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## SUBMITTAL FOR APPROVAL

Date: 7/1/2016

To: Sandra Reser, [sandra@melleninc.com](mailto:sandra@melleninc.com)

Purchase Order #: 14929

Plasti-Fab Job #: ORD-3347/1-16

Project Name: City of Wichita Re-Use Pump Station

Contractor: Wildcat Construction Co. Inc.

Engineer: MKEC

Send Submittals by: Email

Description: Heavy Duty Tite Seal Sluice Gate ✓

Drawing #: HDTS-01-3347-1 Sheet 1 of 19 Rev A  
HDTS-01-3347-1 Sheet 2 of 19 Rev A

NOTE: Sheets 3 through 19 are for manufacturing purposes only

\* IMPORTANT: We are holding production pending return of approved drawings.

Please mark as "APPROVED", "APPROVED AS NOTED", OR "REVISE & RESUBMIT". Please mark all notations and/or changes on the drawings in RED, and return one (1) copy.

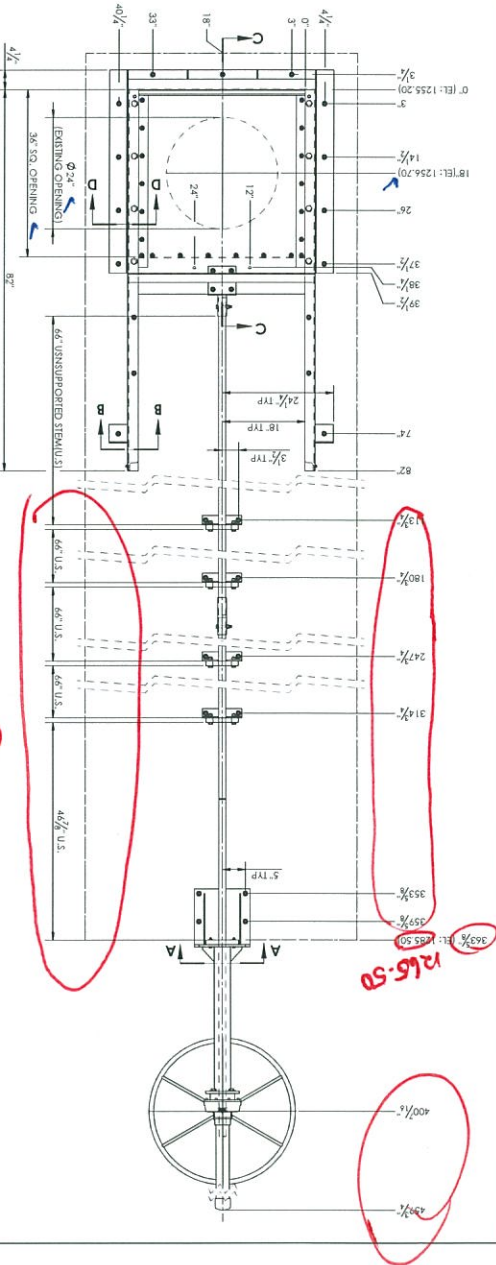
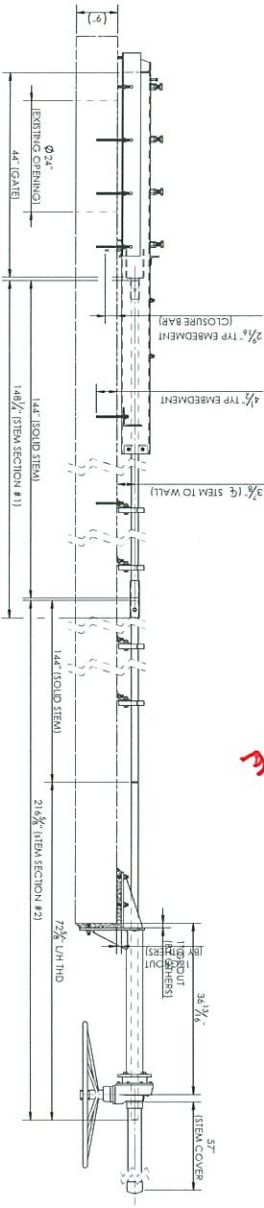
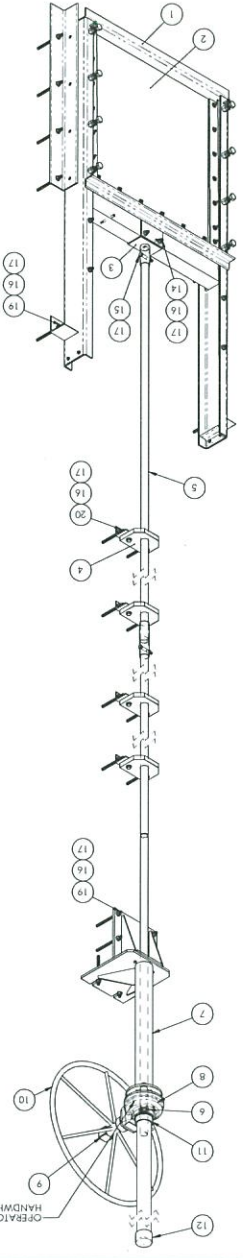
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<b>MKEC ENGINEERING, INC.</b>	
<b>411 N. WEBB ROAD • WICHITA, KS 67206</b>	
<input type="checkbox"/> Reviewed	<input checked="" type="checkbox"/> Revise and Resubmit
<input type="checkbox"/> Reviewed as Noted	<input type="checkbox"/> Rejected
<input type="checkbox"/> Not Required by the Contract Documents	
Reviewed for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication process or to techniques of construction; and for coordination of the work of all trades.	
BY <u>Angie L. Kuhn</u>	DATE <u>7-7-16</u>

ITEM NO.	QTY.	DESCRIPTION	MATERIAL	PART NUMBER
1	1	HDIS FRAME ASSEMBLY, 36" WD X 36" HT OPENING X 82" HL SURFACE MOUNT	HDIS-01-3347-1-GF	
2	1	HDIS GATE ASSEMBLY, 3 1/2" X 39 1/2" X 44"	HDIS-01-3347-1-GA	
3	1	STEM BRACKET WELDMENT FOR 3 1/2" GATE, 1 1/2" STEM	1000-0231	
4	4	STEM GUIDE ASSEMBLY, FOR 3 1/2" GATE, Ø 1 1/2" STEM	1000-0909	
5	1	STEM ASSEMBLY, COUPLED, Ø 1 1/2", 22 5/8" LEFT HAND THREAD, 288 1/2" SOLID, 361 1/8" OVERALL	HDIS-01-3347-1-ST	
6	1	1 1/2" LIMIT NUT ASSEMBLY, LH THREAD, 1/4", 1/4L	1000-0199	
7	1	PEDESTAL, WALL/FLOOR MOUNTED, #A14, 3 1/2" THK GATE	1000-1548	
8	1	EXCECO GEARED LIFT BS (4 : 1 RATIO), Ø 1 1/2" LH ACME THREAD	1000-0711	
9	1	2" SQ. DRIVE NUT ASSEMBLY	1000-0711	
10	1	32" HANDWHEEL	544-0025	
11	1	SCH 40 PVC 2 1/2" NPT MALE THREADED-FEMALE SOCKET ADAPTER	522-0026	
12	1	PPE CAP, SOCKET, 2 1/2" ID SCH 40	522-0027	
13	1	STEM COVER TUBE, 57" LG	CLEAR PLASTIC	521-0011
14	4	HHCS, 1/2-13UNC X 5 1/2"	661-0243	
15	1	HHCS, 1/2-13UNC X 3"	661-0098	
16	31	FLAT WASHER, 1/2"	664-0021	
17	32	NUT, HEX, 1/2-13UNC	663-0028	
18	2	SLOTTED FLAT HEAD WEDGE ANCHOR, Ø 3/8" X 4" LG	666-0020	
19	19	ALL-THREAD ROD, 1/2-13UNC	416-0008	
20	8	ALL-THREAD ROD, 1/2-13UNC	416-0008	

- NOTES:
- THE GATE COLOR IS GRAY.
  - THE GATE MATERIAL IS COPOLYMER COMPOSITE WITH AN INTERNAL STEEL STRUCTURE.
  - THE GUIDE FRAME IS 1/4" THICK FORMED AND WELDED 1-304 S/S.
  - ALL BOLTS, NUTS & WASHERS (EXCEPT THE SILICON-BRONZE ADJUSTING BOLTS) ARE 1-304 S/S.
  - PEDESTAL MATERIAL IS 1-304 S/S.
  - BEARING AND BEARINGS ARE 316 S/S.
  - MAXIMUM OPENING HEAD FROM INVERT: SEATING 30"-Ø ONLY.
  - ANCHOR ADHESIVES BY OTHERS (HILTI H-200 OR EQUIVALENT RECOMMENDED).

