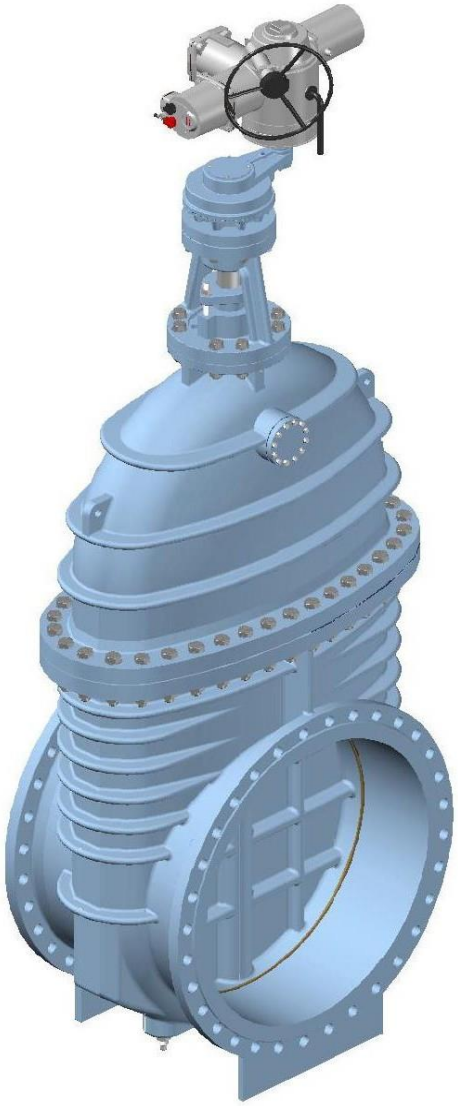
SOUTHERN AFRICA

AVK SOUTHERN AFRICA



Installation, Operation and Maintenance Manual

Series-6133

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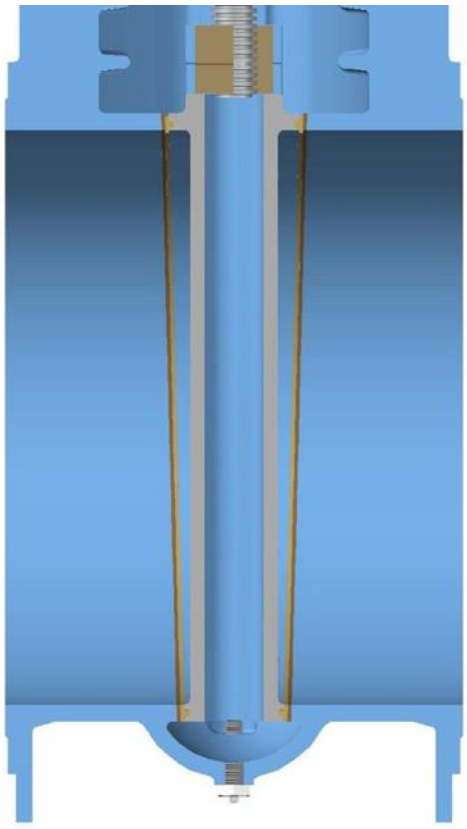
1. VALVE GENERAL DISCRIPTION

In Waterworks and Industrial applications, gate valves are the most widely used of all valve types. The majority of gate valves are used in isolating applications and will spend the majority of their service lives in either the fully open or fully closed position. They are ideal for fully open service, utilised only when it is necessary to isolate sections of pipe work for maintenance or repair etc.

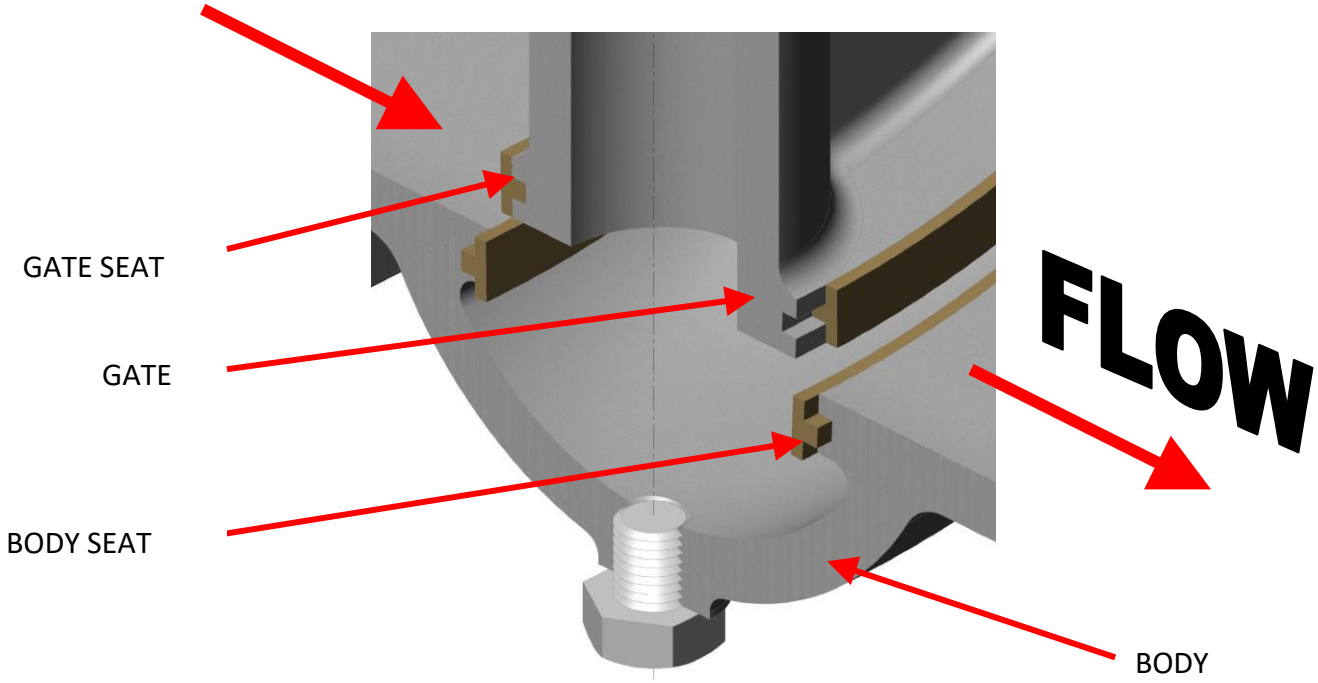
The maximum safe velocity of flow through the valves is **5 m/s**. The valve gate is oriented at 90 degrees to the direction of flow, and gate valves should not be used for throttling applications sincethis can cause serious erosion of the gate seating surfaces.

