



# MANUAL: Z Series Nozzles

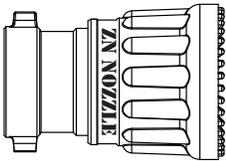
## INSTRUCTIONS FOR INSTALLATION, SAFE OPERATION AND MAINTENANCE

### **WARNING**

Understand manual before use. Operation of this device without understanding the manual and receiving proper training is a misuse of this equipment. Obtain safety information at [www.tft.com/serial-number](http://www.tft.com/serial-number)

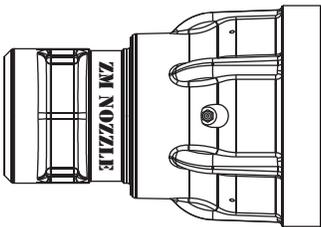
This instruction manual is intended to familiarize firefighters and maintenance personnel with the operation, servicing and safety procedures associated with the ZN, ZM and ZO firefighting nozzles.

This manual should be kept available to all operating and maintenance personnel.



### **ZN NOZZLE**

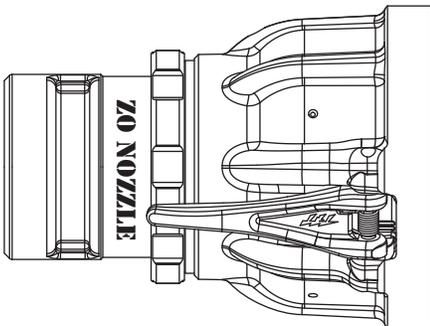
250, 350, 500 or 750 GPM @ 100 PSI  
950, 1300, 2000 or 3000 LPM @ 7 BAR (700 KPA)



### **ZM NOZZLE**

500 or 750 GPM @ 100 PSI  
2000 or 3000 LPM @ 7 BAR (700 KPA)

1000 or 1250 GPM @ 100 PSI  
3800 or 4750 LPM @ 7 BAR (700 KPA)



### **ZO NOZZLE**

1250 or 1500 GPM @ 100PSI  
4750 or 5700 LPM @ 7 BAR (700KPA)

1750 or 2000 GPM @ 100 PSI  
6600 or 7500 LPM @ 7 BAR (700KPA)

**TASK FORCE TIPS, INC.**  
MADE IN USA • [www.tft.com](http://www.tft.com)

3701 Innovation Way, Valparaiso, IN 46383-9327 USA  
800-348-2686 • 219-462-6161 • Fax 219-464-7155



#### PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and /or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.



Fire and Emergency Manufacturers and Service Association  
P.O. Box 147, Lynnfield, MA 01940 • [www.FEMSA.org](http://www.FEMSA.org)

# Table Of Contents

- 1.0 MEANING OF SAFETY SIGNAL WORDS
- 2.0 SAFETY
- 3.0 GENERAL INFORMATION
  - 3.1 USE WITH SALT WATER
  - 3.2 VARIOUS MODELS AND TERMS
  - 3.3 PATTERN CONTROL
  - 3.4 SHAPER POSITION LOCK
  - 3.5 USE WITH FOAM
    - 3.5.1 FOAMJET LX WITH MASTERSTREAM NOZZLE
- 4.0 FLOW CHARACTERISTICS OF ZN & ZM NOZZLES
  - 4.1 DETERMINING FLOW WITH PRE-PIPED MONITORS
  - 4.2 STREAM TRAJECTORY DATA
- 5.0 FLUSHING DEBRIS
- 6.0 FM APPROVAL (FACTORY MUTUAL)
- 7.0 DRAWINGS & PARTS LIST
- 8.0 WARRANTY
- 9.0 ANSWERS TO YOUR QUESTIONS
- 10.0 MAINTENANCE
  - 10.1 FIELD LUBRICATION
  - 10.2 SERVICE TESTING
    - 10.2.1 HYDROSTATIC TESTING
    - 10.2.1 FLOW TESTING
    - 10.2.3 RECORDS
  - 10.3 REPAIR
- 11.0 INSPECTION CHECKLIST

## 1.0 MEANING OF SAFETY SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI standard Z535.6-2011, the definitions of the four signal words are as follows:



**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION** indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



**NOTICE** is used to address practices not related to physical injury.

## 2.0 SAFETY

### **⚠ WARNING**

This equipment is intended for use by trained personnel for firefighting. Their use for other purposes may involve hazards not addressed by this manual. Seek appropriate guidance and training to reduce risk of injury.

### **⚠ WARNING**

Injury can occur from an inadequately supported nozzle. The mounting must be capable of supporting the nozzle reaction force which can be in excess of 665 LBS (1250 GPM at 100 PSI).

### **⚠ WARNING**

Some volatile liquids can be ignited by static discharge. Static build-up can occur from:

- Electrochemical separation of charge as water drains through low conductivity, refined products.
- Applying foam over a low conductivity liquid of sufficient depth to retain the charge created as the foam blanket drains.
- Streaming currents as water or foam is introduced into the storage tank.<sup>1</sup>

### **⚠ WARNING**

Water is a conductor of electricity. Application of water solutions on high voltage equipment can cause injury or death by electrocution. The amount of current that may be carried back to the nozzle will depend on the following factors:

Voltage of the line or equipment • Distance from the nozzle to the line or equipment  
Size of the stream • Whether the stream is solid or broken • Purity of the water<sup>2</sup>

### **⚠ CAUTION**

Nozzle must be mated to a hose with matched threads. Mismatched or damaged threads may cause nozzle to leak or uncouple under pressure and could cause injury.

### **⚠ CAUTION**

Do not connect aluminum to brass or brass to aluminum. Dissimilar metals coupled together can cause galvanic corrosion that will freeze the threaded joint or cause complete loss of thread engagement. If dissimilar metals must be coupled together, the effects of corrosion can be greatly delayed by various coatings on the metal such as powder paint, hard anodizing, or silicone grease.

### **⚠ CAUTION**

The nozzle may become damaged if allowed to freeze while containing water. Always drain after use to avoid damage and possible loss of use.

<sup>1</sup> Electrostatic Hazards of Foam Blanketing Operations by Peter Howels. Industrial Fire Safety July/August 1993

<sup>2</sup> The Fire Fighter and Electrical Equipment, The University of Michigan Extension Service, Fourth Printing 1983. Page 47.

## **NOTICE**

To prevent mechanical damage, do not drop or throw equipment.

## 3.0 GENERAL INFORMATION

The Task Force Tips ZN, ZM and ZO Series nozzles are deluge nozzles with clean far reaching straight stream. They are adjustable from straight stream to a dense fog pattern. Their rugged construction is compatible with the use of fresh water as well as fire fighting foam solutions. A summary of each nozzle's characteristics is shown in the tables below.

