

A Cool Head in Heated Situations

The Dräger **HPS FIREFIGHTER HELMETS** provide maximum protection—even under extreme conditions.

THE STANDARDS in effect for helmets were adjusted once before, in 1997. The Bundesunfallkasse (German Federal Accident Insurance Agency) had previously studied accidents involving helmets made of textile-phenol plastics, the use of which was still allowed at the time. These helmets failed to withstand heat adequately, and their chin straps sometimes strangled their wearers. It wasn't until 2008, however, when EN 443:2008 took effect, that protection requirements caught up with current production technology and the needs of customers. In terms of the scope and intensity of the necessary testing, the new standard actually goes far beyond the requirements of other standards such as NFPA and AS/NSZ.

One notable aspect is the longer radiant heat exposure time. A firefighter's helmet must withstand a helmet temperature of 250 °C for eight minutes while exposed to a heat flux of 14 kW/m². The helmet should also survive at least ten seconds at roughly 1,000 °C during the "flame engulfment test" (see Dräger Re-

view 372, p. 6) without catching fire or melting. Ten years ago, three minutes were sufficient with 7 kW/m² and a helmet temperature of about 150 °C.

Heat changes the protective properties of the helmet material dramatically. The tests for "shock absorption" (5 kg ball from a height of 2.5 meters) and penetration (1 kg pointed object from a height of 2.5 meters) were carried out on a cold helmet in the 1997 standard. The current standard requires this protection from a hot helmet. In collaboration with a well-known helmet manufacturer, Dräger has developed firefighter helmets that completely fulfill the more demanding requirements. The centerpiece of the Dräger "Head Protection System" (HPS) is a helmet shell of glass-fiber reinforced thermosetting material. This exceptionally light material is extremely resistant to very low and very high temperatures.

The Dräger HPS firefighter helmets even pass the "Nordtest" conducted in Scandinavia since the 1990s: firefighters pass through temperatures of 250 to

320 °C for five minutes in a controlled environment. Sensors measure the temperature on the skin of the test subjects, underneath the helmets. The maximum permissible temperature is 47 °C. The Dräger helmets HPS 4100, 6100, and 6200 limited the skin temperatures to 39.1 or 38.7 °C and thus passed this heat test with flying colors. "When it comes to radiant heat exposure and the flame test, the helmet material and the quality of the finish are the be-all and end-all," says Siegbert Tolk, a development engineer at Dräger.

The HPS 6200 is an upgraded version of the HPS 6100 with a high-quality chin-length protective visor. The newer helmet has more optimizations in the thermal barrier and modified padding at the ears that makes it easier for the wearer to get his or her bearings acoustically. In addition, the new Dräger FPS 7000 full-face mask can be easily and securely combined with the HPS 6200 helmet using the patented Q-fix system. The result is a 1,365-gram helmet—the at this time lightest approved full-face helmet (type B) on the market.

The standard EN 443:2008 doesn't mark the limit of what's possible technically, however: "We'll continue to address thermal radiation in the coming years," says Tolk. "Buildings are getting better insulated all the time—a feature that dams up all the heat when there's a fire. It has become increasingly common for firefighters to work inside buildings, where they're exposed to extreme radiant heat." **Mario Gongolsky**

Further information online:
www.draeger.com/96/HPS

Technical data: HPS 6200

Size: adjustable for head sizes 52 to 64, optionally 50/51 **Weight:** approximately 1,365 g **Outer shell:** GRP, high temperature stability, molded SMC **Mask connection:** masks with Supra-Adapter and Dräger adaptation systems (FPS 7000) **Inner liner:** flame-resistant, washable Nomex straps, "eco-leather" headband, head support ring with quick-adjustment system to accommodate full-face masks with straps or 5-point harness **Fastening system:** 3-point chin-neck strap of aramid with quick-release catch **Visor:** 2 mm polysulfone (amber-tinted), anti-scratch coating on both sides with grip tabs on both sides. Approved to EN 14458. **Approvals and tests:** EN443:2008, DIN 58610, Nordtest

