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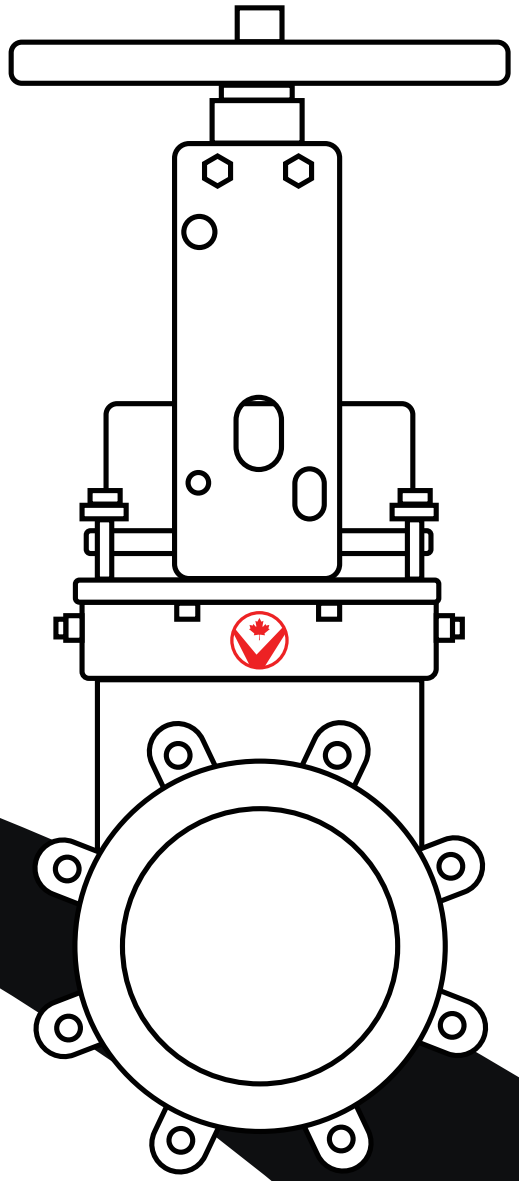

E5100
Light Process KGV

Installation, Operation, & Maintenance Manual

Customized valve solutions for the toughest applications.

Safety First!

Safety messages in this manual are identified by the following:

= Danger!

Failure to heed the following warning or instruction could result in injury or death.

= Attention!

Failure to follow this procedure could result in equipment damage or injury.

Disclaimer

- Safety precautions should be taken at ALL times when working with industrial valves. Transportation, installation, commissioning and maintenance actions should only be carried out by skilled professionals with the qualified experience required for using the appropriate tools and equipment involved. Proper understanding of relevant procedures, processes, applications, and valve operation are required.
- Personnel involved in the installation or maintenance of valves should always be aware of the potential emission of process material and should take all necessary safety precautions. Always wear the required personal protective equipment when dealing with any hazardous materials. Always handle valves that are removed from service with the assumption that process material remains within the valve.
- The correct Personal Protective Equipment (PPE) should be worn at all times when working with industrial valves. This may include, but not be limited to, protective footwear, hard hats, safety glasses, and high-visibility clothing.

Material or design suggestions provided by Elite Valve, either directly or indirectly through product quotation or sale, are solely for general information purposes. Technical and any other necessary review by the customer is expected, and it is ultimately the responsibility of the customer to determine product suitability and application based on the customer's own needs and criteria. Elite Valve and its employees assume no liability in this regard.

Elite Valve reserves the right to make design and material changes without notice or obligation. Design features and materials of construction as described in this manual are for informational purposes only.

