



**HOSE MONSTER**  
COMPANY



# HYDRANT FLOW TESTING

*Application Catalog*

# HYDRANT FLOW TESTING

## THE ONE-SOURCE SOLUTION FOR ALL OF YOUR TESTING NEEDS!

Our business was launched in 1996 with our flagship product, the Hose Monster®. It was the first flow-measuring device to enable safe discharge of high-flowing water, minimizing property damage and traffic interference.

The professionals at The Hose Monster Company understand the industries and sectors in which our clients operate. We turn

our practical knowledge into clear advice and find solutions that nobody else can provide. When you face unique and challenging testing situations, our knowledgeable staff stands ready to find the best equipment and procedural solutions for you. Your satisfaction is the truest mark of our excellence.

**HYDRANT FLOW TESTING**

**STANDPIPE TESTING**

**APPARATUS TESTING**

**SOFTWARE**

**FIRE PUMP TESTING**

**MAIN FLUSHING**

**DECHLORINATION**

### HOW TO ORDER

#### Online:

Go to [www.hosemonster.com](http://www.hosemonster.com) and click on the products

#### Phone:

Call 1.888.202.9987 to speak with one of our helpful Customer service representatives

#### Purchase Order:

Send to [service@flowtest.com](mailto:service@flowtest.com) or fax to 847.434.0073

*(Note: Requires a credit account with HFP)*

## HYDRANT FLOW TESTING

Flow tests are conducted on hydrants to determine water availability in planning for firefighting activities, fire sprinkler systems or domestic water demand. The tests help detect closed valves or wall deposits. This can be extremely useful

in determining the condition of the water distribution system being tested. A well-maintained water system enables firefighters to extinguish flames and prevent large-scale damage or loss of life.

## HOW OFTEN DO I TEST A HYDRANT?

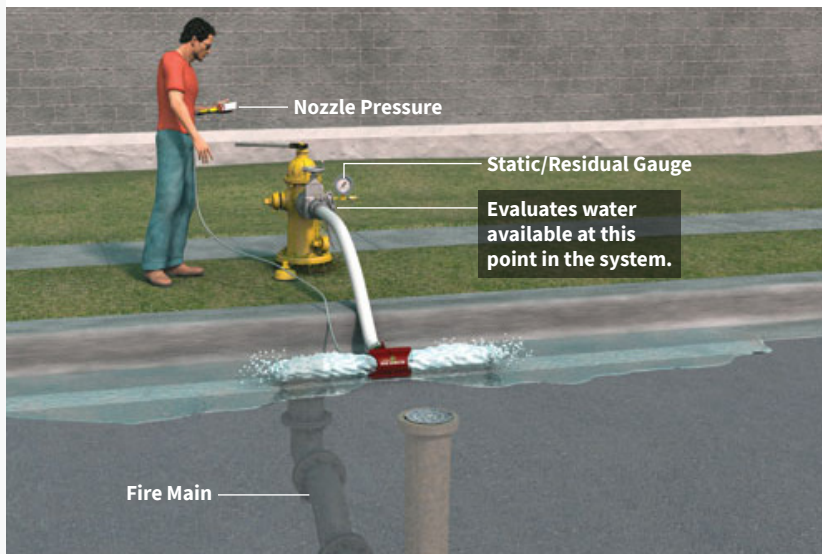
- AWWA recommends flow testing all areas at least every 10 years. (AWWA M17).
- NFPA requires flow testing of underground and exposed piping at least once every 5 years (NFPA 291)

## WHERE DO I FIND MORE INFORMATION ON HYDRANT FLOW TESTING?

- NFPA 291 — Recommended practice for fire flow testing and marking of hydrants
- AWWA Manual 17 — Installation, field testing, and maintenance of fire hydrants
- Hydrant Flow Test Calculator — Calculates the rated capacity at 20 psi for a fire flow test. Visit the calculators section on our resources page at [www.hosemonster.com/resources](http://www.hosemonster.com/resources)
- FAQs on Hydrant Flow Testing — Page 6 of this catalog or at [www.hosemonster.com/resources](http://www.hosemonster.com/resources)



# HYDRANT CAPACITY vs. MAIN CAPACITY



## HYDRANT CAPACITY FLOW TEST

The information derived from this test is used by the fire service to plan for fighting fires. If all hydrants in a system are tested, partially closed valves and other obstructions will become known. This test uses a single hydrant as both the test hydrant and the flow hydrant.

