

▼ advertisement ▼

SUBSCRIBE  e-newsletter  magazines

SEARCH

Advanced

Home | Print Edition | Training | News | FDIC & Events | Links | Contribute | Buyers Guides | Classifieds | |
Contact

Fire Engineering

▼ advertisements ▼

NOZZLE SETTINGS

 [SAVE THIS](#)

 [EMAIL THIS](#)

 [PRINT THIS](#)

 [MOST POPULAR](#)

We recently had an officer's meeting. During the meeting, we asked, "What do you have your nozzles set at?" The answer was surprising. Many officers said they set them at 95 gpm because the hoselines are easier to handle. Now, granted, most room-and-contents fires can be handled with 95 gpm, but what about those fires that necessitate larger flows?

Most would think that it would be easy to simply "dial up" the gpm setting and let 'er rip. Well, we found instances where the nozzleman (and officers) neglected to dial up when necessary, probably because of anxiety and stress.

▼ advertisement ▼

John "Skip" Coleman, deputy chief of fire prevention, Toledo (OH) Department of Fire and Rescue, is author of *Incident Management for the Street-Smart Fire Officer* (Fire Engineering, 1997) and *Managing Major Fires* (Fire Engineering, 2000), a technical editor of *Fire Engineering*, and a member of the FDIC Educational Advisory Board.

Question: *Engine company officers say most engines set their automatic nozzle 1 3/4-inch preconnected hoselines at 95 gpm because it is easier to handle the line and 95 gpm is adequate for the majority of fires. Does your department have a policy on the initial gpm at which to flow or pump?*

Ron Hiraki, assistant chief, Gig Harbor (WA) Fire & Medic One

Response: *We developed a simple fireground hydraulics chart to standardize our pump pressures. This is to ensure that all members know what to expect out of their hoseline. For a 1 3/4-inch preconnect with an automatic nozzle, our beginning pump pressure delivers 150 gpm. Our members believe that the hoseline is still manageable and has plenty of "knockdown" power. The fireground hydraulics chart offers choices for increasing the volume*

of water delivered to 175 gpm or 200 gpm.

Use of the fireground hydraulics chart is not an official policy or a directive. It is simple and easy to use, so most pump operators, career or volunteer, will use it. Another reason some officers or departments deliver a lower gpm may be related to the amount of water carried on the apparatus. Since we serve rural, nonhydranted areas, the smallest amount of water we carry is 750 gallons. Most of our engine companies carry 1,000 gallons.

Rick Lasky, chief, Lewisville (TX) Fire Department

Response: *Our department does not use automatic or adjustable nozzles as a primary attack line in structure fires. Our handlines are equipped with the following:*

- *Crosslays that consist of 200 feet of 1 3/4-inch hose with a nozzle that flows 250 gpm at 50 psi or 425 gpm at 100 psi.*
- *200 feet of 2 1/2-inch hose with a nozzle that flows 325 gpm at 50 psi or 500 gpm at 100 psi.*
- *Front "bumper" line on the engines and quints that are 100 feet to 150 feet of 1 3/4-inch hose with a fog nozzle for car fires, rubbish, and miscellaneous fires; smooth bore nozzles are also used when adding additional lines after the initial leadouts.*

My concern is that those who might feel that 95 gpm is adequate will get caught without enough water or be put in a situation where they will have to start dialing in the amount of water needed. If it works for them, fine. But, I would rather our firefighters go in with enough water every time regardless of the size of the fire. Better to have more water than not enough!

Another factor is that when you practice your leadouts enough and work on that skill, it becomes a lot easier when you are proficient with what you are using. Today's fire is not that much different from yesterday's, but what is burning is different. It's burning a lot hotter and flashing a lot faster. I would rather have the peace of mind of knowing that our firefighters are going in with what they need every time, no matter what.

Leigh T. Hollins, battalion chief, Cedar Hammock (FL) Fire Rescue

Response: *Our policy is that our five engines are set up the same and offer the officer a variety of choices of preconnected hoselines, depending on the conditions on arrival, the occupancy type, and other factors. I believe a minimum of 125 gpm is required on any working fire.*

We recently switched from automatic to low-pressure, high-volume nozzles because of several reasons. First, we want to use combination nozzles, which allow the use of a fog nozzle at the end of a 15/16-inch solid-tip nozzle. This allows an even wider choice of stream as well as gpm flow. Additional benefits are that the water flow can be shut off at the nozzle and additional hose can be added without shutting down the line at the pump.