REV	DESCRIPTION	DATE	BY
1	REVISION	06/27/2016	



REV	DATE	BY	DESCRIPTION
1	06/27/2016		REVISION

PROJECT	CLIENT	DATE	SCALE	SHEET
HDIS GATE & GUIDE ASSEMBLY, SURFACE MOUNT, 36" X 36" OPENING X 82" GUIDE HEIGHT	LOCATION: SPR-G001	DATE: 6/27/2016	SCALE: 1:10	SHEET 1 OF 10





## HEAVY DUTY TITISEAL SLUICE GATE

The Heavy duty Tite seal Copolymer Sluice Gate is a non-metallic, corrosion resistant sluice gate that provides the engineer with a superior alternative to other plastic gates and competes well with stainless steel and cast iron gates. It is designed to handle high head applications of 25 feet or more in seating and unseating service. The guide includes a top closure bar that allows the gate to seal around all four sides. This gate is also often used for open channel weir applications. This gate is like the Wedging Tite seal® gate, a high performance, low leakage slide gate.

The gates are individually fabricated and can be designed to cover most opening. Sizing can range from about one-foot square to over ten feet in width and height.

Copolymer gates can range in thickness from 2-1/2 inches to over 12 inches depending on the head and deflection requirement.

The gate is fabricated using a reinforced copolymer composite material (FRP), which totally encapsulates an internal structural steel matrix, and has no seams, joints or cut edges. The core of the gate is completely sealed against any corrosive attack by water or chemicals that might be present in the stream.

Heavy Duty Tite seal sluice gates do not use wall thimbles. Instead, the guide is anchored to a flat surface and approximately one inch of grout is used to permanently seal between the guide and the wall. The guide is normally fabricated using T-304 or T-316 stainless steel, but FRP guides and other more exotic metals are available. Plasti-Fab has fabrication experience with Monel, Hastelloy and Aquamet to name a few.

**GUIDES** The gates require specially formed guides, but these will still be classified as embedded, surface mounted, or in-channel according to how they are mounted. Surface mounted guides bolt to the face of the wall around an opening using special slotted clips that slide onto the anchor bolts. In-channel guides bolt to the inside face of an existing channel.

**SEALS** Heavy Duty Tite seal Sluice Gates have a virgin neoprene J-seal and wedged bottom seal mechanically fastened to the gate. Neoprene forms a true seal that has high resilience and durability, and will not bridge or gap over small debris. It has been used successfully by the U. S. Army Corps of Engineers in hydro-electric dams for the past seventy years as the proven seal of choice. Plasti-Fab will not use sponge rubber, which has low compression set characteristics and low tear strength.

Mounted on the opposite side of the gate is a UHMW low-friction sliding surface which helps to reduce the lifting force required to move the gate. As the gate starts to open, the seal is released from

contact with the wedge. This allows the gate to move freely in the guide with lower operating forces. The adjustable wedging bar in the guide allows the gate to be fine-tuned to achieve the lowest possible leakage rates. The end result is leakage rates that are much less than the AWWA standard for sluice gates (AWWA C-501 establishes leakage of no more than 0.1 GPM/foot of wetted perimeter for a seating head, and 0.2 GPM/foot of wetted perimeter for unseating heads of 20 feet or less.)

**Example A** four-foot by four-foot gate with 20 feet of seating head will require nearly 18,000 pounds of thrust to begin upward movement. (16 ft.<sup>2</sup> gate surfaced X 18 ft. Head to the gate center line X 62.4 lbs/ft.<sup>3</sup> H<sub>2</sub>O = 17,971 lbs. breakaway force.)

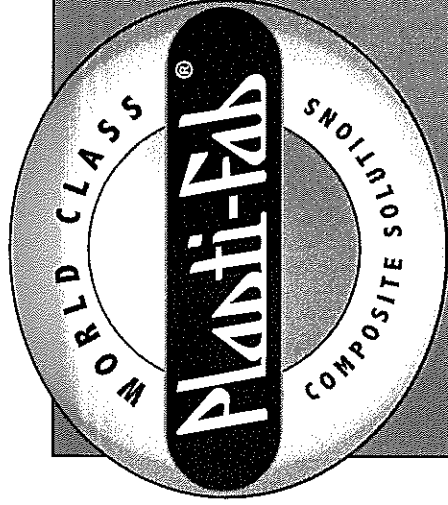
The entire load plus the weight of the gate and stem must be moved by the stem and lift nut, and supported by the head frame and lift. For periods of up to 20 years (sic). In addition, AWWA C-501 sluice gate standards require that this initial gate movement should take place with no more than 25 to 40 pound pull on the handwheel or crank. All this means that proper sizing of the lift, stem, and other gate components is critical.

All lifts used by Plasti-Fab will have ball bearings, and many will be geared. Geared lifts can also be operated by an electric or gas powered portable operator to reduce cycling time. Plasti-Fab also uses electric, pneumatic, and hydraulic actuators. We have worked with most of the major gate and operator manufacturers in the U. S. for over twenty years.

**LOCATION** May include any size open channels and any wall opening that will have a seating or unseating head greater than the opening itself.

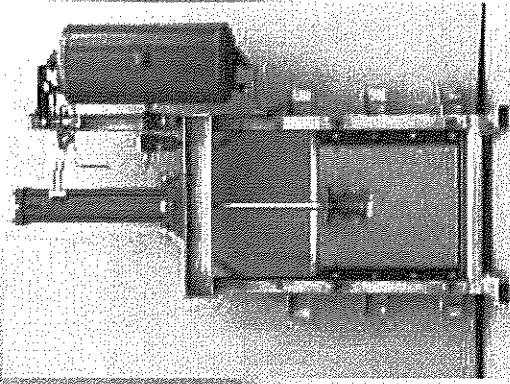
#### **WHY BUY PLASTI-FAB?**

- 1.** The Heavy Duty Tite Seal Sluice Gate exceeds any other metallic gates. We can give the owner, engineer, and contractor an alternate to this high-priced proprietary spec., that exceed the functional aspects of the specification in all areas.
- 2.** The seals are mounted to the gate which is a unique feature to most other gates on the market today. This allows the adjustment and replacement of the seals without dewatering of the channel.
- 3.** Plasti-Fab can fabricate using a large variety of high corrosion performance metals and resins.
- 4.** Gate will perform when needed for emergency shut off, spill containment or any other critical shut-off situation.
- 5.** Wide range of experience with customer requirements that will help get the job done right the first time.



# HEAVY DUTY TITISEAL® SLIDE GATES

- Engineered & Built to Order
- Low to Zero Maintenance
- No Binding or Seizing
- Wall Thimbles not Required
- Designed for any Head Pressure

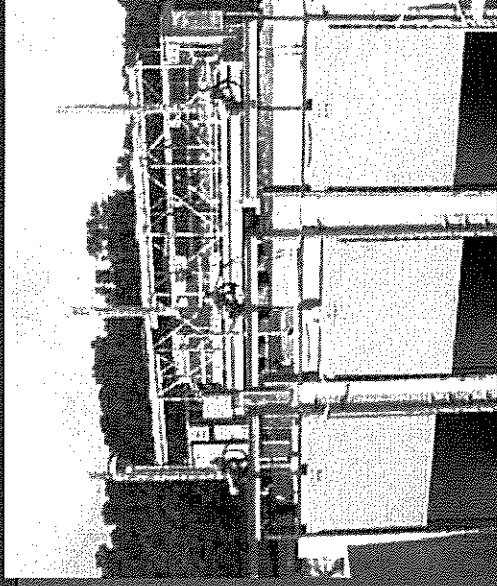


25 year  
Corrosion  
Warranty

Plasti-Fab is a world class manufacturer of composites with over 40 years of experience designing, engineering, and building products for fluid control and management. Plasti-Fab products are fabricated from highly corrosion resistant composite fiberglass reinforced plastic (FRP). Recognized around the world as an experienced innovator and provider of quality composite solutions, Plasti-Fab has a wealth of experience and expertise in flow control products.