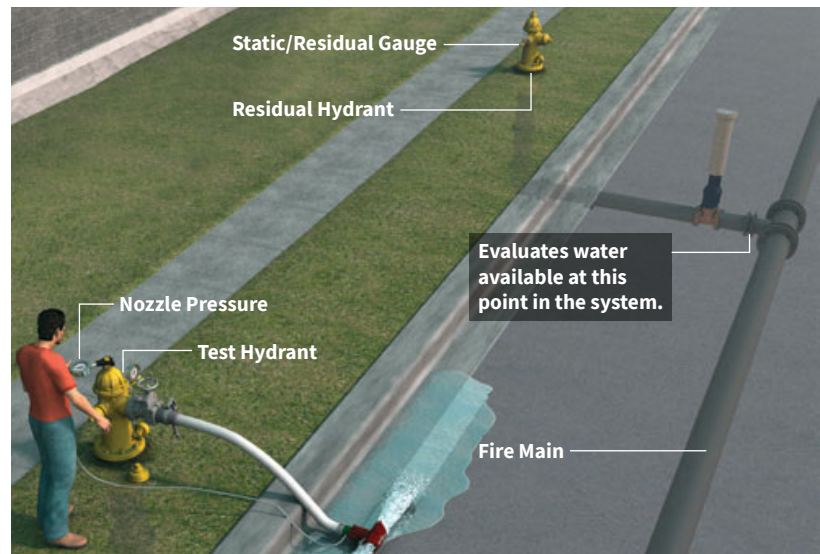
### SETUP

1. Attach gauge cap.
2. Attach hydrant slow-close gate valve and tighten all other caps.
3. Set the Little Hose Monster™ with Pitotless Nozzle™ in an appropriate location for flowing water.
4. Attach hose to Pitotless Nozzle™ and Little Hose Monster™ assembly.
5. Attach Remote Reader assembly to gauge to Pitotless Nozzle™.

### CONDUCT THE TEST

1. Slowly open the hydrant using the gauge cap to purge air from the hydrant. Close it when air is vented.
2. Record static pressure from gauge cap.
3. Fully open hydrant gate valve.
4. When the flow-rate stabilizes
  - a. Record nozzle pressure from the Remote Reader.
  - b. Record the residual pressure reading from the gauge cap.

*At this point, the test is complete*



## MAIN CAPACITY FLOW TEST

A Main Capacity Test evaluates the water supply of the fire main at the location of the test hydrant. The information derived from this test is used by city planners and contractors to consider the water supply for general use and fire sprinkler systems.

### SETUP

*At the test hydrant (pressure hydrant, static/residual hydrant):*

1. Attach gauge cap to test hydrant. Tighten all other caps.
2. Open test hydrant, vent air from hydrant body through the valve on the gauge cap assembly. Close it when air is vented.

### AT THE TEST HYDRANT

1. Set the Little Hose Monster™ with gauge to the Pitotless Nozzle™ in an appropriate location for flowing water.
2. Attach Remote Reader and gauge to the Pitotless Nozzle™.
3. Attach hydrant gate valve to the hydrant.
4. Tighten other caps.
5. Attach hose to Pitotless Nozzle™ and Little Hose Monster™ assembly.

### CONDUCT THE TEST

1. Record static pressure reading from gauge cap. (Test hydrant)
2. Open flow hydrant fully.
3. When the flow-rate stabilizes,
  - a. Record nozzle pressure from the Remote Reader. (Test hydrant)
  - b. Record the residual pressure reading from the gauge cap. (Test hydrant)

*At this point, the test is complete*

### AFTER TEST COMPLETION

1. Close all open hydrants and remove testing equipment. Replace and tighten caps. If the hydrant is a dry barrel type, note that the water drains properly from the hydrant.
2. Record the number of minutes that the water was flowing. This is used to account for the amount of water used during the flow test.

