

Sprinklers, the next generation



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Ronny J. Coleman has served as fire chief in Fullerton and San Clemente, Calif., and was the fire marshal of the state of California from 1992 to 1999. He is a certified fire chief and a master instructor in the California Fire Service Training and Education System.

The letter “G” often is used behind a number to indicate the generation of something, for example a 4G cellphone network. A new number usually means that the previous generation soon will be obsolete, which isn’t a bad thing if you don’t care about being on the cutting edge.

What digit would be in front of the “G” for today’s fire sprinklers? The sprinkler system has undergone amazing transformation over the last 150 years, and people continually are finding more and more ways to use sprinkler technology to limit the fire problem.

Sonny Scarff — a longtime sprinkler advocate — recently retired from the Marriott International as the senior director of fire protection. In October, Scarff demonstrated to more than 200 fire-service participants a new generation of fire sprinklers at the Maryland Fire and Rescue Institute.

The Minifog EconAqua water-misting system applies extinguishing water through special nozzles or sprinklers, multiplying the total surface area many times through fine droplet formation. The water entrains the heat from the fire, so its base and surroundings are cooled immediately. The evaporation also captures a great deal of additional latent heat, while the steam impedes the supply of oxygen to the base of the fire. The reduction of the oxygen concentration in the immediate vicinity of the flame zone results in an additional smothering effect. The arrangement of the nozzles and the optimal droplet formation mean that the base of the fire is reached, even still if there are inhibiting factors, such as thermal currents or air movement.

The demonstration highlighted the generational differences sprinkler technology. The first generation of sprinklers produced large droplets and relatively low pressures. The second generation, the residential sprinkler system, responded faster and dealt with the products of combustion. The third generation, the high-pressure misting systems, produced small droplets under high pressures.

The new generation uses relatively low or medium pressures but produces a more mist-like distribution pattern. Its design operates with the premise that it’s better to put a small amount of water on a fire in its early stages, rather than wait until the fire gets bigger and requires larger volumes of water. With a minimum supply pressure of 72 psi, the Econ Aqua sprinklerhead flows 8.2 gpm, compared to the 7 psi and 16 gpm of a classic residential head. Test results indicate that this system uses up to 85% less water than conventional fire sprinklers.

Scarff believes that this generation of fire protection has price advantages over conventional sprinkler systems plus it provides the advantages of a system that uses a minimum amount of water to achieve the objective of restraining the fire. Each day two live fire demonstrations were conducted which were witnessed by invitees. Video and thermal imaging camera footage was captured as well as instrumentation of the fire environment. Data was collected on room temperature, oxygen level and carbon dioxide levels.

A 10-minute public-education video based on the demonstration currently is in production. For more information, contact Scarff at 240-529-2228 or robsonny@yahoo.com. Also, for videos of the Minifog EconAqua, visit <http://Minimax.en/>.

A major difference between the creation of a new generation of sprinklers versus other technologies is that while each generation of sprinklers evolves to address specific fire problems, it does not void the justification for the previous generation. Every stage of the evolution of fire sprinklers has resulted in them being more applicable to solve a specific fire problem. Commercial and residential sprinklers are different — and they ought to be. In our case, a new generation does not mean obsolescence, but rather that we are building upon a capacity to attack America’s fire problem where it all begins, at the point of ignition. ■