FITTING

Any component, other than valves, used with pipe as part of the pressure system and normally referring to items covered by a national standard.

FLANGE

A cast or formed pipe fitting consisting of a projecting radial collar with bolt holes to provide means of attachment to piping components having a similar fitting. The end piece of flanged-end valves.

FLAT FACE (FF)

A flange surface in which the gasket sealing area is the entire surface from the ID to the outside edge. Usually used for class 125 cast iron valves.

FLEXIBLE TUBE VALVE

A special valve using a flexible sleeve or tube which acts as the closure element. Pressure applied to the jacket space surrounding the outside of the tube, controls the opening and closing of the valve.

FLOAT VALVE

A valve which automatically opens or closes as the level of a liquid changes. The valve is operated mechanically by a float which rests on the top of the liquid.

FLOATING BALL

A ball valve having a non-trunnion mounted ball. The ball is free to float between the seat rings, and thus causes higher torques.

FLOW COEFFICIENT

The number of gallons of water per minute that will flow through a valve with a pressure drop of 1 psi. Also referred to as the Cv of the valve.

FLOW LAMINAR

The flow of a viscous fluid in which the fluid moves in parallel layers with a fixed velocity gradient from the centerline to the containing walls of the conduit. Sometimes referred to as “streamline” flow.

FLOW METER

An instrument used to measure flow rate or total flow or both.

FLOW RATE

The volume or weight of a fluid passing thru a pipeline or conductor per unit of time, i.e., 3000 barrels of oil per day; 4 MMCF of gas per hour.

FLOW, TURBULENT

The random flow of a fluid in which the velocity at a certain point in the fluid varies irregularly.

FLOW

A fluid in motion in a conducting line.

FLUID

Any non-solid substance that can be made to flow. Both liquids and gases are fluids.

FORCE

The intensity of an influence tending to produce motion, distortion or change of shape. The product of unit force (PSI) and the area over which it acts. Usually expressed in pounds.

FORGING

A metalworking process that involves hammering or squeezing, with or without a die, at hot working temperatures to form a specific shape.

FRICTION

The resistance to motion between two contacting surfaces or substances. Friction is also developed between a flowing fluid and the inner wall of the conducting pipe – resulting in a drop in pressure.

FULL BORE (FULL PORT)

Describes a valve in which the bore (port) is nominally equal to the bore of the connecting pipe.

FULL OPENING

Describes a valve whose bore (port) is nominally equal to the bore of the connecting pipe.

GALLING

The tearing of metal when two elements rub against each other. Usually caused by lack of lubrication or extreme contact pressure.

GAS

A compressible fluid – such as air, hydrogen, nitrogen, etc.

GASKET

A component whose purpose is to seal a joint between two larger components, softer than the surfaces of the joint being sealed and usually squeezed by means of bolting to effect the seal.

GATE VALVE

A straight-thru pattern valve whose closure element is a wedge or parallel-sided slab, situated between two fixed seating surfaces, with means to move it in or out of the flow stream in a direction perpendicular to the pipeline axis.

GATE

The closure element of a gate valve (sometimes called wedge or disc).

GAUGE, PRESSURE

An instrument, usually with a threaded connection, for measuring and indicating the pressure in a piping system at the point at which it is connected.

GLAND FOLLOWER OR GLAND FLANGE

The component used to hold down or retain the gland in the stuffing box.

GLAND OR GLAND BUSHING

That part of a valve which retains or compresses the stem packing in a stuffing box (where used) or retains a stem O-ring, lip seal, or stem O-ring bushing. Sometimes manually adjustable. See "Packing," "StuffingBox."

GLAND PLATE

The plate in a valve which retains the gland, gland bushing or stem seals and sometimes guides the stem.

GLOBE VALVE

A valve whose closure element is a flat disc or conical plug sealing on a seat which is usually parallel to the flow axis. Can be used for throttling services.

GO – GEAR OPERATED

The actuation of a valve thru a – ear set which multiplies the torque applied to the valve stem. See "BGO", "MGO."

GRAPHITE

Flexible carbon material used to make gaskets and packing. The gaskets may be flat graphite sheet or have metal inserts for added strength. The packing is a combination of lattice braided rings used as anti-extrusion or wiper rings and die-formed rings which are compressed to effect the seal.

GREASE FITTING

A fitting through which lubricant or sealant is injected.

HAND WHEEL

A wheel-shaped valve operating device intended to be grasped with one or both hands which allows turning the valve stem or operator shaft to which it is attached.

HARD FACING

A surface preparation in which an alloy is deposited on a metal surface usually by weld overlay to increase resistance to abrasion and or corrosion.

HEAT ANALYSIS

A chemical analysis conducted by a foundry immediately prior to pouring which measures the exact chemical composition of a particular batch of molten metal.

HEAT TREATMENT CHARTS

Furnace charts providing a temperature vs. time record of the heating and cooling cycle, required by a specific heat treatment process for a particular furnace load of steel or steel parts.

HEAT TREATMENT

Describes any process or procedure by which the internal structure of steel is altered by heating to produce desired physical characteristics. This is usually accomplished by furnace heating followed by controlled cooling.

HOLIDAY

An imperfection or “bare spot” in a coating or plating.