# ALL-IN-ONE TESTING BUNDLES


In an effort to make your job simpler, we bundle our products for ease of use, transportation, and storage. The following bundles are our recommended set-ups for Hydrant Flow Testing. Actual equipment needed may vary depending on intended use and preferences. Each component is sold as a separate line item and can be

substituted for the equipment best suited for your job. Contact The Hose Monster Company today to determine the best configuration, the best equipment, and the best setup for your testing operation.

*NH threaded coupling is standard. Other thread types are available by request.*

## LITTLE HOSE MONSTER™ HYDRANT FIRE FLOW TESTING BUNDLE #FFTK

Item #	Description
HML	Little Hose Monster™
PN2GRV	2" Pitotless Nozzle™ (493 to 1,305 GPM)
HMRR12	Remote Reader
GK100D4	Pressure Gauge 4" dial, 0.5% accuracy rated, 0 to 100 PSI (for Nozzle Pressure)
HGV25	Gate Valve (2½" F NH X 2½" M NH)
GCSW200	Gauge Cap, 2½" NST, with Pressure Gauge, 0 to 200 PSI (for Static/Residual)
HW107	Hydrant Wrench
WSPA101	Spanner Wrench
CASE920	Equipment Case
H2H.10YR	2 ½" x 10' Hose, Synthetic Nitrile Rubber



## LITTLE HOSE MONSTER™ HYDRANT FIRE FLOW TEST KIT #HMLK

Item #	Description
HML	Little Hose Monster™
PN#GRV	Select either 2", 1 ¾", 1 ½", or 1" Pitotless Nozzle Grooved. Depending on Anticipated Flow-Rate
GK100D4	4" dial pressure gauge 0 to 100 PSI, 0.5% accuracy rated
CASE720	Equipment Case
HMRR12	Remote Reader





# 4” BIG BOY HOSE MONSTER™ HYDRANT FIRE FLOW TESTING BUNDLE #FFTK4

Item #	Description
HMBB4	The Big Boy Hose Monster. Flow Testing. 4” F NH Swivel. Gauge Incl. (766 to 2,708 GPM)
HGBV4NST	Gate Valve (4” F NH X 4” M NH)
HMRR12	Remote Reader
GCSW200	Gauge Cap, 2½” NST, with Pressure Gauge, 0 to 200 PSI (for Static/Residual)
HW107	Hydrant Wrench
WSPA101	Spanner Wrench
CASE720	Equipment Case
H4.10.4	4” F NH X 10’ X 4” M NH. Connects to a 4” outlet

# 4.5” BIG BOY HOSE MONSTER™ HYDRANT FIRE FLOW TESTING BUNDLE #FFTK45

Item #	Description
HMBB4	The Big Boy Hose Monster. Flow Testing. 4” F NH Swivel. Gauge Incl. (766 to 2,708 GPM)
HGV45NST	Gate Valve (4” F NH X 4” M NH)
HMRR12	Remote Reader
GCSW200	Gauge Cap, 2½” NST, with Pressure Gauge, 0 to 200 PSI (for Static/Residual)
HW107	Hydrant Wrench
WSPA101	Spanner Wrench
CASE720	Equipment Case
H45.10.4	4.5” F NH X 10’ X 4” M NH. Connects to a 4.5” outlet and reduces to 4”

# 5” BIG BOY HOSE MONSTER™ HYDRANT FIRE FLOW TESTING BUNDLE #FFTK5S

Item #	Description
HMBB4	The Big Boy Hose Monster. Flow Testing. 4” F NH Swivel. Gauge Incl. (766 to 2,708 GPM)
HGV5S	Gate Valve (5” STORZ)
HMRR12	Remote Reader
GCSW200	Gauge Cap, 2.5” NST, with Pressure Gauge, 0 to 200 PSI (for Static/Residual)
HW107	Hydrant Wrench
WSPA101	Spanner Wrench
CASE720	Equipment Case
HS5.10.4	5” STORZ X 10’ X 4” M NH. Connects to a 5” STORZ outlet and reduces to 4”



