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1.0 GENERAL

It is recommended that this entire document shall be read prior to proceeding with the installation or repair. Only correct installation, maintenance and operation will ensure smooth valve operation and maximum life.

CAUTION

Camtech shall not accept any liability if the instructions set forth in this manual are not complied with.

DESIGN CONDITION

- a) Valves are designed and manufactured to be installed in applications where no more than 1g of force in excess of gravity is applied in any direction. This 1g force can be an effect of traffic, wind or Earthquake.
- b) Valve are intended for clean fluid without any specific corrosive, chemical attack or abrasion presents please get the recommendation for such application if abrasion presents.

1.1 RESPONSIBILITY FOR VALVE SELECTION AND APPLICATION

Due to the variety of duties on which the product can be employed, it is the end users responsibility to ensure the compatibility of the media with the valve rating and materials of construction of the product for each specific application (i.e. corrosion, erosion and wear which may affect the integrity of the pressure containing parts. Camtech may offer suggestions in the selection but the selection process is solely the responsibility of plant designers. Plant designers should take into account the specific effects that the process media will have on the valve wall thickness and corresponding service life and ensure that the selected material is corresponding with the process media.




Warning: The user is advised that misapplication of the product may result in injuries or property damage.


2.0 HEALTH AND SAFETY


2.1 When installing and maintaining valves

- a.) Conduct a risk assessment and eliminate or reduce hazards.
- b.) Work in accordance with safe systems of work.
- c.) Observe all site health and safety rules, and in conformity with the legal local company specific instructions on occupational health and safety and prevention of accidents
- d.) Valve shall only be operated by personnel qualified by training/experience.
- e.) Certain processes utilize flammable, Caustic or unstable media. Care should be taken in these circumstances to ensure that the operator is aware of the specific health and safety risks associated with that media.
- f.) When operating manual valves, gloves should be worn to minimize the risk of injury to the hands/skin due to high temperature/ low temperature valve body.
- g.) When operating any valve stand clear of any moving parts such as the stem and/ or operator moving parts.
- h.) If the process or environments that the products are used in are likely to cause temperatures (high or low) that may cause injury to personnel if touched, then adequate insulation/protection must be fitted.

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 **Warning:** Non observance of safety instructions and warning may provoke risks of personnel injury and damage to the valves or damage to the equipment and pollution or damage to the environment

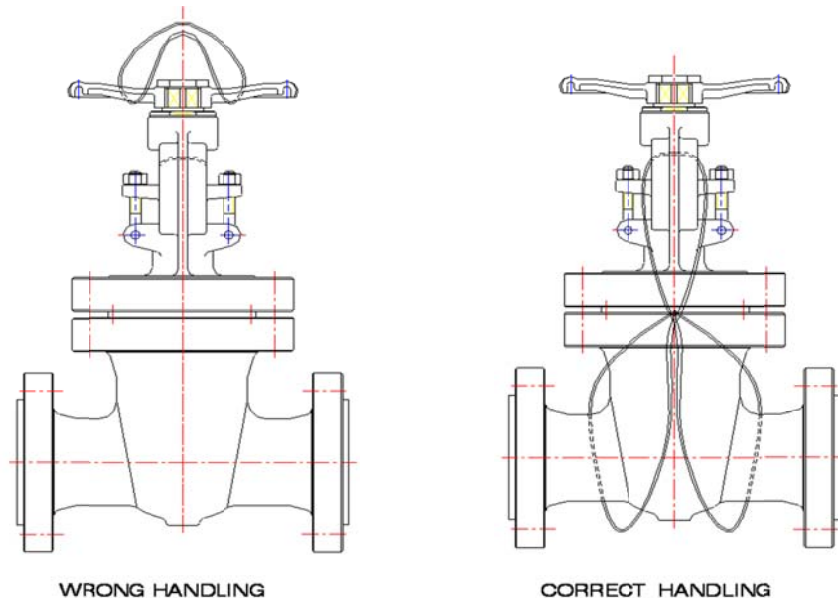
 **Warning:** Do not exceed the maximum operating conditions specified in the name plate. Non observance of this warning may cause personnel injury and damage to property like injuries resulting from fluid leakage (cold, hot toxic, under pressure) and impairment of valve function.