NOZZLE	FLOW (GPM)	PRESSURE (PSI)	FLOW (LPM)	PRESSURE (BAR, KPA/100)	k FACTOR
ZN	250, 350, 500, 750	100	1000, 1500, 2000, 3000	7	15 - 75
ZM	500, 750	100	2000, 3000	7	50 - 125
ZM 	1000, 1250	100	3800, 4750	7	50 - 125
ZO 	1250, 1500	100	4750, 5700	7	125-150
ZO 	1750, 2000	100	6600, 7500	7	175-200

### NOTES ON TABLES:

- 2.5 inch NH female threads are standard on the ZN and ZM series. 3.5 inch NH female threads are standard on the ZO series.
- ZM, ZN & ZO series nozzle are hardcoat anodized ANSI 356 aluminum.
- Temperature Rating: -25°F to 135°F (-32° C to 57°C) for ZN nozzles;  
-40°F to 135°F (-40°C to 57°C) for ZM & ZO nozzles.

## 2.1 USE WITH SALT WATER

Use with salt water is permissible provided nozzle is thoroughly cleaned with fresh water after each use. The service life of the nozzle may be shortened due to the effects of corrosion and is not covered under warranty.

## 3.2 VARIOUS MODELS AND TERMS

See figures 1A, 1B and 1C for views of the ZN, ZM and ZO Series nozzles.

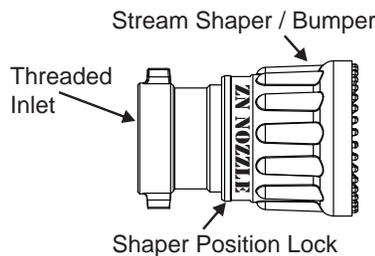


FIG 1A - ZN Nozzle

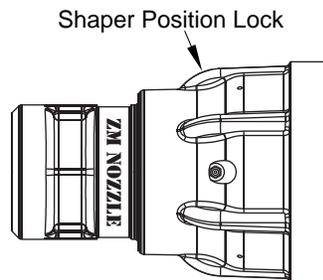


FIG 1B - ZM Nozzle

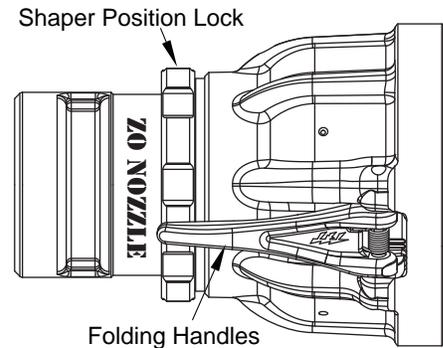


FIG 1C - ZO Nozzle

## 3.3 PATTERN CONTROL

### ⚠ WARNING

Nozzle reaction will vary as supply conditions change: such as opening or closing other nozzles, hose line kinks, changes in pump settings, etc. Changes in spray pattern or flushing will also affect nozzle reaction. The nozzle operator must always be prepared in the event of these changes. Failure to restrain nozzle reaction can cause firefighter injury from loss of footing and/or stream protection.

TFT's nozzles have full pattern control from straight stream to wide fog. Turning the stream shaper clockwise (as seen from the operating position behind the nozzle) moves the shaper to the straight stream position. Turning the stream shaper counterclockwise will result in an increasingly wider pattern.

Since the stream trim point varies with flow, the stream trim point should be "trimmed" after changing the flow to obtain the straightest and farthest reaching stream. To properly trim a stream, first open the pattern to narrow fog. Then narrow the fog pattern to parallel to give maximum reach. Note: Turning the shaper further forward will cause stream crossover and reduce the effective reach of the nozzle.

## 3.4 SHAPER POSITION LOCK

ZN and ZM nozzles offer a shaper lock that can be engaged by tightening a set screw. This will lock the shaper into any given fog position.

ZO nozzles offer a shaper lock that can be engaged by turning and tightening the shaper position lock ring. This will lock the shaper into any given fog position.

## 3.5 USE WITH FOAM

Nozzles may be used with foam solutions. Refer to fire service training for the proper use of foam.

### ⚠ WARNING

For Class B fires, lack of foam or interruption in the foam stream can cause a break in the foam blanket and greatly increase the risk of injury or death. Assure that: Application rate is sufficient (see NFPA 11 or foam manufacturer's recommendations); Enough concentrate is on hand to complete task (see NFPA for minimum duration time requirements); Foam logistics have been carefully planned. Allow for such things as: Storage of foam in a location not exposed to the hazard it protects; Personnel, equipment and technique to deliver foam at a rapid enough rate; Removal of empty foam containers; Keeping clear path to deliver foam as hoses, other equipment and vehicles are deployed.

### ⚠ WARNING

Improper use of foam can result in injury or damage to the environment. Follow foam manufacturer's instructions and fire service training to avoid: Using wrong type of foam on a fire, i.e. Class A foam on a Class B fire; Plunging foam into pools of burning liquid fuels; Causing environmental damage; Directing stream at personnel.

### ⚠ WARNING

There is a wide variety of foam concentrates. Each user is responsible for verifying that any foam concentrate chosen to be used with this unit has been tested to assure that the foam obtained is suitable for the purpose intended.

### 3.4.1 FOAMJET MX WITH MASTERSTREAM NOZZLE

To increase the expansion ratio and drain time, Task Force Tips "Foamjet MX" (model FJ-MX-MD) may be used with the ZN nozzle. This multi expansion foam tube attaches and detaches quickly from the nozzle. Note: As expansion ratio is increased, the reach of the stream will be decreased due to the greater amount of bubbles in the stream and their inability to penetrate the air. Generally, the reach with foam is approximately 10 % less than with water only. Actual results will vary based on brand of foam, hardness of water, temperature, etc.