Our 1 3/4 -inch preconnects offer the choices of 125 gpm fog, 200 gpm fog, and 200 gpm solid. The set engine pressures vary from 100 to 175 psi, depending on the length of the preconnect, the nozzle size, and if the fog or solid tip is used. Additionally, we have one 200-foot 2 1/2-inch preconnect on each engine that flows 250 to 300 gpm, depending on which nozzle is chosen. The 2 1/2-inch line engine pressure is 80 psi (solid) or 130 psi (fog).

This system works best for the types of firefighting we do most-vehicles, trash fires, mobile homes, duplexes, and single-family homes. For the larger homes and mercantile occupancies, which are abundant in our area, we have the option of applying greater gpm with a solid tip advantage when required.

Gary Seidel, chief, Hillsboro (OR) Fire Department

Response: We use 1 1/2-inch preconnect hoselines. In reviewing our history of the use of adjustable-flow nozzles, we first set them at 125 gpm. However, approximately 10 years ago we switched to a 95-gpm nozzle setting on our 1 1/2-inch preconnects. Our workforce was not comfortable with the flow rates and received permission to conduct a series of flow tests with the 95- and 125-gpm preset nozzles. The test results found no appreciable difference in handling the hoselines, and it was easier to move the hoselines because of less kinking. The best result was more available flow when a situation dictated the need. So, for the past year and a half, we have set our adjustable flow nozzles at 125 gpm and with a 30° fog pattern so that when members check the nozzles daily and during emergency operations they know the status of the nozzle.

The volatility of today's fireground necessitates that we constantly look at the building features with which we are confronted at the emergency scene: construction, furnishings, and high fuel loads. We should not sacrifice adequate flow rates just for ease of use.

Thomas Dunne, deputy chief, Fire Department of New York

Response: Department policy determines the diameter of the hose to be used in various fire scenarios. Specific flow and pressure parameters are more difficult to establish, since there are so many variables in different fire operations.

The number of hose lengths stretched, the height of the building in which the nozzle is operating, and the presence of any kinks in the line all influence the pressure requirements at the pump panel as well as the gpm flow.

Ample flow and pressure often may be determined by observation. If one firefighter can easily handle a 1 3/4-inch hoseline, you are not getting an adequate firefighting stream. If two firefighters are struggling to control the hose, you obviously have to cut down on the pressure. Generally speaking, our engines do not exceed 250 psi, and 180 gpm is considered an ideal flow for an attack line.

As long as there is adequate communication among the engine officer, nozzle team, and pump operator, it is probably better for a department to allow for flexibility in flow and pump variations instead of maintaining rigid requirements. The engine officer should concentrate on coordinating the overall fire: Is the hoseline placed in the best position in the building? Are the ventilation efforts properly timed and controlled? Assuming there is an adequate gpm flow, these are the factors that more often have a greater influence on the operation's safety and success.

Jeffrey Schwering, lieutenant, Crestwood (MO) Department of Fire Services

Response: My department has recommended guidelines for pumping our preconnected 1 3/4-inch lines. We start out pumping our low-pressure nozzles between 96 and 185 psi.

Normally, our engineers start out between 120 and 125 psi, which gives us approximately 151 gpm. This flow generally is sufficient for a vehicle, dumpster, or a small one- or two-room structure fire. The company officer determines if more water will be needed out of that line. When we placed the nozzles in service, we calculated flows with a fire calculator to provide our company officers and engineers with the most accurate information possible.

We operate our nozzles on a low-, medium-, or high-pressure system. Low pressure is 96 psi for 135 gpm, medium pressure is 121 psi for 151 gpm, and high pressure is 181 psi for 185 gpm. The company officer chooses the flow most appropriate for the situation. These options better equip all department members to provide the best service possible to our residents and to ensure the safety of our firefighters.

Michael J. Allora, lieutenant, Clifton (NJ) Fire Department

Response: Our department recently converted to a low-pressure, break-apart nozzle for use on our 1 3/4-inch preconnects. We went with this type of nozzle because we wanted to establish a higher minimum flow rate for our preconnected handlines and to relieve some of the nozzle reaction for the firefighter on the nozzle. We were also able to satisfy those who wanted to keep the fog nozzle and those who wanted a smooth bore nozzle.