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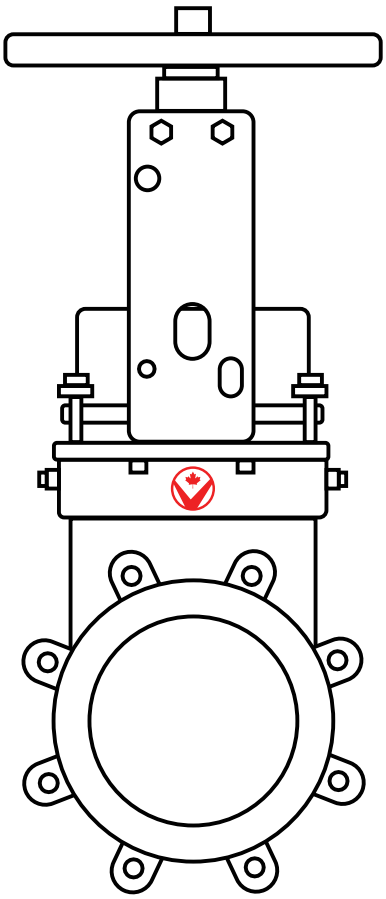

Introduction

This manual is intended for use by personnel involved with the transportation, storage, installation, operation, or maintenance of Elite Valve knife gate valves.

Inspection

Elite Valve products are carefully packaged to provide maximum protection during shipment. Upon receipt, carefully inspect the product for damage and notify your carrier of any issues.

Storage

If valves are not to be installed upon receipt, then it is recommended that the valve be stored in the original factory packing in a clean dry warehouse until ready for installation. Ensure all valves have flange covers installed protecting serrated finishes and valve internals. If storage is longer than 6 months, please refer to our Long Term Valve Storage and Preservation Manual for more details.

Transportation

It is safest to transport the valves on the skid or crate originally supplied. Use proper lifting straps that are in good condition to safely lift the valve. (See Figure-1: Typical lifting strap locations.)

⚠ Some large diameter valves come with tapped hole locations in the yoke and body. Unless reviewed and approved by Elite Valve, these tapped holes are NOT to be used for lifting the entire valve assembly.

⚠ Do not lift by eyelet on the end of pneumatic or hydraulic cylinders (if present).

⚠ Do not attach ropes or hooks to the handwheel of electric actuators for the purpose of lifting.

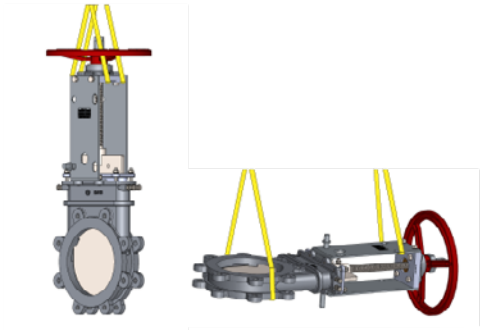

Figure 1 - Typical Lifting Strap Locations

Pre-Installation

Actuators should be mounted and tested prior to installation to ensure correct functionality.

⚠ Check the valve identification tag for materials, and operating pressure to be sure they are correct for the application.

⚠ Check the flange type/rating of the valve and ensure they are compatible with the size/type of pipeline flanges.

Ensure flange bolts (or studs and nuts) are the correct size, thread, length, and grade for the application. Refer to appropriate valve drawing for thread dimensions.

Ensure the pipeline is correctly aligned and correct any misalignments prior to installation. Misaligned pipelines can create stress on the valve body causing premature wear.

Remove any foreign material such as dirt, scale, oil, grease, or weld spatter from the valve and pipeline flange faces before installation.

Ensure the sealing edge of the gate and valve seat are clean.

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Installation

⚠ Elite Valve recommends that installation is performed by qualified technicians only.

Elite Valve recommends that valves (ideally) be installed with a minimum of six pipe diameters upstream and four pipe diameters downstream from any other valves, pumps, elbows, or fittings.

- The E5100 is a bidirectional valve so there is no 'preferred flow' direction.
- Spread the pipeline flanges to allow enough space for the valve to be inserted without contact.
- Insert the valve between the flanges ensuring the seat faces are not damaged while inserting the valve.

Observe the following during installation:

⚠ Select the correct length of flange bolts for blind holes in chest area of the valve so they do not bottom out when tightened. Elite Valve strongly recommends using threaded studs for these locations.

⚠ Consult the gasket and hardware manufacturer regarding any factors that should be allowed for when torquing the flange bolts.

⚠ Do not over torque. If flange bolts are over torqued, this can result in the valve failing to operate due to gate misalignment.