## KEY FEATURES

- Structured steel core engineered to surpass deflection criteria
- Infusion molded FRP encapsulates interior
- Designed to exceed AWWA C563 ✓
- Seals around all four sides of Gate
- No initial or on-going protective coatings
- Composite construction prevents bimetallic corrosion
- Pigmented resin for UV protection
- Neoprene seals provide minimal leakage
- Seals mounted on gate for inspection and replacement without de-watering
- Wedging bar with adjustable wedging bolts for minimal to zero leakage

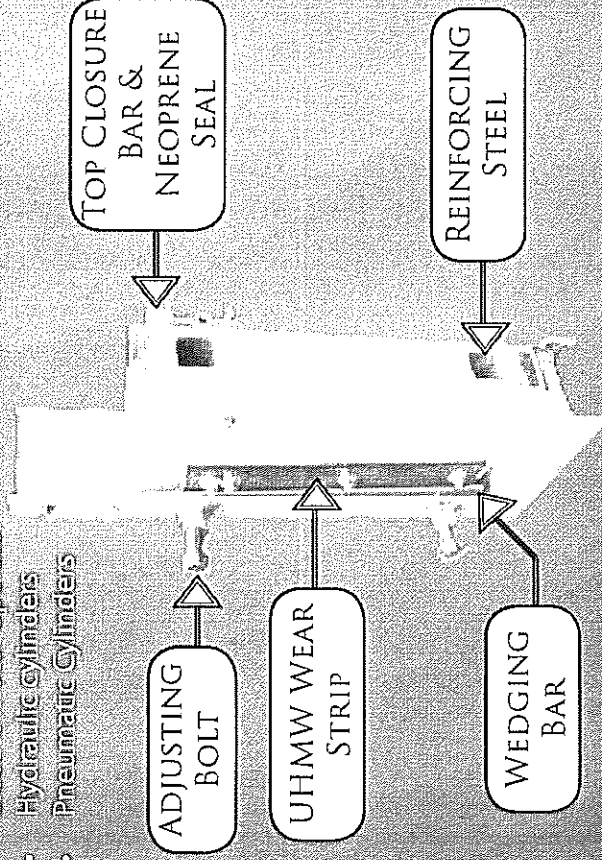


FOR OUR COMPLETE PRODUCT  
CATALOG VISIT US ONLINE AT  
[WWW.PLASTI-FAB.COM](http://WWW.PLASTI-FAB.COM)

## DESIGN FEATURES AND ACCESSORIES

### CONVENIENT FEATURES & ACCESSORIES

- Flush bottom guide design prevents debris accumulation in bottom guide groove
- Each gate is individually vacuum infusion molded in seamless FRP to the exact dimensions specified
- Internal strength matrix, including structured steel, as needed to meet maximum head pressures
- Operator options include:
  - Hand wheel
  - Hand crank
  - Nut for portable operator
  - Electric motor operator
  - Hydraulic cylinders
  - Pneumatic cylinders

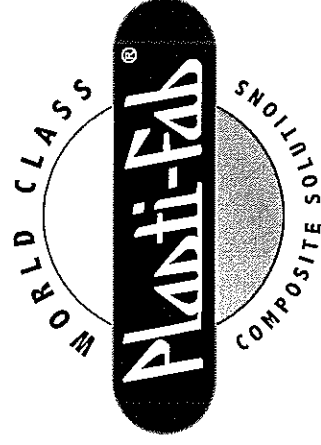
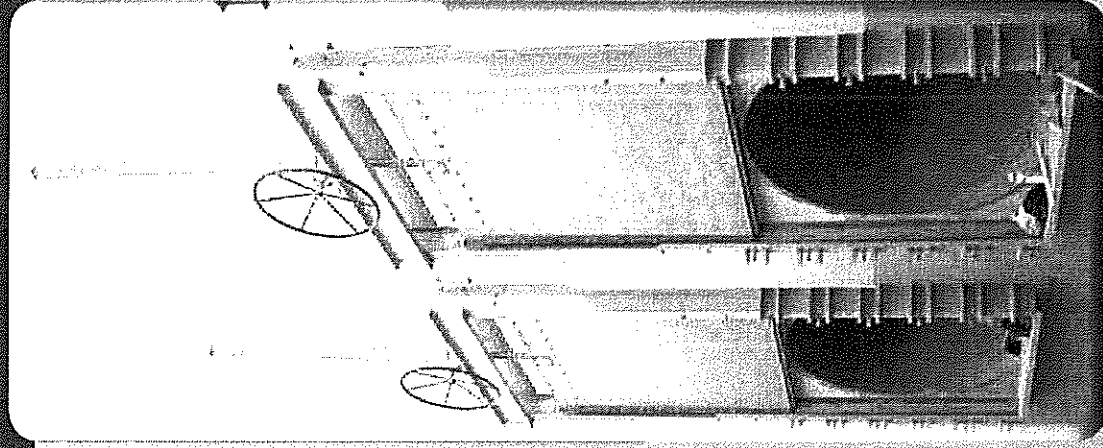


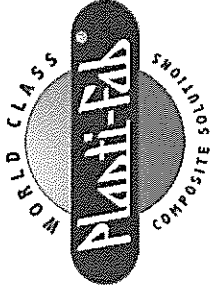
The Plasti-Fab Heavy Duty Triseal Composite Slide Gate is the ideal gate for corrosive environments where metal and other gates rust, corrode, decay, rot, bind or freeze in place. Plasti-Fab vacuum infused seamless composite FRP slide gates have no chemical bonds that can be broken down causing the gate to fail. Plasti-Fab Heavy Duty Triseal Composite Slide Gates have been installed and in operation for over 40 years and continue to operate and function as designed. All Composite materials are guaranteed against corrosion for 25 years.

### CONTACT US FOR MORE INFORMATION

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## HEAVY DUTY TITESEAL (HDTS) SLUICE GATES

### PART 1 GENERAL

#### 1.01 SUMMARY

- A. This Section includes all Sluice Gates required for the project.

#### 1.02 REFERENCES

- A. Design, fabricate and test Gates and materials in accordance with manufacturer's recommended procedures and the following codes and standards:

1. ASTM A193 - Stainless Steel Anchor Bolts
2. ASTM A276 - Stainless Steel Bars
3. ASTM B584 - Alloy 865 Manganese Bronze
4. ASTM D256 - Izod Impact Strength
5. ASTM D570 - Water Absorption Rate
6. ASTM D638 - Tensile Strength
7. ASTM D695 - Compressive Properties of Rigid Plastic
8. ASTM D696 - Coefficient of Linear Expansion
9. ASTM D790 - Flexural Properties
10. ASTM D792 - Density and Specific Gravity at 23°C
11. ASTM D1056 - Polymer Grade
12. ASTM D2563-0 - Visual Defects
13. ASTM D2583 - Indentation Hardness
14. ASTM D2584 - Resin, Glass & Filler Content
15. AWWA C-563 - Fabricated Composite Slide Gates
16. AWWA C-540 - Power Actuating Devices - Sluice Gates

- B. Manufacturer shall be experienced in the design and manufacture of specific gates and accessories for a minimum period of 20 years.
- C. Manufacturer must provide warranty for 25 years against failure due to corrosion.

#### 1.03 SUBMITTALS

- A. Submit the following for acceptance:

1. Approval Drawings
  - a. Showing all critical dimensions.
  - b. Showing principal parts and materials.
2. Spare parts list (when applicable).

#### 1.04

##### **DELIVERY, STORAGE AND HANDLING**

- A. Ship all gates with suitable packaging to protect products from damage.
- B. Protect threads, flanges, stems and operators from damage.

#### **PART 2 PRODUCTS**

##### 2.01

##### **MATERIALS**

A. Gate body shall be:

- 1. Engineered composite fiberglass reinforced plastic (FRP) completely encapsulating an internal steel reinforcing structure.
  - a. Infusion molded to create a seamless corrosion barrier impervious to moisture.
  - b. FRP resin shall be Choose a material
  - c. Internal Steel Reinforcing: Carbon Steel as needed for deflection requirements.
  - d. Internal Core Foam: 2lb (0.9kg) polyisocyanurate closed cell rigid foam.

B. Guide Frame

- 1. Guide Frame Rails: Choose a material
- 2. Operator Support Yoke: Choose a material

C. Stems and Gate Hardware

- 1. Stem: Choose a material
- 2. Gate Hardware: Choose a material

D. Seals

- 1. Side, Top and Flush Bottom Seals: Hollow Bulb J Seal molded of extruded virgin Choose a item

E. J-Seal Clamping Bar and Fasteners

- 1. Clamping Bar: Choose a material
- 2. Fasteners: Choose a material

F. Lift Nuts and Thrust Nuts

- 1. Manganese Bronze, ASTM B-584, Alloy 865.

G. Hand wheel

- 1. Cast Iron, ASTM A-126, Class B.

H. Anchor Bolts

- 1. Choose a material

I. Stem Cover

- 1. Butyrate (manual hand wheel).
- 2. Clear PVC (Electric Motor Operators).

J. Stem Guides (When applicable)

- 1. UHMW

##### 2.02

##### **SLUICE GATES**

A. Acceptable Manufacturers:

- 1. Plasti-Fab, Inc.
- 2. Or approved equal. Pre-approved by Engineer at least 10 business days prior to bid date.
  - a. Manufacturer must have a qualified Engineer on staff with at least 5 years' experience with hydraulic control gates

**B. Gates shall meet AWWA C-563 Requirements:**

1. Leakage:
  - a. Gates shall have a maximum leakage rate of 0.05 GPM per foot (1.24 LPM/m) of wetted perimeter under seating and unseating head pressures under full design head.  
Sluice gate shall be wedging and have adjusting bolts.