We referenced NFPA 1410, Standard on Training for Initial Fire Attack, which recommends flowing a total of 300 gpm from the first two lines. With the new nozzles, the fog tip flows 150 gpm at 50-psi nozzle pressure. The smooth bore nozzle is 7/8 inch, which flows 160 gpm at 50 psi. Our pump discharge pressures are standardized for the 150- and 200-foot preconnected handlines.

This setup works well. The increased flow allows the attack crew to extinguish a larger fire in the same time or the same fire in less time. This keeps the fire confined to a smaller area, causes less damage, decreases fatigue, and increases the safety of those operating the line and those protected by it-the search crews and civilians.

Craig H. Shelley, EFO, CFO, MI FireE, fire protection advisor, Advanced Fire Training Center

Response: In my years at the Fire Department of New York, I was taught that 180 gpm is an effective interior stream. Many departments, however, choose to use much lower gpm settings. I would rather use the highest setting available, knowing that I can always cut back if necessary. In an industrial setting, this point is crucial, especially when using the streams for cooling.

This brings up another point: Departments that get in the habit of stretching only 1 1/2- or 1 3/4-inch attack lines for everything usually get caught short-handed when the smaller attack line with limited flow is stretched for the larger fire. Remember, big fire, big water.

Also, a department that uses foam operations frequently should ensure that the attack nozzle is matched with the foam eductor. This helps to ensure adequate foam solution at the nozzle.

Jim Grady III, chief, Frankfort (IL) Fire Department

Response: Our department has adopted the philosophy of volume over pressure-that is to say, we operate at 150 gpm at 100 psi. The safety of our fire suppression crews is the first priority, and that is ensured with volume.

We also work with high-volume gallonage, 150 gpm at a lower pressure of 75 psi. The companies have not encountered any problems with handling the line during an attack. I talked with our lead instructor for engineering/hydraulics and one of our company officers; they verified this information-I sought the opinion of the members who actually work the line.

Look at the calculation involving a 14,400- square-foot building: dividing by 100 nets you a flow of 144 gpm. Dividing by 0.5 (30 seconds), you would need the flow of 122 gpm. This is just a figure we used in going with 150 gpm. Finally, an operator familiar with nozzles and hose lengths would already have precalculated the engine pressure. We also looked at flashover situations and, once again, the safety factor; we encourage an aggressive first-in line attack.

Kai W. Rieger, captain, Jackson Township Fire Department, >Canton, Ohio

Response: As an engine company officer, I disagree with the statement regarding ease of operation and adequate flow. Admittedly, it is easier to handle a line at 95 gpm vs. the 150 to 185 gpm more often recommended. However, it is relatively common for one nozzle

firefighter to operate a 1 3/4-inch line while kneeling or lying on the line. There are very few instances where one must operate a line standing up while fighting interior fires.

Current recommendations for today's synthetic-laden interior fires with 1 3/4-inch lines call for a minimum of 150 gpm with the optimal being 185 gpm. Some fires can be handled with 95 gpm, but a 1 3/4-inch line at 95 gpm many times can be overpowered by a well-involved interior fire. As the old saying goes, "Don't take a knife to a gunfight." If you are going through the hassle of stretching a 1 3/4-inch line, at least supply the gallonage the hose is capable of delivering. If only 95 gpm will be flowed, stick with the 1 1/2-inch line you have lying around the firehouse.

We operate our hoselines with nonautomatic combination nozzles and a break-apart tip with a 15/16-inch orifice. The combination tip flows 150 gpm at 75-psi nozzle pressure, with the break-apart tip operating at 185 gpm at 50-psi nozzle pressure. This configuration offers flexibility while still delivering the needed gallonage. The pump operator must be advised of the nozzle change to adjust pump pressures accordingly.

Tom Yohe, captain, Webster Groves (MO) Fire Department

Response: We do not have a policy. Fire extinguishment using water is essentially a battle between heat energy production (Btus) and heat energy absorption (gpm).

When using mathematical calculations for needed fire flow, the formula usually includes the latent heat energy needed to completely convert the applied water to steam. Since the most common nozzle pattern from an adjustable combination fog nozzle is a straight stream, the large water droplets do not allow enough surface area to be exposed to the heat for complete conversion to steam. This results in an underestimated fire flow.

