



# Certificate of Compliance

This certificate is issued for the following:

ZO SERIES NOZZLES IN CONFIGURATIONS OF 1250 GAL/MIN (4732 L/MIN), 1500 GAL/MIN (5678 L/MIN), 1750 GAL/MIN (6624 L/MIN), 2000 GAL/MIN (7570 L/MIN), or 2500 GAL/MIN (9463 L/MIN) AT 100 PSI (7 BAR)

**Prepared for:**

Task Force Tips Inc  
3701 Innovation Way  
Valparaiso, IN 46383-9327  
United States

**Manufactured at:**

Task Force Tips Inc  
3701 Innovation Way  
Valparaiso, IN 46383-9327  
United States

FM Approvals Class: 5511

Subsequent Revision Reports/Date Approval Amended

<u>Report Number</u>	<u>Date</u>
3045707	April 29, 2013

Approval Identification: 3040179

Approval Granted: December 12, 2011

Said Approval is subject to satisfactory field performance, continuing follow-up Surveillance Audits, and strict conformity to the constructions as shown in the Approval Guide, an online resource of FM Approvals.

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A handwritten signature in black ink, appearing to read 'Richard B. Dunne', is written over a white rectangular background.

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Richard B. Dunne  
Group Manager – Fire Protection  
FM Approvals  
1151 Boston-Providence Turnpike  
Norwood, MA 02062



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# APPROVAL REPORT

## EXAMINATION OF CHANGES TO THE MONSOON MONITOR AND HURRICANE MONITOR AND EXAMINATION FOR APPROVAL OF THE ZO 1250 AND ZO 1500 MONITOR NOZZLES

**Prepared for:**

**Task Force Tips  
3701 Innovation Way  
Valparaiso, IN 46383-9327**

**Project ID: 3045707**

**Class: 1421, 5511**

**Date of Approval: November 12, 2013**

**Supersedes Report**

**Dated: April 29, 2013**

**Authorized by:**



Richard B. Dunne, Group Manager – Fire Protection

**EXAMINATION OF CHANGES TO THE MONSOON MONITOR AND HURRICANE  
MONITOR AND EXAMINATION FOR APPROVAL OF THE ZO1250 AND ZO1500 MONITOR  
NOZZLES**

from

**Task Force Tips  
3701 Innovation Way  
Valparaiso, IN 46383-9327**

**I INTRODUCTION**

- 1.1 Task Force Tips submitted several 797 change forms depicting changes to the currently FM Approved Hurricane and Monsoon monitor assemblies. The FM Approval for the Hurricane and Monsoon monitor assemblies are described in the following applicable Approval Reports:

<b>Title</b>	<b>Project Identifier</b>	<b>Issue Date</b>
Hurricane Series and Monsoon Series Monitor Assemblies	3024612	June 7, 2006
Re-examination report Hurricane Series and Monsoon Series Monitor Assemblies	3031038	October 8, 2008
ZO Series Nozzles in configurations of 1750 gal/min(6624 L/min), 2000 gal/min (7570 L/min), or 2500 gal/min (9463 L/min) at 100 psi (7 bar)	3040179	December 12, 2011

- 1.2 This report may be freely reproduced only in its entirety and without modification.

**1.3 Standards**

<b>Title</b>	<b>Class Number</b>	<b>Date</b>
Approval Standard for Monitor Assembly	1421	June 2007
Firefighting Nozzles for Use with Hose, Monitor Assemblies and other Firefighting Equipment	5511	June 2005

- 1.4 The products will continue to appear in the Approval Guide, an online resource of FM Approvals, in the following directories:

Fire Protection – Hydrants & Hoses – Monitors

Fire Protection – Hydrants & Hoses – Nozzles – Master Stream Nozzles for use with Monitors

- 1.5 This report supersedes the original Approval report for PI 3045707 dated April 29, 2013. Task Force Tips requested a revised report to correct a discrepancy in the address listed in the report, and a correction to the description of the Hurricane Monitor on the Certificate of Compliance.