Each time the gate is opened, the area of flow varies from a minimum to a maximum when the gate is in the fully open position. The velocity of flow is at a maximum, when the area is a minimumand the high velocity results in turbulence, vibration, cavitation's and erosion. For this reason, frequent operation of wedge gate valves is undesirable.

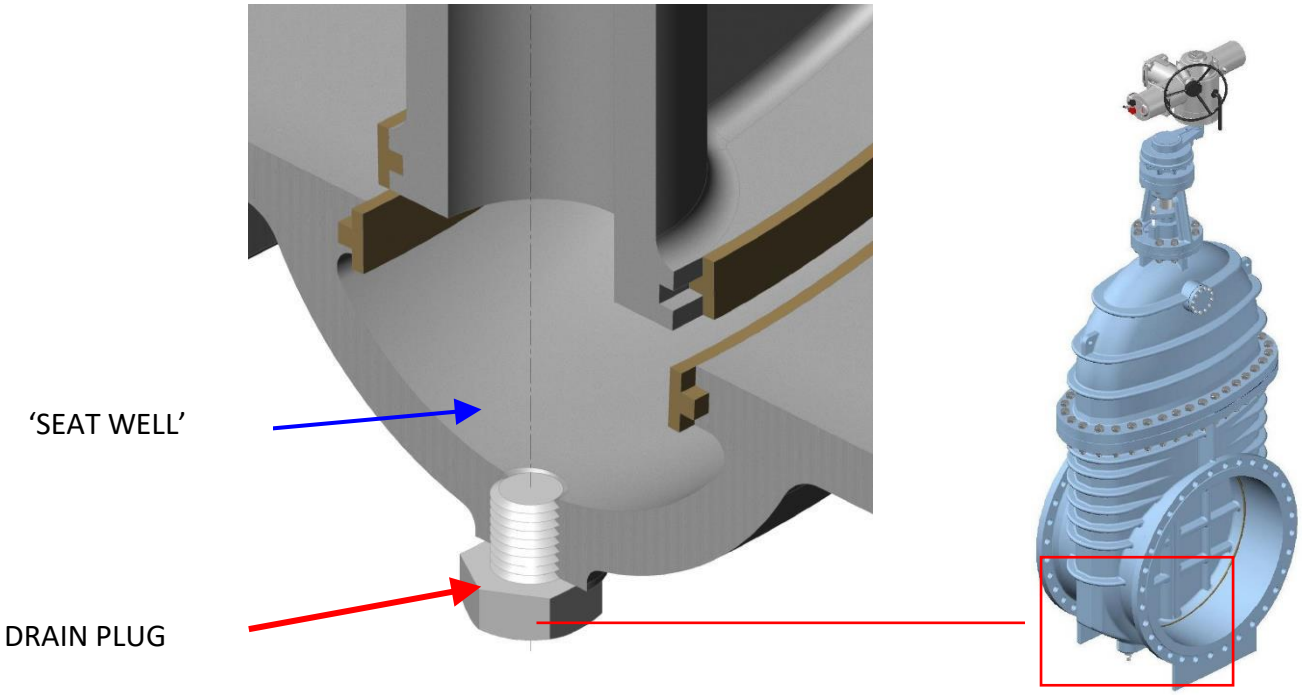


The Wedge Gate Valve is so called because of the shape of the gate and body-seating faces utilised to effect sealing.

Sealing is affected by a combination of the weight of the gate and the line pressure acting to push the gate and body seat faces into intimate contact.

