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## Valencia man's idea may better protect firefighters from intense heat

***A former insurance exec and musician crafts a combination of heat-resistant materials that could offer fire protection up to 4,000 degrees.***

***Bob Pool, LOS ANGELES TIMES - LOS ANGELES, CALIFORNIA***

You don't have to be a rocket scientist to fight wildfires in the West. But it helps.

A Valencia resident is turning to space-age technology to create improved fire safety shelters for firefighters who battle blazes in rugged and remote areas.

Fire shelters are cocoon-like covers made of foil and woven silica cloth that are designed to provide emergency protection from flames as hot as 500 degrees.

But the fire shelters, deployed as a last-ditch effort when firefighters are overrun by fast-moving blazes, have not always been effective. Nineteen members of a Prescott, Ariz. hotshot crew died June 30 when they were trapped near Yarnell, Ariz.

"The Yarnell fire was a huge wake-up call," said James E. Moseley. "Those firefighters didn't have a chance in a 2,000-degree fire."

Moseley, 47, is a former insurance company executive and professional trombone player who performed with Frank Sinatra, Sly & the Family Stone and Grover Washington Jr., and was a regular with the Crystal Cathedral Orchestra.

He doesn't have a background in fire science or aerospace, but his curious mind found common ground between the two.

As he taking a tour of a Santa Clarita-based aerospace company near his home, Moseley found himself intrigued by the technology of the space shuttle's exterior heat-shield tiles that protected craft from reentry temperatures of 2,300 degrees. Workers there demonstrated a flexible ceramic wool fabric that insulates against temperatures as high as 2,200 degrees.

"That's when the light bulb went off in my head," Moseley said. He wondered: Why not use that cloth to wrap the steel beams in the new World Trade Center being built in New York City or insulate the roofs of homes in fire-plagued regions in Southern California and Colorado?

After consulting with a cousin who works on the Mars Exploration Program project at the Jet Propulsion Laboratory, Moseley acquired some rolls of Morgan Thermal Ceramics wool fabric and found a Los Angeles company with quilting machines that could strengthen the cloth by adding heat-resistant Inconel thread stitching. He then formed a company, Sunseeker Enterprises, to market the material.

Work on the World Trade Center was too far along to consider wrapping the five new skyscrapers' beams in the fabric, but when the Yarnell tragedy unfolded Moseley saw a more immediate need for his idea.

Moseley believes that a NASA-style version of the fire shelter can be made of layers of the woven silica cloth clad in aluminum foil and coated with an Inconel spray that could add even more heat resistance — perhaps from flames as hot as 4,000 degrees.



*Jim Moseley demonstrates the strength of his ceramic fire shelter with a blowtorch. (Kirk McKoy, Los Angeles Times)*

Compared with current shelters that are a relatively light 5 1/2 pounds, the enhanced shelter would weigh about 9 pounds, which could be heavy for fire crews that also have to carry water and firefighting equipment, Moseley acknowledged. And he estimated that the enhanced shelter would run about twice what a typical \$300 shelter costs.

In his backyard overlooking brush-covered hillsides south of Magic Mountain, Moseley demonstrated how a butane torch can quickly burn through a conventional foil-covered fire shelter. When he placed a piece of the woven silica cloth over his arm and aimed the torch in its direction, the exterior of the cloth was scorched from the flame, but Moseley's arm was unscathed.

"This material has had a 3,000-degree torch on it for an hour. It works," he said. "You want firefighters to have confidence in their shelter. Let's give them three-times the protection and they'll feel comfortable going under it."

Before being approved for use by fire agencies, Moseley's space-age shelter needs to be thoroughly tested. Weeks after the Yarnell fire, a Los Angeles County fire official asked him about the evaluation process.

"I told him that the U.S. Forest Service doesn't have the money to test it," Moseley said.

That's true, said Tony Petrilli, project leader for fire-shelter research at the Forest Service's technology and development center in Missoula, Mont.

"We don't have the cash right now. We were scheduled for a project review in 2015. I'm trying to get that bumped up to 2014," Petrilli said.

So Moseley and others hope to pay for fabric testing at the University of Alberta's Fire Management Systems Lab in Edmonton, Canada, through a \$100,000-Internet fundraising campaign.

Mark Ackerman, an adjunct professor at the university, said the testing will examine how the fragile ceramic material holds up over time. Researchers will also watch for any release of toxic fumes when the shelter comes into contact with flames and examine the potential effect of its weight on firefighters.

"You need to think about how you can get people to use this without impairing their functions. You don't want to add a whole lot more weight. That means there's less water that is carried for hydration," Ackerman said.

Petrilli, who is helping investigate the Yarnell fire, agreed. "Shelters now weigh five pounds or so. That's as big as we're going to get. Firefighters are already carrying 40 pounds of gear," he said.

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