**II DESCRIPTION**

- 2.1 The modifications to the Task Force Tips Hurricane monitor assembly are as follows:

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- 2.1.1 A change was made where the XX330NJ Cast Elbow with sheet metal vane was replaced by XX339NJ which is a Cast Elbow with a cast vane.
- 2.2 The modifications to the Task Force Tips Monsoon monitor assembly are as follows:
  - 2.2.1 The Monsoon had a new 2.5NH outlet threaded outlet option tested as part of this program for FM Approval.
- 2.3 The following new configurations of ZO Nozzles were evaluated for FM Approval as part of this examination:
  - ZO1250
  - ZO1500

### III EXAMINATIONS AND TESTS

- 3.1 Samples were considered to be representative of the product line and were examined, tested, and compared to the manufacture's drawings. All data is on file at FM Approvals along with other documents and correspondence applicable to this program under PI 3045707.
- 3.2 The components described in this report were examined and tested at Task Force Tips, located in Valparaiso, IN.
- 3.3 All other aspects of the Monsoon and Hurricane monitor assemblies remain identical to the currently FM Approved versions as described in Section 1.1 of this report.
- 3.4 All other aspects of the ZO1250 and ZO1500 Nozzles other than the baffle remain identical to the currently FM Approved versions as described in Section 1.1 of this report.
- 3.5 The following tests were conducted on the Hurricane Monitor Assembly:
  - 3.5.1 FM 1421 Section 4.1 Examination

One sample of the re-designed Hurricane Monitor Assembly was inspected and compared to the manufacturer's drawings and specifications. The sample was determined to conform to the physical and structural requirements described in FM 1421 Section 3, General Requirements. The results of this examination are satisfactory.
  - 3.5.2 FM 1421 Section 4.2 Hydrostatic Proof-Pressure

One sample of the Hurricane Monitor Assembly monitor assembly was subjected to a hydrostatic proof pressure test in accordance with FM Standard 1421, Section 4.2. The monitor assembly was hydrostatically pressurized to 500 psi (27.6 bar), more than twice the rated operating pressure, and held at that pressure for a period of one minute. No visible leakage occurred. Subsequently, the monitor assembly was hydrostatically pressurized to 1000 psi (55.2 bar), more than four times the rated operating pressure, and held at that pressure for a period of five minutes. No ruptures, noticeable distortions, or other failure that would impair function occurred. Task Force Tips requested the elevated hydrostatic test for future possible re-classification of the maximum rated operating pressure. The results of this test were satisfactory.
  - 3.5.3 FM 1421 Section 4.4 Pressure Verses Flow Rate

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One sample of the Hurricane Monitor Assembly with the new XX339NJ cast vane was subjected to a pressure vs. flow rate test in accordance with FM Standard 1421, Section 4.4. The pressure differential between the inlet and outlet was measured over the full range of rated flow rates.

The pressure differentials associated with the re-configured Hurricane monitor assembly were improved over the values tested in PI 3039720. The results of this test are satisfactory.

3.6 The following tests were performed on the Monsoon Monitor Assembly

3.6.1 FM 1421 Section 4.1 Examination

One sample of the Monsoon Monitor Assembly with 2.5NH outlet configuration was inspected and compared to the manufacturer's drawings and specifications. The sample was determined to conform to the physical and structural requirements described in FM 1421 Section 3, General Requirements. The results of this examination are satisfactory.

3.6.2 FM 1421 Section 4.2 Hydrostatic Proof-Pressure

One sample of the Monsoon Monitor Assembly with 2.5NH outlet configuration was subjected to a hydrostatic proof pressure test in accordance with FM Standard 1421, Section 4.2. The monitor assembly was hydrostatically pressurized to 500 psi (27.6 bar), more than twice the rated operating pressure, and held at that pressure for a period of one minute. No visible leakage occurred. Subsequently, the monitor assembly was hydrostatically pressurized to 1000 psi (55.2 bar), more than four times the rated operating pressure, and held at that pressure for a period of five minutes. No ruptures, noticeable distortions, or other failure that would impair function occurred. Task Force Tips requested the elevated hydrostatic test for future possible re-classification of the maximum rated operating pressure. The results of this test were satisfactory.

3.6.3 FM 1421 Section 4.4 Pressure Verses Flow Rate

One sample of the Monsoon Monitor Assembly with 2.5NH outlet configuration was subjected to a pressure vs. flow rate test in accordance with FM Standard 1421, Section 4.4. The pressure differential between the inlet and outlet was measured over the full range of rated flow rates.