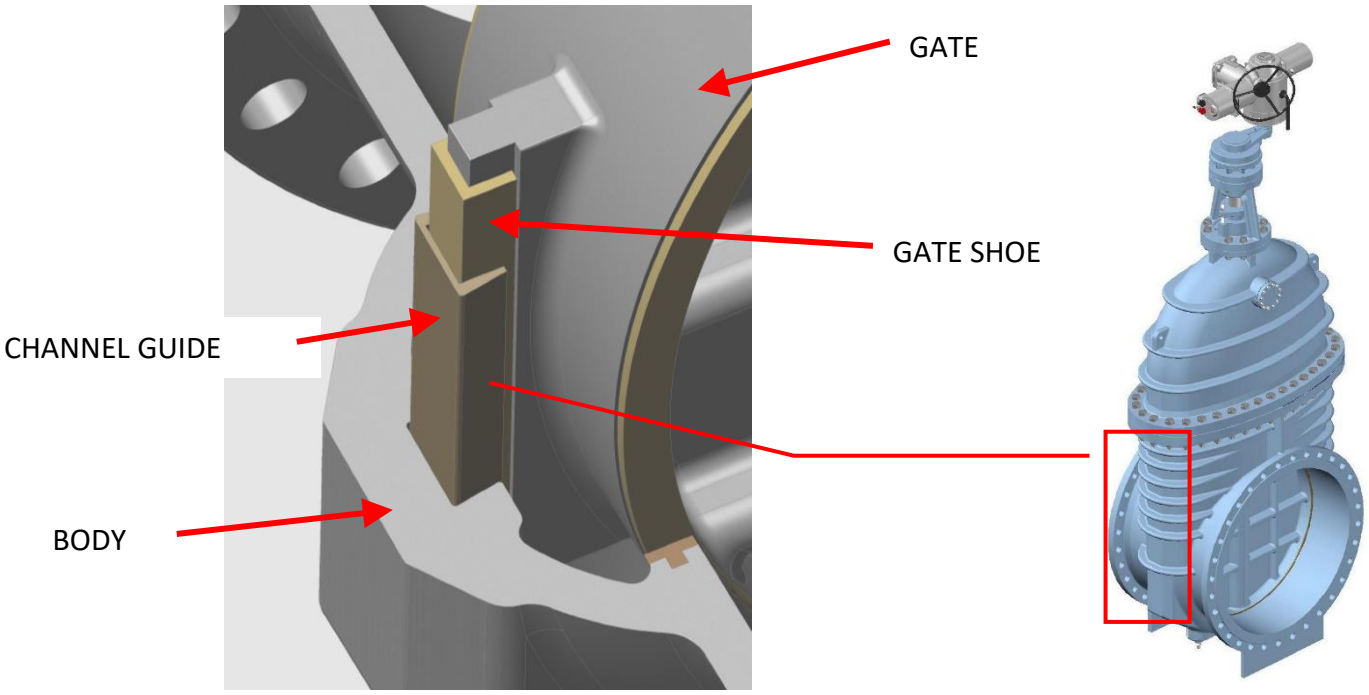


A Drain plug is fitted at the bottom of the valve body. The drain plug may be used to drain the valve 'Seat Well', in the likely event that the dirt and debris in the water has accumulated in the lower area between the sealing faces of the valve body.



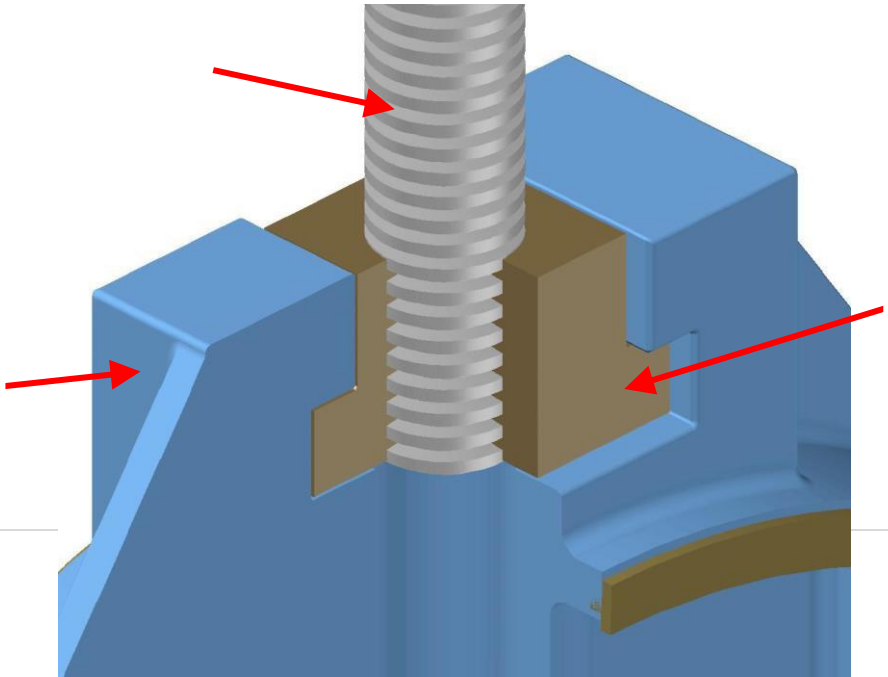
Channel Guides are fitted to the body to assist and guide the gate during the travel length of the gate in the body. These channel guides are made of Aluminium Bronze BS EN 1982 Gr CC333G (AB2).

Gate shoes are fitted to the gate to assist and guide the gate during the travel length of the gate in the body

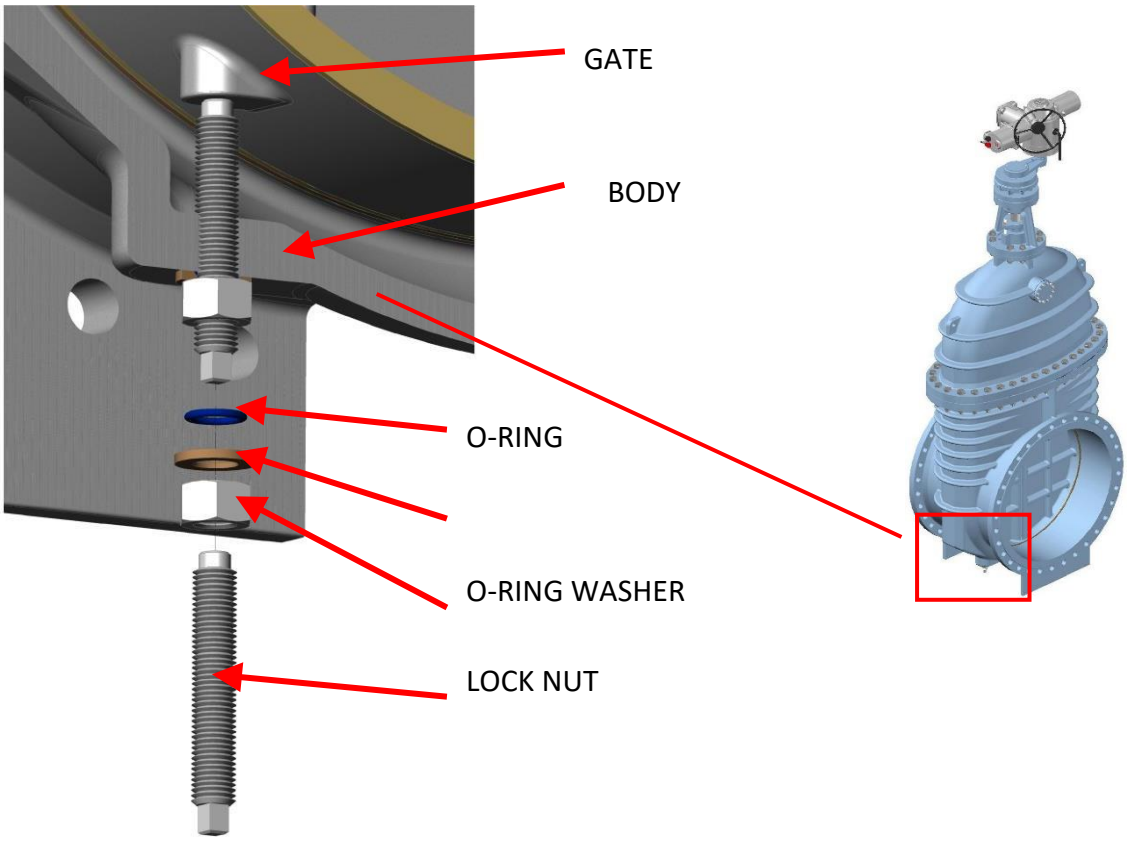


These gate shoes are made of Aluminium Bronze BS EN 1982 Gr CC333G (AB2).

