Fire
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Firefighters' Leather Gloves Redesigned To Be More Comfortable

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In the summer of 2005, the Missoula Technology and Development Center (MTDC) conducted a nationwide product review to evaluate the fit, comfort, and utility of the standard heavy-duty gloves available through the General Services Administration's (GSA) Wildland Fire Equipment Catalog. Comments from almost 2,000 wildland firefighters indicated the existing gloves needed to be more comfortable, although the firefighters said the gloves provided acceptable levels of protection and durability.

Heavy-duty gloves for firefighters must meet the National Fire Protection Association (NFPA) 1977 Standard on Protective Clothing and Equipment for Wildland Fire Fighting. Generally, thicker leather is needed to provide enough protection to meet NFPA 1977 requirements. Thinner leather would be more comfortable, but it would not pass NFPA 1977 requirements. MTDC worked with the manufacturer of the existing gloves to increase comfort while maintaining protection and durability.

Three modifications of the existing gloves were developed for field testing during the summer of 2007. Based on the feedback received after those tests, product specifications were changed, resulting in new heavy-duty gloves that will soon be available in the GSA Wildland Fire Equipment Catalog. Two other styles of heavy-duty gloves featuring a gunn-cut design were tested and are now in the catalog.

Highlights...

- Feedback from firefighters led to modifications of the standard heavy-duty gloves used by firefighters.
- New heavy-duty gloves for firefighters are more comfortable than the existing gloves and they maintain the same level of protection.
- The new gloves will be available through the General Services Administration and the National Interagency Support Caches when supplies of the existing gloves have been depleted, probably sometime during the early summer of 2009.
- Two other styles of gloves are now available through the General Services Administration's Wildland Fire Equipment Catalog.

Design Changes

Users complained about discomfort caused by bulky seams in the fingers and at the finger/palm junction of the existing standard gloves. Many firefighters turned the gloves inside out, so the seams were outside the glove. That approach exposes the gloves' stitching to the rigors of firefighting. Thread binding the fingertips soon breaks and the gloves fall apart.

The first modification to the existing glove's design was to shrink the bulk in the finger seams by reducing the seam allowance—the distance between the stitching and the edge of the material. The finger seams are still inside the gloves to protect the thread.

The second modification was to reduce bulk at the seam between the fingers and palm by removing a thin strip of leather reinforcement (the welt). The seam is much flatter with half the material outside the seam and half inside. The

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seam stitching is exposed outside the glove, but field trials indicated that the seam is not a weak spot. Several pairs of gloves returned to MTDC after the field trials had holes worn through the leather, but the exposed stitching at the junction of the fingers and palm remained intact.

The final design modification was to make the gloves with a "rough-out" finish, placing the smooth, grain side of the leather inside the gloves rather than outside. Gloves for the field test were made in both styles. Most participants preferred the rough-out version. The rough-out finish may be more durable. MTDC will monitor the new gloves' durability (figure 1).

Figure 1—The new glove design features a rough-out finish that may increase durability. Seam allowance was reduced for increased comfort.

Picking the Right Size of Gloves

Participants who field tested the new gloves said that they seemed to be sized larger than the existing gloves. The glove patterns were not changed, but because there's less leather sewn into the seams, there's more room inside the gloves. This is particularly noticeable in the fingers. Firefighters may need gloves that are one size smaller than those they are used to wearing.

Fit gloves to the finger and thumb tips—not to the crotches between the fingers. The crotches may "float" for some users. Next make a fist to see if the gloves bind too tightly around the fingers or hands. It is best to go up a size, even if the finger crotches float, to get a better fit for the fingers. This will keep the seams from hurting your fingers, improving the gloves' overall comfort. Remember, the leather will stretch slightly once the gloves have been broken in.

Ordering the New Gloves

The new gloves will be available from GSA for $14.10 per pair (all sizes). The national stock numbers (NSNs) remain unchanged. They are:

- X-small, 8415-01-394-0208
- Small, 8415-01-394-0209
- Medium, 8415-01-394-0210
- Large, 8415-01-394-0215
- X-large, 8415-01-397-3937

The new gloves comply with NFPA 1977: Protective Clothing and Equipment for Wildland Fire Fighting, 2005 Edition. The NFPA label, sewn into each glove, should not be removed.

The new gloves and the existing gloves will continue to be the only firefighting work gloves stocked by the National Interagency Support Caches. The GSA and the caches will replenish their glove stocks with the new gloves as the supply of existing gloves is depleted, probably early in the summer of 2009.

Two Glove Styles With Special Features

The field test conducted in 2007 included two glove styles from two additional manufacturers, who were already producing NFPA 1977-compliant work gloves. Both glove styles received positive evaluations from firefighters and are now available through the GSA Wildland Fire Equipment Catalog (*http://www.gsaadvantage.gov*, figure 2). These NFPA 1977-compliant gloves are made with a different leather and a different pattern for a slightly different fit and feel than the heavy-duty gloves stocked by the National Interagency Support Caches.

Figure 2—Two other styles of gloves, a brushed pigskin glove and a split cowhide with wristlet, are now available through the GSA catalog.

Both glove styles feature a gunn-cut design that has a single-piece seamless back with finer seams set farther away from the working area of the palm. The two middle fingers are sewn separately onto the palm piece. Gunn-cut gloves provide better wear and comfort, especially for heavier gloves. Both gloves have hanger loops to make them easier to carry.

One style of gloves is made from brushed pigskin and has an elastic wrist shirring that gathers the back of the glove for snugness. These gloves cost $18.33 per pair. The NSNs are:

- X-small, 8415-01-565-0623
- Small, 8415-01-565-0620
- Medium, 8415-01-565-0618
- Large, 8415-01-565-0624
- X-large, 8415-01-565-0625

The other style of gloves is made from split cowhide and has a 2-inch elastic Kevlar knit wristlet. These gloves cost $25.87 per pair. The NSNs are:

- X-small, 8415-01-568-0011
- Small, 8415-01-568-0006
- Medium, 8415-01-568-0013
- Large, 8415-01-568-0008
- X-large, 8415-01-568-0012

About the Authors

John Smith joined MTDC in 2005 as an equipment specialist. He graduated from the University of Montana with a bachelor's degree in education and taught elementary school in Ovando, MT. He began his Forest Service career in 1974 as a wildland firefighter for the Lolo National Forest's Superior Ranger District. A Missoula smokejumper for more than two decades, Smith applies his experience as assistant loadmaster foreman, master parachute rigger, and safety program manager to developing equipment for firefighters.

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After a nationwide product review, almost 2,000 wildland firefighters said that the heavy-duty leather gloves they were issued were uncomfortable. Because the gloves must meet the National Fire Protection Association (NFPA) 1977 Standard on Protective Clothing and Equipment for Wildland Fire Fighting, they have to be made from relatively thick leather. The design of the gloves was changed to make them more comfortable without reducing their protection. Firefighters who tested the new gloves during the summer of 2007 liked them. The General Services Administration and the National Interagency Support Caches will supply the new gloves once the stock of the existing gloves has been depleted, probably sometime during the early summer of 2009. Two other new gloves have features that may be preferred by some wildland firefighters. They can be ordered through the General Services Administration.

Keywords: fire fighting, firefighting, General Services Administration, GSA, personal protective equipment, PPE, safety at work

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Additional single copies of this document may be ordered from:

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Electronic copies of MTDC's documents are available on the Internet at:

http://www.fs.fed.us/eng/t-d.php

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