HOT TAP

A connection made to a pipeline while the line is under pressure or in service. A special procedure is required to make an opening in the pipe without leaking any of the line contents.

HOT TEARS

A defect occurring in castings caused where partially solidified or weak, newly solidified sections are subjected to a pull resulting from the contraction of thinner parts that have solidified earlier. A hot tear is an intergranular failure.

HUBS

The end connection tubes on a gate valve.

HUEY TEST

A corrosion resistance test for stainless steels, most useful for predicting resistance to intergranular corrosion.

HWO – HANDWHEEL OPERATED

A valve on which the handwheel drives the stem directly to operate the valve.

HYDRAULIC MOTOR ACTUATOR (OPERATOR)

A device by which rotation of a hydraulically powered motor is converted into mechanical motion.

HYDRAULIC SEATS

The movement of the seats in a valve that are controlled by using water, oil, or other liquids under pressure.

HYDRAULIC

Pertaining to, or using, water, oil, or other liquids.

HYDROSTATIC TEST (SHELL TEST)

A test in which a valve is completely filled with water and pressure tested. Used for conducting proof pressure testing. See “Proof Pressure.”

IBBM

Iron body, bronze mounted – common term for valves with cast iron body and bonnet and bronze trim (seating surfaces, stem, bushings).

ID

The measurement of the inside diameter of a circular part.

IDS (INSTRUMENT DATA SHEET)

A table summarizing data such as service, valve size, supply pressure, etc., necessary for actuator sizing.

INCREMENTAL SEAT TEST

The leakage testing of valve seats in an assembled valve by increasing the applied pressure in prescribed pressure steps.

INLET PORT

That end of a valve which is connected to the upstream pressure zone of a fluid system.

INNER SEAT RING

The inner part of a two-piece valve seat assembly.

INSIDE-OUT AIR SEAT TEST

A pressure test that can be performed only on independent seating trunnion mounted ball valves. By closing the valve and pressurizing the body cavity, all of the seals in an independent seating ball valve can then be pressure tested.

“INSITU” (MAINTENANCE)

To maintain or repair a product “in its original place,” such as a top entry ball valve or regulator.

INTERNAL PRESSURE RELIEF

A self relieving feature in non-independent seating valves that automatically relieves excessive internal body pressure caused by sudden changes in line pressures. By means of the piston effect principal the excessive body pressure will move the seat away from its seating surface and relieve it to the lower pressure side.

ISO (INTERNATIONAL STANDARDS ORGANIZATION)

An organization which sets minimum international standards for a wide variety of items manufactured and used in pipeline services.

ISRS

Inside screw, rising stem – common term for any valve design in which the stem threads are exposed to the fluid below the packing and the stem rises up through the packing when the valve is opened.

KEY STOP

A method of restricting the travel of a ball valve from fully open to fully closed. The stem key bears against the ends of an arc machined in the adaptor plate.

LANTERN RING

See “Chevron Packing.”

LEVER

A handle type operating device for quarter-turn valves.

LIFTING LUGS

Lugs provided on large ball, gate, and check valves, for lifting and positioning valves. Also called lifting eyes.

LIMIT SWITCH

An electrical device providing a signal to a remote observation station indicating when the valve is in the fully open or fully closed position. Usually a component of a valve operator.

LINE

A pipe, tube or hose for conducting fluids.

LIP SEAL

A circular seal ring of “U” shaped cross section encompassing an elastomeric O-ring which provides resiliency and ensures a seal at the inner and out lips of the “U.”

LIQUID PENETRANT INSPECTION

A nondestructive method of detecting the presence of surface cracks and imperfections through use of a special red dye. Abbreviated as LPI or PT.

LNG – LIQUEFIED NATURAL GAS

Natural gas in the liquid state. To remain liquefied, the temperature must be maintained in the cryogenic region. The liquid occupies far less volume than an equivalent volume of gas, and it can be readily transported by ship and stored a shore in insulated tanks to await re-gasification.

LOCK UP PRESSURE

The differential pressure required to produce tight shutoff in a regulator. It is usually a few PSI.

LOCKING DEVICE

A mechanism provided on valve operators to prevent unauthorized operation or tampering.

LPG – LIQUID PETROLEUM GAS

Gases such as butane or propane in the liquid state. LPG, under relatively low pressure, remains a liquid at normal ambient temperature.

MAGNETIC PARTICLE INSPECTION

An inspection procedure for detecting surface cracks in welded areas thru the use of fine iron particles in an electrical field.

MALE THREAD

The external thread on pipe, fittings or valves used in making a connection with mating female (internal) threaded parts.

MANIFOLD (HEADER)

A common pipe or chamber having several lateral outlets.

MAOP

Maximum allowable operating pressure. Determined in accordance with piping codes, DOT regulations, etc.

MASS SPECTROMETER

An instrument used for sorting streams of electrified particles in accordance with their different masses by means of deflecting fields. The instrument can produce a photographic or graphic record of each compound and the percentage of the compound. Most commonly used in analyzing petroleum and steel products.

MATERIAL TEST REPORTS

Certificates provided by the steel manufacturer indicating the chemical analysis and mechanical properties of a specific batch of steel traced by sequentially assigned heat numbers or codes.