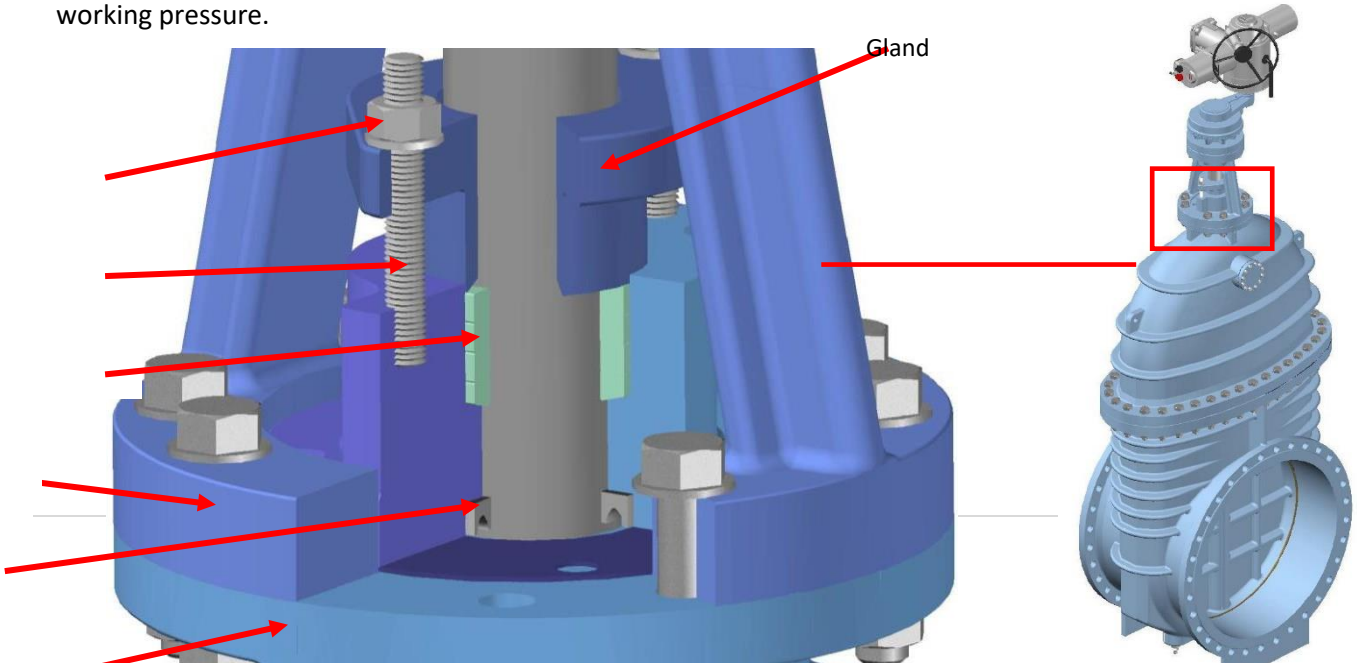
The valve is a Non-Rising Spindle Type Gate Valve.
In this application the gate valve gate nut is threaded onto the valve spindle, the spindle protrudes through the gate nut by a short distance to locate the spindle and the gate nut about the boreinside the valve gate. This is to prevent the valve gate from being miss-aligned with the valve spindle caused by vibration during opening or closing. The spindle turns but remains stationary (Non-Rising Spindle). The gate nut is prevented from turning due to its location in the gate. As the spindle turns, threading through the gate nut, it then draws the gate upward together with the gate nut.



Jacking screws are fitted to the body. These are used to set the closing limit of the gate travel.



A ‘U’-Seal is fitted into the base of the stuffing box which is bolted to the valve bonnet. This is the Primary Seal which will serve to prevent excessive water from flowing up to the gland packing, thus assisting to retain the flow of water while the gland packing (Secondary Seal) is being replaced. Note: This seal **cannot** be replaced when the valve is at full working pressure.
The Gland Packing is the Secondary seal, and this seal arrangement may be replaced during full working pressure.



2. OPERATING AND SITE INSTALLATION DETAILS

2.1 Operating Details

The valve can be hand wheel operated, gearbox operated or electrically operated and may be manually overwritten by clockwise rotation of the hand wheel on the actuator, if applicable.

Open/close the valve until the position indicator, (when fitted), indicates that the valve is open/closed. If no indicator is available open/close the valve until there is resistance but do not exceed the valve operating torque.

Under no circumstances should an extension lever be applied to the hand wheel, to obtain extra leverage. The use of excessive force to operate the valve will lead to serious damage of the valve internals.

Should the valve become difficult to operate, the cause should be investigated as there may be some obstruction or other problem preventing easy operation.

