Firefighters live with risks by managing them effectively. But the fact that these risks include an increased rate of cancer among firefighters is only now coming to the fore. There are ways and means of minimising this risk – including improved hygiene on the job – and the issue is now stirring lively debate worldwide.

Firefighters live dangerous lives. And that’s not just because they venture into the kind of danger that nobody else would choose to experience. Aside from the risk they run of being injured or even dying in the line of duty, firefighters also have an approximately 30 percent higher risk of cancer than the population average. Scientists in Germany will soon be embarking on a pilot study to determine whether the hazardous substances that contaminate firefighters’ helmets, breathing apparatus (BA) masks, protective clothing, shoes and other equipment could be responsible for this increased risk. The Hamburg-based study will be the first of its kind anywhere in the world to seek clear evidence of a causal link.

“It’s high time we got some clarity on this issue,” says Marcus Bätge, a 47-year-old full-time fireman who is responsible for occupational safety and health at the German firefighters’ trade association BvFw in Hamburg. The fact that the pilot study was designed by the German Social Accident Insurance (DGUV) body in collaboration with the Institute for Occupational and Maritime Medicine (ZfAM) is something that Bätge sees as particularly encouraging: “They will be using a biomonitoring system for the Hamburg firefighters which will take urine samples, skin swab samples and blood samples after each incident.” Data will also come from the incident site, where samples will be taken of the air and fire smoke. The goal is to investigate how harmful substances enter firefighters’ bodies. Marcus Bätge knows exactly how tough conditions can sometimes be: “When you’re fighting a fire your body temperature can climb to 38° or even 39°. Your body tries to cool itself down by opening the pores of the skin. That provides perfect access for just about any hazardous substance including soot, polycyclic aromatic hydrocarbons and benzene (N.B.: asbestos fibres are only inhaled into the lungs).

Ultimately that means the risk of harmful substances penetrating your skin is around 400 times higher.” Even two or three days after an incident with high levels of contamination, firefighters are still typically washing enough soot particles out of their skin to make the shower water turn black.

Raising awareness among firefighters that “only a clean firefighter is a good firefighter”, as Bätge puts it, is an oddly difficult task: “The public admire the image of a soot-covered hero. And they expect the helmet, in particular, to look as grimy as possible, showing that the firefighter was right in the thick of the action,” says Bätge. “But of course the next time a firefighter wears that helmet in bad weather, all that soot will end up running down their neck from the helmet and penetrate the skin.” The firefighting equipment maker Dräger confirms that helmets are the most “emotionally charged” items of personal protective equipment (PPE). “People
PPE Directive replaced by Europe-wide Regulation

In March 2014 the EU Commission decided to revise its 25-year-old personal protective equipment (PPE) Directive 89/686/EEC and replace it with a Regulation. Two years later almost to the day, the European Parliament voted by an overwhelming majority to accept the draft revision of the PPE Regulation. Following approval by the European Council, the act was signed on 9 March 2016 and published in the Official Journal of the European Union on 31 March 2016.

Over the past 25 years the PPE Directive has served to create a single market for personal protective equipment, ensuring a greater degree of protection for PPE users. Problems had emerged in regard to the effectiveness of market surveillance and the different approaches taken by notified bodies, and some of the risks related to protective equipment were not covered by the Directive. Furthermore, some of the key points which had been established in the PPE Directive were worded in ways which created confusion, leading to inconsistencies in the technical requirements.

To rectify these problems and further improve legislation designed to protect the health and safety of PPE users, the European Commission submitted the draft for a PPE Regulation on 27 March 2014. Having successfully made its way through the EU’s legislative procedures, this came into force in all EU Member States on 21 April 2016, 20 days after the Regulation was directly applicable in all Member States. While the Regulation is directly applicable in all Member States, which means that it no longer covers the health and safety of PPE users, the European Commission published a draft for a PPE Regulation on 21 April 2014, 20 days after its publication in the Official Journal of the European Union.

Key changes include the following:

- The Directive has now been replaced by a Regulation.
- The content and structure have been changed.
- The Regulation is aligned with the New Legislative Framework.
- The Regulation is easier to understand and based on up-to-date legal concepts and terminology.

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Technology you can rely on when the going gets tough

Faced with a tricky combination of heat, sludge, fire, slag and particulates, the German company Aurubis – the world’s largest copper recycler – has to do a whole lot of „dirty work“ and apply plenty of expertise to produce marketable, pure red copper at its Hamburg plant. The job of processing anode sludge, refined materials, and coin and precious metal scrap – as well as slag and dross which contain traces of precious metals – inevitably leads to problems with air quality in the production halls. To ensure this doesn’t affect the health of the 2,000 people who work at Aurubis’s Hamburg plant, the company imposes strict safety regulations. This keeps the number of workplace accidents extremely low, with the company recording just 63 accidents a year among its 6,500 employees worldwide. And the safety regulations don’t only apply to the people working at the modern blast furnaces, but also to the 85 members of the plant fire brigade and security team, including 55 firefighters.

Up until the end of 2015, the BA equipment managers were running more than 150,000 washer-disinfector cycles a year for full and half-face masks and breathing helmets, and they had some 8,500 masks and breathing helmets in full-time use. But, as Michael Hauschild explains, these figures fell drastically following the construction of a new BA cleaning facility, leaving just 1,000 full-face masks, 1,000 half-face masks and 220 breathing helmets in circulation.

As the head of the plant fire brigade and security team, he is delighted with how much they have saved by cutting the number of masks by well over half, a decision which reduced the amount of capital tied up in them by one million euros. That provides the perfect basis for benchmarking within the company!

The Hamburg-based MEIKO team spent 175 person-hours on the Aurubis project, but it was clearly worth it, with MEIKO technology now being used to clean industrial masks on a large scale for the first time. All this is yet another example of what the experts at the Otterburg, Germany-based specialists in cleaning and disinfection technology and commercial warewashing systems do so well – namely applying their wealth of know-how and experience to plan outstanding workflows, ergonomics, hygiene standards and customer requirements in BA cleaning facilities. „This project was an all-round success,“ says Michael Hauschild, noting that the whole process ran impressively smoothly. „It really is the perfect solution for fire departments!“
Efficient separation of dirty and clean equipment at the incident site

Bruchsal Fire Service has a strictly defined process for firefighters to follow when they take off their masks immediately after an incident. The mask needs to find its way into a large blue plastic box within a matter of seconds. The lid is then shut, effectively eliminating any chance of passing on contamination. That’s the main reason why we believe in totally separating clean and dirty equipment before we even leave the deployment site,” says BA equipment manager Thomas Zöller. The boxes containing used breathing apparatus equipment and clothing are then taken back to the station in a separate vehicle. “We’ve made all the boxes bright red,” says Zöller, “because that means we can identify contaminated items at a glance.” Although the firefighters attend some 800 incidents a year, there is no risk of bottlenecks thanks to the use of a swap body vehicle and the diligence of five full-time members of staff who have each been trained to properly clean and disinfect BA equipment.