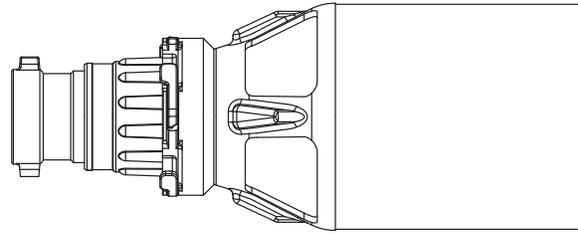
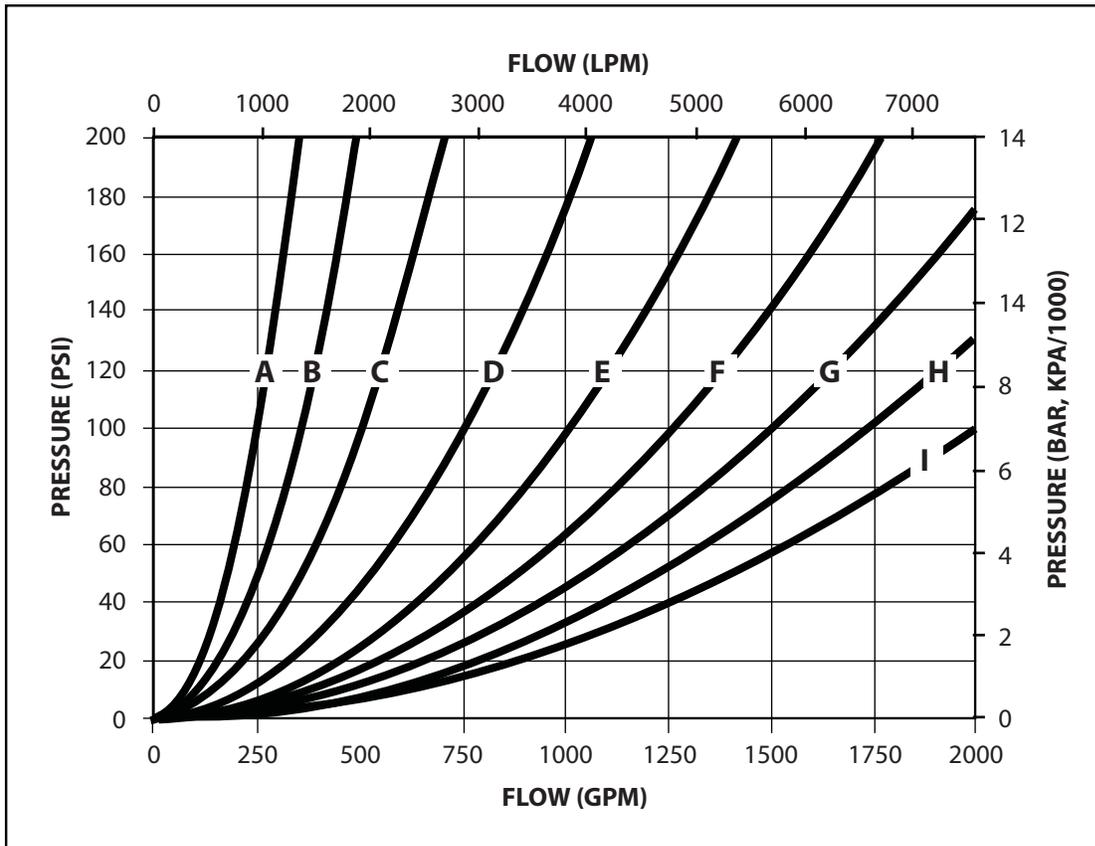


FIG 2.4.1 - FJ-MX-MD Shown on ZN Nozzle

### 4.0 FLOW CHARACTERISTICS OF ZN & ZM NOZZLES

The ZN, ZM & ZO Nozzles are manufactured to a predetermined fixed orifice. The orifice size is not adjustable and is specified at time of order. 250, 350, 500 or 750 GPM flow rates at 100 PSI are available on the ZN, 500, 750, 1000 or 1250 GPM @ 100 psi are available on the ZM nozzle and 1250, 1500, 1750 or 2000 GPM flow rates @ 100 psi are available on the ZO. The flow rate is marked on the nozzle's baffle. Figure 3 gives relationship of flow and pressure for various orifice sizes.



Line	Baffle
A	250GPM @ 100PSI
B	350GPM @ 100PSI
C	500GPM @ 100PSI
D	750GPM @ 100PSI
E	1000GPM @ 100PSI

Line	Baffle
F	1250GPM @ 100PSI
G	1500GPM @ 100PSI
H	1750GPM @ 100 PSI
I	2000GPM @ 100PSI

FIG 3 - Nozzle Flow Characteristics



**WARNING** An inadequate supply of nozzle pressure and/or flow will cause an ineffective stream and can result in injury, death or loss of property.

## 4.1 DETERMINING FLOW WITH PRE-PIPED MONITORS

The simplest procedure to determine flow is with a flow meter. If a flow meter is unavailable then the flow may be estimated using pressure loss data between the nozzle and an in-line pressure gauge at the pump or considerably upstream from the nozzle. Data is taken with a smooth bore nozzle and handheld pitot gauge. Note: equations assume no substantial change in elevation between in-line pressure gauge and nozzle.

### Step 1: Determine flow of smooth bore nozzle.

Flow water with a smooth bore nozzle and record the nozzle's size, pitot pressure and in-line pressure gauge reading. The smooth bore nozzle's flow is calculated from the Freeman formula:

$$Q_{\text{nozzle}} = F \times D^2 \sqrt{P_{\text{pitot}}}$$

Where: F = 29.71 for English units (GPM, INCHES, PSI)  
 F = .667 for metric units (LPM, MM, BAR) Note: 1 BAR=100 KPA  
 $Q_{\text{nozzle}}$  is smooth bore nozzle flow in GPM (or LPM)  
 D is nozzle exit diameter in INCHES (or MM)  
 $P_{\text{pitot}}$  is pitot pressure in PSI (or BAR)

### Step 2: Find piping pressure loss constant.

Using the results from step 1 use the following equation to calculate the pressure loss constant between the in-line pressure gauge and the nozzle.

$$C_{\text{piping}} = \frac{Q_{\text{smooth}}^2}{P_{\text{in-line}} - P_{\text{pitot}}}$$

Where:  $C_{\text{piping}}$  is pressure loss constant in GPM<sup>2</sup>/PSI (or LPM<sup>2</sup>/BAR)  
 $P_{\text{in-line}}$  is inline pressure gauge reading in PSI (or BAR)

### Step 3: Calculate nozzle constant.

Where:  $C_{\text{nozzle}}$  is the nozzle's constant in GPM<sup>2</sup>/PSI (or LPM<sup>2</sup>/BAR)  
 $Q_{\text{nominal}}$  is the nozzle's nominal flow in GPM (or LPM)  
 $P_{\text{nominal}}$  is the nozzle's nominal pressure in PSI (or BAR)

$$C_{\text{nozzle}} = \frac{Q_{\text{nominal}}^2}{P_{\text{nominal}}}$$

### Step 4: Calculate flow.

Using the pressure loss constant from step 2, the nozzle constant from step 3, and the in-line pressure gauge reading, the flow with a fixed orifice nozzle can be calculated with the following equation.

$$Q = \sqrt{\frac{C_{\text{piping}} \times C_{\text{nozzle}} \times P_{\text{in-line}}}{(C_{\text{piping}} + C_{\text{nozzle}})}}$$

Where: Q is fixed orifice nozzle's flow in GPM (or LPM)

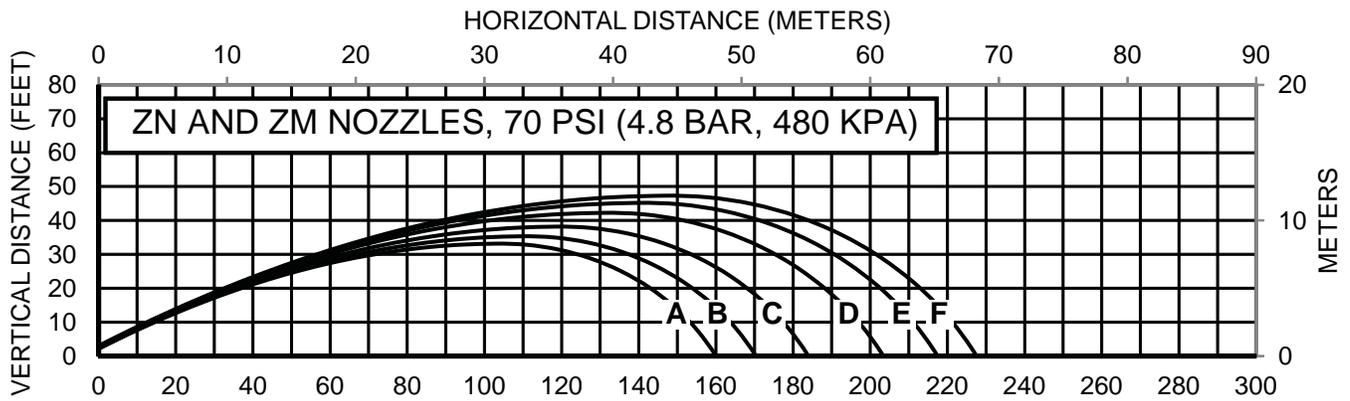
Mount a graph or table of the results adjacent to the in-line pressure gauge. Deliver any desired flow by adjustment of pump pressure.