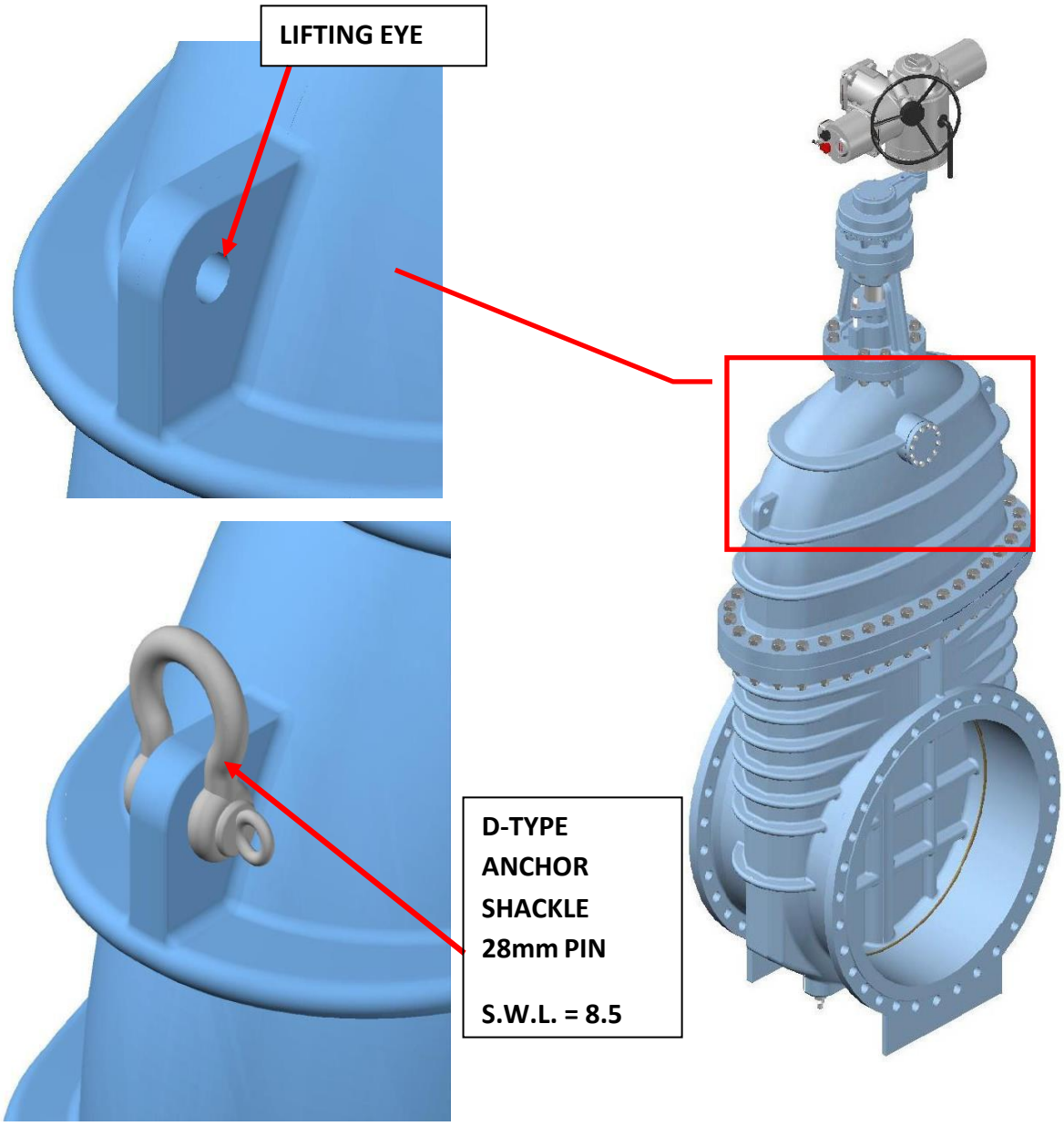
2.2 Safety

The valves are installed in the vertical position. All the valves are operated by hand wheel, gearboxes and electric actuators mounted directly onto the valve.

IMPORTANT NOTE FOR LIFTING VALVE FOR INSTALLATION :-

THE VALVE MAY NOT BE HOISTED / LIFTED IN ANY OTHER WAY OTHER THAN BY THE LIFTING EYES PROVIDED FOR ON THE BONNET.

USE THE CORRECT D-SHACKLE FOR THE SIZE AND WEIGHT OF THE VALVE.


LIFTING EYE
D-TYPE
ANCHOR
SHACKLE
28mm PIN
S.W.L. = 8.5

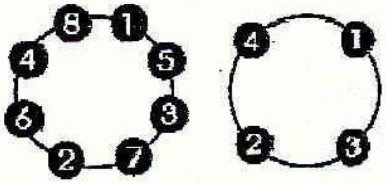
2. Valve Installation Procedure

- Remove any dirt that may have accumulated in the valve during storage.
- Ensure that the pipeline has been cleared of all foreign objects before installation.
- Ensure that no forces are transmitted from the pipeline to the valve by employing the correctpipe supports and expansion joints.
- Ensure that the flanges are correctly aligned.
- Bolts should be tightened as per good engineering practice i.e., tighten diagonally opposedbolts and tighten all bolts evenly.
- The valve must be in the fully open position before the system is flushed.

Bolt Tightening Sequence

Bolts should be tightened in the correct sequence and a sufficient number of circuits undertaken to ensure that the specified bolt torques are achieved as shown. It must be noted on flanged joints using elastomeric gaskets some relaxation of the gasket will be experienced. Bolt torques do not have to be restricted to those applicable for a specific test pressure and higher torques can be applied up to the maximum rated test pressure of the appropriate flange.

Bolt Tightening Sequence - 4 and 8 Bolts

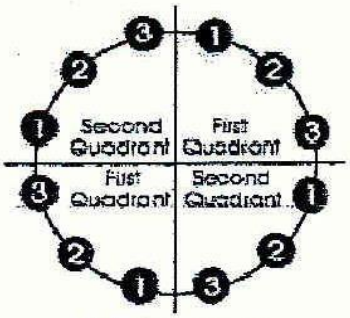


8 Bolts 4 Bolts

- Hold the gasket in correct position on clean flange face until flanges meet.
- Use only undamaged rust free bolts, nuts and washers.
- Lubricate bolt threads and all mating surfaces of nuts, washers and flanges using an automotive grade of oil or grease.
- Tighten the bolts in the sequence shown until full torque is achieved.
- Check and, if necessary, re-tighten bolts immediately before pressure testing.

Bolt Tightening Sequence - 12 Bolts or more

For sizes having 12 bolts or more it is recommended that two jointers work simultaneously on diametrically opposite bolts. Each jointer tightens the first nut in the first quadrant, then the first nut in the second quadrant, returns to the second nut in the first quadrant and so on.