Previously, Bruchsal Fire Service used an ultrasonic cleaning process, but in 2012 they switched to MEIKO technology. “We heard from Interspiro about a machine that could be used to reliably clean and disinfect BA masks,” says Thomas Zöller. “We purchased it directly from MEIKO and since then we’ve been using it not only to clean our own equipment, but also the equipment used by the fire departments in Weingarten and Ubstadt-Weher, as well as some of the postal service from Ostengen and, for a short time, from Pfinztal.” This work commissioned by colleagues at the six years he has spent in charge of cleaning the firefighters attend some 800 incidents a year, they clubbed together to buy two machines at a cost of €30,000. “We explained how unhealthy it is to work with the chemicals in a dip tank when you clean masks manually,” says Zöller. “One of our colleagues works for a company that has to remove all limescale from the tap water gradually building up in the masks’ speech diaphragms. Thanks to the TopClean M’s built-in desalination capabilities, this is no longer an issue and there’s no need to polish the masks’ visors any more, either. The new machine is also a hit with Michael Kirchner who is currently on a Federal Volunteers Service programme at Bruchsal Fire Service and Zöller’s colleague Ulrich Koukola. After all the practice drills and call-outs, they both appreciate getting things done faster and having the equipment ready for use quicker so that they can keep the 350-strong local fire service in the town of 43,000 inhabitants at the top of their game!

Matthias Massopust’s BA mask cleaning room is as clean as an OR!

The room where Hilpoltstein Fire Service cleans its breathing apparatus equipment and masks is not only newly refurbished, but also designed in what some may consider to be a rather “cold” style. „One of our colleagues works for a company that kits out hospitals and operating rooms,” explains Matthias Massopust. And that’s why Hilpoltstein Fire Service’s BA cleaning room looks pretty much as clean as an OR. The BA equipment manager of the volunteer fire service in this town of 13,000 inhabitants some 30 kilometres from Nuremberg is visibly proud of the place where he works. During the six years he has spent in charge of cleaning and disinfecting BA equipment, this 33-year-old volunteer firefighter has seen plenty of changes. He is particularly pleased that his impressively smart BA equipment manager Thomas Zöller doesn’t just focus on hygiene in the BA room – he also ensures masks are handled properly at the incident site.

And talking of speed, everything now runs like clockwork when it comes to cleaning the total of 819 regulators, 1,185 masks and some 737 SCBA sets. „The machine does a lot of the work essentially on its own, so we can get other things done while it’s running. The masks also take less time to dry in the drying cabinet, so they’re back in action and ready for use quicker,” says Zöller.

There’s also another major advantage for him and his colleagues. Before they started using the MEIKO machine they had a problem with shrink-wrapping them. Frank Schmidtke, Global Business Manager Segment Fire Services held by Dräger in 2014: „If I immediately knew it was the solution I’d been looking for,” says the volunteer firefighter. „He submitted an application to the municipality’s fire service budget which was approved by both the treasurer and the municipal council. „Largely because we explained how unhealthy it is to work with the chemicals in a dip tank when you clean masks manually,” says Matthias Massopust. Since the adjacent town of Albersberg just 10 kilometres away was facing the same problem, they clubbed together to buy two machines at a discount. „That made it even easier on the town’s budget. Otherwise we would have had to install an extraction system and continued with the totally ineffective manual method of cleaning our 65 masks which are in active use and our 40 regulators,” says Massopust.

Once the masks have been cleaned, they are checked and stored using a sophisticated system specially developed by Massopust. A software programme notifies him when each mask is due for its next service. These rigorous processes provide a solid framework for the BA equipment manager’s work. Not unlike an operating room in fact...
Swiss District Fire Department opts for German-made technology

The Swiss are renowned as perfectionists who love order and precision. So it’s easy to understand the shock that Station Commander Urs Felix must have felt the first time he used a newly purchased TopClean M washer-disinfector to clean his firefighters’ breathing apparatus gear. As an experiment, Felix decided to put a batch of supposedly clean masks through the machine and then check the screen filter for any dirt. “We were genuinely shocked to see how much dirt came off the masks which we had thought were clean.”

That sense of dismay is now safely in the past and has been replaced by a feeling of satisfaction. Urs Felix is delighted with the new system, not only as a BA equipment manager, but also as the head of the fire department which, since 1 January 2015, is no longer simply an “appendage” of a local authority but rather a separate, fully-fledged company: “We’ve created a group of fire services from seven municipalities which is now run independently of the local authority administration” Felix explains. The task of establishing a centralised fire department for the Lauenthal area also included the construction of a brand-new fire station with state-of-the-art technical features such as a display which recommends the optimum choice of equipment for each emergency call-out. And state-of-the-art technology was also on the cards when it came to cleaning the fire department’s regulators in the TopClean M: “In Switzerland we work with special adapters, so MEIKO had to develop a new solution to enable us to clean and disinfect that component of our BA gear in the machine,” says Felix. Fortunately the third party that love order and precision. So it’s easy to understand the shock that Station Commander Urs Felix must have felt the first time he used a newly purchased TopClean M washer-disinfector to clean his firefighters’ breathing apparatus gear. As an experiment, Felix decided to put a batch of supposedly clean masks through the machine and then check the screen filter for any dirt. “We were genuinely shocked to see how much dirt came off the masks which we had thought were clean.”

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Gütersloh test machine quickly became a permanent fixture

The relationship between Gütersloh Fire Department and MEIKO almost ended before it began. “We had spent years washing our masks in an industrial washing machine with a chemical powder. Then we decided to switch to a liquid detergent and suddenly we found that our masks were getting horribly sticky,” says Frank Vornholt, group leader and BA equipment manager at Gütersloh Fire Department. He found this extremely frustrating, because there was no way he would expect firefighters to use sticky masks. So when Vornholt’s supervisor came up with the idea of purchasing a TopClean M from MEIKO to clean and disinfect the station’s masks, he was not exactly brimming with enthusiasm: “It was basically going to mean we had to use the same chemical that had already caused us so much trouble,” he recalls. So the MEIKO brochure was put to one side.

Not long after, at the RETTmobil trade fair for emergency professionals in Fulda, Frank Vornholt was once again told that MEIKO technology was a great way to clean masks – yet another recommendation for the TopClean M, and this time it came from a completely different quarter. A dealer agreed to provide them with a test machine, and the TopClean M soon turned into a permanent fixture in Vornholt’s BA cleaning room.

Before the Gütersloh team switched to MEIKO cleaning technology, things were far from easy for Vornholt and his colleagues: “We crammed 10 to 12 masks in each cloth bag and then had to carry them down to the basement. After cleaning them we had to take them apart and rinse them with clean water, and then it took ages for them to dry,” he explains. Nowadays the whole process is carried out on just one floor in the BA cleaning room and it takes far less time: “In 2015 we cleaned 1,400 masks with the TopClean M,” Vornholt calculates. If his colleagues have been training in the live fire container or if their personal protective equipment has been heavily contaminated during an incident, then the BA masks and harnesses are given a preliminary clean before they go into the machine. Ultimately he and his team are very aware of how easily contamination can spread, and none of the 118 full-time firefighters and 200 volunteers want to take any unnecessary risks.

The click-fit connection for the regulators in the TopClean M was specially designed by MEIKO.
REMONTDIS and Bramsche Fire Department find the perfect clean solution

REMONTDIS – a leading waste management company – runs a recycling centre in Bramsche, Germany which offers solutions for just about any kind of hazardous waste. The company was founded in the Lower Saxony region in the 1960s. Since then it has specialised in collecting, transporting and recycling full and half-empty spray cans as well as specialist chemicals of a particularly hazardous or toxic nature. Whenever a pharmacy clears its stocks, REMONTDIS receives a shipment of brown glass bottles carefully packed in blue barrels. Ideally the professional waste management company should also receive any tough-to-handle waste from local authorities such as paint, varnish and out-of-date bottles of the highly toxic herbicide E605. That’s because REMONTDIS knows how to handle it and neutralise the hazard.