Many methods for calculating fire flow do not consider the changes in fuel loads and fuel composition. Some studies contend that most fires are oxygen-driven events and that the fuel composition does not greatly affect Btu production. All I know is that today's fires are hotter than ever. Btu production is not the end of our fuel composition problem. Today's hydrocarbon-based fuels produce highly flammable environments that result in rapid fire spread. It is suspected that in many cases the smoke-filled environment is actually too "rich" to burn until we open the door or take the window. In addition to fuel composition, people have more "stuff" to burn. The increased fuel load results in higher temperatures and more rapid fire spread.

Ninety-five gallons per minute may be enough water to extinguish some fires. However, today's ever-changing fire environments demand that we bring the added protection of additional heat-absorbing capacity. Is 150 gpm enough?

Joseph D. Pronesti, captain, Elyria (OH) Fire Department

Response: I believe the question should read, Does your department have enough fires, or does it train enough to know if 95 gpm is sufficient? My department tries to maintain anywhere from 125 to 150 gpm with an automatic fog nozzle. We have no set policy. Sometimes, it shows when you have inexperienced pump operators. We placed smooth bore nozzles in service within the past couple of years. Each engine is set up with one preconnect with a fog, the other a smooth bore. The difference in fire attack with a smooth bore is amazing.

The automatic nozzle, in my opinion, can often deliver a "good looking" stream but not the proper number of gpm needed to combat the fire.

Fuel loads today are mostly plastics. They burn hotter and faster than the products of 40 to 50 years ago, when adjustable and automatic nozzles were gaining in popularity.

An engine company in today's world must be knowledgeable, well-trained in hoseline

advancement, and-when the situation dictates-somewhat aggressive when combating a room-and-contents fire. The mindset that "95 gpm is adequate for the majority of fires" is incorrect. With the lack of fires and the inexperience of crews today, tunnel vision can be a common affliction. You might stretch and try to attack "just as we always do" and get caught without enough fire power.

Know your enemy; know how to beat it. Taking in 95 gpm all the time may beat you and your crew. If you feel more than 95 gpm takes away your mobility, train on hoseline advancement.

Fred Taylor, battalion chief, Bryan (TX) Fire Department

Response: *Why would I want to use 1 3/4-inch hose for 95 gpm unless it is for mop-up or a trash fire? I could do that with a 1 1/2-inch line flowing 125 gpm and still have maneuverability. My department pretty much subscribes to Paul Shapiro's theory of big water and the fact that all it will do is put out the fire more quickly. Our initial attack is 200 gpm, and fires GO OUT. Technique is more important, but you have the big lines for a reason, so use them.*

Our normal staffing is three to an engine, so you usually will wind up on the line by yourself. Remember our recruit days when we were taught that we should achieve knockdown within 10 to 15 seconds and that anyone should be able to handle the line for that long? If not, you need more water or you're not getting it in the right place. If you need to move, shut down. Interior work should be done from a hands-and-knees position anyhow, not standing up. We recently have tried some 75-psi automatics. They seem to work well and, at 75 psi, the hose doesn't kink like with the old 50-psi nozzles.

I also work with a very rural volunteer department, which is the only department in the county to use 1 3/4-inch instead of 1 1/2-inch hose. Even here, we use them only with the water we can bring and shuttle. We will not flow less than 125 gpm and usually initially start at 200 gpm.

Tom Sitz, lieutenant, Painesville Twp. (OH) Fire Department

Response: *We do not have a written SOP stating that all our handlines be pumped to maintain a certain number of gpm. However, for the past 13 years, all of our 1 3/4-inch handlines have been pumped at the appropriate pressure to maintain 150 gpm departmentwide for interior firefighting. When we switched from 1 1/2- to 1 3/4-inch lines in 1993, we looked at several hose brands and nozzles that would allow us to maintain 150 gpm. We determined that 150 gpm was the volume we needed for offensive fire attack when we stretched a 1 3/4-attack line, and we bought hose and nozzles to fit those needs.*

Ninety-five gpm certainly will handle a one- or two-room fire, but with today's volatile fire environment, we doubt that it would handle anything beyond that. Our job as the engine is to make the fire area as quickly as possible and kill the fire as soon as we get to it. If this means the line is a little heavier and the nozzleman has to endure a little more nozzle reaction to accomplish those goals, so what? We are not in the business of making things easier for us at the expense of the citizens we swore to protect, and for every second that the fire continues to burn because we are not applying enough gpm, we and the residents suffer.