- Tighten the flange bolts evenly in a crisscross pattern. Do not exceed the values for bolt torque found in Table 1 - Maximum Flange Bolt/Stud Torque
- When bolting the valve in-line, we recommend intially tightening to 75% of the maximum flange bolt torque. Complete final torquing after process start-up or as required for gasket leaks etc.
- Maintain alignment of the mating pipeline flanges at all times during installation.
- Ensure the packing gland follower is tight. After start-up, check for leakage from the packing and tighten the packing gland as required. (See Packing Adjustment on Page 7)

Valve Size (in)	Bolt/Stud Thread	Number of Bolts/ Studs	Max Torque (lbs-ft)
2	5/8-11	4	50
3	5/8-11	4	50
4	5/8-11	8	50
6	¾-10	8	50
8	¾-10	8	50
10	7/8-9	12	70
12	7/8-9	12	90
14	1-1/8	12	140
16	1-8	16	190
18	1-1/8-7	16	300
20	1-1/8-7	20	300
24	1-1/8-7	20	300
30	1-1/8-7	28	300
32	1-½-6	28	300
36	1-½-6	36	300

Table 1 - Maximum Flange Bolt/Stud Torque

Vertical Installations

If an actuated valve is to be installed in a vertical pipe, the weight of the actuator can cause the valve to become stressed and result in gate misalignment. Due to the actuator's weight, it must be supported externally to prevent valve gate and cylinder rod misalignment. A pneumatically actuated valve is shown for illustrative purposes, but these guidelines should be followed for pneumatic, hydraulic or electrically actuated valves.

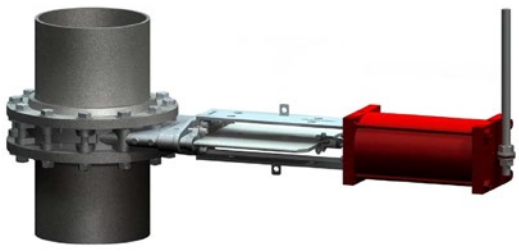

Figure 2: Example of KGV in vertical installation

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Limit Switches

If the valve is equipped with yoke mounted position sensors and targets, ensure sensor and target are aligned to provide accurate feedback of valve position. Alignment adjustments can be made by moving the sensors in their slotted mounting holes.

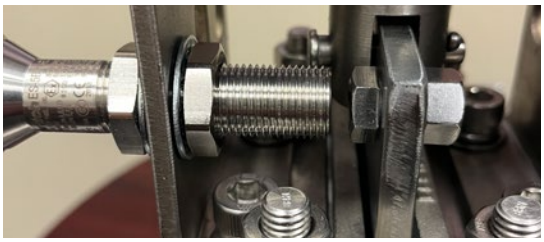

Figure 3 - Correct Limit Switch and Target Alignment

Operation

⚠ If the valve is supplied with a lock-out pin, it may be installed when delivered. The lock-out pin must be removed before actuating/operating the valve.

The gate is manually positioned by the valve's handwheel, or a gear box operator. It may also be actuated by a pneumatic, or hydraulic cylinder, or by an electric actuator. When in the closed position, the actuator slides the gate over the valve seat and withdraws the gate from the seat into the open position. Note: if over-travel occurs when opening the gate (gate loses contact with seals or packing), the bottom of the gate could get caught on top of the seal/packing and cause considerable damage upon closing (e.g. bending the gate, crushing the seal/packing, etc.). For this reason, there should be no adjustments made to the pre-set gate travel.

⚠ The E5100 utilizes a travel stop (Figure 4) on manual valves. This is factory set to prevent damaging the seat. Do not remove or adjust the travel stop.

For details regarding actuator operation, please consult the appropriate actuator manual.

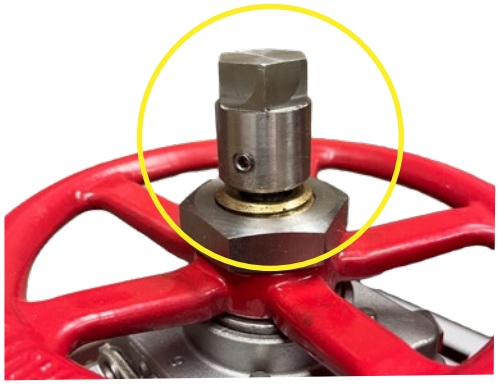

Figure 4 - Travel Stop

Routine Maintenance

❗ When working on, or maintaining process valves, personnel should always be aware of the potential emission of process material and should take all necessary safety precautions. Always wear the required personal protective equipment when dealing with any hazardous materials. Always handle valves with the assumption that process fluid remains in the valve.