**2.03 DESIGN CRITERIA**

A. Composition of the sluice gate laminate shall be in accordance with the recommendations shown in the Quality Assurance Report for Reinforced Thermostat Plastic (RTP) Corrosion Resistant Equipment prepared under the sponsorship the Society of the Plastics Industry, Inc. (SPI) and the Material Technology Institute of the Chemical Process Industries, Inc. (MTI) for "Hand Lay-up Laminates" and shall meet the specifications for Type 1, Grade 10 laminates shown in Appendix M-1 of said report.

1. Visual inspection for defects shall be made without the aid of magnification and defects shall be classified as shown in Table 1 Level II of ANSI/ASTM D2563-0, approved 1977, (or any subsequent revision).

**B. Deflection**

1. Deflection across the gate width shall be limited to: L/360 or ¼" (6mm), whichever is less, at the maximum operating head.

**C. Head Pressure**

Gate shall be designed for a maximum head pressure as shown in gate schedule.

**D. Gate Size as shown on the contact drawings and/or gate schedule.**

**E. Surface Conditions**

1. All sluice gates shall be flat and level.
2. Warpage throughout the entire gate shall not produce a crown of more than 1/16" (1.6mm) in any direction.
3. Gates having reinforcing members bolted or bonded to flat sheet stock will not be acceptable.

**F. Sealed Area**

1. Sluice gate shall seal on all four sides.

**2.04 CONSTRUCTION**

**A. Gate Body**

2. Sluice gate body shall be manufactured of fiberglass reinforced polyester totally encapsulating an internal reinforcing structure.
3. Each gate shall be infusion molded individually to the exact dimensions specified. Seams and joints in and on the body are not acceptable.
4. Sluice gates shall be manufactured of reinforced thermoset plastic.
5. Gate body shall have UV Stabilizing pigment in the Resin to provide long-term protection from UV.
6. The surface shall be resin rich to a depth of .010 inches to .020 inches (.25 - .51 mm) and reinforced with C-glass and/or polymeric fiber surfacing material.
7. The surface shall be free of exposed reinforcing fibers.
8. The composition of these layers shall be approximately 95% (by weight) resin. The remaining laminate shall be made up of copolymer composite and reinforcing fibers in a form, orientation and position to meet the mechanical requirements.

9. Structural reinforcing shall be utilized to attain the necessary stiffness to meet deflection requirements, and shall be well encapsulated with a laminate not less than 1/4" (6mm) thick on each side to ensure against any permeation by water to the core areas.
10. Choose a material stem mounting bracket shall fasten to the gate with through bolts. The through holes shall not pass through or be in contact with the internal mild steel reinforcing.
11. Core material must be 100% resistant to decay and attack by fungus and bacteria and be resistant to hydrocarbons.
12. Gate body shall be manufactured using advanced technology vacuum infusion resin transfer processes. The closed mold vacuum process must completely evacuate all air from the mold prior to infusing the mold with premium quality resin as specified. The vacuum infusion process must eliminate the potential of air entrapment and/or voids in the matrix of the gate body thus producing a finished product that is one-piece, seamless and uniformly impenetrable by fluids eliminating interior corrosion. Manufacturing techniques that employ adhesives or mechanical fasteners to attach individual panels to a pre-fabricated framework results in seams along vertical and horizontal axes of the gate body which create stress-potential areas, portals for fluid infiltration, subsequent de-lamination and product failure due to corrosion.

#### B. Seals

1. The gate shall be equipped with elastomeric seals to reduce leakage.
2. Elastomeric J-seals shall be made of molded or extruded Choose a item having a hardness range of 55 to 65 shore A durometer and conforming to ASTM spec. D-2000 having a maximum compression set of 25%, and low temperature brittleness to meet suffix F-17 (-40°).
3. Seals, including bottom seals, shall be mounted on gate covers with Choose a material cap screws and Choose a material clamping bars thus providing a means of repair, and replacement without dewatering the channel.
4. HDTS gates shall be designed and manufactured with the seals mechanically affixed to the gate body NOT the guide frames. When replacement of seals eventually becomes necessary (variables such as frequency of open-close cycles, chemical composition and abrasiveness of the fluid will ultimately determine the effective life of the seals) the HDTS gate shall be removable from the guide frame without dewatering the channel and, in a suitable work area, easily and economically refitted with a new seals. Gates designed with seals integral to the guide frames, which require channel de-watering, scaffolding/lifts/ladders and time-consuming "non workshop" conditions shall not be permitted.

#### C. Frames and Guides

1. Guides shall be styled for Choose item as shown on the contract drawings and/or gate schedule.
2. Guides shall be fabricated from Choose a material and shall have a slot suitable for mating with the gate body.
3. Where self-contained guides are extended above the operating floor level to form the bench stand upon which the lift mechanism is fastened, they must be suitably strong and rigid without the use of additional stiffening members.

4. The head rail shall be affixed so as to allow the gate to be removed from the guide without disassembly.
5. The head rail shall have a maximum deflection of 1/4" (6mm) when subjected to a horizontal force of four times the 40 lb. (2.8 ksc) maximum hand wheel pull.
6. Where a wall mounted guide frame extends above a concrete wall the top anchor bolt shall be not more than 6" (152mm) below the top of the wall.
7. Gate inverts shall be flush with the channel bottom.
8. If the Gate width is greater than 4' (1.2m) wide and 2x the gate height, a tandem stem shall be used.
9. Guides to be bolted to the head wall shall be equipped with heavy duty mounting angle for ease of mounting to the channel wall by means of *Choose a material* anchor bolts.
10. No wall thimbles shall be required for installation.

#### D. Adjustable Wedging Device

1. Gates shall be fitted with an adjustable wedging assembly comprised of a *Choose a material* wedging bar and silicon bronze adjusting bolts with locking nuts. The adjusting bolts shall be non-galling for long-term easy adjustment. Gate wedging assembly shall be initially adjusted at the factory; however, they shall be easily adjusted to achieve the specified leakage rate. HDTs gates utilizing the Plasti-Fab wedging device shall be provided for ease of reliable manipulation, accessibility and adjustment if required

#### E. Lifts & Operators

1. Operators shall be sized to start the gate moving under a maximum head pressure with a pull of not more than 40 lbs (2.8 ksc).
2. A manual *hand wheel or crank* shall be supplied that is compatible with the lift.

#### F. Electric, pneumatic or hydraulic Operators (OPTIONAL)

1. Gate Manufacturer shall provide actuators per Electric Motor Operator Manufacturer's recommended sizes based on Operating Forces and design requirements and shall be for *open/close or modulating* service as shown in the gate schedule.

#### G. Operating Stems

1. Each HDTs gate shall be equipped with a *rising or non-rising* operating stem. The stem shall be *Choose a material*
2. The stem will have Acme threads and shall be provided with adjustable stop collars to limit upward and downward travel.
3. Stems shall have a maximum L/R of 200.
4. Stem guides with UHMW bushings shall be used to maintain an L/R of 200.

#### H. Stem Covers

1. Transparent plastic stem covers shall be provided with vent holes to minimize condensation.
2. The stem covers shall be marked with 'Open' and 'Closed' position indicators.

#### I. Pedestals

1. For non-self-contained guide frames a *Choose item* pedestal shall be furnished for mounting the operator.
2. Pedestal material shall be *Choose a material*

**2.05**

**PHYSICAL PROPERTIES**

- A. Structural characteristics for a 1/8" (3mm) glass mat laminate shall meet the following minimum physical properties:

Tensile strength	15,000 psi (1034 ksc)
Flexural Modulus	1,000,000 psi (70307 ksc)
Flexural Strength	20,000 psi (1406 ksc)
Compressive Strength	22,000 psi (1547 ksc)
Impact Strength	9.0 ft-lbs/in. (1.24 kgf.m/25mm)
Water absorption	0.13% (in 24 hours)

- B. Seals: Extruded Virgin Neoprene Seals shall have the following physical characteristics:

C.

Specific Gravity	1.25
Hardness	55 – 65 Shore A Durometer
Tensile Strength	1500 psi min. (0.07ksc)
Elongation	300%
Low temperature brittleness	- 40°

- D. Wear Strips UHMW Polyethylene:

Tensile Strength	5,600 psi (0.7kg/cm <sup>2</sup> )
Flexural Modulus @ 73°F (23°C)	130,000 – 140,000 psi (9140 – 9843kg/cm <sup>2</sup> )
Coefficient of Friction	0.15
Water Absorption	0.01% in 24 hours

**PART 3 EXECUTION**

**3.01**

**INSTALLATION**

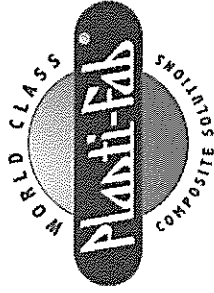
- A. Thoroughly clean and remove all shipping materials prior to setting.
- B. Install Gates per Manufacturer's recommendations.
- C. Operate all gates from fully opened to totally closed.