David Polikoff, captain, Montgomery County (MD) Fire and Rescue

Response: *Two issues are involved here: (1) Are we still using automatic nozzles, and (2) are we pumping them at 95 gpm?*

My department does not have a written policy covering a minimum gpm for given hoselines; however, the unwritten rule is a minimum of 150 gpm for the 1 3/4-inch attack line.

I feel we should abandon the automatic nozzle (50 to 350 gpm) and move to a fixed-gpm, low-pressure or smooth bore nozzle. Whichever you choose, the minimum should be 150 gpm. With the reduced staffing on our engine companies, the lower pressure obtained from a low-pressure fog or smooth bore nozzle results in decreased nozzle reaction, which allows one person to control the nozzle; therefore, the officer can function as the officer and not as a backup firefighter.

Some argue that using 95 gpm reduces water damage. My position is that higher gpm means quicker knockdown, which also means less water damage. Thirty years ago, we were burning natural materials (wood, wool, leather, for example). These materials released about 8,000 Btus per pound. Today, everything is plastic, and about 18,000 Btus per pound are released. The extra water is needed to ensure effective knockdown and protection for the firefighters.

The bottom line is this: If a fire requires 200 gpm to achieve knockdown and you bring 95 gpm to your fight, you will lose. Of course, you will eventually achieve knockdown once the fire burns down to a 95-gpm fire. You may have replaced the decreased water damage with excess fire damage.

William R. Mora, captain, San Antonio (TX) Fire Department

Response: *Since firefighter safety during interior attacks depends on the protection, effectiveness, and reliability provided by attack lines, each department selects the handline pressure and fire flow with care. When using an automatic nozzle rated at 200 gpm, we use an engine pressure of 170 psi through four sections of preconnected 1 3/4-inch handlines to deliver a flow of 200 gpm per handline.*

Taking a worst case scenario approach, this flow allows firefighters the option of opening the nozzle halfway to obtain a flow of 100 gpm and to fully open it to 200 gpm when larger volumes of fire are encountered. This pressure and flow standard is used within an overall departmental SOP and with the understanding of the application time limitations based on the volume of water in the booster tank prior to obtaining a water supply.

As adequate staffing arrives on the scene, this flow per handline routinely allows up to 10 handlines to be used by two attack engines positioned in front of the structure. Although the flow per handline is of utmost importance, the flexibility of multiple handlines also provides an enhanced level of safety for the overall operation.

Mike Daley, lieutenant/training officer, Monroe Twp. (NJ) Fire District #3

Response: *In our department, it is the first-arriving officer's responsibility to determine the fire flow needed for the incident. That information is then given to the pump operator.*

It is imperative that the engine company attacking the fire has the tools to do the job safely and adequately. One of the most important tools, of course, is the correct amount of water needed to absorb the amount of Btus given off by the fire.

All of our firefighters serve as pump operators. All have successfully completed an academy pump operator training course and have pocket pump cards to help with the calculation process. A list of pump discharge pressures is also listed inside on the driver's side of the pump operator's door. As the operator opens the door, there is information pertaining to the appropriate discharge pressure based on the needed gpm, the type of nozzle, and the size and length of the hose stretched. We also have an Engineer's Resource Guide in each apparatus, which contains tables, pump pressures, friction losses, drafting procedures, and other information the operators need. Pump operator training and review modules are included in our yearly training program so all of our operators are fully prepared.

Stan Mettinger, captain, Brooksville (FL) Fire Department

Response: Our department preconnects (with the exception of bumper lines) are 200 feet of 1 3/4-inch hose with a break-apart nozzle and a 175 at 75-psi fog tip attached. We set our master discharge pump control at 145 psi. At 175 gpm, the friction loss is approximately 45 psi/100 feet (depending on the formula used). Theoretically, you would need to pump the line at 165 psi to flow the maximum gpm. Using that pump discharge pressure (145) and flow would leave you with 55 psi nozzle pressure and equate to a discharge in the area of 125 to 130 gpm.