While there are no regular maintenance requirements for the E5100, Elite Valve recommends performing the following periodic checks:

- A visual inspection of the valve to assess condition and identify any leaks at the flange connection or packing/seal.
- Verify Flange bolting is tight.
- Check actuator connections and condition to ensure reliable operation.
- Check the stem and stem nut are adequately lubricated. If required, use a lithium complex grease with 3-5% molybdenum for lubrication of the stem and stem nut.
- Some knife gate valves equipped with hand wheel operators have a grease fitting for the threaded drive bushing.
- Test operate the valve (if possible) to ensure it is unrestricted.

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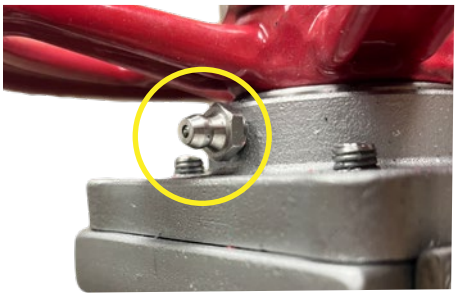

Figure 5 - Grease fitting location

Lock-out Pins

Lock-out pins should be utilized along with the correct Lock-out-Tag-out procedures before any maintenance is performed.

Lock-out pins are normally tethered to the valve yoke for convenience. When the valve is in the fully open or fully close position, insert the lock-out pin through both sides of the yoke ensuring that it passes through the appropriate hole in the valve gate. Apply lock-out tag to the end of the pin while the valve is out of service.

Figure 6: Lock out pin installed in fully-closed position

Figure 7: Lock out pin removed

Packing Adjustment

Over time, the packing may become compressed or worn from valve use and process fluid may leak out through the packing. This is normal. Simply tighten the Packing Gland Follower until the leaking stops (Figure 8). If leakage continues to occur through the packing, please consult the Troubleshooting section.

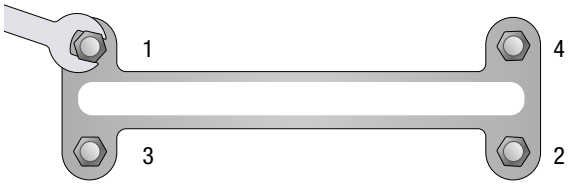

Figure 8 - Packing Gland and Adjustment Screws

⚠ Do not overtighten as this will only increase the torque required to actuate the valve and reduce the life of the packing.

Transverse Seal

To stop process fluid leaking past in E5100 valves configured with the transverse seal type packing:

- Loosen the lock nuts (both sides) for the transverse seal (Figure 9)
- Tighten each packing adjustment screw ½ turn until the leak stops
- Tighten another ½ turn each
- Tighten the lock nuts to prevent the bolt from backing off

⚠ Do not compress the packing more than is needed to stop leaks. Over-tightening the packing adjustment screws will cause excessive operating forces, decrease the life of the seal, and may prevent the valve from operating correctly.

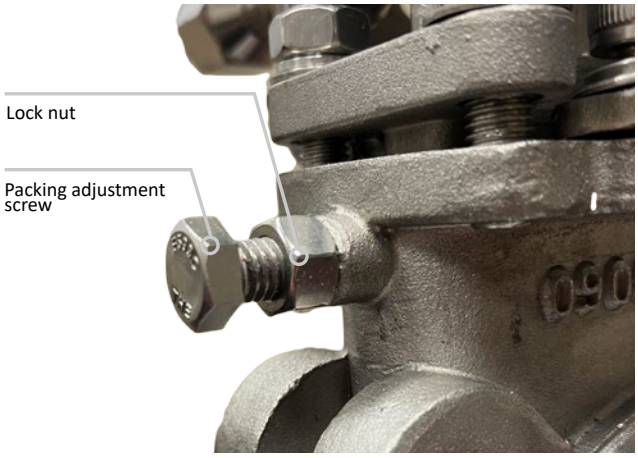

Figure 9 - Packing Adjustment screws and lock nuts

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Removal from Service

When working on, or maintaining process valves, personnel should always be aware of the potential emission of process material and should take all necessary safety precautions. Always wear the required personal protective equipment when dealing with any hazardous materials. Always handle valves with the assumption that process fluid remains in the valve.