The pressure differentials associated with the Monsoon Monitor Assembly with 2.5NH outlet configuration were improved over the values tested in PI 3039720. The results of this test are satisfactory.

3.7 The following tests were performed on the ZO1250 and ZO1500 Nozzle Assemblies

3.7.1 FM 5511 Examination

The nozzles were examined and compared to the manufacturer's drawings and specifications, and to FM Approvals requirements stated in Section 3 of FM Class 5511 – General Requirements.

Representative samples of each of the components were examined and found to conform to the physical and structural requirements as set forth in Section 3 of FM Class 5511.

3.7.2 FM 5511 Discharge Performance Test

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One ZO Nozzle with 1250 gal/min baffle and one ZO Nozzle with 1500 gal/min baffle were subjected to a discharge performance test in accordance with Class 5511, Section 4.2. This test was conducted simultaneously during the Spray Reach vs. Pressure test per Class 5511, Section 4.6.

The nozzles were mounted such that they discharged horizontally 3 ft (1 m) above grade level, and the discharge rate and pressure at the inlet to each nozzle was measured. The samples were visually inspected for full and uniform wide spray patterns. The center of the spray sheet was filled for narrow and straight spray pattern, whereas the center of the spray sheet was hollow for wide angle spray pattern. The thickness of the sheet of spray at the surface of the cone was measured around its entire circumference. The sheet thickness was at least 2 in. (51 mm), along the entire surface of the spray sheet, at a distance of 2 ft (0.61 m) from the nozzle. Flat spots, lobes, or spray ejected outside the general shape of the cone did not exceed 2 in. (51 mm) at a distance of 2 ft (0.6 m) from the nozzle, along the entire surface of the spray sheet.

The results of this examination were satisfactory.

### 3.7.3 FM 5511 Flush Test

Two ZO Nozzles were subjected to a flush test, in accordance with Class 5511, Section 4.3. The nozzles were held in the vertical position, with the discharge end facing down. The appropriate size steel ball was inserted into the inlet side of each nozzle. The steel ball passed through the nozzle when the nozzle was moved to the wide position. The test results were considered satisfactory.

### 3.7.4 FM 5511 Rotational Pattern Control

One sample of the ZO Nozzle was subjected to Rotational Pattern Controls tests in accordance with Class 5511, Section 4.4.2. The nozzle does not have a shutoff feature therefore the nozzle was not able to be completely closed to perform the maximum rated pressure test per Class 5511, Section 4.4.2.

The test results were considered satisfactory.

### 3.7.5 FM 5511 Spray – Character, Reach and Discharge vs. Pressure

One sample of the ZO Nozzle with 1250 gal/min baffle and one sample of the ZO Nozzle with the 1500 gal/min baffle were each subjected to a Spray-Character, Reach, and Discharge vs. Pressure test, in accordance with Class 5511, Section 4.6. With water discharging at the pressures outlined in Table 3.7.5 below, the spray pattern controls for each sample were rotated through the entire range of spray patterns. These pressures and flows were recorded, and are outlined in Table 3.7.5 below.

Each wide angle spray pattern produced a uniform circular pattern on a plane 4 ft (1.2 m) from the nozzle, with greater than 90 percent of the total discharge falling within a 12 ft (3.7 m) diameter circle. The straight stream pattern setting for each nozzle provided a cohesive jet, delivering greater than 90 percent of the rated discharge within a 1 ft (0.3 m) diameter circle at a distance of 10 ft (3 m) from the nozzle. The test results were considered satisfactory.