We have discussed the need to increase the pump pressure to allow for maximum flow, but there is hesitation because of concern about being able to handle the line. So we have nozzles capable of flowing a good amount of water, but we limit ourselves (as most do) to flowing less water and living with it.

Because of the much greater fuel load a suburban fire department sees in homes today compared with the fuel load of the same size house 15 years ago, I do not feel that 95, 100, or even 150 gpm is enough water to get the job done in most cases. We have the capability to deliver 175 or 200 gpm to the seat of the fire; why should we not use that capacity as a standard? This discussion could lead to the age-old debate of fixed-gallon vs. automatic nozzles.

Mike Bucy, assistant chief, Portage (IN) Fire Department

Response: Our department has been back and forth forever on the age-old question of what pressure to pump at. We are considering rewriting the policy to reflect optimum gpm based on the fire's showing or the gpm as determined by command. The idea of selecting the gpm based on the ease of handling the line should have gone out with the two-way radio. A variety of nozzles that fit the task and the department are available. We are planning to evaluate the newest technologies until we find the optimal gpm-vs.-maneuverability model. We are fully aware now that gallons of water, not pressure, put out fire.

Brian K. Singles, firefighter, Hampton (VA) Fire Department

Response: Our department does not have a set policy for pumping 1 3/4-inch attack lines. Our driver/pump operators are taught the basics of pumping fire apparatus in driver pump operator school after finishing rookie school and then learn from the veterans the proper way to set pressures for and to pump different size lines. Most of us were taught the three basic pressures-50, 80, and 100: 50 psi for handheld attack lines with a solid bore nozzle, 80 psi for master streams with a solid bore nozzle, and 100 psi for all fog nozzles, handheld or master streams.

Our 10 front-line engines are set up with at least two preconnected attack lines with fog nozzles. One is 150 feet long and the other 200 feet long; most of the time, these engines are driven and operated by seasoned veteran pump operators who have at least 10 years of experience and are very reliable when operating on the fireground. These veterans pump the engines' attack lines (1 3/4-inch) at a range of 100 psi to a maximum of about 120 psi.

When speaking recently with a couple of rookie firefighters who were fresh out of drill and driver pump operator school, they mentioned that they were taught to pump a 1 3/4-inch attack line with a fog nozzle at 150 psi. I told them there is no way anyone should have to pump an attack line at that high a pressure. I quickly corrected them, and they thanked me.

The department has gone through many types and brands of fog nozzles in the 23 years I have been here. Because of this, most of us have adjusted the pressures at which we pump the engines. Recently, we put a new type of nozzle in service on all pumping apparatus, including our two first-run aerial devices. It can flow 175 gpm at 100-psi pump discharge pressure, making it easy to maneuver around corners and advance to the second or third floor of a structure. The only adjustments the operator should have to make at the pump panel is for supplying a standpipe system or adding the correct additional pressure for elevation; this information is learned by experience. In my long career, I have found that the first-in pump operator is the most important person on the fireground, responsible for the

outcome of the entire operation.

Matt Rettmer, lieutenant, Castle Rock (CO) Fire Rescue

Response: Over the past few years, our department has improved the training for the driver/engineer/chauffeur position to validate the position. It has become standard for us to operate 200-foot-long 1 3/4-inch handlines at 150 gpm minimum. We have trained with two-person crews to ensure that all members can maneuver the lines and handle this flow.

As we all have learned, today's fires produce a lot more Btus. Thus we need more water to cool and extinguish these fires. For our personnel, anything less than 150 gpm puts us in more danger than doing a little extra work to get to the seat of the fire.

Eric Dreiman, lieutenant, Washington Twp. (IN) Fire Department

Response: Our department currently operates with low-pressure break-apart nozzles. The fog tip on these nozzles is rated to flow 150 gpm at 75 psi; the 15/16-inch smooth bore tip under the fog is rated to flow approximately 185 gpm at 50 psi. By using nozzles rated to flow at lower pressures, we can meet our required fire flows without having to operate at high pressures. This reduces firefighter fatigue and wear and tear on pumps and hose. If higher flows are needed, we still have the option of increasing the pressure to flow as much as 200 gpm from the fog tip and 250 gpm from the smooth bore at pressures still manageable for our nozzle crews.

