



Dust is everywhere—and it can be dangerous in some types of work.

D-1885-2009

EN 149: New Standard Stirs Up Dust

Developments in occupational safety have always been a balancing act between the technically possible and the economically sensible. Advances in materials and manufacturing in addition to greater safety awareness drive the **CONTINUOUS REFINEMENT** of the standards—and new test methods for masks are no exception.

DUST IS EVERYWHERE. Measuring between 0.02 and 0.5 micrometers, the tiny particles float in the air like fog. Human airways and lungs are designed to cope with this natural dust to a certain extent. At many workplaces, however, this physiological cleaning function needs some support: a filter. This keeps the particles—unavoidable in trade crafts, many industries, and mining—at bay. The extent to which this is possible is determined by international specifications as a common denominator, with national regulations also playing a role.

These regulations and specifications are constantly being reviewed and further improved to protect people. As an element of “personal protective equipment” (PPE), this sector of respiratory protection

receives the full attention of standards organizations and lawmakers. Users can rely on compliance with the various standards that have been established. A product may only bear a corresponding label if it has successfully demonstrated its protective function in a specially developed and standardized test.

Testing the standard

The overarching binding standard in Europe for particulate respirators (filtering facepieces) is EN 149, which was adopted in 2001. Its test procedures were recently made more stringent. “The changes primarily affect masks with electrostatic filtering materials,” says Alexander Grünke, portfolio manager for filtering facepieces at Dräger.

These materials do not retain dust in the same way a coffee filter and its paper pores hold back the grounds—solely by mechanical means. They also contain electrostatically charged fibers. Dust particles, which themselves are electrostatically charged due to air friction, “stick” to these fibers like iron shavings to a magnet. Proven over more than 30 years of use, this technology allows the development of particularly thin filter materials with lower breathing resistance. This not only makes it easier for the wearer of the mask to breathe but also reduces the heat buildup beneath the mask.

This technology works extremely well with solid particulates, but the presence of oil-based aerosols, for exam-

ple, can diminish its effectiveness. Experts estimate that this issue applies to roughly 10 percent of all cases (refer to “sicher ist sicher – Arbeitsschutz aktuell” 01/2007; p. 22 ff.). The test procedure has been modified to focus on this particular area of application, ensuring compliance with the European standard for filtering facepieces in these applications as well.

“This refinement of the standards leads to even greater safety under specific conditions,” explains Grünke, who is one of the people responsible for ensuring that Dräger masks passed this more stringent test well before its entry into force.

Getting this far was not exactly easy, as the final formulation of the new requirements was not known for quite some time. That stirred up quite a bit of dust at first, but “We gladly accepted the challenge, and in light of the new required test we also handled it masterfully,” recalls Grünke.

Safety by design

Although the standard allows for the masks to be designated as either non-reusable (NR) or reusable (R), the latter comes with some additional stipulations. One of them is the requirement that the manufacturer offer a suitable cleaning method. “However, we don’t consider current cleaning and disinfection methods to be capable of restoring a filtering facepiece to its original condition without damaging the mask,” adds Grünke.

These methods do not remove all of the dangerous substances from the

Standards, tests, and protection classes

Filtering facepieces are governed by European standard EN 149. The 1991 version was revised in 2001, when the number of FFP (filtering facepiece) classes was reduced to three and the classes were standardized. An FFP 1 mask must demonstrate a filter performance of at least 80 percent, followed by FFP 2 (> 94 percent) and FFP 3 (> 99 percent). These values are retained without change by the new EN 149:2001+A1:2009. However, the test procedure behind these figures was made significantly more stringent. The test substances used are 120 milligrams each of table salt dust and paraffin oil. Other parameters for the individual protection classes are total leakage and breathing resistance.



Three colors, three protection classes—for greater personal safety.

mask, nor is the mask completely hygienic thereafter. Reuse of the masks after they have been contaminated with pathogens such as viruses is the most powerful example of the associated risks. Classic half-masks in combination with particle filters (such as the Dräger X-plore 2100) are the better choice for applications where a reusable mask is to be used.

Dräger refreshed its range of filtering facepieces back in spring 2008, more than a year before the new standard took effect. The first new model was the X-plore 1700 series—folding masks with low breathing resistance, high wearing comfort, and a good seal. In addition, all versions bear the “D” mark, indicating that they have also passed the dolomite clogging test.

The two V versions include the CoolMAX exhalation valve for greater comfort. It reduces breathing resistance to just one fourth compared to conventional valves and releases moist and warm ex-

haled air to prevent the buildup of heat beneath the mask. Grünke has observed that “In practice, a mask is generally well received if it can be worn comfortably.” And as obvious as it sounds, only a worn mask offers protection, regardless of the standard behind it.

The X-plore 1700 series was followed by the X-plore 1300 series with its classical preformed mask body. It too is available with the new CoolMAX exhalation valve, as well as with a seal pad and a skin-friendly inner liner. Another new feature is a continuous loop harness that makes it easy to put on and take off the mask.

Both series offer variants in all three protection classes: FFP 1, FFP 2 and FFP 3. “Plus,” says Grünke, “we’ve revised the user instructions for all of our masks to ensure even greater safety when they’re being used.”

Nils Schiffhauer

Further information online, including:
 Product information
www.draeger.com/98/filter