“Obviously everyone who works with the hazardous materials is equipped with a protective face mask to keep them safe,” says Benedikt Gerbrand, the local manager of REMONTDIS Industrie Service GmbH. This requires some 30 masks a week to be cleaned and disinfected, a task which, until recently, was performed manually. That typically took around one person-day a week – a considerable expense which had nothing to do with the company’s core competence.

Just a few hundred metres away as the crow flies from REMONTDIS is a man whose core competence is cleaning and disinfecting masks – Jörg Reinhardt. He works as a full-time breathing apparatus (BA) equipment manager at Bramsche Fire Department. Together with district fire chief Jörg Ludwigs he helped put together a very special joint venture: REMONTDIS regularly sends soiled masks to Bramsche Fire Department for cleaning. The BA team at the Bramsche station has been performing this task since February 2016 with a TopClean M from MEIKO which was paid for by REMONTDIS. Jörg Repetzky, who works at MEIKO’s Hannover office, explains how this solution came about: “We worked out together that it would make perfect economic sense for REMONTDIS to buy the machine for the fire department, which would then provide the mask cleaning service for REMONTDIS in return.”

Everything is clearly labelled and categorised in Jörg Reinhardt’s breathing apparatus facility. And the TopClean M installed in Jörg Reinhardt’s BA room also saves money for the fire department: „REMONTDIS is still paying a fee for us to clean each mask, and we can clean and disinfect the equipment for the eight fire brigades in Bramsche in one person-day a week is equivalent to about two months’ salary a year. We immediately realised that would make perfect economic sense for REMONTDIS to buy the machine for the fire department, which would then provide the mask cleaning service for REMONTDIS in return”.

A TopClean M from MEIKO is the “magic dividing line” in the BA cleaning facility at Ahlen FTZ

Some of the federal states in Germany – including Brandenburg, Lower Saxony, Saxony, Saxony-Anhalt, North Rhine-Westphalia and Schleswig-Holstein – operate fire service technical centres which are responsible for inspecting and maintaining firefighting equipment such as breathing apparatus (BA) sets, vehicles, fire hoses, and radios. The centres, abbreviated as FTZ in German, also carry out training courses. Many local authorities prefer to elevate these vital support tasks from a local level to a district level, in part because it allows them to reap the benefits of centralisation. One of these central facilities is the FTZ located in Ahlen, which is in the district of Warendorf. Peter Wagener works here as the head of the BA equipment team. He is responsible for ensuring some 3,500 masks are cleaned and returned to use each year. “Our technical centre supports a total of 13 fire departments,” Wagener says. „But only eight of those fire departments send their masks to us for cleaning.” Up until a few months ago the masks were cleaned by hand. Even though Peter Wagener always followed the instructions to wear gloves when cleaning masks in the dip tank, his hands still

REMONTDIS often deals with problematic residues which are of uncertain composition.

When it comes to clearly separating clean and dirty items in a BA room, meticulous care and attention to detail are absolutely essential. Jörg Reinhardt has made sure everything runs like clockwork. All the crates and pieces of equipment are neatly labelled, and clear rules are in place, for example stating that contaminated clothing and PPE must be delivered to the BA room through the courtyard and not carried through the fire station. Because when it comes to dealing with hazardous situations, Bramsche Fire Department prides itself on finding the right solution!
A number of studies have shown that firefighters are more likely than the population average to suffer from certain types of cancer. Interspiro manufactures breathing apparatus equipment, which is one of the most important components of personal protective equipment (PPE). How has your company responded to these findings in terms of product development?

André Jänicke: Interspiro has been committed to promoting firefighters’ personal safety for over 90 years. These studies have obviously caused a stir in Sweden, too, and in fact they recently prompted our company to come up with an innovation.

What kind of innovation?

André Jänicke: Firefighters return from some call-outs with their protective gear heavily contaminated with toxic and carcinogenic substances such as benzene and polycyclic aromatic hydrocarbons, or PAHs. These toxins can find their way into people’s bodies through their skin, so it’s vitally important to decontaminate the PPE without delay. That also applies to masks, cylinders and SCBA harnesses. That’s why Interspiro decided to replace the textile components of personal protective equipment (PPE). How has your company responded to these findings in terms of product development?

So when it comes to cleaning this new product, what type of machines have you had the best experiences with?

André Jänicke: Definitely the TopClean M from MEIKO.

What impressed you so much about that particular model?

André Jänicke: Interspiro was involved in MEIKO’s development of this machine right from the start, and we were impressed with their professional approach. You can really tell that this is a company with more than 80 years of experience in cleaning and disinfection which specialises in the hospital arena. And our own experience has confirmed MEIKO’s expertise time and again...

Can you give an example?

André Jänicke: Well, Interspiro Germany in Hamburg is responsible for cleaning 1,000 diving masks for the German Armed Forces, including the regulators. Only MEIKO offers the technology we need to achieve that within a sensible timeframe and with a process that we can validate properly.

You started as a firefighter at an early age and you’ve spent 17 years dealing with BA equipment issues on a professional basis. How would you say this technology and the contexts it’s used in have evolved over that time?

André Jänicke: Mask-cleaning in particular has come a long way over the last five to seven years. I can still remember the times when people cleaned masks with just a scrubbing brush and some disinfectant! When the first machines were eventually introduced they used a drum which quickly wore down the materials. Then along came MEIKO. I think it would be fair to classify their arrival on the scene as a quantum leap forward!

A lot has changed in terms of the masks themselves too...

André Jänicke: Absolutely. The latest innovation from Interspiro is the SpiroCom. The reason we developed it was that the emergency services in Los Angeles needed a radio system which would allow firefighters to communicate with each other directly without using the existing long-distance radio system managed by the officer in charge. We’ve installed an external loudspeaker on the mask, everything is compatible with the standard radio units, and the firefighters can communicate with each other perfectly.

And can the SpiroCom go in the TopClean M?

André Jänicke: We’re looking into that already, and I’m sure we’ll work something out!
Over 125 years of technology for life

According to statistics compiled by the credit agency Creditreform, German companies are, on average, 18 years old. Only a handful of mid-sized companies ever reach the ripe old age of 100 or beyond. One of this elite group is the German company Dräger, which is headquartered in Lübeck. Founded in 1889, Dräger has managed to match the achievement of household names like Sellotape and Kleenex by making its brand name synonymous with its product in several countries. In the USA, the word Drägermen is used as a synonym for heroes, referring to the rescue workers who risk their lives to save trapped miners. The name originates from the safety equipment originally designed in Lübeck.

The company was already on an upward trajectory even before it developed its original 1904/09 breathing apparatus kit at the start of the last century, but it was this ground-breaking technology which won plaudits from rescue teams all over the world. The word Drägerman still appears in US American and Canadian dictionaries. And in one of the first Superman comics, published in 1938, Drägermen are seen rushing to the aid of trapped miners together with the super-hero. “Trust plays a key role at Dräger, and in the safety equipment market in general,” says Frank Schmidtke, a marketing manager for the fire services sector at Dräger. And this isn’t just some kind of marketing blurt, he explains: “The functionality and reliability of our products is far too important to waste time on exaggerations. Our products are developed to protect and support people and save lives.” HARDLY surprising, then, that the company’s guiding principle is “Technology for Life.”