If the valve is required to be removed from service, be sure to verify the following conditions and follow any relevant site requirements and procedures:

Loosening flange bolts on a pressurized valve can cause the release of fluids in the pipeline. Relieve pipeline pressure before loosening flange bolts to avoid causing injury or damage to the pipeline.

Do not remove the operator or actuator from the valve while the line is under pressure

Identify the pipeline media and ensure the correct PPE is utilized to protect against hazardous/toxic/flammable materials

- Ensure the line is depressurized and drained.
- Place the valve in open position.

The accidental operation of a valve actuator can cause injury or damage. Ensure any powered actuators are correctly disconnected and locked out prior to removing the valve from service.

- If the valve is actuated (pneumatically, hydraulically or electrically) follow procedures from the actuator manual to correctly disconnect and lock-out the actuator to prevent injury or damage caused by accidental operation.
- Ensure valve is properly supported or secured. (See Figure 1)
- Remove flange bolts and spread the pipeline flanges.
- Remove valve from pipeline.

Troubleshooting

If you are experiencing performance issues with this valve, please refer to the matrix below. If the issue is still unresolved, please reach out to your distributor for assistance or contact the factory for support.

Symptom	Possible Causes	Action
Process fluid is leaking through packing	Packing is loose or worn.	Tighten packing gland.
	Packing is damaged.	Replace packing and check gate for galling/damage. Replace gate if necessary.
Valve leaks when closed.	Seat is damaged or worn.	Replace seat and check gate for galling/damage. Replace gate if necessary.
Valve will not close.	Actuator disconnected from power source.	Check actuator power source.
	Valve is jammed due to gate misalignment.	Consult factory. Replace or repair valve.
	Valve is jammed due to material build-up or gate misalignment.	Remove material build-up. If valve still does not open, consult factory. Replace or repair valve.
Valve will not open.	Actuator disconnected from power source.	Check actuator power source.
	Gate is disconnected from stem/cylinder.	Consult factory. Replace or repair valve.
	Valve is jammed due to material build-up or gate misalignment.	Remove material build-up. If valve still does not open, consult factory. Replace or repair valve.

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Limited Warranty

Elite Valve (Seller) warrants to Purchaser that for a period ending as of the earlier of twelve (12) months from the installation date and eighteen (18) months from the shipment date ("Warranty Period"), Products manufactured by Seller will be free from defects in materials and workmanship when used for the purposes for which they designed and manufactured. The warranty exclusions include, without limitation, (I) any defects caused by faulty installation performed by Purchaser or third parties, (II) any damage caused by the contractors or tradesman of the Purchaser, (III) any damage caused by improper use or misuse, including exposure to excessive temperatures, moisture or cleaning agents and solvents and (IV) any damage caused during transportation or improper storage.

Products manufactured by a third party ("Third Party Product") may constitute, contain, be contained in, incorporated into, attached to or packaged together with, the Products. Third Party Products are not covered by the warranty in Section 11(A). Third Party Products are subject only to the limited warranties provided by the manufacturer of the Third Party Products.

The Seller shall not be liable for a breach of the warranty set forth unless: (i) Purchaser gives written notice to Seller of the defect during the Warranty Period and, in any event, within fourteen (14) days of the time when Purchaser discovers or the defect; (ii) Seller is given a reasonable opportunity after receiving the notice to investigate and/or to verify Purchaser's claim that the Products are defective. If requested, to do so by the Seller, the Purchaser shall return (freight prepaid) such Products to Elite Valve Canada factory in accordance with the Sellers Return Authorization procedures.

Subject to above, with respect to any such Products during the Warranty Period, Seller shall, in its sole discretion, either: (i) repair or replace such Products (or the defective part) or (ii) credit or refund the price of such Products at the contract rate provided.