## 4.2 STREAM TRAJECTORY DATA

Figure 5 gives the stream trajectory for the nozzles at various pressures. The graphs represent orifice sizes as defined in Figure 3. For other orifice sizes and pressures the graphs may be interpolated.

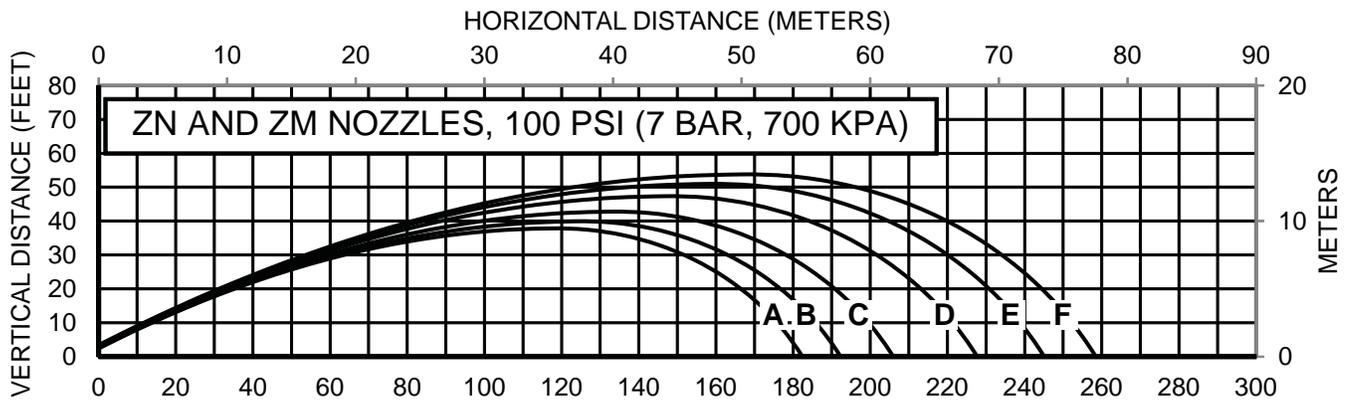
### Notes on trajectory graphs:

- Graphs show approximate effective stream trajectory at 30 degrees elevation in no wind conditions. Distance to last water drops approximately 10% farther.
- Trajectories shown are for water. The addition of foam is expected to decrease the reach by approximately 10%.
- Tail or head winds of 20 MPH (30 KPH) may increase or decrease the range approximately 30%.



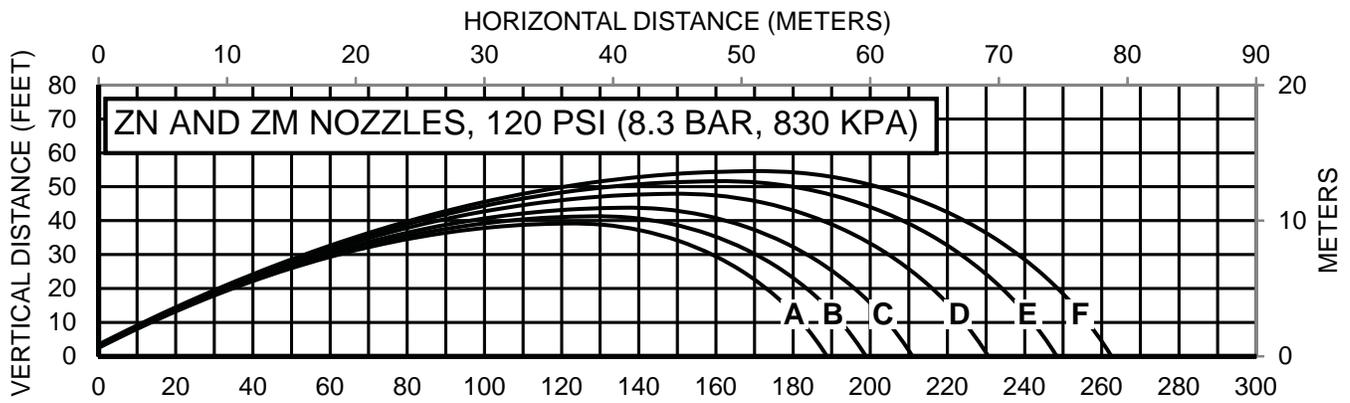
CURVE	K FACTOR	GPM FLOW	LBS REACTION
A	25	210	90
B	35	290	130
C	50	420	180
D	75	630	290
E	100	840	370
F	125	1050	460

CURVE	K FACTOR	LPM FLOW	KGf REACTION
A	25	800	40
B	35	1100	60
C	50	1600	80
D	75	2400	130
E	100	3200	170
F	125	4000	210



CURVE	K FACTOR	GPM FLOW	LBS REACTION
A	25	250	130
B	35	350	180
C	50	500	260
D	75	750	400
E	100	1000	530
F	125	1250	660

CURVE	K FACTOR	LPM FLOW	KGf REACTION
A	25	1000	60
B	35	1300	80
C	50	1900	120
D	75	2900	180
E	100	3800	240
F	125	4800	300



CURVE	K FACTOR	GPM FLOW	LBS REACTION
A	25	270	160
B	35	380	220
C	50	550	320
D	75	820	480
E	100	1100	630
F	125	1370	790

CURVE	K FACTOR	LPM FLOW	KGf REACTION
A	25	1000	70
B	35	1500	100
C	50	2100	140
D	75	3100	220
E	100	4200	290
F	125	5200	360