## WHY SHOULD I USE A HOSE MONSTER® OVER THE HAND-HELD PITOT METHOD?

A few reasons:

- The hand-held pitot requires precise positioning where the pitot is half the orifice diameter away from discharge and the pitot tube is perpendicular to discharge. This is nearly impossible to hold by hand, which is why you will see a bouncing gauge needle and inaccurate readings.
- The hand-held pitot method requires you to guess the required coefficient depending on the shape of the hydrant nozzle. This is not always known.
- The hand-held pitot requires that the water is discharged out into the open. This method is a risk to safety and can also lead to property damage.
- The Little Hose Monster™ with the Pitotless Nozzle™ or the steel Hose Monster accessory make it easy to take consistent and precise flow-rate measurements.

## HOW MUCH FRICTION LOSS IS THERE WHEN USING A HOSE?

A hose causes friction loss, but it doesn't matter in a fire flow test. A hydrant flow test evaluates the water supply to determine what flow-rate will be available at 20 psi residual. A hydrant flow test requires three measurements: static pressure, residual pressure and test flow-rate. The reading from the gauge cap on the test hydrant gives you static and residual pressures. The Pitotless Nozzle™ or Hose Monster gives you the test flow-rate. The friction loss created in the hose results in lower test flow and, at the same time, greater residual pressure. This does not affect the predicted flow at 20 psi, as long as you're getting sufficient drop from static to residual. NFPA 291 recommends a drop of at least 25%, while AWWA M17 recommends a minimum drop of 10 psi.

## WHY SHOULD I USE A REMOTE READER?

Three good reasons. It enables you to take the pressure readings away from the flowing water, it keeps you dry, and it encourages workers to remove and safely store the gauge after a flow test.

## CAN WE USE THE TABLE FOUND IN NFPA 291 TO DETERMINE THE FLOW BASED ON OUR READING OF THE GAUGE FROM THE HOSE MONSTER?

No. The table found in NFPA 291 is not the same as the Hose Monster flow chart. We provide the appropriate flow charts with each Hose Monster or Pitotless Nozzle™ sold. Flow charts are also available in the resources section of the Hose Monster website. If you are taking hand-held pitot readings directly from a hydrant nozzle or pumper port, use NFPA Table 4.10.1 and apply the correct coefficient(s).

## DO I TAKE INTO ACCOUNT THE HYDRANT COEFFICIENT WHEN CALCULATING FLOW-RATE FROM THE HOSE MONSTER?

No. The flow-rate is measured correctly at the Pitotless Nozzle™ or the Hose Monster and not affected by the flow characteristics of the hydrant nozzle or pumper port.

## IS THE HOSE MONSTER OR PITOTLESS NOZZLE™ NFPA COMPLIANT? NFPA 291 OUTLINES ITS PROCEDURE USING A HAND-HELD PITOT.

NFPA 291 is a recommended practice but not a requirement. We are not aware of a standard that requires a hand-held pitot. NFPA does not yet require Approved/Listed devices for flow-rate measurement in either fire flow testing or fire pump testing. Standards tend to shy away from requiring a particular product to be used.

## PREVIOUSLY WE DID HYDRANT FIRE FLOW TESTS USING A HAND-HELD PITOT. WHY ARE OUR DISCHARGE FLOWS DIFFERENT?

The test flow-rate will be less using HoseMonster™ and hose, but the residual pressure will also be higher. This will not adversely affect the flow test when calculating flow at 20 psi residual. Remember, the test flow-rate by itself doesn't mean much. You also need to take into account static and residual pressures. The discharge flow-rates are also influenced by whether you're flowing from the pumper port or the nozzle port of the hydrant, the length of hose and the flow test device.