MDS – MATERIAL DATA SHEET

The material data sheet defines the minimum requirements for the required materials, i.e., chemical requirements, manufacturing, qualification of supplier, mechanical testing and properties, non destructive examination, repair, marking, and certification.

MECHANICAL SEAL

In a valve, a shut off that is accomplished by a mechanical means rather than with fluid or line pressure. The wedging action of a gate against the seats or the seat springs pushing the seat against the ball or gate are examples of mechanical seals in a valve.

METAL-TO-METAL SEAL

The seal produced by metal-to-metal contact between the sealing face of the seat ring and the closure element, without benefit of a synthetic seal.

METER PROVER

A system used to check or “prove” a flow meter. A close fitting sphere is launched into a pipe of known inside diameter. The flow medium pushes the sphere thru a measured length of pipe between two sphere detection devices. Knowing the transit time and the exact volume between the two stations, a flow rate is calculated and compared with the meter reading.

METER RUN

A section of pipeline in which a meter is installed to measure the volume of fluid passing thru the line.

MGO – MANUAL GEAR OPERATOR

A gear operator that is operated manually (with a handwheel).

MILL CERTIFICATES

Certificates, provided by the steel mill, indicating the chemical analysis and physical properties of a specific batch of steel. “Mill Certs” are usually required only for pressure containing parts and the customer’s need for such “Certs” must be made known at the time an order is first placed, otherwise traceability of a valve part, back to the mill, is not possible. See “Heat Analysis.”

MILL TESTS

All tests required by the material specification. Usually includes both the heat analysis (chemical) and the physical properties. Sometimes also impact tests.

MMCF

An abbreviation for “million cubic feet.” Used to designate gas volume and gas flow rates in pipelines (MMCF per hour or day).

MO – MOTOR OPERATED

See “Power Operator”; “EMO.”

MODULUS OF ELASTICITY (COEFFICIENT OF ELASTICITY)

The ratio between a force per unit area (stress) which acts to deform a body and the corresponding fractional deformation (strain) produced by the stress.

MOLD

A hollow cavity (frequently in packed sand) for giving a desired shape to a material in a molten or plastic state. Used in making metal castings,

MONITORING – MONITOR SERVICE

A field procedure whereby two valves – usually regulators – are installed in series and adjusted in such a manner that, should the primary regulator fail, the standby regulator will automatically take over at a slightly higher pressure setting.

MSS – MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY

A technical association of valve, fitting and actuator manufacturers that writes standards and practices for the valve and fittings industry. Recommendations of this society are advisory only.

MWP – MAXIMUM WORKING PRESSURE OR CWP (COLD WORKING PRESSURE)

The maximum working pressure (pounds per square inch) at which a valve can be operated. The maximum working pressures for various pressure classes. (Table 2.1 of API-6D, within temperature limits of -20°F and +100°F)

NACE – NATIONAL ASSOCIATION OF CORROSION ENGINEERS

This technical association publishes papers, articles and standards on all aspects of corrosion, and has written the definitive standards for valve materials for sour gas service.

NDE – NON-DESTRUCTIVE EXAMINATION

See “Non-Destructive Tests.”

NEEDLE VALVE

A type of small valve, used for flow metering, having a tapered needle-point plug or closure element and a seat having a small orifice.

NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION

An association which has set up guidelines for the manufacture of electrical equipment. Generally applicable to specifications for switches, etc., for electric operators.

NIPPLE

A short length of small size pipe, threaded on both ends. Used on end connections of screwed-end valves and in small size piping systems.

NITROGEN/HELIUM TEST

A pressure test conducted using nitrogen or helium (inert gases) instead of air, water, or other gases to prevent any dangers of fires or explosions. Generally specified by the purchaser when buying a valve or regulator product.

NON-DESTRUCTIVE TESTS

Those inspection tests which are not destructive to the valve structure or function. See “Radiography,” “Dye Penetrant,” “Magnetic Particle” and “Ultrasonic Testing.”

NON-RISING STEM

A gate valve having its stem threaded into the gate. As the stem turns, the gate moves, but the stem does not rise. Stem threads are exposed to line fluids.

NORMALLY CLOSED SOLENOID VALVE

An electrically operated valve whose inlet orifice is closed when the solenoid coil is not energized. Energize to open. See “Solenoid Valve.”

NPS: NOMINAL PIPE SIZE

Dimensionless number used to indicate sizes of pressure pipe and valves – used interchangeably with valve size in inches.

NPT – NATIONAL PIPE TAPER

Standard tapered thread for pressure pipe and components. Requirements defined in ASEM B1.20.1.

NRS – NON-RISING STEM

A gate valve having its stem threaded into the gate. As the stem turns the gate moves but the stem does not rise. Stem threads are exposed to the line fluid.

O.D. – OUTSIDE DIAMETER

The measurement of the outermost diameter of a circular part.

OCMA – OIL COMPANIES MATERIALS ASSOCIATION

An association of British oil companies which has written a standard for “fire safe” testing of soft seated valves. See “Fire Safe.”

OD

The measurement of the outside diameter of a circular part.

OLDHAM COUPLING

A double slider connection used to connect shafts which have only lateral misalignment.