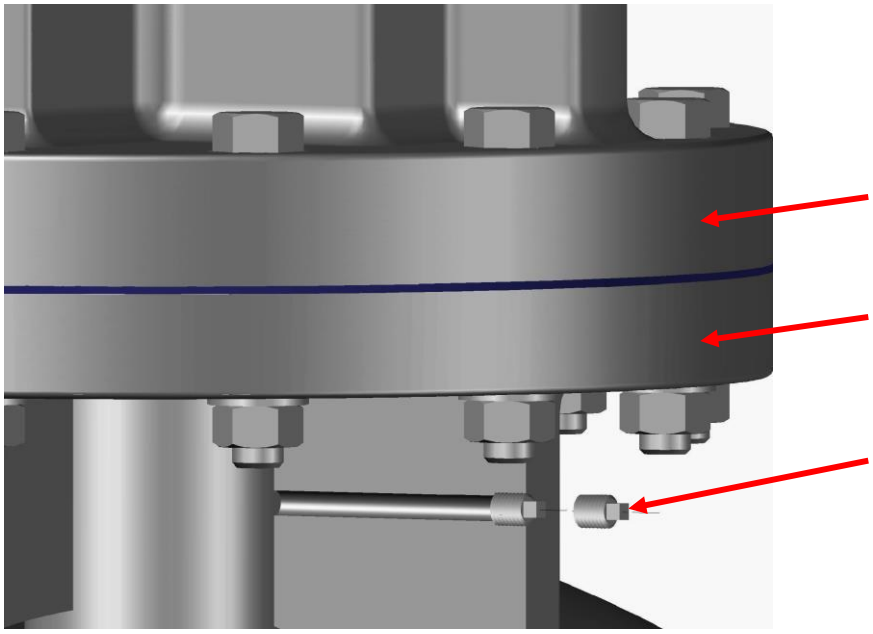


12 Bolts or more

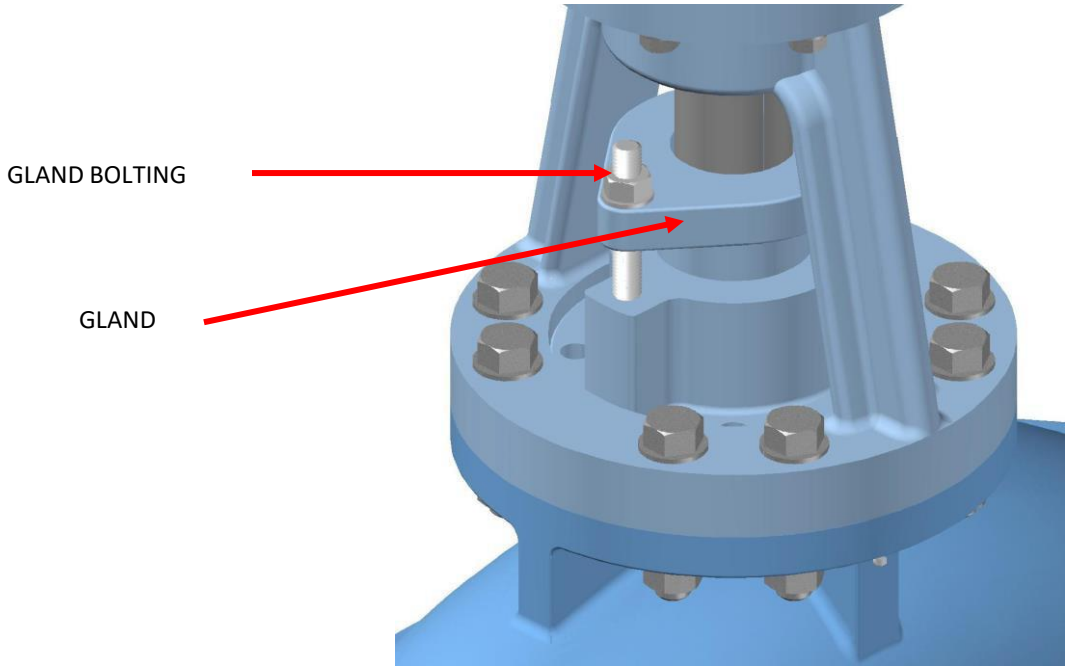
It is recommended that sufficient complete tightening circuits are carried out in sequence to ensure all bolts have attained the specified torque.

4. Commissioning Procedure

- Ensure that there is no air in the valve bonnet by removing the air release plug. Replace theplug once all the air has been removed.



- Once the pipeline has reached its operating pressure check the gaskets and gland packing for leaks. If the gland packing is leaking tighten the gland bolting.



Gaskets should not leak on new valves as the valves are tested before they are released from thefactory.

- Stroke the valve fully open/closed.

5. MAINTENANCE REQUIREMENTS

The maintenance intervals recommended are to be used as a guide and the end users should determine maintenance intervals to suit their specific operating conditions and environment.

5.1 Routine Maintenance (every 3 months)

- Inspect general appearance of valve. Check for cracks or damage.
- Inspect gland packing for leaks. Adjust the gland packing if required taking care to tighten the bolts evenly as uneven tightening may cause the gland to bind onto the steam. Replace gland packing in necessary, see 2.6.3
- Inspect valve bolting. Check for loose bolts and for leaking at the gaskets. Slight leaking can beeliminated by even tightening of all the bolts concerned as per good engineering practice.
- Inspect gearbox. Check lubrication of the gears, that the shear pin has not been broken and the overall condition of the gearbox. Lubricate gears and bushes with Molybdenum Disulphide Lithium Based Grease.

Quality Standards

Manufactured under quality-controlled procedures and quality assurance, with dedicated machinery and premises which meet pharmaceutical audit requirements.

Safety in Use

Non-toxic and non-irritating to skin and eyes, reducing health risks to engineers and plant operatives. The products are fully synthetic and contain no mineral hydrocarbons, but only food safe chemicals.