3.0 PRESERVATION, SHIPMENT AND HANDLING

3.1 All valves are properly packed in order to protect the parts that are subject to deterioration during transportation and storage on site. The valves are packed with the wedge in the closed position. Valve ends both flanged and butt-weld ends are protected with suitable plastic or wooden caps. The packing are appropriate to ensure safe transportation, protect the valves against external forces such as impacts, and vibration. During handling use appropriate tools like brackets, hook, fastener, ropes, etc. respecting the load capacity as appropriate.

CAUTION


1. Do not lift the valve through hand wheel, eye bolt, gear box or actuator.
2. Caution must be taken during the handling to avoid that this equipment passes over the workers or over any others place where a possible fall could cause damage. In any case, the local safety regulations must be followed.



4.0 STORAGE

- a.) Store the valve in closed dry rooms on solid ground in a dirt-free atmosphere. Allow the valves to remain in their original protective packings.
- b.) Do not place the consignment packages directly on the ground.
- c.) Do not expose consignment packages to the weather or directly to the sun.

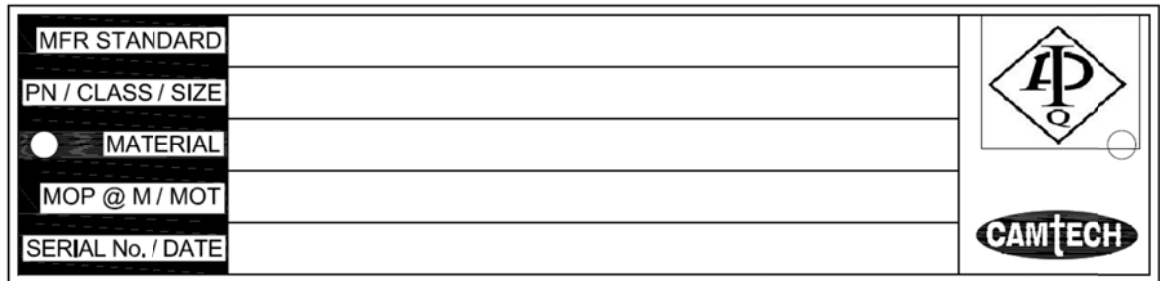
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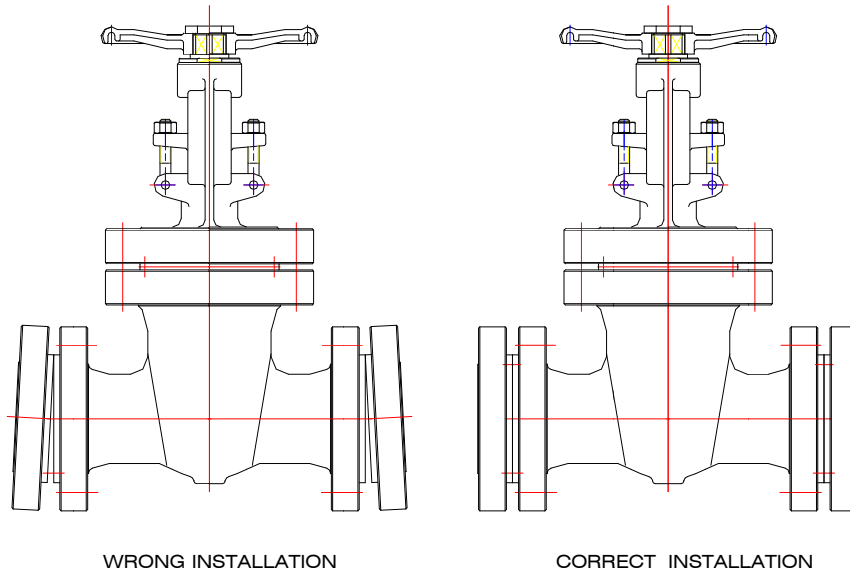
- d.) Check the paint coating for damage and corrosion at regular intervals.
- e.) Check the packaging every two months.
- f.) Repair the protective coating if necessary.

5.0 MARKING


Valves are provided with 1 nameplate



6.0 INSTALLATION



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6.1 PREPARATION BEFORE INSTALLATION

1. As a rule, the engineering contractor, Construction Company or operator/user is responsible for the positioning and installation of the valves. Planning and installation errors may impair the reliable function of the valves and pose a substantial safety hazard.
2. Confirm that the materials of construction of the valve, and the maximum pressure / temperature specified in the nameplates are appropriate for the service intended and are as specified.
3. Thoroughly clean adjacent piping system to remove any foreign material, weld, pieces of wood/plastic.
4. Verify that the space available for installation is adequate to allow the valve to be installed and to be operated.
5. Clean thoroughly the accessible interior spaces of body ends, surfaces and functional parts and mounting parts (stem, flange for actuator, mounting etc.)
6. Gate valves can be installed normally in horizontal pipelines with vertical stem and with flow from either direction. Valves can also be installed in vertical pipeline.
7. Valve shall not be used at the end of the pipe line.