OPERATING TIME

The time required for a power operator to stroke the valve from the full open to full closed position, or vice-versa.

OPERATOR

A device which converts manual, hydraulic, pneumatic or electrical energy into mechanical motion to open and close a valve. See “Power Operator,” “EMO”; “GO”; “HWO”; “MGO”; “MO.”

O-RING

An elastomeric or synthetic seal ring of circular cross-section.

OSANDY – OUTSIDE SCREW AND YOKE

A valve in which the fluid does not come in contact with the stem threads. The stem sealing elements is between the valve body and the stem threads.

OUTER SEAT RING

The outer metal piece of a two-piece seat ring unit. See “Inner Seat Ring.”

PACKING GLAND

See “Gland.”

PACKING

The deformable sealing material inserted into a valve stem stuffing box, which, when compressed by a gland, provides a tight seal about the stem. See “Gland”; “Stuffing Box.”

PATTERN

A duplicate, usually wooden, of a part to be cast. Used to form the mold into which molten metal is poured.

PEAK SHAVING

When daily usage of natural gas is charted on graphs, it will show high peaks (usage) during the winter months. These peaks can be “shaved” (averaged out) when the daily consumption is augmented with stand-by supplies of synthetic natural gas, propane, or methane.

PHENOLIC COATING

A thermo-setting resin applied to valve interiors and/or exteriors to inhibit corrosion.

PIG

A device, closely conforming to the pipe bore, which is forced thru a pipeline to clean the pipe of all foreign material and debris. The valves in a pipeline that will be pigged, must be thru-conduit, full port, otherwise the pig will not pass through them.

PILOT

A spring loaded pressure regulator used to control the pressure and flow of other larger pressure regulators or instruments.

PILOT-OPERATED REGULATOR

A regulator which is controlled by a second small volume high accuracy regulator or pilot. This arrangement has the advantages of improving performance by minimizing the effects of unbalance and droop. The number of possible applications are also increased since a wide range of pilot configurations are feasible.

PINHOLE

Numerous small gas holes at the surface or just below the surface of castings, generally occurring in the thicker parts of the casting as a reduction in the solubility of gases in the metal as the metal cools.

PINION SHAFT

The external input shaft of certain gear operators which drives internal reduction gearing. The pinion shaft can accept a handwheel or power operator.

PISTON EFFECT

The sealing principle involved in utilizing line pressure to effect a seal across the floating seats of some valves.

PITCH AND LEAD

Pertaining to screw threads. The pitch refers to the measurement between adjacent threads. The lead refers to the distance the screw advances in one complete revolution. Worm gears of gear operators, are also identified by pitch and lead. Speed of operation and torque required are related to pitch and lead.

PLASTICS

A broad classification covering a variety of nonmetallic, synthetic or organic materials capable of being molded or formed into desired shapes. Also used as a protective coating for valves.

PLUG VALVE

A quarter turn valve whose closure element is usually a tapered plug having a rectangular port.

PLUG

The rotating closure element of a plug valve. Also a threaded fitting used to close off and seal an opening into a pressure containing chamber, e.g., pipe plug.

PMI: POSITIVE MATERIAL IDENTIFICATION

A method for cross checking the identity of a piece of material, often using a portable spectrometer, usually with x-rays (TN 9266, nuclear analyzer) or a welding arc (Arc Met 900, optical spectrometer).

PNEUMATIC TEST

A test in which a valve is tested with air – usually a seat closure test.

PNEUMATIC

Pertaining to, or using, air or gas.

POLY PAK STEM SEAL

An O-ring energized lip-seal which replaces O-ring stem seals in certain gate valves. Also used for stem seals in some ball valves.

POROSITY

A defect found in castings or welds consisting of gas bubbles or voids in the solidified metal.

POSITION INDICATOR

Any external device which visually indicates the open and closed position of a valve. See “Stem Indicators.”

POWER OPERATOR

Powered valve operators are of the following general types: Electric Motor, Pneumatic or Hydraulic Motor, Pneumatic or Hydraulic Cylinder. Operators can either be adapted directly to the valve stem or side mounted on existing gear or scotch-yoke operators.

PRESSURE CLASS

A pressure rating expressed as a dimensionless number. The class rating charts give actual pounds per square inch maximum allowable pressure at a given temperature.

PRESSURE DROP

The decrease in pressure along the direction of flow in a piping system, caused by fluid friction, restrictions, and by change-of-direction fittings. Pressure drop is related to velocity, specific gravity, viscosity and to the size and roughness of the pipe interior. See “Differential Pressure.”

PRESSURE REDUCING REGULATOR

Regulator designed to control downstream pressure. See “REGULATOR.”

PRESSURE SWITCH

A switch (usually electric) activated by a rise or drop in pressure.

PRESSURE TEST

A test using specified pressures of liquid or gases, which can be used to check sealing, integrity, design standards, etc. of a particular product.

PRESSURE-TEMPERATURE RATINGS

The maximum allowable working pressures at specified temperatures. For steel valves, the ratings are defined by “classes” and found in ASME B16.34. For iron and bronze valves, the ratings are defined in the applicable MSS specifications.