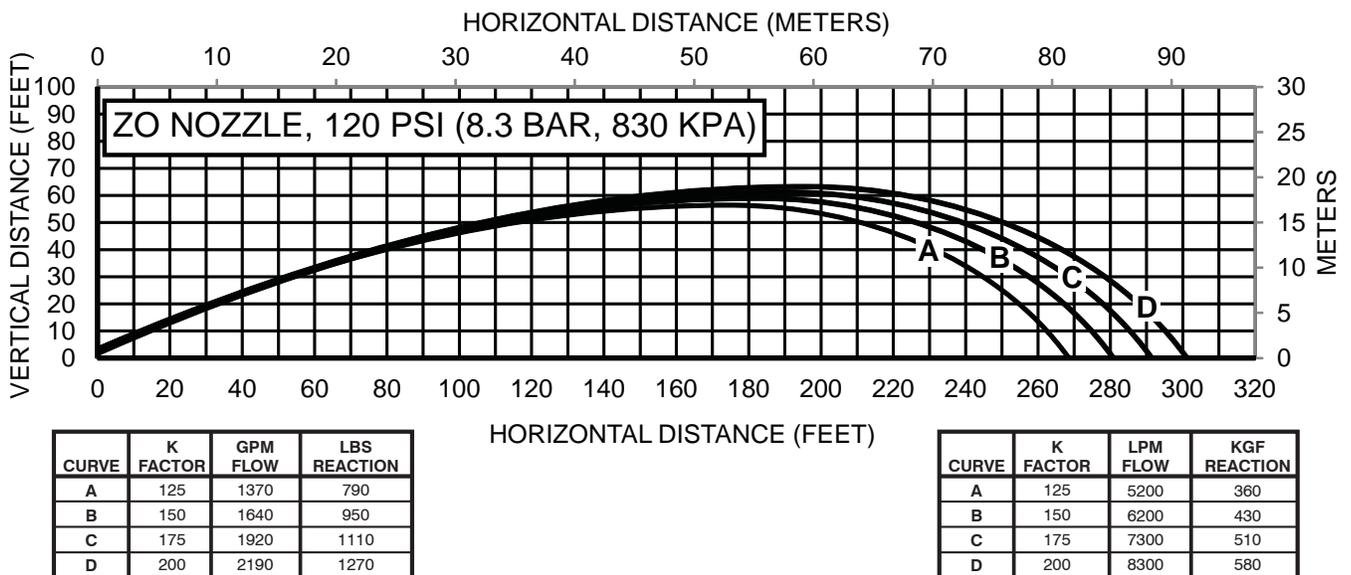
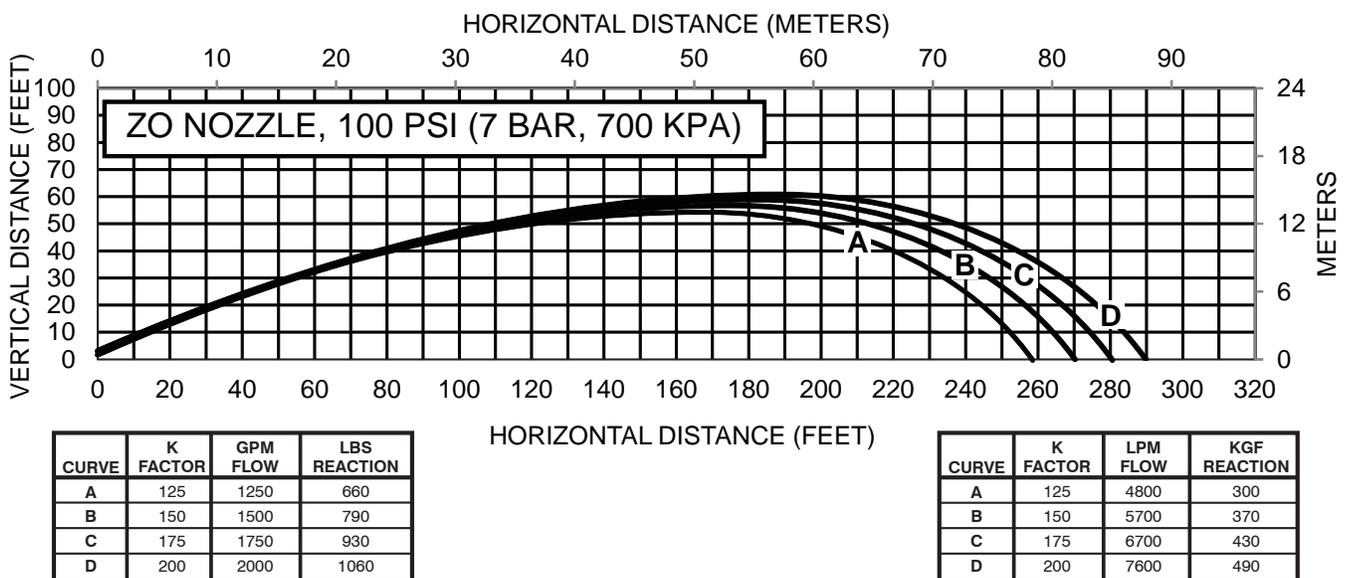
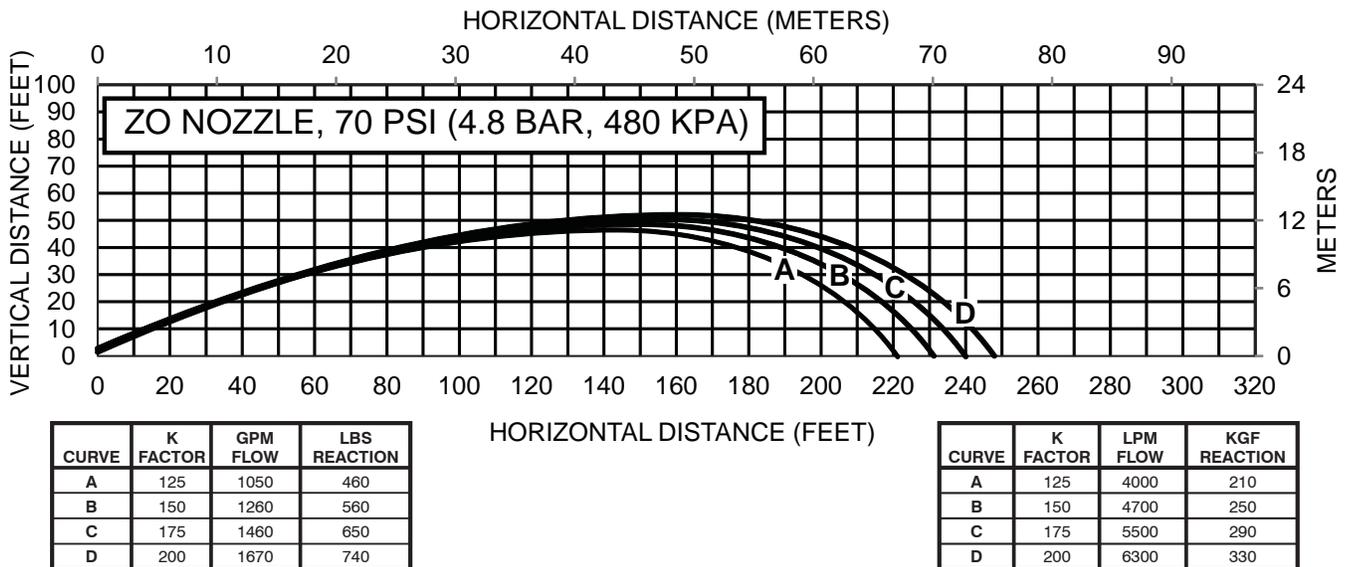


Fig. 3.2 Stream Trajectory Data

## 5.0 FLUSHING DEBRIS

Debris in the water may get caught inside the nozzle. This trapped material will cause poor stream quality, shortened reach and reduced flow. To remove debris trapped in the nozzle:

- 1) Shut off flow to the nozzle.
- 2) Move the stream shaper to the wide fog position.
- 3) For ZN Nozzle: Unscrew baffle using a 1-1/8 inch (28mm) socket.  
For ZM Nozzle: Unscrew the bolt using 7/8" socket and remove baffle.  
For ZO Nozzle: Unscrew the bolt using a large adjustable wrench and remove baffle.
- 4) Remove debris. Flow water to flush if necessary.
- 5) Reassemble the nozzle.