THE FOLLOWING PROVISIONS SHALL BE MADE IN THE PIPELINE

- a) Draining and venting. Valves are provided with bosses for draining and venting. Drilled , tapped and plugged connections for draining and venting are provided when requested by the customer.
- b) Dangerous discharge of pressure relief blow off.
- c) Appropriate measure in the pipeline due to decomposition of unstable fluids where exist. Operator shall have thorough knowledge of such fluids and operate the valve as per established documented instructions.
- d) Pressure relief valve, where unexpected increase in pressure, water hammer is anticipated and allowable pressure limit can be exceeded.
- e) Valves are not provided with filling or discharge. Such provisions where required, shall be provided in the pipeline.

6.2 VALVE INSTALLATION

1. Install the valve with wedge in the closed position.
2. Support the valve and adjacent pipelines, such that pipeline thrust and torsional forces are not transmitted to the valve.

A. FLANGED VALVES

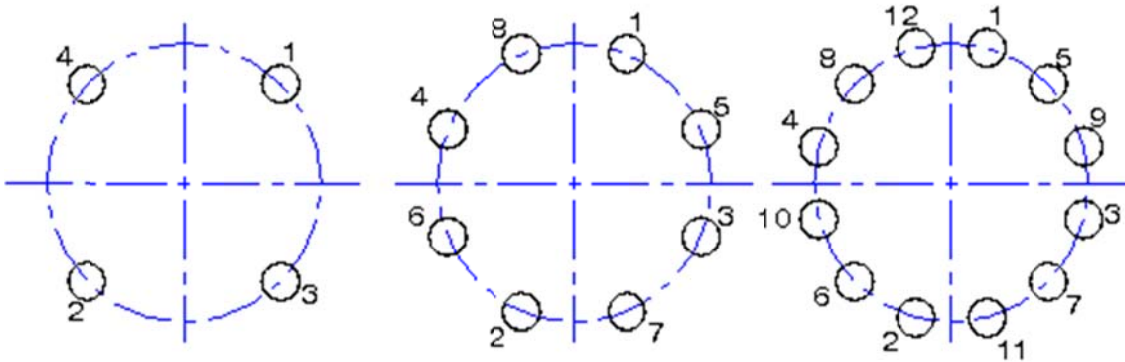
1. Clean the flange faces to ensure that it is free from damage.
2. The gaskets on the mating flanges are properly centered. Only fasteners and gaskets of approved materials shall be used. Place the valve between the two flanges of the pipe and put the gasket between the valve flanges and the pipe flange. Make sure that it is correctly positioned. Tighten the flange bolts progressively and crosswise. Use torque wrench to tighten to the requested torque specified by the specification. Ensure that the flanges are straight and aligned to the pipe.

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Bolt Tightening Sequence

B. BUTT WELD VALVES

Position the valve and align with the pipe. Remove any grease or protective paint that may have been applied to the weld ends. Use the smallest electrodes and the minimum amperage possible consistent with approved welding procedures. This will help to minimize warpage in the seat areas. Valves of carbon steel should be allowed to cool slowly. The valve may be covered with a heat insulating blanket to promote slow cooling and limit the heat affected zone. Follow ASME standards and industry standards.

C. VALVE VERIFICATION BEFORE START-UP

1. Tighten the packing just enough to prevent stem leakage. Over tightening will decrease packing life and increase operating torque.
2. Check the operation of the valve by stroking it to full open and full close.

7.0 OPERATION

1. Valves are closed by turning the hand wheel in clockwise direction and opened by turning in counter clockwise direction.
2. Do not use gate valves for throttling operation. Valves shall be either in full open or full close position.
3. Subject the valve to the required pressure and temperature gradually and slowly.
4. Retighten all bolts/nuts including the stuffing box gland. Clean and degrease the stem.
5. Ensure that there is no leak from the valve and the operation is smooth.