PRODUCT ANALYSIS

A verification conducted by the valve manufacturer to assure that the chemical composition of received material coincides with the heat analysis and with requirements of the applicable specification.

PROOF PRESSURE

A hydrostatic test pressure, usually 1 ½ times the rated working pressure, applied to an assembled valve to verify the structural integrity of the pressure containing parts. Synonymous with hydrostatic shell test. (Table 5.1, API-6D).

PROTECTIVE SLEEVES

A circular “pipe like” sleeve inserted in place of the ball and seats of a top entry ball valve. This protective sleeve remains in place inside the valve during valve installation and ultimate pigging of a pipeline to clear debris from the line before placing the pipeline into service. Once the pipeline has been purged of all debris, the protective sleeve is removed entirely from the ball valve cavity and operating trim (i.e. ball and seats) is then installed for normal service conditions.

PSI (PSI) – POUNDS PER SQUARE INCH

Force per unit area exerted against a resisting body.

PULSATION

Rhythmical throbbing or vibrating. In pipelines, flow or pressure oscillation which is identically repeated in every fixed time interval. Pulsation is an inherent characteristic of reciprocating gas compressors and reciprocating liquid pumps. Pressure and flow pulsations interact with piping systems to cause vibration, metering errors, and potential equipment damage.

PUMP CONTROL VALVE

A ball valve that is not meant for on-off service, but whose specific function is to control flow and prevent cavitation in pumps on liquid pipelines.

PUMP

A rotary or reciprocating device using mechanical energy to propel liquids thru pipelines or to draw liquids from tanks or sumps by suction.

QUALIFICATION TEST

An investigation, independent of a purchasing function, that is performed on a product to determine whether or not the product conforms to all of the requirements of a particular specification. This is generally done by a third independent party to qualify a product for a specific application.

QUALITY ASSURANCE

Planned regular and/or preventive actions which are used to ensure that materials, products, or services will meet specified requirements.

RATCHET DRIVE

A shaft or valve that is operated by means of a ratchet mechanism. The ratchet delivers an intermittent stepped rotation through a gear in one direction only.

RADIOGRAPHIC INSPECTION

A nondestructive inspection method using x-rays to locate internal flaws in castings, fabricated parts and welds. Abbreviated as RT.

RAISED FACED (RF)

The raised area of a flange face which is the gasket sealing surface between mating flanges. Defined in ASME B16.5. Class 150 and 300 valves have 0.06" RF and Classes 600 and up have a 0.25" RF.

REDUCED PORT

A valve port opening that is smaller than the line size or the valve end connection size.

REGULAR PORT VALVE

A term usually applied to plug valves. The "regular" port of such a valve is customarily about 40% of the line pipe area. Hence, it corresponds to a venture or reduced port valve of like nominal pipe size. Venturi ball valves are often a logical alternative to plug valves with advantages in price, torque, and low maintenance.

REGULATOR

A throttling valve which exercises automatic control over some variable (usually pressure).
Not an on-off valve.

RELIEF VALVE

A quick acting, spring loaded valve that opens (relieves) when the pressure exceeds the spring setting. Often installed on the body cavity of ball and gate valves to relieve thermal overpressure in liquid services. See "B.R.V."

REMOTE CONTROL

The operation of a valve or other flow control device from a point at a distance from the device being controlled. Can be accomplished by electrical, pneumatic or hydraulic means.

RESILIENT SEAT

A valve seat containing a soft seal, such as an o-ring, to assure tight shut-off.

RF (RAISED FACE)

The raised area of a flange face which affords a seal with a mating flange face by means of a flat gasket of the same diameter as the raised face.

RIM PULL

The force required at the edge of the handwheel to generate the required torque at the center of the handwheel.

RING TYPE JOINT (RTJ)

A flange connection using a specially shaped soft metal ring as a gasket. Generally used on high pressure valves. May be the body and bonnet connection and/or the end flange connection.

RISING STEM BALL VALVE

A single seated ball valve that is designed to seal by using the valves stem to mechanically wedge the valves ball into a stationary seat effecting a bubble tight seal. The valves stem operates through a guide sleeve assembly that guides the stem through a quarter turn of rotation as the stem is raised or lowered by a handwheel (or actuator). The mechanical action of the stem moves the ball away from the seat prior to the 90° rotation of the ball. This design provides lower operating torques and longer seat life while assuring bubble tight shut off.

RISING STEM

A valve stem which rises as the valve is opened.

ROAD BOX

A concrete or metal box with a removable cover, enclosing and providing access to valves installed in buried lines alongside roads or streets. The valves are operated by removing the box cover and inserting a long handled “tee” wrench which engages a 2" square nut attached to the valve stem or to the pinion shaft of geared valves.

ROCKWELL HARDNESS NO.

A numerical expression of the hardness of a metal as determined with a Rockwell Hardness Tester. There are several hardness scales. The most commonly used are the Rockwell “B” scale for soft metals and the Rockwell “C” scale for hard materials. RPM – Revolutions Per Minute: Rotational speed, turns per minute. For example, the RPM delivered by a power operator to the pinion shaft of a gear operator.

RS

Rising stem – A valve stem with threads arranged so that as the stem turns, the threads engage a stationary threaded area and lift the stem along with the closure element attached to it.