Yet the company actually has its roots in a quite different field. In 1889 Johann Heinrich Dräger was working as a sales representative for technical instruments when he became frustrated with the unreliable nature of beer tap dispensing systems. As well as his sales skills, he also proved to be a highly capable inventor. Noticing that the flow of beer into the glass was remarkably uneven, Dräger decided to create a completely new pressure reducing valve. This became known as the Lubeca valve in reference to the city of Lübeck. Dräger registered a patent for his eminently functional design, and that marked the start of Dräger’s success story. “It soon became clear that the ability to make gases easier to dose and manage was a sought-after skill in many other areas, too,” says Schmidtke. In collaboration with a physician, Prof. Dr. Otto Roth, Dräger developed an anaesthesia machine. The Roth-Dräger apparatus is one of the cornerstones of modern anaesthesia, and the company is still a global market leader in the field of medical devices.

The company has changed and evolved its product portfolio, although the company has constantly changed and evolved its product portfolio, Dräger is still regarded as one of the world’s leading companies for medical devices and safety equipment.

One example of the origins of modern safety technology is the so-called “Lubeca valve”, a carbon dioxide pressure reducing valve designed to improve beer tap dispensing systems which was invented by Johann Heinrich Dräger in 1889. Photos: Dräger

In the early 20th century Dräger was one of the founders of modern anaesthesia.

The “Pulmometer” – the first resuscitation device for patients in respiratory distress – was invented by Dräger in 1907. Photos: Hartmut Zielke

• Fire Service

• 2016 NEWS FROM MEIKO, THE INTERNATIONAL BRAND FOR PROFESSIONAL WAREWASHING TECHNOLOGY

• MEIKO SPLASH • Fire Service • Special Issue • 2016
Dräger has come a long way from the masks of the early 20th century to its cutting-edge FPS 7000 full-face mask. Nowadays the company uses synthetic materials such as EPDM instead of leather. EPDM is an ethylene propylene diene terpolymer, a kind of synthetic rubber. Silicon is also a popular choice in modern designs. Yet Dräger hasn’t abandoned its tried-and-tested models from previous years: its Panorama Nova full-face mask, for example, has been available since 1964, and it’s still a very popular mask both in the fire service and in industry,” says Schmidtke. The Dräger expert spent 11 years working in safety equipment sales, and for the last five years he has been responsible for marketing at Dräger in the fire services market segment. He is confident he knows what active firefighters all over the world are looking for when it comes to BA masks. In short, safety – but there’s a whole lot more to it than that. The extras that Dräger provides also play a part in enhancing firefighters’ safety. They include communication modules and head-up displays which allow the firefighter to monitor their air and battery levels. These features may seem complex, but they could make the difference between life or death. “Our FPS 7000 has long ceased to be just a mask. Now it’s more of an upgradable system based around the core function of a BA mask,” Schmidtke explains.

“This whole evolution has been hugely promoted by the NFPA, the National Fire Protection Association in the USA,” he adds. In fact the NFPA was founded almost as long ago as Dräger itself: the not-for-profit organisation has been active in the field of fire protection since 1896 and boasts 79,000 members around the globe. That’s 79,000 people who share a genuine concern for safety, and who could begrudge them the fact that they pursue every available innovation in the field of safety equipment? Today’s helmets and masks include Bluetooth units as well as cable and telemetry solutions. Schmidtke notes that questions such as whether people prefer a mask/helmet adapter or a head harness and which type of neck protection they favour are essentially a question of their personal philosophy. One thing that Dräger also specialises in is ensuring its equipment can be professionally managed and maintained to ensure it works perfectly in real-life conditions. Whole sections of respiratory protection training systems, fire training containers, test set-ups, servicing workshops and similar systems stem from this long-established Lübeck company. And the Dräger Academy is on hand to teach people the skills they need. “We’re not just trying to sell our equipment. We want our customers to see us as a partner working on their level,” says Schmidtke. Dräger is very much aware that each fire department has its own very specific style of process management and who could begrudge them the fact that they pursue every available innovation in the field of safety equipment? This is a skill that this experienced Lübeck-based company shares with the Offenburg-based machine maker MEIKO. A number of BA equipment rooms at German, Swiss and French fire departments have now installed the TopClean M from MEIKO, which are used to clean breathing apparatus sets including Dräger masks. “We got in touch with Dräger and all the other mask manufacturers right from the start because the market quickly told us that was an important step. Demand for the TopClean M was huge,” says Manuel Paulat, a MEIKO expert who specialises in products for cleaning and disinfecting BA equipment, recalling the period shortly after the machine was launched in 2010. The Offenburg-based washer-disinfector specialists have stayed in close touch with Dräger ever since.

Dräger long ago approved the TopClean M to clean its masks, and the two companies are keen to pursue this avenue in the future. Together with MEIKO, Dräger engineers have carried out a lengthy test process involving more than 300 wash cycles to check whether the materials used in regulators are also compatible with this cleaning method. “The TopClean M successfully met Dräger’s high standards for this task, too. We are expecting them to grant approval for regulators in early autumn 2016,” says Paulat.

The Dräger HPS 7000 is the latest generation of firefighter’s helmet. Every last detail can be configured.

Before the introduction of modern synthetic materials, BA masks were made from leather.

The Panorama Nova full-face mask has been in use since 1964. Photos: Hartmut Zielke

The HPS 4500 from Dräger in action.

Frank Schmidtke, Global Business Manager Segment Fire Services at Dräger: “Our FPS 7000 has long ceased to be just a mask. Now it’s more of an upgradable system based around the core function of a BA mask.”
When the Splash editorial team asked Wolfgang Gabler to help them write a description of a key task in the fire service – namely cleaning BA equipment using Meiko’s TopClean M – he promptly responded “it’s more complex than it seems!” Gabler runs a major German website on personal protective equipment for fire services known as the “Atmenschutzlexikon” which generates around 1.4 million clicks a year. In the future he will also be known as the expert who helped MEIKO cleaning and disinfection experts create a step-by-step series of words and pictures to describe this critical process.

Explaining why the topic is so complex, he says that “the risk of contamination for emergency response teams depends on hygiene and decontamination factors during firefighting, plus a very real risk of infection. And people aren’t discussing or writing about these issues anywhere near as much as they should be!”

We’re hoping we can help redress the balance. In collaboration with the MEIKO product management team for cleaning and disinfection technology, Wolfgang Gabler has painstakingly put together a description of the entire BA cleaning process. It starts from the moment a full-face mask is removed from its mask container or mask bag and plastic wrapping and follows the mask on its journey, describing how it should be handled after use, transported to the BA cleaning facility, cleaned by machine, inspected and prepared for the next call-out.

Drawing up this process required plenty of discussion, including weighing up all the different factors and consulting the mask manufacturers. It also involved a healthy dose of common sense and plenty of input from mask wearers and BA equipment managers.

It wasn’t easy for the team to decide how detailed the process should be and how strictly they should stick to state-of-the-art methods. The problem is that everyday realities don’t always match their textbook equivalents. Recently there was an incident where firefighters returned their masks to a fire service technical centre after a call-out only for the cleaning team to

1. Disconnect the regulator’s medium pressure coupling from the complete medium pressure line, then disassemble the regulator prior to washing in accordance with the manufacturer’s instructions (usage and maintenance guidelines).

