FPA winners

Bag preserves M-16 rifles

Winning Gold for Packaging Excellence in the Technical Innovation category was a complex structure developed with the United States Army, Materiel Command, Logistics Support Activity, Packaging, Storage, and Containerization Center in Tobyhanna, PA. In this instance, the Army was contracted by the U.S. Marine Corps to create a bag (4) that could hold a single M-16 rifle and preserve the gun for years, if necessary, during storage. The structure had to prevent corrosion and provide a window to allow military personnel to see the weapon's serial number for tracking purposes.

Heritage Packaging converts the unprinted three-layer structure that has a thickness that measures nearly *50* mils. The outer 8.7-mil layer itself is a three-layer extrusion-lamination. From the outside-in, it includes **Valeron Strength Film's** cross-laminated high-density polyethylene film that provides strength and puncture-resistance. Barrier properties come from 0.00035" aluminum foil. On the inside of the film layer is **Cortec's** Corrlam™, a low-density polyethylene film treated with a vapor corrosion inhibitor. That three-layer structure is

heat-sealed to a 30-mil LDPE "netting," which provides additional strength and puncture-resistance. Heat-sealed to the other side of the netting is a 9-mil layer of Cortec VpCI®-126 anti-corrosion film.

Heritage creates a three-sided, heat-sealed bag from the structure, die-cutting a viewing window to

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make visible the rifle's serial number. A **Velcro** closure allows easy opening and closing of the bag to retrieve and store the M-16. The trapezoidal-shaped bag measures about 52" x 13". It's not used for new rifles, but for weapons that have been serviced. The bagged weapons are stored globally.

"In this division, we have lead service responsibility for designated packaging materials and processes," explains Charlotte Lent, an Army industrial engineer based at Tobyhanna. "Our job was simply to test the material and report that it did or did not meet the criteria designated by the USMC. We pass test results on to the Marine Corps."

While the Marine Corps evaluates the new bag, it continues to use a bag designated by the military as the MIL-PRF-131. "It's a water-vapor-proof, grease-proof barrier material, a foil/polyethylene-lamination material that's opaque and heat-sealable," says Lent. "You can't read the rifle's serial number through the bag, so if you need to check on the condition of the weapon, you have to cut open the bag's heat seal. There is a lot of labor, and they were interested in cutting down the labor it required.

"The Marines preserve the weapon, which is prone to rust, with a material called MIL-PRF-3420, a volatile corrosion-inhibitor-impregnated paper, which comes from any number of paper manufacturers. It's very labor-intensive to wrap this rifle up in this paper, then put it in a heat-sealable bag. They have to do this by hand. The Marines wanted a reusable closure so they could get into and out of this bag when it was time to inspect the weapon," says Lent. Those limitations led the USMC to a search for alternative packaging.

The results of material testing led to the "winning" collaboration by Heritage, Valeron, and Cortec. "We had no rust on any of the rifles," says Lent. "And it uses a newer-generation Velcro closure that's very smooth and doesn't stick to other things. This has proven to be a successful candidate for the Marine Corps to look at."