7.1 USE OF GATE VALVES


Gate valves are used for on-off service. Gate valve shall not be used for throttling operation. Valve shall be opened/closed slowly and gradually to the position.

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7.2 SHUT DOWN

Close the valve. De-pressure and drain/vent all fluids. Allow the valve to cool down. Remove any electric connector before maintenance. Follow the process guide lines.

7.3 EXAMINATION OF VALVES

Periodically examine the valve depending on the fluid condition and criticality. As a minimum annual examination of shell thickness and valve condition shall be made depending upon the fluid.

8.0 MAINTENANCE

a. PACKING MAINTENANCE

If leakage is observed through the packing, tighten the gland nuts slowly and evenly until the leakage stops. Use half-turn increment for tightening.

CAUTION

Do not over tighten packing gland nuts. Over tightening will increase the torque required to operate the valve and reduce packing life.

PACKING REPLACEMENT



WARNING:

Before starting any maintenance, depressurize, drain, vent and flush the line with air. Check that the valves are not in temperature. Disconnect any electrical power supply.

Failure to do so may cause serious personnel injury and/or equipment damage.

1. Open completely the valve up to the backseat position
2. Remove the nuts (19) of the gland bolt.
3. Lift the gland flange (12) and gland (11)
4. Remove the worn-out packing using a hocking wire/other device. Clean the stem and stuffing box bore.
5. Repack the packing rings at a time and ensure that they are fitted correctly and against the bottom.
6. Place the gland (11), gland flange (12) in their original position
7. Tighten lightly the gland nut
8. Cycle the valve. Pressurize the line
9. If the leakage occurs, tighten the gland nuts slowly and evenly until the leakage stops.

b. BODY – BONNET FLANGE GASKET MAINTENANCE



WARNING:

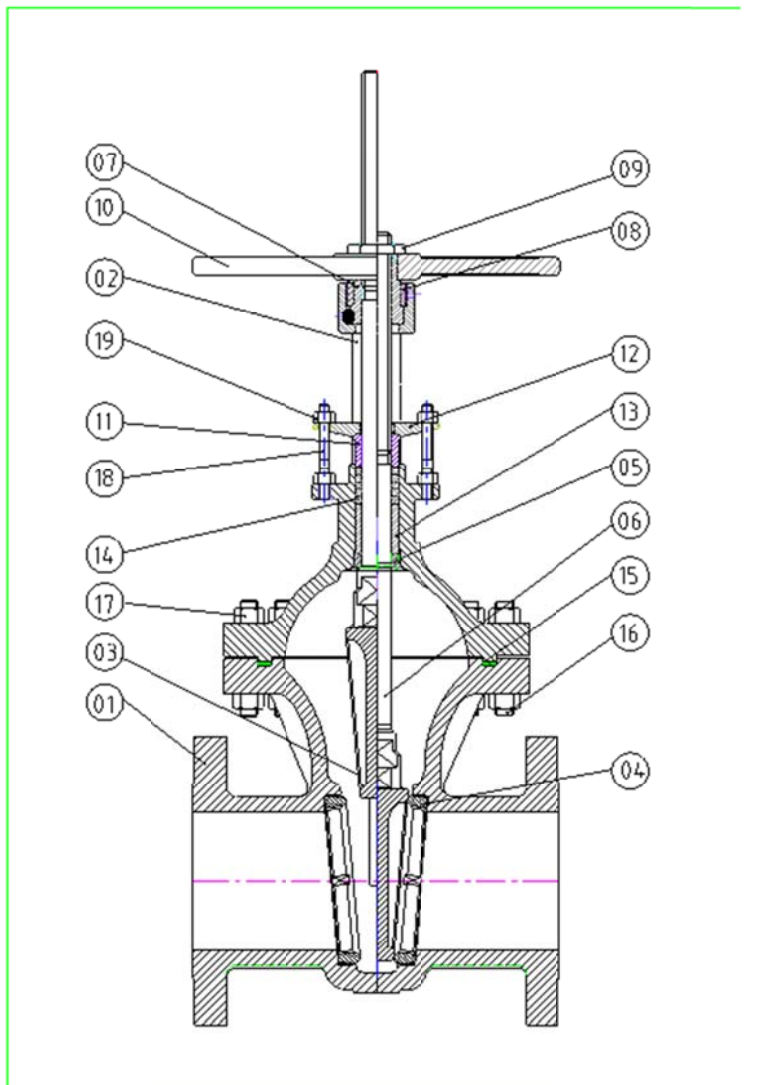
Before starting any maintenance, depressurize, drain, vent and flush the line with air. Check that the valves are not in temperature: Disconnect any electrical Power supply. Failure to do so may cause personal injury and or/equipment damage.

