



The low nozzle pressure/nozzle reaction characteristics of the Vindicator nozzle allow for high flows with less effort.

PHOTOS PAUL SHAPIRO

## GEAR TEST

# The Vindicator

## A firefighter-friendly nozzle that works

By Paul Shapiro

**W**e've all heard sales pitches about virtually every nozzle ever made—it's part of the routine. However, the new kid on the block, First Strike Technologies' (Algonquin, Ill.) Vindicator nozzle line, is actually pretty promising.

If you want to invest in a new attack nozzle, ensure your choice offers a high flow rate and an effective stream because those two factors determine how fast you can suppress a fire. Then, determine what other features you want in your nozzle.

In my department, we came up with the following list of desirable nozzle features:

1. High flow;
2. Low nozzle reaction (NR);
3. Rapid heat absorption;
4. Durable and reliable;
5. No maintenance;
6. Foam capable;

7. Automatic flush;
8. Effective range;
9. Effective footprint;
10. 10+ year warranty; and
11. Cost effective.

The Vindicator offers every one of these features. I would like to emphasize one important point made by First Strike: The Vindicator nozzle cannot replace the nozzles you already have. It's designed to augment your current arsenal.

### VINDICATOR SPECS

The Vindicator is a fixed-pattern nozzle that flows water in the straight-stream mode. It consists of two basic parts: the ball valve and the barrel. The ball valve utilizes a 1½" waterway capable of flows up to 500 gpm. It comes with 1½" threads on the inlet and outlet. The barrel features a stream shaper and a stream deflector that mold the water into a workable firefighting stream with low NR characteristics. You can also operate the Vindicator at nozzle pressures as low as 30 psi, further reducing NR.

The barrel's base features air inlet ports designed to introduce air into the fire stream, creating large droplets of water. In conjunc-

tion with the nozzle's high-flow capabilities, these large droplets produce rapid heat absorption, which, in turn, allows for a quicker knockdown. The air inlet ports also let you use the Vindicator as a foam nozzle. Depending on the foam manufacturer, you can expect foam expansion ratios ranging from 7-1 to 15-1 without a reduction in stream performance.

First Strike Technologies offers three different Vindicator handline nozzles and one



The Vindicator nozzle consists of two parts, a 1½" ball valve with a 1½" waterway and the barrel, which houses the stream shaper/deflector. It can be adapted to 2½" or 3" hose by using a 2½" x 1½" reducer.

Vindicator master-stream nozzle:

- Vindicator Light Attack—Produces 90–200 gpm for standard handline operations. Intended for use on 1½" and 1¾" hose, it's capable of 95 gpm at 50 psi nozzle pressure (NP) and 200 gpm at 100 psi NP. Cost: \$639.95;
- Vindicator Heavy Attack—Produces 175–425 gpm for heavy-handline attack units. It generates 250 gpm at 50 psi NP through 1¾" hose and 425 gpm at 100 psi NP through 2½" hose. Cost: \$699.95;
- Vindicator Blitz Attack—Produces 250–500 gpm for 2½" handlines. It's capable of 325 gpm at 50 psi NP through 2½" hose and 500 gpm at 100 psi NP. Cost: \$749.95; and
- Vindicator Master Attack—Produces 675–1,000 gpm for monitors, 1,000 gpm at 85 psi NP. Its operating NP ranges from 65 psi to 125 psi. Cost: \$1,099.95.



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The patented design of the Vindicator nozzle creates far-reaching, high-volume and large droplet, heat-absorbing streams.

- Fire knockdown (no visible fire on pallets): 6 seconds;
- After 6 seconds, the ceiling temperature dropped to 110 degrees F; and
- Total flow time: 6.2 seconds.

## THE VINDICATOR VS. A SMOOTH-BORE TIP

The following tests compared a standard, ½" smooth-bore tip to a Vindicator Heavy Attack nozzle.

### Flow Impact

This test used an impact plate attached to a certified load cell that measured water impact and placed this device 60 feet away from the nozzles. The ½" tip flowed 180 gpm, and the Vindicator Heavy Attack nozzle flowed 240 gpm. I know the flow rates differed, which explains the different impact readings, but these flow rates were used because they produced equal NR in both nozzles.

The Vindicator's impact measured 60.2 psi, while the ½" tip produced a 53.4 psi impact. In other words, the Vindicator Heavy Attack provided 6.8 psi (11 percent) more impact than the ½" tip with virtually the same NR. Thus, the Vindicator not only flows more water, it also carries it deeper into the fire.

### Nozzle Reaction

This test used a certified load cell attached to a device that measures NR. The ½" tip again flowed 180 gpm and the Vindicator Heavy Attack nozzle 240 gpm.

The results? The Vindicator produced a 60.2 psi NR, while the ½" tip's NR measured 62 psi. Thus, even though the Vindicator flowed 25 percent more water, it produced 1.8 psi (3 percent) less NR.

### Heat Absorption

This test compared the two nozzles in a series of test burns performed in a controlled-burn facility equipped with thermocouples to measure temperature. Six oak pallets were set aflame for each burn to make each burn and fire attack identical. The fire attack began when the ceiling temperatures stabilized. The test results:

#### Test #1—The ½" smooth-bore tip at 180 gpm, 50 psi NP:

- Ceiling temperature peaked at 830 degrees F;
- After 3 seconds of water application, the ceiling temperature measured 183 degrees F;
- Fire knockdown (no visible fire on pallets): 6 seconds;
- After 10 seconds, the ceiling temperature rose to 192 degrees F; and
- Total flow time: 10 seconds.

#### Test #2—Vindicator Heavy Attack at 180 gpm:

- Ceiling temperature peaked at 860 degrees F;
- After 3 seconds of water application, the ceiling temperature measured 170 degrees F;

#### Test #3—Vindicator Heavy Attack at 240 gpm:

- Ceiling temperature peaked at 890 degrees F;
- After 3 seconds of water application, the ceiling temperature measured 170 degrees F;
- After 6 seconds, the ceiling temperature dropped to 140 degrees F;
- Fire knockdown (no visible fire on pallets): 7 seconds; and
- Total flow time: 7.8 seconds.

#### Test #4—Vindicator Heavy Attack at 260 gpm, 50 psi NP:

- Ceiling temperature peaked at 820 degrees F;
- After 3 seconds of water application, the ceiling temperature measured 102 degrees F;
- Fire knockdown (no visible fire on pallets): 4 seconds; and
- After 10 seconds, the ceiling temperature dropped to less than 100 degrees F.

The results weigh heavily in the Vindicator's favor. Utilizing the same flow as the ½" tip, the Vindicator absorbed more heat—its final ceiling temperature measured 42 percent cooler than the smooth-bore tip's—and cooled the room 38 percent faster.

At the same nozzle pressure, the Vindicator dropped the room temperature 44 percent lower than the ½" tip in the same amount of time, knocked the fire down 33 percent faster and reduced the ceiling temperature 48 percent lower.

A recent independent evaluation of the Heavy Attack Vindicator evaluated the nozzle's range while delivering water at a 20° angle above horizontal. The results:

NP	GPM	Range
40 psi	210	90 feet
50 psi	250	100 feet
60 psi	285	118 feet
70 psi	330	133 feet
80 psi	365	156 feet
90 psi	400	165 feet
100 psi	440	178 feet
110 psi	460	191 feet

If you're serious about enhancing your fire suppression capabilities, take a look at the Vindicator line of nozzles. For more information, call First Strike Technologies at 847/658-3216, or visit [www.vindicatornozzle.com](http://www.vindicatornozzle.com).