**3.02**

**FIELD TESTING (OPTIONAL)**

- A. Qualified Factory representative shall provide (8) hours of training for facility employees. (Optional)
- B. Representative shall complete a Certification of Proper Installation and provide copies to the Owner, Engineer, Contractor and Manufacturing Facility. (When applicable)

END OF SECTION



## PLASTI-FAB HEAVY DUTY TITESEAL GATES: MANUAL FOR INSTALLATION | OPERATION | MAINTENANCE

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## FOREWORD

This manual covers the full range of gates manufactured by Plasti-Fab, Inc. Therefore, some information may not apply to your particular style of gate. Please keep this in mind as you read this manual.

This manual provides information for engineers, contractors and plant operators involved with installation, operation and maintenance of equipment supplied by Plasti-Fab, Inc. Every care is taken in our factory to insure equipment of top quality. However, we cannot be responsible for damage caused by negligence during or after shipping. Therefore, described herein are Plasti-Fab, Inc.'s recommended methods of handling, storage, installation, adjustment and initial operation for standard situations. This information should be used in conjunction with the approved installation drawings provided by Plasti-Fab, Inc. If proper care and accuracy are exercised in the field during installation, the gates will operate as designed at maximum efficiency.

## RECEIVING

*Check and Count* all parts when you receive shipment. All individually shipped parts or assemblages are listed on the packing list. Should a shortage exist, notify Plasti-Fab immediately. We cannot be responsible for any shortages reported more than 30 days after receipt of shipment. Special care should be taken in accounting for and safely storing all bolts, nuts and small items that are often misplaced at job sites.

Unless your contract with Plasti-Fab, Inc. states otherwise, all equipment is shipped F.O.B. factory. If any equipment has been damaged in transit, the purchaser will be responsible for filing a freight claim with the transportation company. For assistance in filing any claim and/or replacing equipment, please contact Plasti-Fab, Inc. directly.

## HANDLING AND STORAGE

All Plasti-Fab gates and appurtenances are precision machinery and should be handled accordingly. While all parts are of rugged design, it is still possible to damage surfaces, stems, etc., through improper storage and handling. To avoid all problems of this nature, we recommend the following:

1. Handle the Heavy Duty Tite Seal Gates as you would handle any precision machinery. Support full length of stems at all times, being sure not to damage threads.
2. Store equipment on an even, clean, dry surface to prevent distortion.
3. Cover all equipment to protect surfaces.
4. **DO NOT** stack equipment without protection.
5. Handle lifts as you would any precision machinery.

See Electric Motor Operator instructions for storage of electric motor operators.

## SECTION I: INSTALLATION

### GATE AND GUIDE INSTALLATION

Some gates can be removed from guides to make guide mounting easier. Do so when practically possible. If they must be dismantled, see "Disassembly of Gates". See product bulletins for description of various types of guide frames offered by Plasti-Fab, Inc.

**NOTE:** We recommend leaving self-contained gates in the guides during installation.

### SURFACE MOUNTED GUIDES

Placement of anchor bolts is critical for an easy and proper guide installation. Be sure placement is identical to print. Check hole spacing on guide before installing anchor bolts. Install anchor bolts before mounting the guide on the wall. If bolts do not align with holes, it may require adjustment of bolts or re-drilling holes. Consult factory before boring out an existing hole. **DO NOT** hammer the guide onto the bolts. This may damage the guide frame. Be sure to maintain integrity of dimensions.

Once guide is mounted on the anchor bolts, adjust to a flat plane and grout or seal between the guide and the wall. Be sure all bolts have washers before tightening nuts.

Before operating, be sure all guides are clean and free of debris.

### EMBEDDED GUIDES

Embedded frames may be installed in one of two ways. If you have the guide on-site before pouring, you can mount them in the concrete forms and pour around them. Be sure they are level, well fastened and all inside grooved surfaces are protected from concrete or debris.

**NOTE:** Proper guide dimensions must be maintained at all times, and care must be taken to protect grooved sliding surfaces from debris.

The second method may be used if the guide is not on the job site at the time of the pour. At the location where the guide is to be mounted, build a block out into the forms that is larger than the guide frame. Allow at least 1" of space around sides and back of the guide frame for grouting purposes. Secure the frame firmly and protect against debris.

### STEM INSTALLATION, STEM GUIDE ADJUSTMENTS AND LIMIT NUT POSITIONING

Most of Plasti-Fab gates are self-contained units. The gate is mounted in the guide with the stainless steel stem attached and threaded through the lift on the head frame. Limit nuts are factory set on all self-contained gates. For those units not having a self-contained frame, read the following sections on Stem Installation, Stem Guide Adjustment and Limit Nut Positioning.

## STEM INSTALLATION

1. Take care not to bend stem or damage threads. This is especially true on electric operated lifts. Extra care should be taken with stems for these operators.

**NOTE:** When a limit nut is used to stop the upward travel of a gate, the limit nut must be installed prior to the lift. See "Installation of Limit Nuts", Pg. 4.

2. After the gate, guide frame assembly and stem guides have been mounted, feed the stem down (or up, as required) through the head frame, stem guides and stem mounting bracket on the gate. Bolt stem to the mount.
3. At this point, the lift or lift nut may be threaded onto the stem by one of two methods depending on the circumstances and type of lift being used. The first way is to bolt the stem to the gate mounting plate and then thread the lift or lift nut down from the top of the stem to its proper mounting position. The second way is to position the lift over the stem and screw the stem into the lift until the stem is properly positioned to be bolted to the gate mounting plate.
4. Thoroughly clean and grease stem threads with heavy duty grease, such as Mobilox grease #3EP or equal. (See Maintenance section for equivalent greases.)

## STEM GUIDE ADJUSTMENT

After the stem is installed and the lift is bolted into position, check stem guides for proper alignment with the stem. The stem should not ride with direct pressure against the walls of the stem guide. If the stem is forcing against the stem guide, loosen the stem guide mounting bolts and position the guide so the stem is centered in the guide hole.

If enough adjustment cannot be made at the stem guide, move to the next guide or to the lift on the head frame to obtain needed adjustment. Loosen bolts and center as previously outlined. If the stem continues to ride on the guide, consult the local representative or manufacturer.

After stem guides are properly aligned, secure all bolts on guides, lifts and stem mount. Rotate the stem several times and make careful note of any stem wobble or rubbing. If either of these conditions exist, readjust as previously described. If further adjustment does not resolve the problem, consult the local representative or Plasti-Fab, Inc.

**NOTE:** Before operating gate, read operating instruction in Section II of the manual.

## INSTALLATION OF LIMIT NUTS AND STEM COVERS

- 1. IMPORTANT:** In those cases where a limit nut is used to stop upward gate travel and a pedestal lift is also used, the limit nut must be installed on the stem prior to installing lift.
- 2.** After lift is installed, with gate in closed position, screw top limit nut down on stem until it just starts to bottom out on top of the lift nut. Tighten setscrews.
- NOTE:** If gates have wedges that require adjustment, final setting and tightening of nut will have to be done after gate wedges are adjusted.
- 3.** Screw stem cover into threaded bracket on top of lift. A thread sealant should be used on threads. Cover should be approximately four inches longer than gate height.

## LIMIT NUT ADJUSTMENT

Setting and maintaining correct limit nut placement is vital to the protection and operation of the gate, guide and lift assembly. Limit nuts that are factory set should need no adjustment.

- 1.** To regulate the upward opening ability of the gate, place the limit nut on the stem between the gate and lift. Open gate to desired height, screw the limit nut up the stem unit it is against the lift, and secure Allen screws on limit nut against stem.
- 2.** To limit the downward closing ability of the gate, place the limit nut on the stem above the lift. Close the gate to the desired position, screw the limit nut down against the lift and secure Allen screws on limit nut against the stem.
- 3.** For a non-rising stem, make same adjustments as mentioned above, except place the limit nut in reference to the gate rather than the lift.

## ADJUSTING WEDGING BAR

The fiberglass Heavy Duty Tite Seal gates are equipped with a seal adjustment feature. The gate seals were initially adjusted at the factory; however, they may need to be tightened to achieve the specified leakage rate of 0.1 gpm/foot of wetted perimeter for seating heads or non-seating heads.