COSHH Regulation

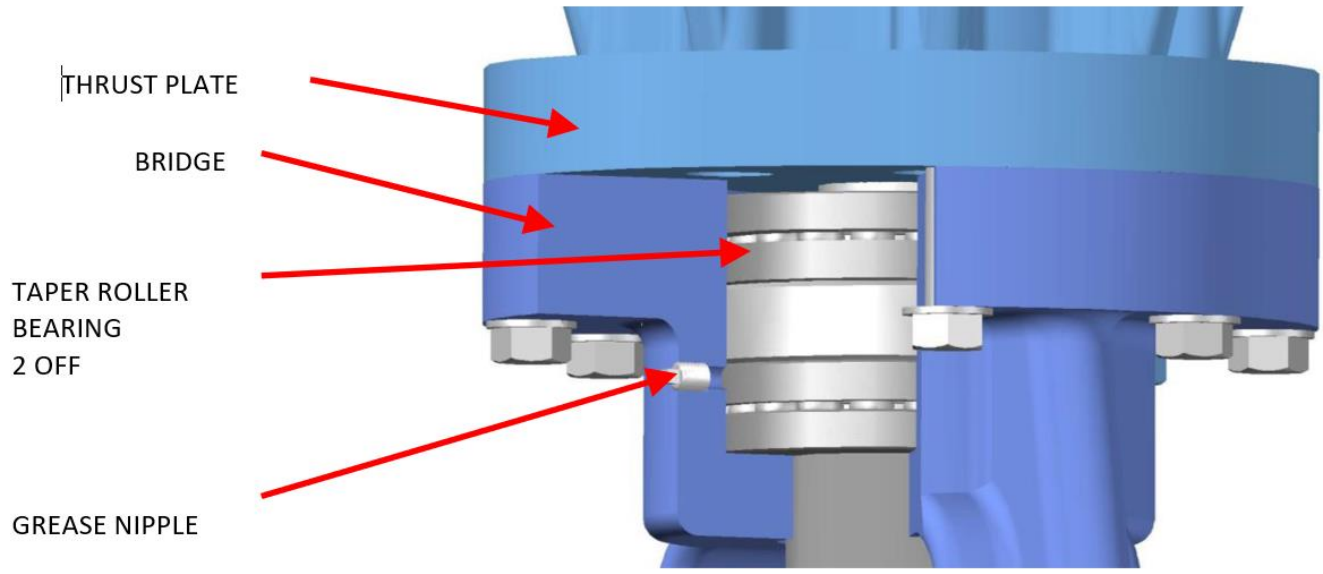
From available toxicological information G.B. OILS present no significant adverse health effects when used and handled properly. No special precautions are necessary beyond attention to good personal hygiene. Avoid prolonged, repeated skin contact.

PHYSICAL DATA PRODUCTS G.B. OILS	LIGHT	MEDIUM	HEAVY
Replaces ISO Grades	22,32,46,68	100,150,220,320	460,680,1000
Viscosity (cSt)@40°C	46	220	680
Viscosity (cSt)@100°C	**11**	36	64
Viscosity Index (min)	150	155	160
flash Point °C(COC)	+220	+220	+220
Pour Point °C (max)	-40	-35	-30
Working Temperature Range °C (cont)	-35 to +170	30 to+ 180	-25 to +190
Copper Corrosion (IP154) 3hrs@ 150°c	: 1b	1b	1b

For further information, please contact:-Technical Support Section
Tel: 0424 851 266 Fax: 0424 853 715

Manufactured in Great Britain by HYDRALUBE Ltd.

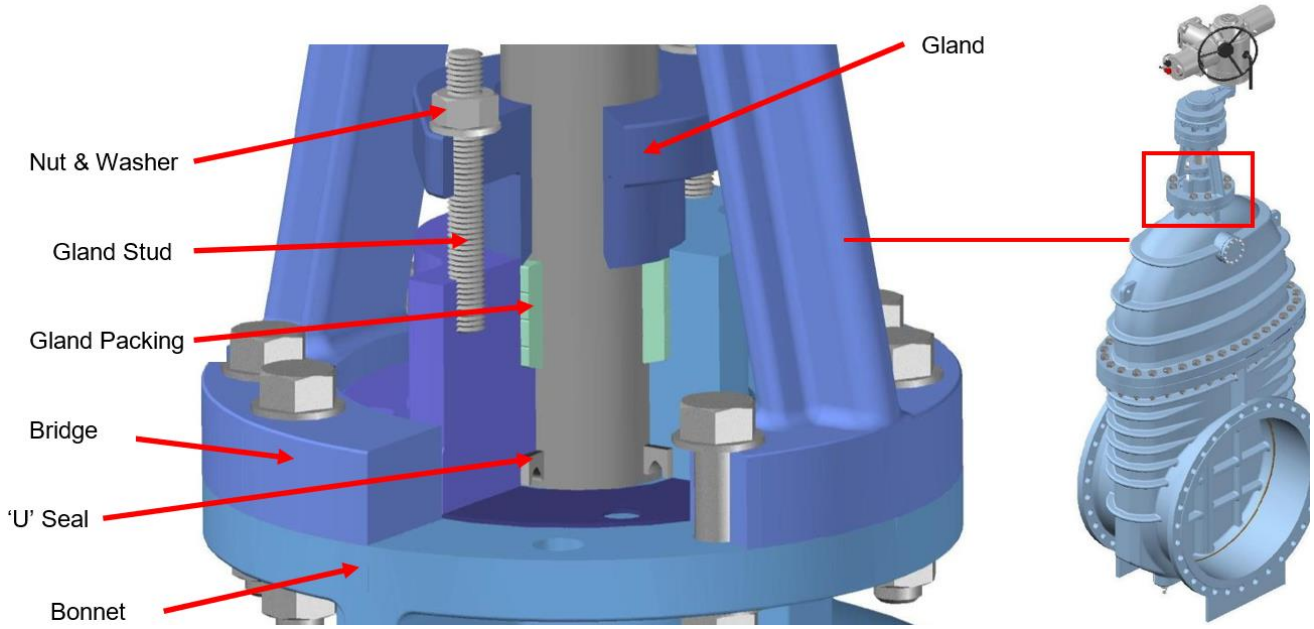
Lubricate thrust bearings with G.B. Oil (HEAVY).



5.1 Annual Maintenance

- Conduct the checks as detailed in 2.6.1, If required repair corrosion protection.
- Remove the inspection cover and inspect the spindle and gate nut. Check for wear.
- Ensure all safety precautions are in place before conducting an internal inspection. Checkgeneral appearance of the corrosion protection, channel guides and seat faces.

