

Firefighting Gels Evolve

While still not as popular as once predicted, gels have been steadily overcoming their disadvantages and proving their usefulness.

By Steve Sinunu

Solutions for wildland fire management have evolved from using spruce branches to beat on flames to spraying water and, later, foam. But from there the progression has become hazy. Although gels have since come on the scene and become the cool, new buzzword, they have yet to catch on to the degree expected. A tenured fire chief may see a demonstration that highlights all the benefits of the latest gel only to proclaim, "but we use foam."

Even so, firefighting organizations have been using gel-based fire retardant and water-enhancing products for more than 20 years, primarily for structure protection. The gel retardant is sprayed on the outside of buildings to offer protection from radiant heat, direct flame and fire brands. Gel is sticky and has good surface adhesion, even on vertical surfaces, and it has longevity up to several hours. Normally an engine is used to pump the gel, but it also can be dropped from aircraft such as air tankers and helicopters.

PROS AND CONS

Gels are made up of four basic components: water, polymers, surfactant and either mineral or vegetable oil. Gel concentrate can be purchased in a powder or liquid form. Depending

on an engine's configuration, the gel concentrate can be added directly into the hose line with an eductor/injector or added to the water tank. The concentrate is then mixed with water in the system and pumped out through a standard nozzle.

One strategic advantage of using gel is that it allows engine crews to spray it on a structure then leave the scene well in advance of the fire sweeping through the area.

Gels work to encapsulate water and absorb heat while sticking to most surfaces. This is certainly an advantage over foam, but it also has disadvantages. Some gels do not biodegrade and are harmful to the environment. Some have shelf-life issues, needing attention every few months, and others are rendered useless once they lose hydration. Once applied, some gels require extensive cleanup of both surfaces where they have been used and the equipment that deployed them. In addition, none

of the companies that sell gel products share a standardized mixing and deployment system.

With this in mind, it's easy to understand the reluctance of some in the wildland fire community to accept this technology. However, some manufacturers offer gel products that are organic, nontoxic and biodegradable. Some gels even work wet or dry, allowing for a fireline to be thrown down a few days in advance of controlled burns or those ever-changing Santa Ana winds. This is not achievable with foam.

GELS IN USE

One strategic advantage of using gel is that it allows engine crews to spray it on a structure then leave the scene well in advance of the fire sweeping through the area. This enhances the safety of the fire crew while offering some level of protection for the structure. The technique's effectiveness has been shown on houses and structures during fires in South Dakota's Black Hills National Forest, Colorado's Mesa Verde National Park and California.

Challenges still remain in the industry, including standardization on mixing and delivery and chemical makeup. But just as with everything else, you need to separate the good gel solutions from the bad ones. **W**



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