**Large amounts of debris may be unflushable and can reduce the flow of the nozzle resulting in an ineffective flow. In the event of a blockage, it may be necessary to retreat to a safe area.**

## 6.0 FM APPROVAL (FACTORY MUTUAL)

FM Approved nozzles are identified with the symbol



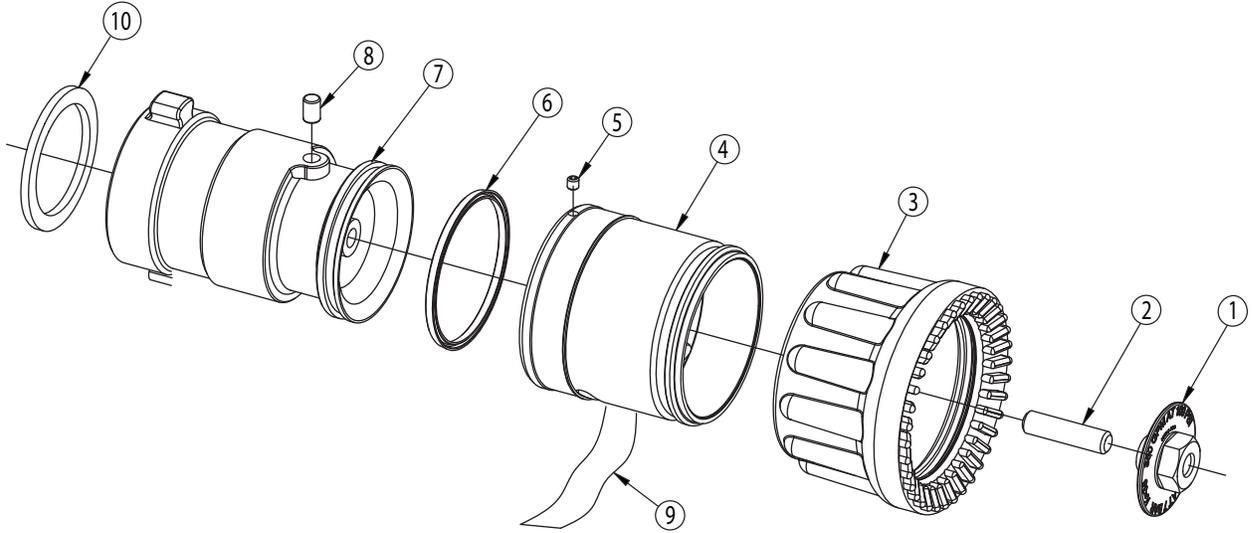
on their label.

All models with FM Approval have been tested to FM Approval Class 5511-Firefighting Nozzles for Use with Hose, Monitor Assemblies and other Firefighting Equipment.

FM Approved nozzles are not FM Approved for use with foam.

## 7.0 DRAWINGS & PARTS LIST

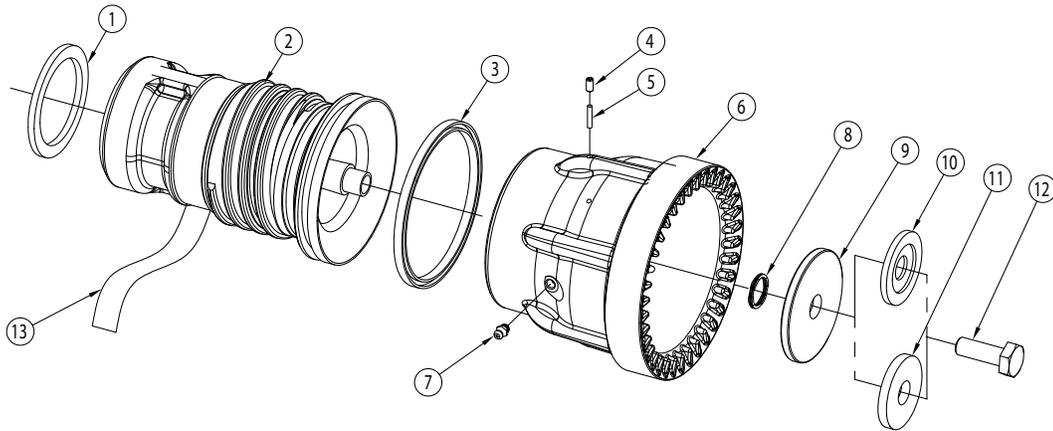
### ZN NOZZLE



ITEM	DESCRIPTION	QTY	PART
1	BAFFLE 350 GPM	1	Z565
	BAFFLE 500 GPM	1	Z566
	BAFFLE 750 GPM	1	Z567
2	1/2-13 X 2 STUD - FULL THREAD	1	VT50-13SD2.0
3	BUMPER	1	Z700
4	STREAM SHAPER	1	Z505

ITEM	DESCRIPTION	QTY	PART
5	1/4-28 X 1/4 SOCKET SET SCREW	1	VT-25-28SS250
6	SHAPER SEAL 3.255 ID - DEFLASHED	1	Z330
7	IND. NOZ. BODY ALUM 2.5" NH	1	Z650ANJ
8	CAM PIN	1	Z660
9	NAME LABEL - ZN NOZZLE	1	ZL150
10	GASKET - 2.5" HOSE COUPLING	1	V3190