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01	BODY
02	BONNET
03	WEDGE
04	SEAT RING
05	BACK SEAT BUSH
06	STEM
07	STEM NUT
08	STEM NUT RETAINING NUT
09	HANDWHEEL NUT
10	HANDWHEEL
11	GLAND
12	GLAND FLANGE
13	JUNK RING
14	PACKING
15	BONNET GASKET
16	BONNET STUDS
17	BONNET NUTS
18	GLAND STUDS
19	GLAND NUTS

1. Clean the flange surface
2. Place the gasket in its position on the body. Ensure that gasket is not shifted from the correct position.
3. Position all the studs/nuts
4. Tighten the stud/nut uniformly, gradually and crosswire.
5. Follow the bolt tightening sequence. Follow the tightening torque given.
6. After equipment is installed and pressured tighten once again all the bolts.

1. Bolt tightening Torque

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Nominal bolt size (inch)	Torque (Nm)	Nominal bolt size (inch)	Torque (Nm)
1/2"	80	1 3/8"	1780
5/8"	160	1 1/2"	2300
3/4"	275	1 5/8"	3000
7/8"	440	1 3/4"	3700
1"	650	1 7/8"	4700
1 1/8"	950	2"	5700
1 1/4"	1300		

2. Valve Torque and Mounting of actuator

The valve torque depends upon many parameters like size, class, maximum operating pressure, frequency of operation, fluid details, viscosity and flow velocity. Please contact camtech, who selects the optimum size of actuator and supply of mounting plates for field conversion.


8.1 PREVENTIVE MAINTENANCE

All valve components have been designed to be largely maintenance free. The material of the moving parts has been selected for minimum wear. However malfunction caused by wrong operation, lack of maintenance or improper use reduces valve life. All repair and maintenance work shall be performed by qualified personnel following all safety instructions. Maintenance intervals should be selected by the valve user in compliance with the application condition.

9.0 TROUBLE SHOOTING

TROUBLE	POSSIBLE CAUSE	HOW TO ELIMINATE
No fluid flow	End flange covers not removed. Valve in closed position. Pipeline upstream of valve is blocked.	Open the valve. Clean the valve. Clean or replace strainer/other blocking equipment. Inspect the pipeline
Flow Rate not sufficient	Valve is not full open. Sediments inside the valve. Dirty strainer.	Open the valve. Clean the valve. Clean or replace strainer/other blocking equipment. Inspect the pipeline.

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Valve is leaking	Valve is not firmly closed. Excessive differential pressure. Seat and wedge seat faces damages. Excessive load from the pipeline.	Close the valve. Check the system. Remachine/lap seat faces.
Valve cannot be operated or it is difficult to open/close	Operating condition might be outside the specification. Bent shaft or threads damaged Valve cavity clogged.	Check the line/Valve. Check and replace worn/bent parts.

10.0 VALVE DISASSEMBLY AND ASSEMBLY

VALVE DISASSEMBLY

Follow the following steps to disassemble the valve.

A. BONNET ASSEMBLY

1. Loosen and remove stud (16,17)
2. Lift the bonnet assembly (02) from the body
3. Remove the bonnet gasket (15)

B. WEDGE (03)

1. Remove the wedge from the stem (06)

C. STEM

1. Remove the hand wheel nut (09) by loosening in anti clockwise directions
2. Remove the hand wheel (10) from the stem nut(07)
3. Remove the stem nut retainer nut(08) from the bonnet
4. Remove the stem nut from stem by turning clockwise direction
5. Loosen the gland nut (19) and pull the stem from downside and remove it.

VALVE ASSEMBLY

Follow reverse sequence of disassembly and assemble the valve

11.0 GREASES AND SPECIAL TOOLS

The following greases or equivalent other make can be used for bearing/stem/nut/gearboxes/stem
 BEACON 2 ESSO, MOBILELUX EP2 MOBL, ALVANIAR2 SUPER GREASE SHELL, MULTIFAK EP2 GREASE,
 TEXACO

SPECIAL TOOL

No Special tool is required for the maintenance.