# ENGINEERING INFORMATION & FLOW RATES

## K-FACTOR TABLE FOR VARIOUS FLOW DEVICES

### BIG BOY HOSE MONSTER™

Device	K-factor	Orifice Diameter	psi Range	Flow Range GPM
4 to 10 psi (BigBoy Hose Monster™)	382.9	3.05"	4-10	766-1211
11 to 36 psi (BigBoy Hose Monster™)	376.0	3.05"	11-36	1247-2256
37 to 53 psi (BigBoy Hose Monster™)	372.0	3.05"	37-53	2263-2708

*Note: Due to the shape and size of the BigBoy Pitotless Nozzle™, the BigBoy Hose Monster uses three different K-factors over its operating range.*

### PITOTLESS NOZZLE™

Device	K-factor	Orifice Diameter	psi Range	Flow Range GPM
2" Pitotless Nozzle™ + Little Hose Monster™	156.0	2"	10-70	493-1305
2" Pitotless Nozzle™ + Open Atmosphere	167.2	2"	10-70	529-1399
1¾" Pitotless Nozzle™ + Little Hose Monster	104.7	1.75"	10-90	331-993
1¾" Pitotless Nozzle™ + Open Atmosphere	109.7	1.75"	10-90	347-1041
1½" Pitotless Nozzle™ + Little Hose Monster	37.2	1.125"	5-90	83-353
1½" Pitotless Nozzle™ + Open Atmosphere	37.0	1.125"	5-90	83-351

## CALCULATING FLOW RATES

### K-FACTOR FORMULA

Computes a flow-rate in GPM given a psi and a K-factor of the different flow devices.

$$Q = \sqrt{P \times K}$$

Q = flow-rate in GPM

P = velocity pressure in psi

K = K-factor of flow device

### THEORETICAL DISCHARGE THROUGH CIRCULAR ORIFICES FORMULA

Computes a flow-rate in GPM given a psi and a K-factor of the different flow devices.

$$Q = 29.84 \times \sqrt{P \times D^2 \times C}$$

Q = flow-rate in GPM

P = velocity pressure in psi

D = orifice diameter in inches

C = coefficient of flow device

## US/METRIC CONVERSIONS

### FLOW-RATE:

US Gallons/Minute x 3.785 = Liters/Minute

Liters/Minute x 0.264 = US Gallons/Minute

US Gallons/Minute x 0.1337 = Feet³/Minute

Feet³/Minute x 7.481 = US Gallons/Minute

### WEIGHT OF WATER:

US Gallons of Water x 8.3454 = Pounds

Foot³ of Water x 62.42796 = Pounds

### VOLUME:

US Gallons x 3.785 = Liters

Liters x 0.264 = US Gallons

US Gallons x 0.8327 = Imperial Gallons

Imperial Gallons x 1.201 = US Gallons

Feet³ x 7.48051945 = US Gallons

US Gallons x 0.1337 = Feet³

### LENGTH:

Meters x 3.2808 = Feet

Feet x 0.3048 = Meters

### PRESSURE:

psi x 0.0689 = Bars

Bars x 14.5038 = psi

psi x 6894.757 = Pascals

Pascals x 0.000145 = psi

Bars x 100,000 = Pascals

Pascals x 0.00001 = Bars

# DECHLOR DEMON

## WHY DECHLORINATE?

When chlorinated water is discharged in a flow test, it can drain into lakes, rivers and streams and harm aquatic life. According to AWWA, "Water released into the environment shall meet the applicable federal, state, provincial or local regulatory agency's residual chlorine limit." Your authority having jurisdiction provides dechlorination requirements.

## HOW IT WORKS

A portion of the water flowing through the Dechlor Demon™ is diverted through the bypass into a mixing tank, where it combines with a concentrated dechlorinating agent. The bypass flow is controlled by a precision indicating valve. The concentrate is reintroduced into the Dechlor Demon™ and hose, where it continues to mix with the water. This neutralizes the chlorine by the time it exits the hose.

# DECHLOR DEMON™



### PROTECT YOUR ENVIRONMENT

Keeps natural ecosystems around test sites free of harmful chemical pollutants and keeps you compliant with state and local regulation



### CONNECT TO ANY HYDRANT

The small footprint of the Dechlor Demon ensures no extra stress is put on the hydrant. The Dechlor Demon is available in 2.5", 4", or 4.5" with the option of either a 1 gallon or 10 gallon mixing tank.



### KEEP YOUR EQUIPMENT

The Dechlor Demon™ seamlessly integrates into your existing hydrant testing regimen and is available in NH or your thread spec.



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