With the potential for the added fire loads we face today, I do not feel a nozzle rated for 95 gpm is adequate. When you evaluate how much plastic and other petroleum-based products make up homes and businesses today, it is very important to have higher fire flows. Since staffing is a concern for most departments, using nozzles capable of flowing higher volumes is a necessity.

Mike Stuive, firefighter, Corpus Christi (TX) Fire Department

Response: Although our department does not have a set maximum or minimum flow rate for a specific type of fire, the majority of our members agree that the greater the flow rate, the better. It is in our best interest to hit the fire with the greatest amount of water the 1 3/4-inch handline can deliver-greater than 150 gpm, usually around 200 gpm for the type of nozzles we use. Although 95 gpm is capable of suppressing 95 percent of the fires we encounter, what about that one fire where the Btus are greater than the 95 gpm flow can handle? The ability to flow the maximum amount available initially may mean the difference between immediate suppression and a second alarm.

As for handling the hose at a greater pressure, it has actually become easier to handle because the hose no longer gets caught around corners or on objects in the structure. It travels smoothly along and around corners because of the hose's increased stiffness. Nozzle reaction increases, but if the nozzleman tries to move the nozzle out in front and does not tuck it under his arm, it is easier to handle the nozzle at greater flows. And, if we keep the hose closer to the ground and as straight as possible, nozzle reaction is decreased.

Carl D. Avery, program coordinator, York County (PA) Fire School

Response: I am originally from a small rural volunteer fire department in upstate/central New York. It was not uncommon to have a six- or seven-mile run just to get to the scene of the fire. Mutual aid was equally distant. This meant that because of response times, many of the structure fires to which we responded were beyond the room-and-content phase.

In the late 1980s, my old department switched to a two-inch attack line with high-gallonage fog nozzles (they are now switching to a 1 1/8-inch smooth bore). Our targeted flow rate was

200 gpm delivered at the nozzle at the end of 200 feet of preconnected line. Our typical hose crew was then and is now two firefighters per line. To operate this caliber of attack line demands frequent drilling, but it certainly can be done, as testified to by almost 20 years of experience.

The important question is, What flow rate does the fire demand for control? In these days of minimum staffing and the trend of declining numbers of volunteers, high-flow attack lines—lines that give the nozzle personnel the ability to rapidly kill and control the fire—are mandatory. The difference between attacking a fire with a 95-gpm handline and a 200-gpm handline is two people (considering that no one should enter a fire alone, minimum staffing per hoseline should never go below two per line). If the fire demands more than 95 gpm for control, you have at least just doubled your personnel demands.

The bigger the fire, the bigger the volume of water has to be. Some (but not most) fires can be handled by a pressurized water fire extinguisher. The gpm delivered to the fire kill it. I like to use the analogy of a cat in a house: The fire is the cat. That fire could be anything from a small easily tamed house cat to a rampaging tiger. If you were sending your firefighters in to get that cat, would you equip them with a small-caliber weapon, or would you want them equipped with a weapon that will control the animal they encounter with the first shot?

Make sure your firefighters can put the wet stuff on the red stuff in sufficient quantities to kill that fire before it has a chance to kill them.

Fire Engineering June, 2006

[Looking for more news and information? Search our archives. Click Here!](#)

Interested in a subscription to Fire Engineering Magazine?
[Click here](#) to subscribe!

[Return to Previous Page](#)

Sponsored Training Papers Library

Recently Added Training Papers

[PIDs as Arson Investigation Tools](#) (06/19/2006, RAE Systems)

[CO and Natural Gas Detection for Fire Dept. Engine Companies](#) (06/19/2006, RAE Systems)

[PIDs as Hazmat Tools](#) (06/19/2006, RAE Systems)

more 

♥ advertisement ♥



[Home](#) | [About Us](#) | [Corporate Website](#) | [Privacy Policy](#) | [Courage and Valor Foundation](#) | [Site Map](#)



| Banner photo credit: John Cowpland © | [View all PennWell sites](#) | [View all PennWell events](#)

Also Visit: [Electric Light & Power/Utility Automation T & D](#) | [PennWell Petroleum Group](#) | [WaterWorld](#)

Copyright © 2006: PennWell Corporation, Tulsa, OK; All Rights Reserved. | [Terms & Conditions](#) | [Webmaster](#)