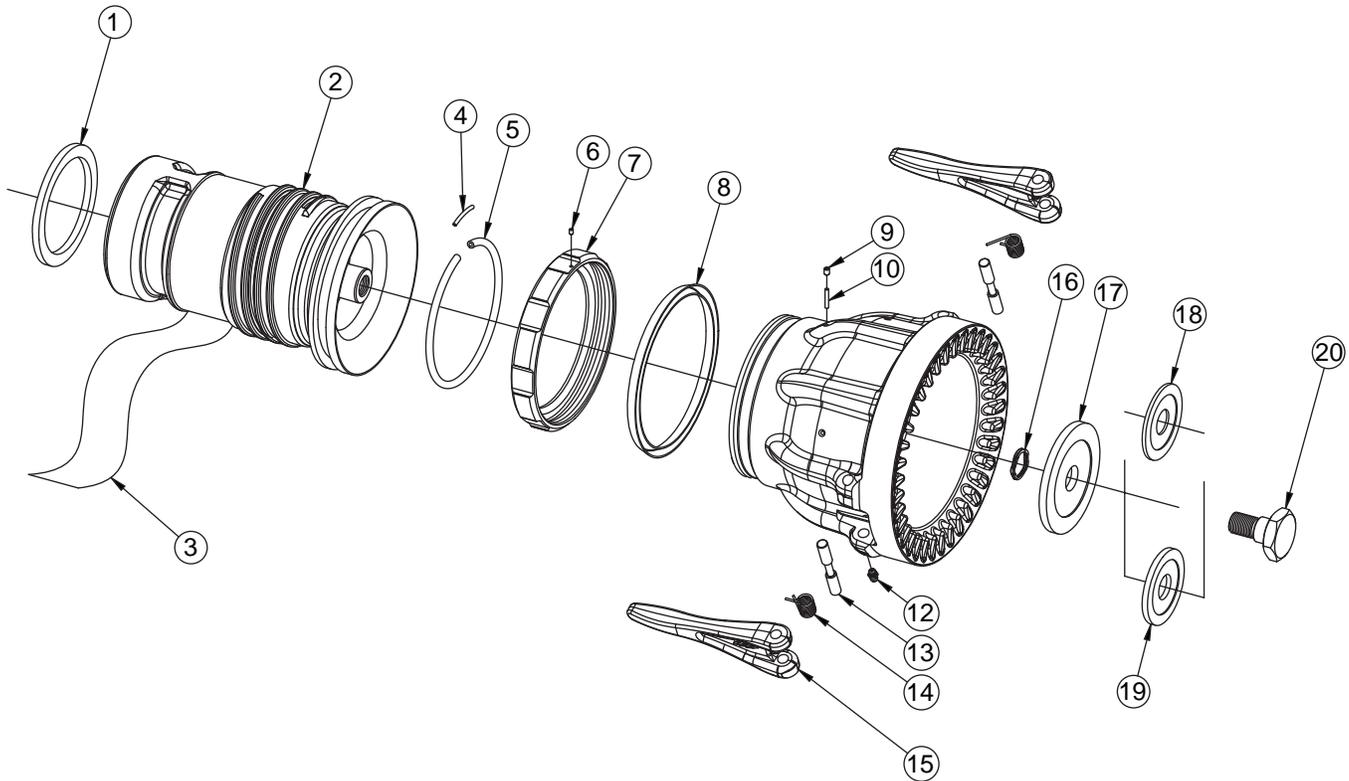
### ZM NOZZLE



ITEM	DESCRIPTION	QTY	PART	ITEM	DESCRIPTION	QTY	PART
1	GASKET - 2.5" HOSE COUPLING	1	V3190	8	SPRING	1	ZFM580
2	NOZZLE BODY 2.5" NH	1	ZFM600NJ	9	BAFFLE K=125	1	ZFM560
3	CUP SEAL 4.25 X 4.75 X 1/4	1	XGE380	10	SUBBAFFLE K=75 & K=100	1	ZFM565
4	10-32 X 3/8 SOCKET SET SCREW	1	VT10-32SS375	11	SUBBAFFLE K=50 - LASERED	1	ZFM570
5	PIN - .680 X 1/8" DIA.	1	D07550	12	HEAVY HEX BOLT 1/2"-13 X 1.5"	1	ZFM575
6	NOZZLE SHAPER	1	ZFM500	13	ZM NAME LABEL	1	ZFML150
7	GREASE FITTING 1/4-28	1	VT25-28ZERK			1	

## 7.0 DRAWINGS & PARTS LIST

### ZO NOZZLE



ITEM	DESCRIPTION	QTY	PART
1	GASKET - 2.5"	1	V3190
2	ZO NOZZLE BODY 3.5"NH INLET	1	ZFM700N
	ZO NOZZLE BODY 3.5"BSP INLET		ZFM700B
3	NAME LABEL - ZO NOZZLE	1	ZFML250
	NAME LABEL - ZO NOZZLE - FM APPROVED		ZFML255
4	TUBING	1	ZFM745
5	TUBING	1	ZFM755
6	6-32 X 3/16 SOCKET SET SCREW	1	VT06-32SS187
7	ZO LOCK RING	1	ZFM725
8	CUP SEAL 6.25"OD X 5.5" X .375"	1	ZFM750
9	10-32 X 1/4 SOCKET SET SCREW	1	VT10-32SS250
10	1/8 X 3/4 HDP SPIROL PIN	1	VP125X750
11	ZO NOZZLE SHAPER	1	ZFM710
12	GREASE FITTING 1/4-28	1	VT25-28ZERK
13	PIVOT PIN	2	A4262
14	HANDLE TORSION SPRING	2	A4263
15	STORZ FOLDING HANDLE	2	A4261
16	ZO NOZZLE BAFFLE SPRING	1	ZFM740
17	BAFFLE K= 250	1	ZFM730
18	BAFFLE K= 175 & K=200	1	ZFM731
19	BAFFLE K= 125 & K=150	1	ZFM732
20	HEAVY HEX BOLT	1	ZFM720

## **8.0 WARRANTY**

Task Force Tips, Inc., 3701 Innovation Way, Valparaiso, Indiana 46383-9327 (“TFT”) warrants to the original purchaser of its ZN, ZM and Masterstream series nozzles (“equipment”), and to anyone to whom it is transferred, that the equipment shall be free from defects in material and workmanship during the five (5) year period from the date of purchase.

TFT’s obligation under this warranty is specifically limited to replacing or repairing the equipment (or its parts) which are shown by TFT’s examination to be in a defective condition attributable to TFT. To qualify for this limited warranty, the claimant must return the equipment to TFT, at 3701 Innovation Way, Valparaiso, Indiana 46383-9327, within a reasonable time after discovery of the defect. TFT will examine the equipment. If TFT determines that there is a defect attributable to it, TFT will correct the problem within a reasonable time. If the equipment is covered by this limited warranty, TFT will assume the expenses of repair.

If any defect attributable to TFT under this limited warranty cannot be reasonably cured by repair or replacement, TFT may elect to refund the purchase price of the equipment, less reasonable depreciation, in complete discharge of its obligations under this limited warranty. If TFT makes this election, claimant shall return the equipment to TFT free and clear of any liens and encumbrances.

This is a limited warranty. The original purchaser of the equipment, any person to whom it is transferred, and any person who is an intended or unintended beneficiary of the equipment, shall not be entitled to recover from TFT any consequential or incidental damages for injury to person and/or property resulting from any defective equipment manufactured or assembled by TFT. It is agreed and understood that the price stated for the equipment is in part consideration for limiting TFT’s liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above may not apply to you.

TFT shall have no obligation under this limited warranty if the equipment is, or has been, misused or neglected (including failure to provide reasonable maintenance) or if there have been accidents to the equipment or if it has been repaired or altered by someone else.

THIS IS A LIMITED EXPRESS WARRANTY ONLY. TFT EXPRESSLY DISCLAIMS WITH RESPECT TO THE EQUIPMENT ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND ALL IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. THERE IS NO WARRANTY OF ANY NATURE MADE BY TFT BEYOND THAT STATED IN THIS DOCUMENT.

This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

## **9.0 ANSWERS TO YOUR QUESTIONS**

We appreciate the opportunity of serving you and making your job easier. If you have any problems or questions, our toll-free “Hydraulics Hotline”, 800-348-2686, is normally available to you 24 hours a day, 7 days a week.