RTJ

Ring Type Joint: A flange connection using a specially shaped soft metal ring as a gasket. Generally used on high pressure valves and not widely used in the pipeline industry.

RUPTURE DISC (BLOW-OUT DISC)

An emergency over-pressure relief device, employing a relatively thin diaphragm, designed to burst at a specified pressure. Cannot be reset – must be replaced after rupture event.

SAFETY VALVE

A quick opening, pop action valve used for fast relief of excessive pressure.

SCHEDULE

A system for indicating the wall thickness of pipe. The higher the schedule number, the thicker the wall for a certain pipe size.

SCOTCH YOKE OPERATOR (USED ON QUARTER TURN VALVES)

A quarter turn operator using a scotch yoke mechanism rather than gears. The “Scotch Yoke” has a torque output at the beginning and ending of its stroke that is generally twice the magnitude of the torque output in the center of its stroke.

SCREWED ENDS

Internally threaded end connections supplied on some valves. Usually tapered pipe threads (NPT).

SEAL WELD

A weld that does not contribute anything to the mechanical integrity of an assembly, but is made purely to seal or prevent leakage from, for instance, a threaded joint.

SEAL, DYNAMIC

A sealing element used between parts that have relative motion, i.e., stem seals, seat seal o-rings, etc.

SEAL, STATIC

A sealing element used as a gasket between two non-moving parts, i.e. valve bonnet o-ring, ball valve body o-ring, flange gasket.

SEAT

That part of a valve against which the closure element (gate, ball) effects a tight shut-off. In many ball valves and gate valves, it is a floating member containing a soft seating element (usually an o-ring).

SELF RELIEVING

The process whereby excessive internal body pressure, in some valves, is automatically relieved either into the upstream or downstream line by forcing the seats away from the closure element.

SEPARATOR

A special tank used to separate gas from oil in some crude oil gathering systems.

SHORT GATE

A gate valve whose seat rings contact the gate only in the closed position. Such valves are not through conduit, as the gate is completely withdrawn from the flow area in the open position.

SHORT PATTERN VALVE

A valve whose face-to-face dimension is less than the API-6D standard.

SHRINKAGE

Internal defect in castings that are internal voids, irregular in shape, caused by volume contraction during solidification. Can be caused by not maintaining a fluid channel to the riser during solidification.

SHUT-OFF VALVE

A valve designed only for on/off service. Not a throttling valve. Sometimes referred to as a “block valve.”

SLAB GATE

A gate having flat, finely finished, parallel faces – as opposed to a wedge gate. Such a closure element slides across the seats and does not depend on stem force to achieve tight shut off.

SLAM RETARDER

A device designed to prevent the clapper of a check valve from slamming as it closes upon flow reversal. Hydraulic damping cylinders, rotary vanes, and torsional springs are all used for this purpose.

SLURRY SERVICE

An application involving a flow medium consisting of small solid particles suspended in a liquid. Coal slurry consisting of about equal parts of coal and water, is transported by pipeline from coal mines to power plants where the coal is de-watered and burned.

SNG – SYNTHETIC NATURAL GAS

A substitute natural gas made from the by-products of chemical plants and refineries. Also, see “Coal Gasification.”

SOCKET END

An end connection in which a pipe or tube is inserted into a counterbored hole and then brazed or fillet welded.

SOCKET WELD END (SWE)

The end connection of a valve suitably prepared for socket welding to a connecting pipe.

SOLENOID VALVE

A small electrically operated valve used in the control piping of powered by hydraulic or pneumatic cylinder operators.

SOUR GAS

Natural gas containing significant amounts of hydrogen sulfide (H₂S). Requires special material treatments to avoid failures from sulfide corrosion cracking.

SPDT – SINGLE-POLE, DOUBLE-THROW

See definition of SPST.

SPECIFIC GRAVITY

The ratio of the weight of a given volume of fluid to the weight of an equal volume of water (if the fluid is a liquid) or to the weight of an equal volume of air (if the fluid is a gas).

SPECIFICATION

A document that defines the requirements that a finished product must conform to – may include chemical and mechanical properties, tolerances, marking, shipping, etc.

SPOOL PIECE

See “Adapter Spool”

SPST – SINGLE-POLE, SINGLE THROW

Refers to the function of an electrical switch often used in the control system of electric valve operators.

SPUR GEAR

The simplest of gears. In a gear set, the input spur gear and output spur gear are aligned on parallel shafts. An idler gear may be used to the direction of rotation on the two shafts is in the same direction.

SQUARE OPERATING NUT

A nut, usually 2" x 2", which is attached to a valve stem or the pinion shaft of a gear operator allowing use of wrenches to quickly operate the valve.

SSIV (SUB SEA ISOLATION VALVE)

A valve used underwater, generally in a manifold that will close and isolate a particular pipeline or process in an emergency.

STAINLESS STEEL (SS)

Any of a number of types of iron alloy with chrome, nickel, or other elements that does not oxidize in free air.

STEM INDICATOR (VPI – VISIBLE POSITION INDICATOR)

A position indicating rod supplied with gate valves. It extends from the top of the valve stem and serves to indicate the relative position of the gate.

STEM NUT

A one or two-piece nut which engages the stem threads of a valve and transmits torque from an operator to the valve stem.