5.2 Gland Packing – Replacement Procedure



Note that during this operation a certain amount of leakage will take place however, it should notbe excessive, and should not prevent this operation being carried out.

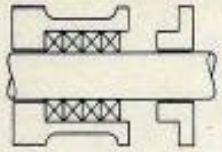
- Ensure that the gate is in the fully opened position.
- Remove the gland Nut and Washer and slide the Gland upward on the spindle.
- Remove and discard the old Gland Packing.
- Clean out the “well” between the spindle and the inside of the stuffing box.
- Fit the replacement Gland Packing and press it down into the stuffing box by gently tapping downward on the Gland.
- Refit the T-bolts and nuts and tighten down the Gland evenly.

To replace the “U” Seal, the valve must first be isolated (no flow of water) or removed from thepipeline. The Bridge must be removed. The old “U” Seal removed, and a new seal replaced.

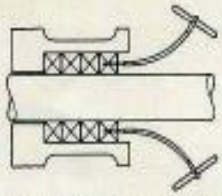
The Correct Way to Fit GLAND PACKING

1 Preparing the Equipment

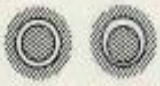
1·1 With the pressure off the stuffing box, and liquid drained where necessary, remove the gland follower nuts and pull the gland follower clear of the stuffing box.



1·2 Carefully withdraw the old packing, using paired extractor tools of the correct size, placed on opposite sides of the shaft. Remove any vestiges of the old packing and wipe the stuffing box clean.
(The old packing rings should be kept for examination if they failed to give good service.)



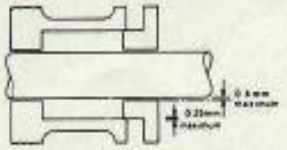
1·3 Check the shaft for concentricity with the stuffing box bore.



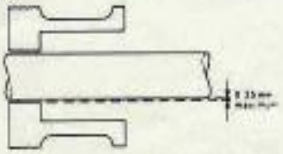
1·4 Check the shaft to ensure run out does not exceed 0.025mm (0.001") T.I.R.

1·5 The shaft surface in way of the packing rings must be free from scores, pitting, grooves or ridges.

1·6 Examine the gland follower for general condition and fit. The inner radial clearance should be 0.4mm (0.015") maximum, and the outer radial clearance should be 0.25mm (0.010") maximum, to prevent risk of cocking or touching on the shaft.



1·7 Check the clearance between the neck bush and the shaft. If this is greater than 0.25mm (0.010") radially, it may be advantageous to employ a thin, close clearance spacer ring in the bottom of the stuffing box, to prevent risk of packing extrusion.



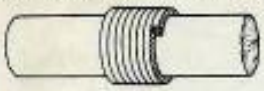
1·8 Measure the depth of the stuffing box, to ascertain how many rings are required, making allowance for entry of the gland follower.

2 Packings

2·1 Gland Packings are normally supplied as spirals or on a spool or coil, or as die-formed rings made to specified dimensions. When supplied as a continuous length, it is necessary first to cut off the length of material to make the required number of rings.

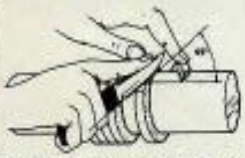
Ring Cutting

2·2 Place the packing round the shaft, or round a mandrel of the specified diameter. (The bore of metallic and extruded packing spirals should conform to this diameter.)



2·3 To assist in cutting rings, two guide lines parallel to the shaft axis and separated by a distance equal to the packing section may be drawn on the spiral.

2·4 Cut the rings from the spiral at an angle of 45°, diagonally across the guide lines - no gap is left between the ends.



2·5 Metallic and extruded packing rings are spirally opened ready for fitting, by pulling the ends axially apart.

2·6 When the rings cannot be opened without risk of damage to the packing section, they are hinge-cut, cutting diagonally about two-thirds through the packing.

2·7 Check the first ring to ensure a correct fit in the stuffing box, before cutting further rings in the same way.

5.3 Other Maintenance

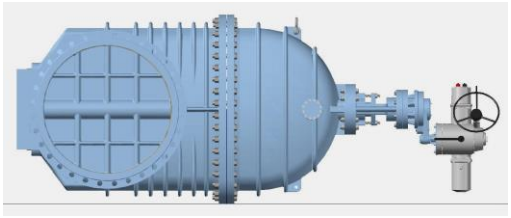
If more serious maintenance is required, this should be referred to AVK Valves Southern Africa (Pty) Ltd. AVK is able to repair and/or refurbish valves to OEM / Client specification.

Physical Address:	AVK Valves Southern Africa 10 Chris Street Alrode, Alberton Gauteng
Telephone Number:	(011) 908 - 3760
E-mail:	sales@avkvalves.co.za

6. Transportation and Storage of Valves

6.1 Transportation

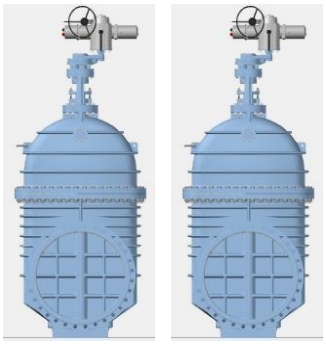
- All valves must be transported in the fully closed position to protect the front seat from damage.
- Valves DN500 and larger to be transported in the horizontal position. This is to prevent thevalve from toppling over and being damaged, for whatever reason during transit.



- Valves DN500 and larger to be tied down to a secure ‘skid’ platform to prevent damage.
- Use the correct lifting equipment to load or unload valves for transit.
- Attach protective cover over the valve bore (use holes in flanges), to prevent dust and site debris from be accidently trapped in the bore of the valve if the valve is to remain on a site priorto installation.

6.2 Storage

- Valves must be placed in the vertical position (on the floor).



- The valves should be kept in the fully closed position whilst on site awaiting installation andshould have the open ends blanked off (covers) to prevent ingress of dirt.
- Throughout the period of storage, the valves should be kept in a cool, dry and clean environmentout of UV-light.