## 10.0 MAINTENANCE

TFT nozzles are designed and manufactured to be damage resistant and require minimal maintenance. However, as the primary firefighting tool upon which your life depends, it should be treated accordingly. Do not drop or throw equipment.

### 10.1 FIELD LUBRICATION

All Task Force Tip nozzles are factory lubricated with high quality silicone grease. This lubricant has excellent washout resistance and long term performance. If your department has unusually hard or sandy water, the moving parts may be affected. Foam agents and water additives contain soaps and chemicals that may break down the factory lubrication.

The moving parts of the nozzle should be checked on a regular basis for smooth and free operation, and signs of damage. IF THE NOZZLE IS OPERATING CORRECTLY, THEN NO ADDITIONAL LUBRICATION IS NEEDED. Any nozzle that is not operating correctly should be immediately removed from service. For additional information refer to <http://www.tft.com>.

The field use of Break Free CLP (spray or liquid) lubricant will help to restore the smooth and free operation of the nozzle. However, these lubricants do not have the washout resistance and long-term performance of the silicone grease. Therefore, re-application of Break Free CLP will be needed on a regular basis. CAUTION: Aerosol lubricants contain solvents that can swell O-Rings if applied in excess. The swelling can inhibit smooth operation of the moving parts. When used in moderation, as directed, the solvents quickly evaporate without adversely swelling the O-Rings.

### 10.2 SERVICE TESTING

In accordance with NFPA 1962 (2013), nozzles must be tested a minimum of annually. Nozzles failing any part of this test must be removed from service, repaired and retested upon completion of the repair.

#### 10.2.1 HYDROSTATIC TESTING

Each nozzle with a shut off mechanism shall be tested in the following manner.

1. The nozzle shall be placed in a device capable of holding it and the shut off shall be closed.
2. A device capable of exerting a hydrostatic pressure of 300 psi (2070 kPa) or 1.5 times the maximum operating pressure, whichever is higher, shall be attached to the nozzle.
3. All air shall be bled from the system.
4. The gage pressure shall be increased by 50 psi (3.5 bar or 345 kPa) increments, held for 30 seconds at each pressure up to the maximum pressure for which the nozzle is being tested, and then held for one minute without leakage.
5. There shall be no sign of leakage through the valve or shut off.

#### 10.2.2 FLOW TESTING

Flow testing must be conducted in the following manner.

1. The nozzle shall be mounted so that the flow rate and pressure through the nozzle and the pressure at the inlet can be accurately measured.
2. With the shut off fully open, the inlet pressure shall be adjusted to the rated pressure  $\pm 2$  percent.
3. The valve or shut off and pattern controls shall be operated through their full range of motion at 100 psi (6.9 bar or 690 kPa) with no signs of leaking, binding or other problems.
4. Evaluate the flow of nozzles as defined by NFPA 1964 in the following manner:

Basic Spray Nozzles shall flow no less than and no more than 10 percent over the rated flow at the rated pressure in the straight stream and wide-angle fog settings.

Constant and Selectable Gallonage Nozzles shall flow no less than and no more than 10 percent over the rated flow at the rated pressure at each predetermined flow selection.

Automatic (Constant Pressure) Spray Nozzles

1. The flow rate shall slowly be increased to the maximum rated flow, and the minimum and maximum pressures through the flow range recorded.
2. Nozzles shall maintain their rated pressure  $\pm 15$  psi ( $\pm 1$  bar or  $\pm 100$  kPa) throughout the rated flow range.

### 10.2.3 RECORDS

A record of testing and repairs must be maintained from the time the nozzle is purchased until it is discarded. Each TFT nozzle is engraved with a unique serial number which, if so desired, can be used to identify nozzle for documentation purposes.

The following information, if applicable, must be included on the test record for each nozzle:

1. Assigned identification number
2. Manufacturer
3. Product or model designation
4. Vendor
5. Warranty
6. Hose connection size
7. Maximum operating pressure
8. Flow rate or range
9. Date received and date put in service
10. Date of each service test and service test results
11. Damage and repairs, including who made the repairs and the cost of repair parts
12. Reason removed from service

*NFPA 1962: Standard for the care, use, inspection, service testing, and replacement of fire hose, couplings, nozzles and fire hose appliances. (2013 ed., Section 5.5.4). Quincy, MA: National Fire Protection Agency.*

### 10.3 REPAIR

Factory service is available with repair time seldom exceeding one day in our facility. Factory-serviced nozzles are repaired by experienced technicians to original specifications, fully wet tested, and promptly returned. Repair charges for non-warranty items are minimal. Any returns should include a note as to the nature of the problem and whom to reach in case of questions.

Repair parts and service procedures are available for those wishing to perform their own repairs. Task Force Tips assumes no liability for damage to equipment or injury to personnel that is a result of user service. Contact the factory or visit the web site at [www.tft.com](http://www.tft.com) for parts lists, exploded views, test procedures and troubleshooting guides.

Performance tests shall be conducted on each nozzle after a repair, or anytime a problem is reported to verify operation in accordance with TFT test procedures. Consult factory for the procedure that corresponds to the model and serial number of the nozzle. Any equipment which fails the related test criteria should be removed from service immediately. Troubleshooting guides are available with each test procedure or, equipment can be returned to the factory for service and testing.

All replacement parts must be obtained from the manufacturer to assure proper operation of the product, and to maintain approval of the device.



**Any alterations to the PRODUCT NAME and its markings could diminish safety and constitutes a misuse of this product.**

## 11.0 INSPECTION CHECKLIST

**BEFORE EACH USE**, the nozzle must be inspected for proper operation and function according to this checklist:

1. There is no obvious damage such as missing, broken or loose parts, corrosion, damaged labels, etc.
2. The waterway is clear of obstructions
3. Coupling is tight and leak free
4. Gaskets are in good condition
5. Shaper or Index ring moves smoothly to all positions including flush (if applicable)
6. Nozzle flow is adequate as indicated by pump pressure and nozzle reaction
7. Shaper detent (if so equipped) operates smoothly and positively
8. Nozzle moves smoothly in and out of flush position (if applicable)
9. There is no damage to the nozzle tip
10. The shut off valve (if so equipped) operates as designed and shuts the flow off completely

**BEFORE BEING PLACED BACK IN SERVICE**, nozzles must be inspected to this checklist;

1. All controls and adjustments are operational
2. Shut off valve (if so equipped) closes off the flow completely
3. There are no broken or missing parts
4. There is no damage to the nozzle
5. The thread gasket is in good condition
6. The waterway is clear of obstructions
7. Nozzle is clean and markings are legible
8. Coupling is retightened properly
9. Shaper is set to desired pattern

*NFPA 1962: Standard for the care, use, inspection, service testing, and replacement of fire hose, couplings, nozzles and fire hose appliances. (2013 ed., Section 5.5.4). Quincy, MA: National Fire Protection Agency.*



**Any nozzle failing any part of the inspection checklist is unsafe and must have the problem corrected before use. Operating a nozzle that fails any of the above inspections is a misuse of this equipment.**