STEM

A rod or shaft used to transmit motion from an operator to the closure element of a valve.

STOP COLLAR

The collar on a ball valve which restricts the ball to 90° of rotation from the fully open to the fully closed position. See Key Stop.

STOPPLE (STOP OFF)

A procedure used in the repair of a pipeline to isolate a section of line in the absence of a shut-off valve. After welding a flanged saddle to the pipe, the line is “hot-tapped” and an expanding resilient plug is inserted into the pipe bore. When repair is completed, the plug is withdrawn and a valve, installed on the saddle flange, is closed.

STRAIN GAUGE

An instrument used to measure small or minute distortions caused by stress forces in mechanical components.

STREET ELL

A 90° pipe fitting with male thread and female threaded or socket weld ends.

STRESS

An engineering parameter used in the design of valves. The value of unit force (psi) produced within material as the result of an applied force or load. Developed stress

STUD

A bolt, threaded on both ends, often used in bolting together two members, one of which has blind tapped bolt holes.

STUFFING BOX

The annular chamber provided around a valve stem in a sealing system into which deformable packing is introduced. See “Packing”, “Gland”.

SUBMERSIBLE SERVICE

Underwater or subsea installation. Valves require special treatment to protect against corrosion and external seawater pressure.

SURGE RELIEVER

A valve designed to relieve pressure surges in liquid pipelines, thus preventing line rupture due to transient pressures exceeding design limits of the pipe. A special flexible tube type valve can function as a fast acting surge reliever.

SURGE

To rise suddenly to an excessive or abnormal value; a transient sudden rise of pressure in a pipeline. Pipeline surges can be positive or negative and are caused most frequently by the sudden closure of a block valve or emergency shutdown of a pump. Surge pressures in excess of the rated capacity of a pipeline can cause ruptures of the piping system.

SWAGE

A tool for bending or forming cold metal to a required shape.

SWEET GAS

Natural gas having no significant hydrogen sulfide content.

SWING CHECK VALVE

A check valve in which the closure element is a hinged clapper which swings or rotates about a supporting shaft. See "Clapper"; "Check Valve".

SY – SCOTCH YOKE

See "Scotch Yoke Operator"

TEE

A pipe or tubing fitting with a side outlet at right angles. Resembles a "T".

TENSILE TEST

A destructive test performed on a specially machined specimen taken from material in its delivered condition to determine mechanical properties, such as tensile strength, yield strength, and percent elongation.

TENSION TEST

Same as "Tensile Test"

THROTTLING

The intentional restriction of flow by partially closing or opening a valve. A wide range of throttling is accomplished automatically in regulators and control valves.

THRU-CONDUIT

An expression characterizing valves when in the open position, wherein the bore presents a smooth uninterrupted interior surface across seat rings and thru the valve port, thus affording minimum pressuredrop. There are no cavities or large gaps in the bore between seat rings and body closures or between seat rings and ball/gate. Consequently, there are no areas that can accumulate debris to impede pipeline cleaning equipment or restrict the valve's motion.

THRUST

The net force applied to a part in a particular direction – e.g., on the end of a valve stem.

TOP ENTRY

The design of a particular valve or regulator where the unit can be serviced or repaired by leaving its body in the line, and its internals can be accessed by removing a top portion of the unit.

TORQUE SWITCH

An electrical device on a motor operator which cuts off power to the operator when allowable torque is exceeded, thus preventing damage to the valve and/or the operator.

TORQUE

The turning effort required to operate a valve. Usually expressed in “pound-feet” and referred to the stem nut, handwheel or operator pinion shaft.

TORSIONAL SPRING

A coiled spring which exerts a force by twisting about its axis rather than by compression or elongation. The spring in a check valve slam retarder which is restrained at one end and fastened to the clappershaft on the other end. As the clapper opens, the spring resists the motion creating a closing force. During a rapid decrease in flow rate, the clapper is urged toward the closed position and is virtually closed just prior to the instant of actual flow reversal – thus slamming is avoided. See “Slam Retarder.”

TRANSITION PIECE

A length of pipe that is welded to a valve hub or closure. Generally provided by the customer, it serves as a transition from the customer's piping to the valve to compensate for differences in material or size.

TRANSMISSION LINE

A main pipeline transporting oil or gas from wells or storage fields to refineries, loading docks or distribution companies. Generally, the pipeline is bigger than 6" and the pressure greater than 150 psi.

TRIM

Commonly refers to the valve's working parts and to their materials. Usually includes seat ring sealing surfaces, closure element sealing surfaces, stems, and back seats. Trim numbers which specify the materials are defined in API 600 and API 602.

TRIPLE ECCENTRIC (BUTTERFLY VALVES)

A particular design of a butterfly valve where the stem is located behind the disc, below the centerline of the disc, and its cone axis is offset from the centerline of the disc. This particular design is capable of a very tight shutoff at temperatures well above 100°F.

TRUNNION

That part of a ball valve which holds the ball on a fixed vertical axis and about which the ball turns. The torque requirement of a trunnion mounted ball valve is significantly less than that for a floating ball design.

TURNS TO OPERATE

The number of complete revolutions of a handwheel or the pinion shaft of a gear operator required to stroke a valve from fully open to fully closed or vice versa.