- 1.** Using a properly sized wrench. Loosen and back off locking nuts on each of the large silicone bronze adjusting bolts.
- 2.** Tighten each of the adjusting bolts uniformly in stages until the desired leakage rate is achieved, and clamping bar is straight through the full length of the gate. This should take no more than 1/4" - 1/2" turn on the bolts. If leakage persists, check seal between the gate and frame. Excessive tightening of adjusting bolts can cause seal damage.
- 3.** Secure the locking nuts back in place.

**NOTE:** Gate is operable with wedging bar tightened into position.

## INSTALLATION OF ELECTRIC MOTOR OPERATORS:

1. Install motor operated lifts in same manner as the manual lifts described in "Stem Installation".
2. **IMPORTANT:** Alignment of lift and stem is of critical importance. Double check all components (stem, stem guides, brackets, pedestal, lift, etc.) to insure all are as perfectly aligned as possible.
3. *Using Emergency hand wheel, manually open gate a minimum of three inches prior to using any electrical controls. Double check hand wheel for proper rotation indication.*
4. Connect electrical power and any remote wiring in accordance with wiring diagrams. During wiring installation, should it become necessary to leave unit, close and tighten limit switch compartment and any open conduit taps so no electrical components are left unprotected.
5. With gate open a minimum of three inches, check electric operator for proper rotation and wiring. By having gate open, the direction of rotation can be checked without damaging the stem, stem cover or hoisting unit.
6. Once the unit has been installed, the electric operator manufacturer's directions should be followed closely in setting the closing and opening limit switches. (See "Installation, Inspection and Adjustment".) The torque switches have been properly set at the factory and should not need adjustment. Follow the manufacturer's instructions if it appears that adjustment is necessary.
7. Lifts are factory lubricated and do not need lubrication at the time of installation.

## SECTION II: OPERATING INSTRUCTIONS

### INITIAL OPERATION OF GATES

1. After gate, stem guides, stem, lifting mechanism and other necessary hardware has been installed check the following before operation.
  - a. Check all assembly and mounting hardware for proper tightness.
  - b. Apply tension to stem and check for proper alignment. Remove any shipping stops on gates.
  - c. Check guide grooves for any foreign matter.
  - d. Clean all dirt, paint, concrete splatter or other foreign material from seating surfaces, wedges, flush bottom seals, etc.
2. If not done previously, or if gate stem has not been used for some time after installation, thoroughly clean stem threads and lubricate in accordance with stem installation instruction.

3. Raise gate to full open position. All lifts are factory lubricated so there is no need for additional lubrication.

- a. For manually operated lifts, turn hand wheel or hand crank in direction noted on hand wheel or lift housing.
- b. Electric operators should be opened manually for the first three (3) inches and the last three (3) inches of gate travel until all limit and torque switches are set and checked. Electrical operation is accomplished by actuating push buttons on operator.

In those cases where operator has both local and remote controls, operator should be operated only with local controls. Maximum caution must be exercised during this phase.

- c. For pneumatic operators, pressure must be applied to bottom side of cylinder piston to raise the gate. This should be done with manually actuated controls, rather than automatic controls. Pressure must be applied very slowly and carefully.

For pneumatic operators, gate may "jump" out of closed position then begin steady rising movement. There is no way to prevent this.

Regardless of operator type, operation should be easy and unlabored. If not, check for binding or other causes by reviewing previously mentioned installation and start-up procedures. Do not apply excessive force to hand wheel or hand crank on operators. In most cases, they are designed to operate at 40 lb. maximum pull.

4. Seating surfaces of fiberglass slide gates, including gates with UHMW polyethylene strips, require no lubrication. NOTE: **DO NOT** apply any petroleum product to neoprene seals as a lubricant.

5. Close gate completely and check for proper closure.

**CAUTION:** Be extremely careful when closing gate. The stem can buckle (bow) under a compressive load if excessive force is applied to the operator.

- a. Check to see that slide fits flat against seating surface.
- b. Check to be sure frame is not warped.
- c. Adjust wedging bar on Heavy Duty Tite Seal Gates to desired leakage. (See Adjusting Wedging Bar).

6. Check and reset any limit nuts or position indicators as required. (See Limit Nut Adjustment).

7. Cycle gates with operators to insure proper installation, alignment and operation.

## INITIAL TEST OPERATION OF ELECTRIC MOTOR OPERATORS

The following test procedure is to be performed in addition to "Initial Operating" requirements previously specified. The purpose of this test is to check for proper installation and alignment of stem and operator. This test should be performed as soon after installation and as long before final inspection acceptance as possible.

If the stem is misaligned, warped or the threads have been damaged, the stem will cut the threads out of the lift nut, eventually causing the gate to fall. If there is a problem, evidence usually begins showing up after three to five gate cycles. For this reason, we recommend that each gate with an electric operator be cycled about 3-5 times.

The following test procedure should be performed over a time period of a few hours to a few days. During start-up, remember to avoid running the gate operator continuously. Most electric operators have a 15 or 30 minute duty cycle. Depending on motor, operating times should be limited to fifteen (15) to thirty (30) minutes per hour.

### TEST PROCEDURE

1. Check to make certain stem has been thoroughly cleaned and has clean coating of grease, then cycle gate three (3) times.
2. Check grease for any signs of bronze. These may be chips or small filings. A few pin head size pieces of bronze or some discoloration of stem is normal.
3. Clean stem and re-lubricate with fresh, clean grease.
4. If there were quite a few chips, recheck installation and alignment, then cycle gate three (3) more times. If there are very few chips, no checks are required and gate can be cycled five (5) times.

During these tests, be aware of any strange noises from operator or stem that could indicate trouble. Stop tests and locate trouble.

5. After cycling gates, recheck for evidence of bronze stripping from nut.
  - a. If stem and grease is fairly clean and free of bronze chips or shavings, clean stem, re-lubricate and cycle five (5) more times. Recheck final time and if only minute amounts of bronze show, installation are correct.
  - b. If the appearance of the bronze is not too great, the stems should be cleaned and re-lubricated. Double check entire installation, especially alignment. Repeat checking, cleaning and cycling for a minimum of five (5) cycles. If there still appears to be a problem, call the factory.
  - c. If the amount of bronze is excessive, test should be stopped and factory called. See "Field Service" for on-site inspection by a factory service representative to

evaluate problem and determine whether any equipment needs to be replaced.  
Gate should not be operated further until it can be checked out.

**Things to look for if problems are encountered**

Depending on severity, factory should be consulted.

1. Observe stem from below operator while gate is being cycled.
  - a. If stem seems to move back and forth or side-to-side, stem may be warped or bent.
  - b. Check to see if stem is rubbing or binding on stem guides or other structure. May indicate alignment problems.
2. Check stem threads.
  - a. If thread crests appear to be mushroomed or slightly rolled over on one side of stem while opposite side (180° away) looks all right, check for alignment problem.
  - b. Stem threads appear rough, chipped or galled. Possibility of damaged threads.

**OPERATION WITH PORTABLE ELECTRIC OPERATOR**

1. With hand crank, open the gate slightly.
2. Loosen setscrew on hand crank and remove hand crank from lift.
3. Position portable operator support so socket of operator lines up with input shaft. Adjust height as necessary.
4. Slip socket on input shaft until fully engaged (minimum 1 inch) and tighten set screw on socket.
5. Plug operator into 115V, 60HZ power source. Be sure outlet is grounded type.
6. Set forward/reverse switch as required for proper gate operation. Direction to open gate is shown on lift above input shaft.
7. Depress trigger switch on portable operator handle to start unit. Operator will continue to run as long as switch is depressed.
8. When limit nut is reached or if overload occurs, overload release clutch will automatically release so no further torque is applied to input shaft.
9. To reset clutch, either reverse rotation or disengage and remove portable operator from lift and electrically "jog" operator. Clutch will automatically reset after several revolutions.

## SECTION III: MAINTENANCE

### MAINTENANCE OF COPOLYMER COMPOSITE GATES AND GUIDES

Other than periodic cleaning to maintain smooth operation of the gates and general sanitation throughout the plant, maintenance of the fiberglass portions of the gates is not required. If desired, the fiberglass material may be cleaned with detergent or water.

Periodic inspection of guides and gates is recommended to insure trouble-free operation. Check for debris that may have caught or collected on the gate and clean accordingly.

### MAINTENANCE OF OPERATING STEMS

1. Operating stems **MUST** be cleaned and greased periodically. Some environmental conditions are harsher than others. The use of stem covers will protect stems, but they still need to be cleaned and greased with Mobilux grease #2EP or equal at least once every six months (see Lubrication Chart for equivalent brand names). Lubricate more often if the grease becomes dirty.
2. **WARNING!** Gates with non-rising stems generally require a special maintenance program. If the level of the water or sewage rises above the top of the gate, the threads on the stem may become coated with grit. Under this condition, frequent cycling of the gate can wear the threads in the thrust nut and create a potentially dangerous situation. Therefore, the following maintenance procedure should be followed:
  3. The stem should be inspected at least monthly.
    - a. The stem should be kept clean and greased. Regular hose downs are recommended.
    - b. If the gate is cycled on the average of once a week, the thrust nut should be removed every year and inspected for wear. (More frequently after the first signs of wear or if operating conditions are more severe).