2. Each mask is disassembled prior to washing in accordance with the manufacturer’s instructions (usage and maintenance guidelines), and the pieces are placed in the TopClean M basket insert.

3. Where possible, place masks in bags before transporting them to the BA facility. This will offer some initial level of protection to all the people. Masks and SCBAs which are contaminated on the outside with hazardous substances must be clearly labelled for transport and compatibility with the next call-out.

4. The officer in charge informs the BA equipment team (e.g., via the control room) that the crew are on their way back and describes what the masks and SCBA are contaminated with. This helps the BA team prepare what they need. Based on their training, today’s BA equipment managers are aware that all used masks and SCBA regulators should be considered as infected.

5. Preparing the SCBA for the next call-out involves replacing the cylinder, performing a visual inspection, checking function and air tightness, and performing any other necessary steps. Make sure any used compressed air cylinders and SCBAs are securely stowed in the vehicle before leaving the incident site.

6. Where possible, place masks in bags before transporting them to the BA facility. This will offer some initial level of protection to all the people. Masks and SCBAs which are contaminated on the outside with hazardous substances must be clearly labelled for transport and compatibility with the next call-out.

7. The contaminated BA equipment is handed over to the equipment managers in the dirty zone of the BA room. Class 3 protective coveralls are recommended in cases of hazardous contamination.

8. The masks undergo an initial cleaning with water to wash off any loose particles.

9. The contaminated BA equipment is handed over to the equipment managers in the dirty zone of the BA room. Class 3 protective coveralls are recommended in cases of hazardous contamination.

10. When the Splash editorial team asked Wolfgang Gabler to help them write a description of a key task in the fire service – namely cleaning BA equipment using Meiko’s TopClean M – he promptly responded “it’s more complex than it seems!” Gabler runs a major German website on personal protective equipment for fire services known as the “Atmenschutzlexikon” which generates around 1.4 million clicks a year. In the future he will also be known as the expert who helped MEIKO cleaning and disinfection experts create a step-by-step series of words and pictures to describe this critical process.

Explaining why the topic is so complex, he says that “the risk of contamination for emergency response teams depends on hygiene and decontamination factors during firefighting, plus a very real risk of infection. And people aren’t discussing or writing about these issues anywhere near as much as they should be!”

We’re hoping we can help redress the balance. In collaboration with the MEIKO product management team for cleaning and disinfection technology, Wolfgang Gabler has painstakingly put together a description of the entire BA cleaning process. It starts from the moment a full-face mask is removed from its mask container or mask bag and plastic wrapping and follows the mask on its journey, describing how it should be handled after use, transported to the BA cleaning facility, cleaned by machine, inspected and prepared for the next call-out. Drawing up this process required plenty of discussion, including weighing up all the different factors and consulting the mask manufacturers. It also involved a healthy dose of common sense and plenty of input from mask wearers and BA equipment managers.

It wasn’t easy for the team to decide how detailed the process should be and how strictly they should stick to state-of-the-art methods. The problem is that everyday realities don’t always match their textbook equivalents. Recently there was an incident where firefighters returned their masks to a fire service technical centre after a call-out only for the cleaning team to
Cleaning breathing apparatus equipment: a complex process
discovers that they were contaminated with hydrochloric acid (see article on pages 14-15). So it's hardly surprising that the recommendations for
preliminary mask cleaning in BA rooms call for the use of protective overalls and face masks. But when we asked the BA equipment managers from
Kenzingen Fire Service to put on all their gear for a photo, there was a certain degree of skepticism. "On a day-to-day basis it's probably taking things a bit too far" and "in certain cases it's probably a good idea – experienced BA
equipment managers know when to insist on it" were just two of the comments we heard. Perhaps more than any other profession, it's fair to say that the fire
service involves a number of hazards that may not be immediately apparent. Eventually you will end up with hydrochloric acid on a fire crew's BA equipment
without anyone knowing anything about it – because the truck had nothing written on the side. Even experts agree that there will always be some risks
that firefighters can't anticipate. But we believe that we can reduce those risks to a minimum.

We very much hope that this issue of our magazine, and especially our series
of BA cleaning descriptions and photos, will enrich the work you do in your
BA facilities. It is intended to provide food for thought – and hopefully make things
even safer.

We would be delighted to receive any feedback or ideas you may have on this
issue. You can easily get in touch with us at either wgabler@t-online.de,
www.atschutzlexikon.de or splash@meiko.de. We look forward to hearing
from you!

Request free poster
You can request the detailed process description for free. Simply email at splash@meiko.de

Inspect and test the masks and SCBAs in accordance with the manufacturer’s instructions (usage and maintenance guidelines).

Finally, store the equipment hygienically sealed in plastic bags, ensuring that the bag is ventilated (e.g. by cutting off a corner). Store the bags containing the masks in appropriate mask
containers.

Clean, disinfect and rinse the used mask containers.

Disinfect the headform before testing the masks.

Assemble the masks and SCBAs in accordance with the manufacturer’s instructions (usage and maintenance guidelines).

The cleaned, disinfected and mixed masks and/or regulators are removed from the TopClean M by the equipment manager in the
clean zone.

The BA equipment manager working in the dirty zone pushes
the basket into the machine. Their colleague in the clean zone
closes the machine and presses start.

If the warning device is included in the wash process too, then
this also needs to be protected to prevent the ingress of liquids.

If water makes its way into the SCBA, this is considered to be
"contrary to proper use". The SCBA must then be sent to the
manufacturer to be checked.

To a minimum.

We would be delighted to receive any feedback or ideas you may have on
this issue. You can easily get in touch with us at either wgabler@t-online.de,
www.atschutzlexikon.de or splash@meiko.de. We look forward to hearing
from you!

SCBA harnesses can be inserted in the baskets designated for
that purpose. Unless the SCBA's pneumatics are removed before cleaning the harness in the TopClean M, then please
remember to seal the SCBA pressure reducer at the manual air
cylinder connection! See photo 14.

The person responsible for the dirty zone should not touch the
outside of the machine. They should leave the task of opening
the machine to their colleague in the clean zone.

SCBA harnesses can be inserted in the baskets designated for
that purpose. Unless the SCBA’s pneumatics are removed before cleaning the harness in the TopClean M, then please
remember to seal the SCBA pressure reducer at the manual air
cylinder connection! See photo 14.
Wolfgang Gabler is an expert in fire control and prevention and personal protective equipment (PPE). A former head of technical equipment at the regional fire service and disaster relief training college in Saxony, he is now regarded as one of Germany’s foremost experts in the field of respiratory protection. He has authored or co-authored more than 80 specialist books on the use of personal protective equipment in the fire service. He also runs the www.atemschutzlexikon.de website, the world’s most comprehensive online source of information on respiratory protection. Wolfgang Gabler is currently working on a joint project with the well-known cleaning and disinfection appliance manufacturer MEIKO, applying his expertise to help formulate a state-of-the-art process for cleaning breathing apparatus equipment. For this project to succeed, it needs to be embedded in a context which clarifies the importance of getting personal protective equipment properly and hygienically clean.

The Splash editorial team talked to Wolfgang Gabler about how fires and the products of combustion have changed over the past few decades and what applications this has for firefighters’ health.

