



Cairns: Your Safety Is Our Tradition

Since 1836, millions of firefighters have put their trust in the innovative design and quality construction of Cairns® fire helmets. No other fire helmet company can claim a longer history or more expertise in the manufacture of fire helmets. Throughout this history, one theme has remained constant: To protect firefighters, Cairns has always incorporated the latest technological advances worthy of the best helmet materials and design. Because of this, Cairns helmets are the best fire helmets available.

Today's Cairns helmets prove this with outstanding exclusive features such as the impact cap shell release system, just one of the many safety features that are patented by Cairns, and thus, ours alone.

Because helmets not made by Cairns lack these safety features, other helmet manufacturers may not understand their value. In fact, we have learned that some competitors' inaccurate comments about our products have led to confusion and misinformation in the fire service marketplace. This white paper is intended to state the facts and clear the confusion.

We'll start with a brief review of Cairns Helmet System features and components.

Helmet Weight:

The Cairns philosophy on helmet weight is to create the optimal balance between helmet performance and helmet comfort. Cairns offers some of the lightest helmets available on the market today. When firefighters compare fire helmet weights of comparably equipped helmets, they should make their own judgements, and not rely solely on the information provided by manufacturers. Weigh the helmets yourself. Information supplied by the manufacturer may not always accurately represent the weight of that specific helmet.

Helmet Design:

Cairns fire helmets have some of the lowest ride-heights in the market. Compare the crown clearance of our popular Cairns 1010 model (with an impact cap) to a competitive traditional helmet (with a non-impact cap). The distance from the inside of the Cairns 1010 shell to the suspension straps is less than 2¹/₂ inches. The competitive helmet, without an impact cap, is actually taller at more than 2³/₄ inches high.



Cairns 1010 Cutaway with Ruler



Competitive Non-Impact Cap Helmet

This clearly refutes any claim that using a thermal impact cap will create a higher riding fire helmet. This is simply false. Plus, a higher-riding helmet is less balanced and more cumbersome in confined spaces.

Helmet Shell Material:

All fire helmet companies generally use the same shell material in fire helmet construction. The differences among helmets may be due to a specific blend or the dimensions that a helmet manufacturer designs their helmet to.

Cairns uses an optimal blend of fiber material to create a shell that is both lightweight and durable. The fiberglass shells use 1- and 2-inch-long fibers which interlock to create this performance balance. Other manufacturers use only a single length of fiber, which does not optimize the strength of the helmet shell.

Thermal Impact Cap Foam:

Cairns chooses to use a foam impact cap because of the many advantages of this design. Manufacturers in many industries know the benefits of using a “cellular” structure to reduce damage from impacts and to provide insulation properties. Using our own Cairns history and knowledge in firefighter’s head protection, we have designed and manufactured helmets without impact caps in the past. Today, Cairns helmets are designed and manufactured to optimize the balance between protection and comfort.

See our Hot Heads bulletin for the benefits of wearing a fire helmet with an Impact Cap.



Impact and Thermal Performance of Foam:

Cairns thermal impact caps meet all NFPA requirements for all condition tests. These tests include hot, cold, wet, and radiant test parameters. Cairns impact caps use water-based foam technology that performs well in heat and flame environments. A water-based foam impact cap will not ignite when exposed to heat.

Helmet Shell Volume:

The perception that using a thermal impact cap will increase the size of the helmet shell is false. Let’s use the Cairns 1010 as an example again. The volume of the Cairns 1010 shell is 4565 mL, while a competitive non-impact cap helmet shell has a volume 5030 mL. This simple comparison proves that use of a thermal impact cap does not increase helmet size. In addition, the weight of a Cairns 1010 shell with an impact cap is similar to a competitive helmet shell without an impact cap.

Innovation in Helmet Design:

No other fire helmet manufacturer has made more advances in helmet design than Cairns. Some examples:

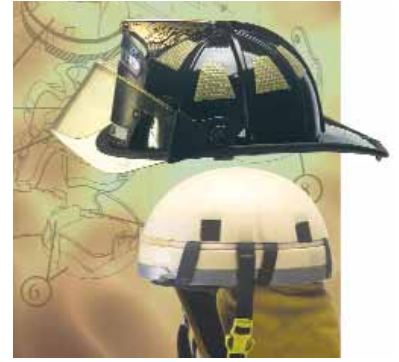
- Cairns was first to develop the composite shells in the early 1990s
- Cairns led the way in certifying composite fire helmets
- Cairns leads the way in producing optimal helmet assemblies which incorporate thermal impact caps

Years ago, Cairns made helmets without a thermal impact cap, too, but we steadfastly recognize and seize opportunities to make our products better. A century ago, we also made aluminum-stamped helmets. Advances in materials and design have kept Cairns in the forefront of innovation, technology, and the creation of market leading fire helmets.