### MAINTENANCE OF GATE OPERATORS

1. The manual crank operators contain ball or roller bearings and should be lubricated at least three (3) times a year. All grease fittings on manual floor stands should be lubricated with a small amount of heavy duty grease such as Zenaplex II, manufactured by Pennwalt Keystone Company, or equal (see Lubrication Chart for equivalent lubricants).
2. **CAUTION:** DO NOT OVERFILL when lubricating pinion shafts on manual 3EP series lifts.
3. For electric motor operators or cylinder lifts, see separate manufacturer's O & M manuals.

#### MAINTENANCE OF PORTABLE ELECTRIC OPERATOR:

1. When not in use, portable operator should be stored in a dry protected area, out of the weather, with the cord neatly coiled or looped and off the floor.
2. Should operator be used in inclement weather, the operator and cord should be thoroughly cleaned and dried prior to storage.
3. See Manufacturer's Operating and Maintenance Instructions for lubrication.
4. In time, as clutch is run and parts become worn, the torque release setting may decrease making it necessary to reset the clutch. See Manufacturer's Operating and Maintenance Instructions for adjustment instructions.

#### MAINTENANCE OF UHMW AND SEALS

If desired, neoprene J-seals may be lubricated using silicone "grease" such as G. E. Silicone Compound G661 or equal.

**CAUTION:** Do not apply any petroleum product to these seals as a lubricant.

Neoprene seals rarely need replacement. However, if the seals and/or UHMW become improperly positioned or damaged, they may be serviced by one of the following procedures.

#### GATES SERVICED IN GUIDES

Gates that are readily accessible can be worked on while still mounted in their guide by:

1. Using a properly sized wrench, loosen and back off locking nuts on each of the large bronze adjusting bolts as far as possible.
2. Back off the large bronze wedging bolts as far as possible.

**NOTE:** Items 1 and 2 above apply to gates with wedging bar assembly only.

3. For repair or replacement of J-seals or UHMW, remove all bolts holding clamping bars with a properly sized wrench. Remove clamping bars, J-seal and UHMW. Carefully label each part to record proper location and positioning.

**NOTE:** Do not throw old J-seal and/or UHMW away. Use the old J-seal and/or UHMW as a pattern for marking hole locations and lengths on replacement parts. Be sure to label new parts in the same manner as the ones being replaced. If necessary, new seals and UHMW can be ordered directly from our factory.

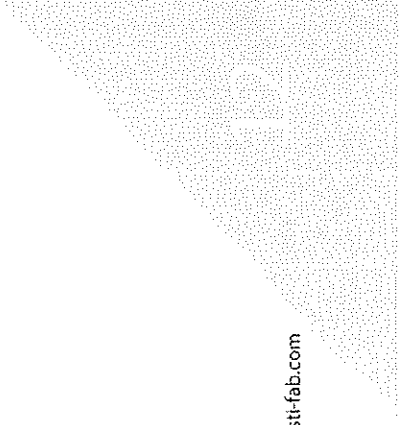
4. Make sure gate surfaces are clean and clear of obstructions. Mount new J-seal or UHMW in reverse order of dismounting instructions listed above. Remember, clamping bar always goes against J-seal.

5. If servicing the bottom seal, first raise the gate to a practical working height. Remove all bolts with a properly sized wrench and take off the clamping bar. Pull off old seal and use it as a pattern for punching holes and checking the length of the new bottom seal. Be sure to label seals and bars when dealing with more than one gate. Before remounting, make sure gate surface is clean and free from obstructions.

#### **GATES SERVICED OUT OF GUIDES**

Gates not accessible for maintenance may be removed from the guide and then serviced by the following steps: NOTE: Not all gate and guide assemblies are equipped with each of these parts. Follow the appropriate instructions for the given equipment and situation.

1. Using properly sized wrenches, remove stem cover, limit nut, hand wheel, electric operator and lift nut assembly.
2. Some operators require the stem to be backed out of the threaded lift nut. This will require unbolting the stem from the gate and possibly unbolting the stem guides as well as pedestal anchorage. Once the stem has been backed out of the lift nut, remove the lift and the stem.
3. Standard hand wheel lifts may be removed by unbolting from the head frame and unscrewing the lift nut off the top of the stem. Now the stem may be removed by detaching from the gate.
4. Once the lift assembly and stem have been removed, unbolt head frame r top plate. Also remove any remaining stem guides. If there is a wedging bar, follow instructions outlined under "Gates Serviced in Guides", Steps 1 and 2.
5. Using a suitable strong device (e.g. chain, cable, etc.) for the size and location of the gate, bolt to the stem mounting hardware on the gate and pull gate from guide. Be sure lifting device is properly situated and strong enough to handle the gate. Also, handle the gate with care so as not to damage the surface.
6. For repair or replacement of J-seal and/or UHMW, see Steps 3 and 4 of "Gates Serviced in Guides".



#### SECTION IV: SERVICE NOTES

##### CALL PLASTI-FAB FIRST!!!

If a problem develops either in the installation, operation or performance of the equipment, the installation manual and drawings should be checked to determine if the equipment has been properly installed. If proper performance and operation cannot be obtained contact Plasti-Fab immediately. *Always reference the job number* so that we may locate the project records and better assist you.

##### **Company may be contacted at:**

Plasti-Fab, Inc.  
P. O. Box 100  
Tualatin, OR 97062

**Phone** 503- 692-5460

**Fax** 503- 210-0602

**E-mail** [sales@plasti-fab.com](mailto:sales@plasti-fab.com)

**Web** [www.plasti-fab.com](http://www.plasti-fab.com)

##### **Our area representative is:**

Mellen & Associates, Inc.  
3404 S. 11<sup>th</sup> Street  
Council Bluffs, IA 51501

**Phone** 712-322-9333

**Fax** 712-322-6557

#### FIELD SERVICE

If necessary, arrangements can be made to send a technician to the job site. This man will make a thorough examination of the problem and if the equipment is defective in workmanship or material, the necessary repairs or adjustment will be made by the factory at no cost to the purchaser. If, however, the problem is due to faulty installation or adjustment, the cost of field service will be charged to the purchaser.

#### UNAUTHORIZED REPAIRS OR BACK-CHARGES

Plasti-Fab, Inc. will not accept any unauthorized alterations, repairs or back-charges to its equipment without prior written notice and agreement.

The company will not be liable for contingent costs or costs of delay due to faulty equipment or the repairs thereof.

#### SPARE PARTS

Unless required by project specifications and shown on appendix attached, no spare parts have been supplied for this equipment. Should it become necessary to replace a part, refer to enclosed installation and detail drawings for appropriate part. If electric motor operated lifts or cylinder operators have been supplied, see separate Manufacturer's O & M Manual for details. See section on "Field Service" for telephone number to call when ordering parts.



### SPECIAL TOOLS

The installation and adjustment of Plasti-Fab gates and equipment requires no special tools and can be accomplished using a minimum of the following standard tools:

1. 10" or 12" crescent wrench (2 required)
2. Open and box end wrenches are preferred
3. Allen wrenches

While these are the minimum tools required, installation time can be greatly decreased with such standard tools as socket wrenches and box wrenches.

If electric motor operated lifts or cylinder operators are supplied, see separate Manufacturer's O & M manual for special tools

### LUBRICATION CROSS REFERENCE CHART

#### 1. STEMS

LUBRICANT	MANUFACTURER
Molykote Type G	Alpha Molykote Co.
Valvoline Wal-Lith #2EP	Ashland Oil & Refining Co.
No. 52 grease	Atlantic Richfield (ARCO)
Dura Lith #2	Chevron Oil Co.
Lubriplate #630-2	Fiske Brothers Refining Co
Gulf Crown EP2	Gulf Oil Co
Mobilox Grease #2EP	Mobil Oil Co.
Mobil Grease #4	Mobile Oil Co.
Alvania #2EP	Shell Oil Co.
MultiFak #2EP	Texaco Oil Co.
Tycol Azebro #11	Tiedwater Oil Co

#### 2. LIFTS

*(Also Aux. Gearboxes and Universal Couplings)*

LUBRICANT	MANUFACTURER
Lubriplate Type 630-AA	Fiske Brothers Refining Co.
Mobilplex #45	Mobil Oil Co.
Mobil Grease Special	Mobil Oil Co.
Zeneplex II	Pennwalt-Keystone Co

### LIMITED WARRANTY

Every effort is made to assure that our customers receive the highest quality merchandise, free of any defects in materials and workmanship. This merchandise has been designed for use in accordance with the project specifications, and the standards and/or instructions recommended by this catalog,

or other written quotation of this firm. However, no warranty, expressed or implied, is made other than as follows:

When installed and operated correctly, Plasti-Fab guarantees this merchandise for 25 full years against functional failure due to corrosion of composite materials, and 24 full months against failure due to any defects in material and workmanship. Such warranty can only be enforced by the product end user. During the warranty period any defects in material or workmanship will be repaired or replaced at Plasti-Fab, Inc.'s option at no cost to the end user. Warranty specifically excludes damage due to improper handling, storage, misuse or neglect.