What makes combustion products so dangerous?

Wolfgang Gabler:
To answer that I first need to explain some of the key developments we’ve seen in recent years. We have around 200,000 fires a year in Germany, a figure that has stayed fairly static over the years. Yet the number of cases of people dying from smoke inhalation has actually increased. Each year some 500 people are killed by fires, a further 4,000 are seriously injured and 60,000 people suffer minor injuries. Around 85 percent of the 500 fatalities are caused by smoke inhalation. Over 80 percent of these people die in their homes, with 70 percent of them falling victim to a fire while they are asleep. More than 90 percent of those people are killed by the smoke from the fire. The biggest change is that the combustion products contained in fire smoke and soot are becoming increasingly aggressive and toxic. This is primarily due to the increased use of plastics. Nowadays many items of furniture and packaging and other household goods are made from polypropylene (PP), polyethylene (PE) or polyvinyl chloride (PVC). These produce highly toxic and even ultra-toxic gases when they burn.

And that’s why firefighters wear personal protective equipment, right?

Wolfgang Gabler:
Right. But based on their characteristics and effects, combustion products are rated as hazardous to human beings. Some are even classed as hazardous in small quantities. A person only has to come into superficial contact with these substances and compounds to suffer a very real risk of contamination. They can enter the body by penetrating the skin or a wound, and they can also be swallowed or inhaled. Hazardous substances which enter the body through the respiratory system are known as respiratory poisons. Anyone who fights a fire, or who enters an area where a fire has been extinguished, will be exposed to these hazards. The dangers stem from the fumes which are emitted as well as the use of certain fire extinguishing agents such as carbon dioxide and the properties of substances as they undergo thermal decomposition. These include pyrolysis products such as carbon monoxide and carbonisation gas as well as gaseous combustion products such as smoke, soot, dioxins and furans. Fires typically produce large quantities of combustion products in a very short space of time, suffocating their victims. These products are typically toxic, corrosive, flammable, explosive and carcinogenic and cause numbness and sensitisation. Many of the products of combustion cannot be perceived by human senses, yet the most dangerous ones take effect even at low concentrations. Once cross-reactivity is thrown into the mix, this can pose extreme danger to the human organism. And the on-site conditions can actually reinforce the action of the combustion products.

What do you mean by cross-reactivity?

Wolfgang Gabler:
Let me give you an example. If someone inhales carbon dioxide up to a certain limit, their breathing accelerates. That means their respiratory volume increases, with more air going in and out. If that person finds themselves in an environment full of hazardous substances without any protection, then their body will take in the toxic substances faster and in greater quantities, and at the same time the carbon dioxide will be driving out the life-giving oxygen from the air that person is inhaling.

And what about the on-site conditions you mentioned?

Wolfgang Gabler:
By that I mean things like the heat of the fire. The heat causes the combustion gases to increase in volume. They become lighter than the surrounding air and start to rise. This movement – the upward current of the hot combustion gas – carries more and more suspended particles upwards as it increases in strength, many of which are harmful. This mixture of combustion gas combined with liquid and solid suspended particles is known as fire smoke. And the lower the amount of oxygen reaching the source of the fire, the greater the concentration of highly toxic and ultra-toxic carcinisation products in the smoke, which pushes the danger level even higher.

The fact that the fire smoke climbs upwards from the burning material means it is more likely to come into contact with people, and unless they are properly protected this can lead to severe poisoning and other harmful consequences.

What effect do respiratory poisons have on people?

Wolfgang Gabler:
Respiratory poisons can cause long-term and short-term harm to people’s health and potentially to the health of their offspring. In some cases they can even be fatal. Experts estimate that a person will typically lose consciousness after taking just three breaths in a modern apartment fire, and could die of smoke inhalation after just a few more breaths. Respiratory poisons may be solid, liquid or gaseous and may consist of a single substance or a mixture. They enter the body when they are inhaled by someone who has no form of protection. Respiratory poisons may be flammable and explosive, strongly irritating or corrosive, carcinogenic, teratogenic, or mutagenic. They can also trigger allergies and are typically hazardous to the environment. We divide them into three categories based on the effect they have on human beings:
- suffocating action;
- corrosive action;
- affects blood, nerves and other cells.

They are hazardous to all living beings in their sphere of action.

So what are the overall risks of fire smoke for emergency personnel?

Wolfgang Gabler:
Individual components of fire smoke can be fatal even in low concentrations. The dangers presented by the smoke depend primarily on the fuel and what stage the fire has reached. Every fire produces a different kind of smoke in terms of quantity, composition and the effects it causes:
- toxic action;
- chemical action;
- visual obstruction;
- transport of heat by fumes;
- flashover (rapid spread of the fire through the air due to intense heat).

What hazards does fire soot create?

Wolfgang Gabler:
Depending on the type of combustion, soot is produced in varying quantities in all fires. The action of fire soot stems from its chemical composition, the size and form of the primary particles, and the impact of its other components. Fire soot may present in the form of dust or flakes, making it easy for unprotected emergency personnel to inhale. Some of the soot is caught by a person’s cilia and mucous membranes, but the rest enters the lungs. The trapped portion may end up being swallowed together with saliva, coughed up or ejected as a secretion from the nasal cavity. Fire soot can be inhaled by unprotected personnel both during and subsequent to the fire. It may then have a toxic effect on the body or stick to personal protective equipment causing serious contamination.

The substances which adhere to soot cause chronic ailments, some of which can lead to immunodeficiency, skin diseases and even cancer.
MEIKO’s microbiology lab confirms log 5 reduction in germs

The Staphylococcus aureus bacterium resides unobtrusively on many people’s skin. The only time it causes a problem is if someone has a weak immune system, undergoes an operation, or has a wound. If they become infected with Staph. aureus – one of the best-known hospital superbugs – they may end up suffering a long illness with boils, pneumonia, endocarditis and even sepsis. The superbug Enterococcus faecium is a type of bacteria which typically inhabits the gut of humans and animals. In the most serious cases this, too, can cause endocarditis or bladder infections in people with weakened immune systems. It ranks as one of the toughest hospital-acquired infections to combat. The fungus Candida albicans can also cause serious infections in people with weak immune systems, just like the two types of bacteria described above. Centers of these and many other germs have an unwavering tendency to pass them on to others – and the inside of a BA mask provides the perfect opportunity...

There are obviously numerous other pathogens which can also take up residence in firefighters’ personal protective equipment. To eliminate them, every mask is sent to the BA cleaning room to get it ready for the next use. In BA rooms which use manual cleaning methods, most of the work is done by chemicals, together with the BA equipment at MEIKO. There are pressurized, so all of us at MEIKO wanted to be sure of the machine’s capabilities. As well as the chemicals used in the TopClean M, we also decided to test the most common detergents and disinfectants which have been approved by the National Sanitation Foundation (NSF) laboratory, to get a more reliable result.

In Germany, for example, the machine is exclusively designed for use with disinfectants and detergents which have been approved by the NSF. Pamela Kasper, who specialises in products for cleaning and disinfecting breathing apparatus equipment at MEIKO, explains MEIKO’s approach: „The TopClean M is a genuine innovation because as well as cleaning masks it also offers machine cleaning of regulators which are pressurized, so all of us at MEIKO wanted to be sure of the machine’s capabilities. As well as getting the material compatibility and cleaning performance of our appliance tested in the NSF laboratory, we also decided to test the most common detergents and disinfectants in combination with the TopClean M in our company’s in-house microbiology lab.”