TWO INCH SQUARE OPERATING NUT

A nut attached to the valve stem or to the pinion shaft of a gear operator. Valves so equipped are usually situated below grade in road boxes and are operated by long handled "T" wrenches.

TWO-WAY SPHERE-LOK

A Sphere-Lok with two ports. See "Sphere-Lok."

U-CUP (RING-PACKING)

A "U" cross-section ring located on the tail end of certain ball valve seats to retain the grease in an emergency seat seal system.

ULTIMATE STRENGTH

That stress at which a material will fail. See "Tensile Test", "Burst Pressure."

ULTRASONIC INSPECTION

An inspection procedure using high frequency sound waves to detect voids and imperfections throughout the thickness of metal parts.

UNION BONNET

A type of valve construction in which the bonnet is held on by a union nut with threads on the body.

UNION CONNECTION

A small 3-piece fitting used to join two lengths of pipe. A female piece is installed on each of the two pipe ends and the connection is mechanically sealed by an external nut.

VACUUM

A space from which air or gas has been exhausted until its pressure is less than atmospheric pressure, i.e., any pressure below 14.7 psi absolute.

VALVE

A device used to control the flow of fluid contained in a pipe line.

VARIABLE ORIFICE

A small variable profile valve put in a flow line and used with a pilot to restrict the flow into the pilot and make the pilot more or less sensitive to changing conditions.

VDS – VALVE DATA SHEET

A data sheet defining the minimum level of a valve design, including the materials, testing, inspection, and certification requirements.

VELOCITY

The speed at which a fluid flows thru a line in a specified direction. Usually expressed in “feet per second.”

VENT PLUG – (VENT PLUG ASSEMBLY) – (SAFETY VENT PLUG)

A special pipe plug having a small allen-wrench operated vent valve. These special plugs are located at the bottom of most ball valves. With the line valve closed (and under pressure) the body cavity pressure can be vented thru this small valve to check tightness of seat seals or to make minor repairs. Having vented the body pressure, the vent plug may be removed to blow out debris and foreign material or to flush the body cavity. On some gate valves, the vent plug is installed on the bonnet for the sole purpose of venting the body. Such valves have separate drain valves. See “Block and Bleed”; “Drain Valve.”

VENTURI VALVE

A reduced bore valve. A valve having a bore smaller in diameter than the inlet or outlet. For example, an 8"x 6" x 8" ball valve has 8" inlet and outlet connections while the ball and seats are 6". The flow through a venture valve will be reduced because of the smaller port. Venturi valves can often be economically substituted for plug valves.

VISCOSITY

A measure of the internal friction of a fluid or the resistance of a fluid to flow. Two fluids of identical specific gravity may have quite different viscosities.

VPI – VISIBLE POSITION INDICATOR

See "Stem Indicator"

W.O. – WRENCH OPERATED

The operation of a valve by means of a handle or lever. Used on smaller size and lower pressure class valves.

WALL THICKNESS

The thickness of the wall of the pressure vessel or valve. For steel valves, minimum thickness requirements are defined in ASME B16.34, API 600, and API 602.

WATER HAMMER

The physical effect, often accompanied by loud banging, produced by pressure waves generated within the piping by rapid change of velocity in a liquid system.

WE OR W.E. – WELD END

The end connection of a valve which is to be installed by welding into the line. To prepare the end bevel, it is necessary to know the wall thickness and specified minimum yield strength of the connecting pipe. See "End Bevel."

WEAR TEST

Verification of a components resistance under specific wear conditions.

WEATHER PROOF

Describes a valve operator or other device that is protected against intrusion of water, sand, dust, or other atmospheric contamination.

WEDGE GATE

A gate whose seating surfaces are inclined to the direction of closing thrust so that mechanical force on the stem produces tight contact with the inclined seat rings.

WELD NECK FLANGE

A flanged piping element with a weld neck used in pipeline construction to provide a companion flange for installation of flanged valves. Also used to convert weld end valves to flanged valves or vice versa.

WELD REDUCERS

A reducing fitting used on weld end piping components to adapt from a large sized pipe to a smaller diameter pipe, or vice versa.

WOG – (WATER – OIL – GAS)

Used in connection with a pressure rating. Thus: 100 WOG indicates the rated pressure is 100 psi in water, oil, or gas service, at normal ambient temperatures.

WORKING PRESSURE

The pressure (pounds per square inch) at which a valve is designed to operate.

WORM GEARS

Gears used to transmit motion or power between right angle shafts when a high-ratio reduction is necessary. The worm is the small gear which drives the larger ring gear. Worm threads resemble screw threads and are available in various leads and pitches.

WP – WORKING PRESSURE

The pressure (pounds per square inch) at which a valve is designed to operate. Same as “operating pressure rating.”

X-RAY

See “Radiographic Inspection”

YIELD STRENGTH

The limiting stress (psi) beyond which a material will sustain permanent deformation. Up to the yield strength, the material will spring back to its original dimension when the pressure is removed. Often in valve specs, the yield strength will be designated. This allows proper material selection.

YOKE

That part of a gate valve which serves as a spacer between the bonnet and the operator or actuator.