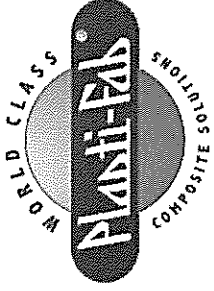
Measure of damage is the price of defective material only. No charges for labor or expense required to remove or replace defective material, or for any consequential damages, will be allowed.

Any implied warranty of merchantability or fitness is limited to the 24 months' duration of this written warranty. To the extent allowed by law, neither Plasti-Fab, Inc. nor its selling dealer or agent shall have any responsibility for loss of use of the product, loss of time, commercial loss or consequential damages.

A "pass-through" warranty is offered for products that are manufactured by other companies and furnished as a component part of a Plasti-Fab product. Typical examples of such products include, but are not limited to: air conditioning units, electric actuators and gearboxes, thermostats, solenoids, gages, controllers, heaters, blowers, and fans. Warranties on these products are pass-through, meaning the equipment warranty will be limited to that offered by the equipment's original manufacturer.

This warranty gives specific legal rights. Other rights vary from state to state and by country. In the event a warranted product is believed defective, please notify Plasti-Fab, Inc. Refer to Plasti-Fab job number, print number, installation location, address and telephone numbers listed in the O&M manual when requesting assistance. Provide date purchased and copy of invoice or shipping documents if possible.

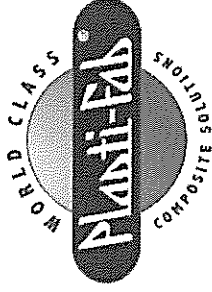
It is the policy of this company to encourage the settlement of disputes in an informal manner, and if such disputes arise over a warranty claim, an informal dispute settlement mechanism can be agreed upon at that time.



## GATES SERVICED OUT OF GUIDES

1. Gates not accessible for maintenance may be removed from the guide and then serviced by the following steps: **NOTE:** Not all gate and guide assemblies are equipped with each of these parts. Follow the appropriate instructions for the given equipment and situation.
  1. Using properly sized wrenches, remove stem cover, limit nut, hand wheel, electric operator and lift nut assembly.
  2. Some operators require the stem to be backed out of the head lift nut. This will require unbolting the stem from the gate and possibly unbolting the stem guides as well as pedestal anchorage. Once the stem has been backed out of the lift nut, remove the lift and the stem.
  3. Standard hand wheel lifts may be removed by unbolting from the head frame and unscrewing the lift nut off the top of the stem. Now the stem may be removed by detaching from the gate.
  4. Once the lift assembly and stem have been removed, unbolt head frame from top plate. Also remove any remaining stem guides. If there is a wedging bar, follow instructions outlined under "Gates Serviced in Guides", Steps 1 and 2.

Using a suitable strong device (e.g. chain, cable, etc.) for the size and location of the gate, bolt to the stem mounting hardware on the gate and pull gate from guide. Be sure lifting device is properly situated and strong enough to handle the gate. Also, handle the gate with care so as not to damage the surface



## HDTS SLUICE GATE LEAKAGE ADJUSTMENTS

The fiberglass Heavy Duty Tite Seal gates are equipped with a seal adjustment feature. The gate seals were initially adjusted at the factory; however, they may need to be tightened to achieve the specified leakage rate desired.

1. Using a properly sized wrench. Loosen and back off locking nuts on each of the large silicone bronze adjusting bolts.
2. Tighten each of the adjusting bolts uniformly in stages until the desired leakage rate is achieved, and clamping bar is straight through the full length of the gate. This should take no more than 1/4" - 1/2" (6mm - 12mm) turn on the bolts. If leakage persists, check seal between the gate and frame. Excessive tightening of adjusting bolts can cause seal damage.
3. Secure the locking nuts back in place.

**NOTE:** Gate is operable with wedging bar tightened into position.

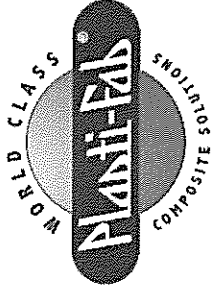
### Possible Leakage Scenarios:

- 1) The adjustment bolts (on the outside face of the frame) are loose. Solution: Tighten the bolts gently until no leakage. Caution – tighten in small increments with even torque pressure until leakage stops. Over-tightening these bolts may cause the threads to strip and/or cause the gate to have excessive friction against the frame.
- 2) The stem is not adjusted correctly and there is too much downward pressure causing the gate body to slightly bow outward in the middle. Solution: Where the top of the stem threads into the bracket there is a lock nut that provides for this adjustment so that the bottom of the gate just compresses (not crushes) the seal. Caution – make small adjustments until corrected.

**Note:** If the top of the gate is sealing without leakage as well as the bottom with only the sides leaking number two is the most likely adjustment that needs to be made, but number one should be performed afterward. Seals on all four sides should be compressed (not crushed) just to the point where there is no leakage.

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## REPLACING J-SEAL ASSEMBLY ON A HDTS GATE

1. Remove fasteners securing j-seal and wedge bar assemblies. Be careful not to damage FRP fasteners.
2. Remove existing j-seal assembly from face of gate.
3. Clean face of gate with putty knife so that there is no remaining silicone. Cleaning may be required on overlapping surface of bottom seal. Clean as required.
4. Dry fit new seal to ensure proper alignment of holes, 5/8" (15.9mm) spacing from each side, and 1/8" (3.8mm) overlap beyond bottom seal (1/8" (3.8mm) will be ground off at later stage).
5. Once proper alignment is confirmed, lift one side of j-seal that is lapping bottom seal and apply superglue. Superglue should be enough to cover mating surface. Lay j-seal into area of super glue, maintaining the 5/8" (15.9mm) side dimension. Hold in place until dry. Repeat to opposite side and keep grinder perpendicular to gate surface
6. Using a grinder with 60 grit disk, grind 1/8" (3.8mm) overlapping j-seal flush to bottom seal. Be sure not to grind past contact surface of bottom seal.
7. Lift remaining j-seal assembly. Apply black silicone bead (approx. 1/4" dia. (6mm)) from hole to hole, circling each hole.
8. Lay j-seal assembly onto surface of gate. Be sure holes align.
9. Re-install fasteners and wedge assembly.
10. Tighten fasteners.



## LIMITED WARRANTY

Every effort is made to assure that our customers receive the highest quality merchandise, free of any defects in materials and workmanship. This merchandise has been designed for use in accordance with the project specifications, and the standards and/or instructions recommended by this catalog, or other written quotation of this firm. However, no warranty, expressed or implied, is made other than as follows:

When installed and operated correctly, Plasti-Fab guarantees this merchandise for 25 full years against functional failure due to corrosion of composite materials; and 24 full months against failure due to any defects in material and workmanship. Such warranty can only be enforced by the product end user. During the warranty period any defects in material or workmanship will be repaired or replaced at Plasti-Fab, Inc.'s option at no cost to the end user. Warranty specifically excludes damage due to improper handling, storage, misuse or neglect.

Measure of damage is the price of defective material only. No charges for labor or expense required to remove or replace defective material, or for any consequential damages, will be allowed. Any implied warranty of merchantability or fitness is limited to the 24 months duration of this written warranty. To the extent allowed by law, neither Plasti-Fab, Inc. nor its selling dealer or agent shall have any responsibility for loss of use of the product, loss of time, commercial loss or consequential damages.

A "pass-through" warranty is offered for products that are manufactured by other companies and furnished as a component part of a Plasti-Fab product. Typical examples of such products include, but are not limited to: air conditioning units, electric actuators and gearboxes, thermostats, solenoids, gages, controllers, heaters, blowers, and fans. Warranties on these products are pass-through, meaning the equipment warranty will be limited to that offered by the equipment's original manufacturer.

This warranty gives specific legal rights. Other rights vary from state to state and by country. In the event a warranted product is believed defective, please notify Plasti-Fab, Inc. Refer to Plasti-Fab job number, print number, installation location, address and telephone numbers listed in the O&M manual when requesting assistance. Provide date purchased and copy of invoice or shipping documents if possible.

It is the policy of this company to encourage the settlement of disputes in an informal manner, and if such disputes arise over a warranty claim, an informal dispute settlement mechanism can be agreed upon at that time.

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