Pamela Kasper, a MEIKO hygiene technician, contaminated the inside of two BA masks with Staphylococcus aureus, Enterococcus faecium and Candida albicans in MEIKO’s Biosafety-Level 2 microbiology laboratory. One of the masks was cleaned in the MEIKO machine, while the other was left contaminated to serve as a reference mask. After cleaning I took samples and cultured them in a nutrient solution.” The results were clear: all the detergents she tested achieved a 5-log or greater reduction in the amount of bacteria and fungus (the minimum amount required for successful disinfection).

Kasper tested the following detergents in the TopClean M using the first wash programme which runs for six minutes and has a minimum contact time of five minutes:

- Curacid PSA TC
- EW 80 mat
- Neodisher Dekonta AF
- Sekumatic FDR

Candida albicans in MEIKO’s Biosafety Level 2 microbiology lab was contaminated the inside of two BA masks with Staphylococcus aureus, Enterococcus faecium and Candida albicans in MEIKO’s Biosafety-Level 2 microbiology laboratory. One of the masks was cleaned in the MEIKO machine, while the other was left contaminated to serve as a reference mask. After cleaning I took samples and cultured them in a nutrient solution.” The results were clear: all the detergents she tested achieved a 5-log or greater reduction in the amount of bacteria and fungus (the minimum amount required for successful disinfection).

Becoming a firefighter was his one and only dream

Every week gets off to a familiar start for the 380 members of Offenburg Fire Department, because Monday night is training night! When station commander Peter Schwinn asked MEIKO Maschinenbau GmbH & Co. KG whether he could use an empty, recently purchased building for a firefighting training session, the answer was a resounding yes. „Absolutely no problem,” said Christoph Homburger, MEIKO Executive Vice President Operations, who immediately gave the green light for the firefighters to put their skills to the test. The first training exercise involved rescuing a woman from the first floor while thick smoke swirled around her, giving the team plenty of opportunity to demonstrate their capabilities when an emergency strikes.

A short circuit in the basement had prompted the woman to check out the fuse box, and that’s when things had gone terribly wrong...

„We were obviously delighted that MEIKO was happy to let us use the building for our training,” enthuses Peter Schwinn. The 50-year-old city platoon leader puts his firefighters to the test every Monday. „Obviously we don’t always have all 300 of us there, but we make sure that everybody gets plenty of training.” That includes to train as a bricklayer. That’s because one of the prerequisites for a career as a firefighter is to have a professional occupation. Regina Oehler from MEIKO’s communications department also felt that was „a really nice sideline story”. So the Splash editorial team and photographer turned up at the firefighter training session, too, and it’s their report you’re reading now...
MEIKO SPLASH! • Fire Service • Special Issue • 2016

NEWS FROM MEIKO, THE INTERNATIONAL BRAND FOR PROFESSIONAL WAREWASHING TECHNOLOGY

The health and safety officer was horrified at what he saw – so now they clean their masks with a TopClean M

There was a time when occupational health & safety was limited to setting up sanatoria for workers with chronic conditions such as lung disease. This was equivalent to shutting the stable door after the horse has bolted, because the workers were of course already sick. One of the biggest sanatorium facilities in the Berlin region is a collection of buildings in the Heilstätten district of the town of Beelitz in Brandenburg, which was originally set up as a facility for workers with chronic illnesses. This district of just 500 inhabitants houses the 60 listed buildings which make up the sanatorium complex. At its heart is the Potsdam-Mittelmark fire service technical centre (abbreviated as FTZ in German).

“Our administrative district is approximately as big as the federal state of Saarland,” says Helge Werner, who heads up the FTZ, explaining why the location of the facility seems rather remote. The 19 volunteer fire departments with a total of 244 local fire brigades rely heavily on the FTZ’s support. But the topic of work safety is handled very differently today than it was in 1898, the year in which the sanatoria were established. One recent example of how things have improved is the incorporation of a TopClean M from MEIKO in the breathing apparatus (BA) equipment cleaning facility at Potsdam-Mittelmark FTZ. “It’s a huge step forward in terms of health and safety,” says Werner enthusiastically.

The fact that more attention is now being paid to this issue is not only due to the historical context, but also thanks to a traffic accident involving a truck. “The vehicle involved didn’t have any markings on it suggesting that it was carrying hazardous materials, so the firefighters only became suspicious when they realised they couldn’t put the fire out,” says Werner. Only once the incident was over and the dirty equipment arrived at the FTZ yard did it become clear that everything was contaminated with hydrofluoric acid! This solution of hydrogen fluoride is so aggressive that it can even be used to etch glass. That means its effects are just as corrosive on skin, mucus membranes and the conjunctiva in people’s eyes. “Hydrofluoric acid is a powerful contact poison which is absorbed by the skin tremendously fast. There is a real risk of chemical burns progressing right through to the bone.” Normally equipment contaminated with hydrochloric acid simply has to be shovelled up by an excavator and taken to the waste incinerator, Werner explains.

Fortunately these kind of events are the exception rather than the norm, but it certainly raised awareness of the topic of occupational safety in Beelitz. The facility uses 400 masks a month for training exercises in fire simulators and for lending to fire brigades who run out of masks after major incidents. All these masks used to be cleaned by hand – but now this job is performed by a MEIKO washer-disinfector. “The work safety team came to do an on-site inspection when we were still washing the masks in dip tanks. Although we had the doors and windows open, the health and safety officer’s eyes started watering – and the TopClean M was ordered virtually the very next day!” says Werner.

Obviously Werner and the five other members of the BA cleaning and maintenance team at the FTZ also looked at other brands when they were choosing a machine, but none of them were suitable: „One of the machines wasn’t approved either by the mask manufacturers or by the the independent DEKRA EXAM test lab, and the other option used 200 litres of water for every wash cycle. We couldn’t even bring ourselves to look at how much electricity it used, but we did see that the overall cleaning cycle – up until the masks were completely dry – took 2.5 hours! Proof of just how unsatisfactory the manual cleaning method really was has come from a completely unexpected source at Potsdam-Mittelmark FTZ: “We’re gradually replacing all the inhalation valve disks because only now is the dirt on them finally starting to come loose.” The BA mask wearers will be pleased to hear that, especially since the sanatoria long ago closed their doors. Of course even if they hadn’t, they would no longer be an acceptable way of compensating for poor occupational health & safety on-site!
Manfred Salzmann: User safety is our top priority when it comes to developing our products. Most of them are used in situations where human lives are in the balance. In environments where the air is full of hazardous substances, it’s essential to have maximum protection. That’s why we develop products which are robust and easy to use so that people have the wearable protection they need.

Our equipment has to be cleaned properly after use by experts so that it will provide the same level of protection at the next incident. The key here is to make it easy to maintain and capable of withstanding the repeated application of detergents and disinfectants. There’s no doubt that using a machine to clean masks reduces the potential risk of contamination when it comes to protective equipment and provides better protection for the people involved than manual cleaning methods.