12. RECOMMENDED SPARES

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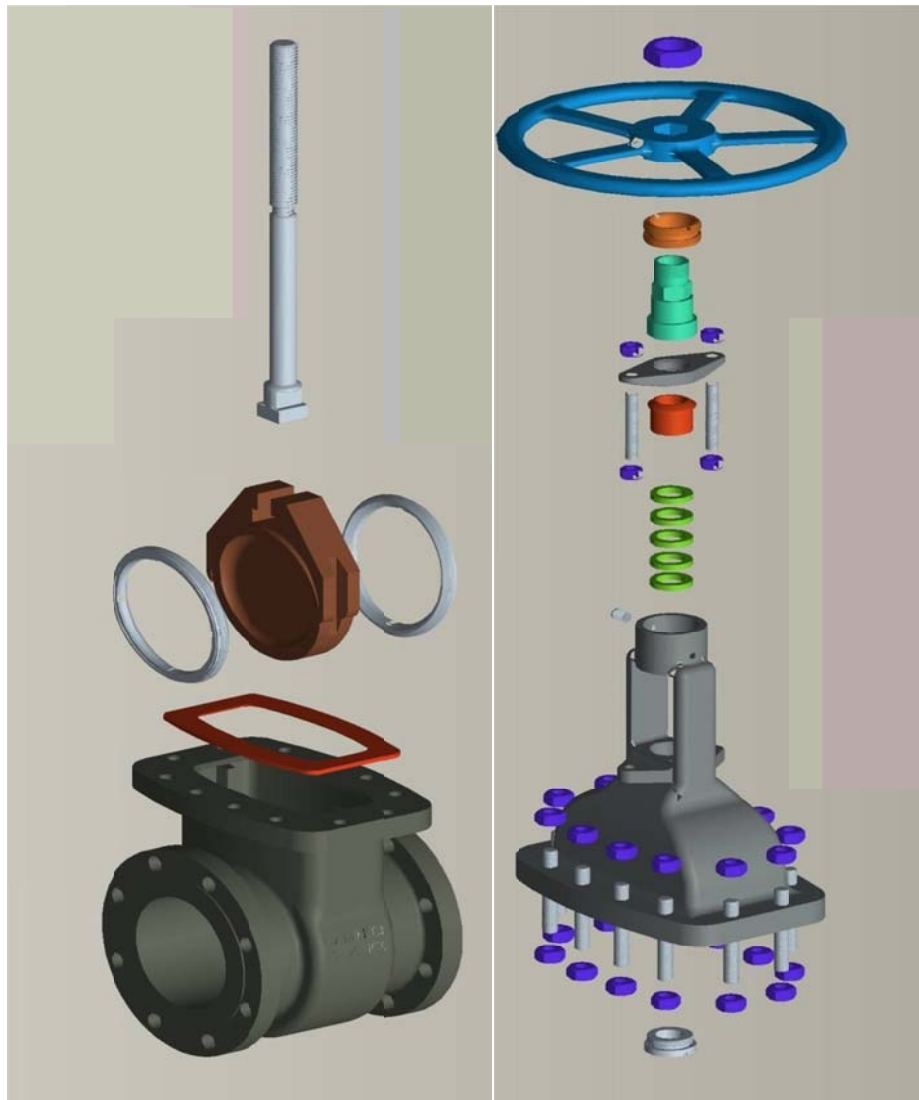


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Gland packing (14)
Bonnet gasket (15)

Note : Only Camtech supplied spares shall be used



For Explosive atmosphere, following precautions/measures shall be taken.

1.0 Maximum Surface Temperature


Valves do not generate energy / temperature on its own. The maximum surface temperature do not depends upon the valve, but on the operating fluid condition. The maximum operating fluid temperature is limited as per ASME B 16.34. However for explosive atmosphere, where

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the surface temperature due to operating fluid is potential source of explosion, provide insulation / other appropriate measures.

2.0 Projected stem

Ensure that the projected stem do not touch any piping or other part that can create spark.

3.0 Bearing lubrication

Bearings are slow moving parts and do not require lubrication. However lubrication is provided for smooth operation.

4.0 Dust deposit

Remove dust at regular intervals for explosive atmosphere. Ensure that dust is not present in the gaps and outside surfaces to exclude the possibility of explosion. Ensure that the surroundings are clean and no external part fall on the surface.

5.0 Valves are not provided with any opening or enclosure for explosion prevention.

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