Impact Retaining Tabs:

In conjunction with our patented shell release system, two retaining tabs provide retention for the thermal impact cap. These tabs are calibrated to release at the proper tension (more than 80 lbs. pressure, as per NFPA 1971-2000). The shell release system is used to reduce the probability of injury to the user when the helmet shell is restrained. The tabs are made from high-strength heat-resistant plastic, improved for better release performance.



Reflective Trim Performance:

All fire helmet manufacturers use the same type of reflective trim on their helmets. Therefore, with all test conditions being equal, the reflective trim will perform the same for all manufacturers. Manufacturers' claims that their fire helmet was exposed to the same environment as a competitor's helmet should be questioned if the reflective trim on their tested helmet appears to be in better condition than their competitor's. The trim on both helmets should look the same if both helmets were indeed exposed to the same environment.

Effect of Heat on Fire Helmet Components:

Although all helmet shells may be manufactured in a similar fashion, differences exist between the components a manufacturer uses. All Cairns components such as edge trim, hardware, front holder brackets, etc., are made from high-temperature materials. But all helmets subjected to high heat do not handle the heat equally.

When exposed to excessive heat, the gray liner covering the Cairns impact cap may react slightly, but this type of reaction denotes the need for the user to inspect all aspects of his/her helmet. It is not an indication of a helmet failure. The damaged components discovered through the inspection process may be replaced and the helmet placed back into service. Through testing, we have discovered that the components of some competitive fire helmets, particularly those made without a thermal impact cap, do not have as high a high-heat resistance as the Cairns components do. These competitive components include the plastic front holder bracket and plastic suspension that will deform severely when exposed to elevated temperatures.

Brass Front Holders:

The Cairns traditional brass front holders are designed to be "hollow" for two important reasons. The first advantage is that a hollow holder is significantly lighter, while a brass front holder that is solid metal adds weight to the overall helmet. Keeping the weight of a helmet as low as possible is critical to the firefighter. The hollow stamped brass helps achieve this.

The second advantage is that the stamped brass front holder incorporates a "crush-zone," which is designed to absorb impact to the front holder on the helmet. A number of documented cases have proven that impacts to the front holder have been absorbed and minimized by the hollow brass front holder. A solid metal front holder simply transfers this impact energy to the user, even increasing the likelihood that the helmet might be knocked off the user.



Suspension Straps:

Cairns uses a six-point suspension strap system in most of our helmet models. These straps use a heat-resistant material that has proven to be extremely reliable, with the millions of Cairns helmets manufactured with this design. The six straps perform independently, so that in the unlikely event that one strap might be cut, the five other straps will continue to support the helmet.

Thermal heat testing of fire helmets:

Like protective clothing for firefighters, fire helmets are designed to be worn in high-heat-and-flame environments. That being said, proper laboratory testing should simulate a fully involved, elevated-temperature environment so that the performance of the fire helmet system can be evaluated properly.

It follows that a logical test would be to simulate the effect of heat on a helmet in an oven, with test sensors on the head form to measure the temperature level on the head form.

However, a test that tries to apply the same test protocol for turnout gear to a fire helmet does not truly represent a real-world environment, and claims resulting from such tests are grossly misleading. This is not a representative test, because the helmet is simply placed on a radiant heat panel. It is not placed in an oven.

A manufacturer of non-impact cap helmets has applied such a test and then claimed that even without an impact cap, their non-impact cap helmet still provides three times the insulation of most turnout gear.

This is akin to saying that a winter coat will protect you to a certain temperature, when in fact only a swatch of fabric was tested against an ice cube. Wouldn't it be prudent to test the winter coat in a cooling chamber to see what the insulation performance was?

The Cairns "Hot Head" bulletin (ID # 3600-14-MC) outlines a representative performance test which properly compares the performance of different fire helmets. A radiant heat test designed for testing protective clothing simply proves nothing with regard to fire helmet thermal insulation.

Conclusion

You can trust Cairns when it comes to fire helmet design and construction. In the late 1970s, we began to put thermal impact caps in our fire helmets. Used with a lightweight yet strong helmet shell, this feature clearly offers wearers balance for effective thermal and impact protection.

You can trust quality that is unmatched. Cairns helmets are designed, and continuously updated, to protect you, the user. Your protection is why our helmets offer more innovative features than any other helmet manufacturer can boast.

You can trust a company with over 168 years of successfully designed head protection for the fire service. Cairns innovation has led to the widest range of fire helmets with superior comfort, quality, and protection that you can find. Your safety is our tradition.

Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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