The Seller is not liable for any costs associated with repairs that have been performed by the Purchaser or third parties unless written permission has been granted. In no event shall Seller be liable for other than the repair or replacement of any defective Products. In no event shall Seller be liable for any damages, direct or indirect, special or consequential, including, without limitation, damages for lost profits, business interruption, or economic loss arising out of defects in the Products.

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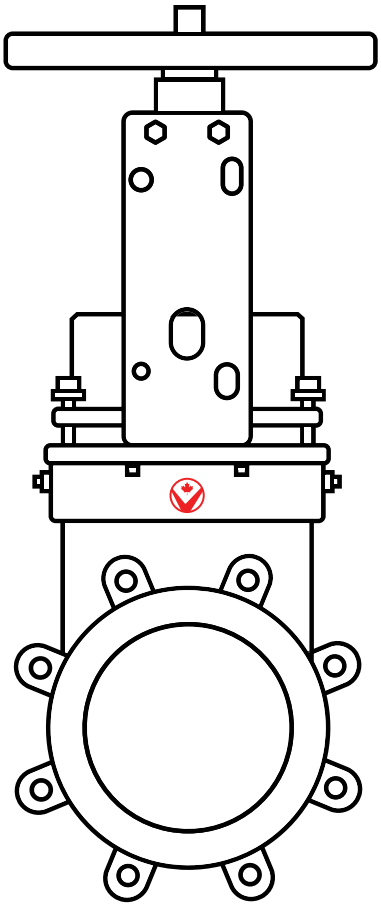

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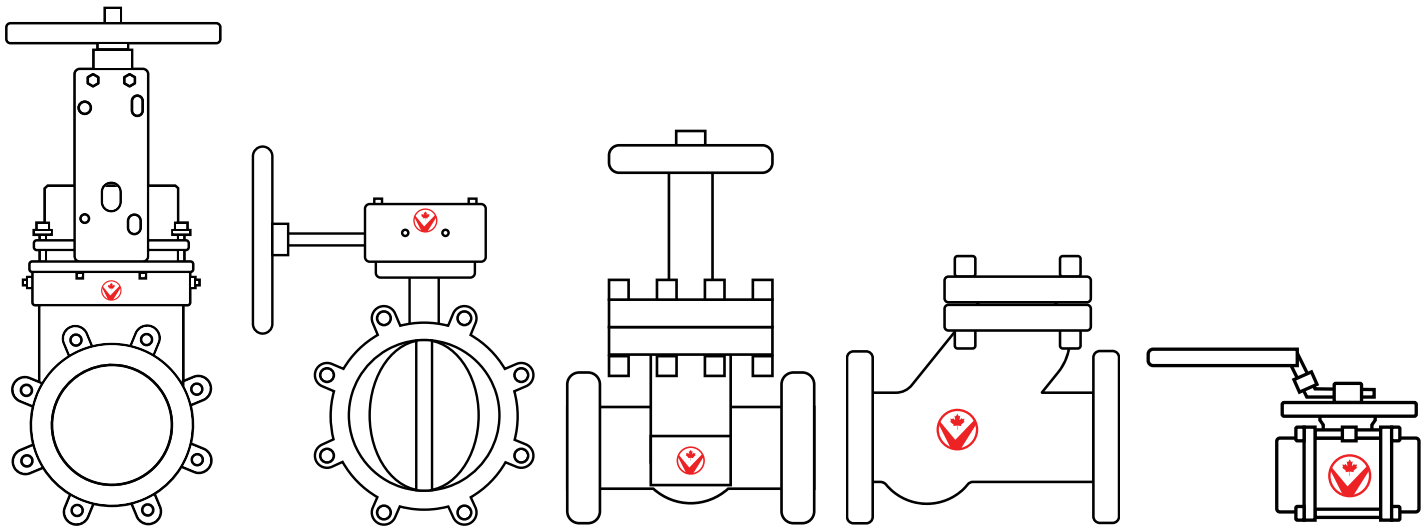

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Our North American manufacturing and testing facility is located in Oakville, Ontario and houses over 190,000 sq ft of inventory.

Contact us at sales@elitevalve.com and our engineering team will work with you to address your process application needs.

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