Table 3.7.6 - Spray Character, Reach and Discharge vs. Pressure

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<b>Model</b>	<b>Spray Angle</b>	<b>Discharge Pressure psi (bar)</b>	<b>Flow Gal/min (L/m)</b>	<b>Measured Spray Range ft (m)</b>
ZO Nozzle with 1250 baffle	32°	100 (7)	1279 (4842)	250 (76.2)
ZO Nozzle with 1500gal/min baffle	32°	100 (7)	1554 (5883)	270 (82.2)

**IV MARKING**

- 4.1 System markings remain as described in the Approval Reports listed in Section 1.1 of this report.
- 4.2 Each Approved product shall be permanently stamped or embossed and identified with the following information:
- Name of manufacturer
  - Model designation
  - Rated pressure
  - Flow rate
  - Straight stream and spray pattern settings, with directional arrows (applicable to nozzles)
  - FM Approval mark

**V REMARKS**

- 5.1 Installations shall comply with the latest edition the manufacturer’s design, installation, operation and maintenance manual.
- 5.2 The manufacturing facility is subject to quarterly follow-up audit inspections. The facility and quality control procedures in place have been determined to be sufficient to manufacture product identical to that examined and tested, as detailed in this report.

**VI FACILITIES AND PROCEDURES AUDIT**

- 6.1 The system described in this report is FM Approved only when manufactured at the following location:

Task Force Tips  
3701 Innovation Way  
Valparaiso, IN 46383

- 6.2 The location specified in Section 6.1 of this report is audited as part of the FM Approvals facilities and procedures audit (F&PA) program on a quarterly basis.

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**VII MANUFACTURERS RESPONSIBILITIES**

- 7.1 Documentation considered critical to this Approval is on file at FM Approvals and listed in Section VIII, Documentation, of this report. No changes of any nature shall be implemented unless notice of the proposed change has been provided to, and written authorization obtained from, FM Approvals. The Approved Product Revision Report, Form 797, must be forwarded to FM Approvals as notice of proposed changes.
- 7.2 As part of the Approval requirements, FM Approvals requires assurance that subsequent equipment produced will present the same quality and reliability as the specified samples examined. The manufacturer shall maintain a Quality Assurance program, which includes as a minimum: incoming, in process, and final inspection and testing, equipment calibration, and drawing change control.
- 7.3 Task Force Tips must provide design, installation, operation, and maintenance instructions with each FM Approved product.

**VIII DOCUMENTATION**

- 8.1 The following drawings describe the Task Force Tips Monsoon Monitor, Hurricane Monitor, and ZO Nozzles, and are filed under original project identification numbers, as identified in Section 1.1.
- 8.2 Monsoon Monitor Drawings

Drawing No.	Revision Level	Drawing Title
LIY-200	10	Monsoon Assembly
Y4310A-2	5	Upper Segment Alum - Machined
Y4311-2	0	Upper Segment 2.5" Outlet - Machined

- 8.3 Hurricane Monitor Drawings

Drawing No.	Revision Level	Drawing Title
LIX-300	14	Hurricane Assembly
X330NJ-2	14	Elbow Aluminum 2.5"NH - Turning
X335	8	Elbow Vane - Cutting Detail
X336	6	Large "H" Insert - Blank
X337	6	Small "H" Insert - Blank
X339-R	0	Elbow Aluminum 2.5"
X339NJ-1	1	Elbow Alum 2.5"NH - Hardcoat
X339NJ-2	1	Elbow Alum 2.5NH - Machined
X320	28	BIG BEND ALUMINUM - MACHINED
X333NJ	1	ELBOW ALUM 2.5NH - MACHINED
X806	2	BELL/BIG BEND HURRICANE - POWDERCOAT
X339NJ	2	Elbow Alum 2.5"NH Amer Red - Powdercoat



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8.4 ZO Nozzle Drawings

Drawing No.	Revision Level	Drawing Title
ZFM732-2	0	BAFFLE K=150 & K=125 - LASER
ZFM732-2	0	BAFFLE K=125 & K=150 - MACHINED

**IX CONCLUSION**

The product described in Section II meets FM Approvals requirements. Since a duly signed Master Agreement is on file for Task Force Tips, Inc., Approval is effective the date of this report.

**EXAMINATION AND TESTING BY:** Robert M. Cordell

**PROJECT DATA RECORD:** P.I. 3045707

**ORIGINAL TEST DATA:**  
3024612  
3031038  
3040179

**ATTACHMENTS:** None

**REPORT BY:** **REPORT REVIEWED BY:**



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**Robert M. Cordell**  
Engineer  
Fire Protection

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**Brian K. MacDonald**  
Technical Team Manager  
Fire Protection