On the morning of 26 March 1912, the Jed Coal and Coke Company mine in West Virginia exploded, killing more than 80 miners. Like many other people at the time, mining engineer John T. Ryan Senior was deeply troubled by this event. He decided to devote the rest of his life to preventing such terrible tragedies. He enlisted the help of his colleague George H. Deike, and the two men decided to set up a company to manufacture dependable, safe mining equipment. To get their idea off the ground, they approached one of the country’s foremost thinkers and inventors, Thomas Edison. He helped them create the electric cap lamp to replace open-flame lamps, an invention which would reduce mine explosions by 75 percent over the next 25 years.

Further innovations followed, including first-aid kits, portable methane detectors, thermal imaging cameras, helmets, and systems for gas and flame detection. Nowadays the company MSA – The Safety Company is regarded as one of the most prestigious manufacturers of respirator technology. The Splash editorial team talked to Manfred Salzmann, product manager for respirators and SCBA equipment at MSA in Berlin.

Safety is one of the paramount values at your company, much like it is here at MEIKO. How important are occupational safety concerns in the realm of respirator and SCBA technology?

Manfred Salzmann: As a global company we try to find cleaning methods which can be implemented in as many parts of the world as possible – methods based on chemicals which have been approved for use in each of the countries concerned. That’s why we prefer companies who have also made the choice to act globally. As a manufacturer we favour materials which offer maximum user safety while meeting all the required standards. Combining those things can be tricky. To ensure machine cleaning doesn’t damage our products and lead to higher maintenance or replacement costs, we spend plenty of time carefully checking which methods we should approve to ensure we keep our customers happy.

What have been the biggest changes in recent years in SCBA and respirator technology?

Manfred Salzmann: Our development team has increased our products’ robustness to reflect both our internal requirements and stricter standards. Based on the European Union’s REACH regulation, for example, we had to focus heavily on the critical substances in our products and develop some new materials. And obviously we’re constantly striving to improve user comfort, too.

Our masks’ special sealing lines, low weight, and maximised field of vision make them tremendously comfortable to wear, and obviously they are also easy to maintain. What’s more, the companies and local authorities who use our products know that they can make very real savings by spending less time on maintenance.
“Nothing ever happens to heroes...”

Monique Breithaupt-Peters has a degree in psychology and is a Coach and Trainer – as well as being a firefighter. Hailing from Offenburg, she has also helped to develop the emergency pastoral care for those working in firefighting in the District of Ortenau. We met with Monique Breithaupt-Peters and talked about the typical approach firefighters take to assessing risks and the “sensation seekers” in the ranks of the firefighters.

Firefighters are aware – at least theoretically – of the risks that their work involves. Knowing this, why do they work in such a dangerous area?

Monique Breithaupt-Peters: Firefighters generally have a lot of experience. They can assess a fire far better than the man in the street. Not every fire is as dangerous as it looks. At the same time, firefighters can often be special people. The technical term to describe the kind of person looking to experience a lot of variety and new experiences in a socially acceptable setting is a “sensation seeker”. There are physiological reasons that determine how much excitement someone is able to cope with or enjoy, and how well they work when under stress. In addition to this, many firefighters feel there is a social necessity to their job: after all, somebody has to do it ...

At the same time, it is a job that gives you the opportunity to be an everyday hero, and there are few such opportunities nowadays.

People are aware of the critical issues regarding PSA but ignore them anyway: for example, when helmets get coated with hazardous dust. Breathing equipment is always thought to be clean even if it has already been used (“I was only used very briefly”). How do you explain this stupidity?

Monique Breithaupt-Peters: Many firefighters have helped to bring about changes here, but we also have a tendency to get things wrong. When risks aren’t immediately detectable, we often respond “generously”. It’s the same for a lot of people – not just firefighters. It is the momentary experience that has a modulating impact on our behaviour. When it comes to the long term consequences, everyone thinks: “That only happens to others”. It is often the case that the resources required to ensure the correct behaviour are lacking, however. When they hand their clothes in for washing, they are afraid their equipment won’t be available in time for the next emergency. At a time of rapidly increasing numbers of both emergency call outs and fire alarms, this is an important issue, especially because firefighters feel very duty bound to their work.

There is currently a battle to recognise certain types of cancer as being occupational diseases that affect firefighters. What does this mean for voluntary firefighters?

Monique Breithaupt-Peters: At the moment it is of little meaning because it is not widely known, and the same goes for the negative consequences of frequent exposure to stress and being constantly on call. This is especially true for voluntary firefighters. The perception of being invincible is another factor – nothing happens to heroes ... And it is also good that firefighters think in this way. We know that it can help protect them from the longer term consequences of stress, such as post-traumatic stress disorder. Comradeship also helps here – especially even at the smallest village fire brigade.

This is a very good source of protection.

Do firefighters generally have lower levels of fear than everyday citizens?

Monique Breithaupt-Peters: No, firefighters also suffer from fear and get scared. It is important and helps provide direction in dicey situations. Firefighters have learned to overcome their fear and to assess risks differently, however. Emergency service organisations often have employees who know how to handle stress better than everyday people do, and to stay clear and focused in tough situations. These are people who enjoy the adrenaline kick – and who feel it is necessary for a good job or helps them to work better than they would in everyday situations. They have found an area of work which combines their yearning for excitement with a socially important and acknowledged activity. For young men in particular, this is certainly a superior alternative to the kind of crazy things they sometimes do to get a kick, such as surfing on railway wagons or racing cars at high speed. At the same time, they get a lot of recognition from the general public and can tell some great stories about their heroism to their friends.

Key information and links

- Boston Firefighters recall colleagues who died from occupational cancer -> https://www.youtube.com/watch?v=OvBypsaHog
- Review of the Epidemiologic Studies for the Association between Firefighters and Selected Cancers -> http://www.aflcio.org/documents/8am/review-of-the-epidemiologic-studies-for-the-association-between-firefighters--and-selected-cancers
- German Fire Community Association (VDFFB) Instruction sheet with recommendations on operational hygiene in fire fighting -> http://www.vdffb.de/download/Meckl/20141106_MBL_Einsatzhygiene_en.pdf
- German Fire Protection Association (VdFfG) Instruction sheet with recommendations on operational hygiene in fire fighting -> http://www.vdfgg.de/download/Meckl/20141106_MBL_Einsatzhygiene_en.pdf

Air Water Safety Service Inc. is one of Japan’s leading manufacturers of BA and respirator masks. The company is currently searching for a valid and reliable method of cleaning breathing apparatus (BA) and respirator masks, a task that is currently carried out by mask wearers themselves in Japan. This led to a recent trip to the Fire Department in the German town of Lahr by Shigenori Imamura, managing director of MEIKO’s partner OGAWA Iriki in Japan, and interpreter Aya Okubo who were visiting the facility on behalf of Air Water Safety Service Inc. to see MEIKO’s TopClean M in action. Ralf Wieseke, head of breathing apparatus equipment at Lahr Fire Department, was happy to explain the process, while the technical details were provided by Manuel Paulet (at far right), a MEIKO expert who specialises in products for cleaning and disinfecting BA equipment, and Sören Gleichmann, Managing Director MEIKO Australia/ Pacific. Photo: Markus Dietze

MEIKO SPLASH! - Fire Service - Special Issue - 2016

MEIKO Fire Service Prize Competition
Take part in our competition and you could win a prize!

Entering competitions is always fun – plus then the chance to win a brand new MEIKO TopClean M! Follow the link to try your luck: http://www.meiko-uk.co.uk/campaigns/fire-Services/

We wish you all the very best of luck.