











Your safety,  
our solutions –  
perfectly linked together.

Our solutions for the mining industry



**INDEX**

ST-19437-2008		Introduction	04
D-114102-2013		1 Fit for Duty	06
D-114264-2013		2 Occupational Health and Safety	08
D-114380-2013		3 Ventilation and Plant Safety	10
D-112826-2013		4 Emergency Escape	12
D-116259-2013		5 Emergency Response and Rescue	14
D-32084-2011		6 Equipment Maintenance	16
D-8691-2014		7 Training	18
		8 Service Needs and Requirements	20



## Ensuring mining safety – at the surface or underground, for coal or metal/non-metal mines

For generations, miners have depended on quality safety equipment and products from Dräger to protect their lives. Our technical solutions are all components of an integrated safety concept that is dedicated to the improvement of mine safety – this begins with respiratory protection and gas detectors for everyday workplace safety and extends to self-contained self-rescuers and refuge shelters for emergency situations. On the following pages, you can learn more about our technical solutions for occupational safety and health, ventilation and plant safety, maintenance and training, as well as emergency preparedness and response.

“We remain committed  
to making lives safer and  
companies more productive.”

Stefan Dräger

# Your safety, our solutions - perfectly linked together





# Our solutions for Fit for Duty



## PREVENTATIVE TESTS

To check the alcohol level in his or her breath, the employee blows into a test device. The values are noted for immediate documentation and automatically stored for later analysis on a PC. A similar approach applies to drug tests: In this case, a saliva sample is taken and immediately analysed in a fully automated process.

## SOBER DRIVING TESTS

With ignition interlock systems for testing breath alcohol levels, vehicles are automatically prevented from being driven if the driver is under the influence of alcohol. If the device measures the driver's breath alcohol concentration to be above the set threshold, the vehicle's engine cannot be started.



D-305693-2017

### Dräger Alcotest® 5000

The Dräger Alcotest® 5000 is a high-speed breathalyser and performs numerous tests in no time. Its special funnel reduces the back-flow of expired air to a minimum, preventing the risk of infection to subsequent test subjects.



ST-150593-2008

### Dräger Alcotest® 7510

The Dräger Alcotest® 7510 delivers quick and accurate measurement of breath alcohol concentrations, even at sub-freezing temperatures. It also allows passive measurement without a mouthpiece, such as measurement of alcohol inside an underground vehicle.\*

\*In the U.S.: only for law enforcement purposes



D-98730-2013

### Dräger Interlock® 7000

The Interlock® 7000 is a breath-alcohol measuring instrument with a vehicle immobilizer, which prohibits a driver from starting the engine after alcohol consumption. It works perfectly at -45 °C in cold winter days and at 85 °C in blazing sunlight.\*

\* In the U.S.: only for law enforcement purposes





### TESTS AFTER MINING INCIDENTS

After incidents involving personal injury or material damage, it is important to determine the cause of the accident and the course of events leading up to it. In this case, drug and alcohol tests taken after the incident can be vital for use as evidence.

Find out more at: [www.draeger.com/application-fit-for-duty](http://www.draeger.com/application-fit-for-duty)  
[www.draeger.com/spotlight-fit-for-duty](http://www.draeger.com/spotlight-fit-for-duty)



**Dräger DrugTest® 5000**  
 With cutting-edge oral fluid drug testing technology, the Dräger DrugTest® 5000 system allows a discreet and hygienic approach with reliable and precise testing results for drug management in the mines.\*



**Dräger DrugCheck® 3000**  
 Use the Dräger DrugCheck® 3000 to find out within minutes if a person recently consumed certain drugs. The compact and quick oral fluid based drug test yields reliable results affordably and easily. The device does not require electricity and can be used anywhere.



**Dräger Mobile Printer**  
 The Dräger Mobile Printer prints breath alcohol and drug test measurement results directly on the spot via wireless data transfer with an IR interface.

\* In the U.S.: only for law enforcement purposes

# Our solutions for Occupational Health and Safety



## OCCUPATIONAL SAFETY

Warning employees about exposure to hazardous substances such as toxic dust, diesel emissions, and blast emissions, and protecting them from such hazards is extremely important. The same applies to emergency alarms in the event of a fire, gas outburst, or a failure of the ventilation system.

## CONFINED SPACES

Limited ventilation and means of escape, a lack of oxygen, and the presence of toxic substances: There are many risks when confined spaces are involved. As a result, strict safety regulations must be observed. This should include performing a clearance measurement before entering an area to ensure that it is safe.



ST-14189-2007

### Dräger X-plore® 1700 series

Dräger X-plore® 1700 makes breathing easy and comfortable by ideally combining low breathing resistance and high filter performance in one mask. The CoolMAX™ valve efficiently releases humid and warm exhaled air to the outside.



D-33520-2009

### Dräger X-pect 8320

Combining the best possible wearer comfort, high safety standards and an attractive design, the Dräger X-pect 8320 is designed to provide special protection to your most important sensory organ: the eye.



D-16519-2009

### Dräger X-am® 5000

The Dräger X-am® 5000 offers the flexibility of tailor-made configuration to measure up to five gases specific to the desired applications including combustible gases and vapours, oxygen and various toxic gases.



#### HANDLING HAZARDOUS SUBSTANCES

Direct contact with hazardous substances is sometimes unavoidable when you offload, mix or transfer chemicals – for instance, when leaching or concentrating. Employees should wear suitable breathing protection and/or protective suits (PPE) in order to prevent dangerous contamination.

#### MAINTENANCE WORK

While performing maintenance and repair work, employees are exposed to welding gases, fumes, and dust when cutting, grinding, and painting vehicles or machinery. Comfortable breathing protection allows them to work without worry.

Find out more at: [www.draeger.com/application-ohs](http://www.draeger.com/application-ohs)  
[www.draeger.com/spotlight-ohs](http://www.draeger.com/spotlight-ohs)



**Dräger X-plore® 9000 and PAS X-Plore®**  
 The Dräger X-plore® 9000 is an airline belt manifold that provides comfortable and reliable respiratory protection. Thanks to such features as the patented safe-flow reducer and autotest function, wearers can enjoy more operating convenience, safety and flexibility.



**Dräger SPC 3800**  
 The disposable Dräger SPC 3800 is a light and comfortable, liquid-tight protective suit. The donning and doffing procedures are especially easy and it provides perfect protection during the operation.



**Dräger X-plore® 8000**  
 The Dräger X-plore® 8000 Powered Air-Purifying Respirator offers intuitive handling combined with intelligent electronics that provide the high degree of safety. It also features heavy-duty design and high ingress protection (IP65) against dust and water jets.

# Our solutions for Ventilation and Plant Safety



## MINE VENTILATION

The ventilation system ensures that hazardous substances can be continuously detected and when necessary purged from the mine. Whether portable gas detectors for personal monitoring and clearance measurements or stationary technology for continuous monitoring, what is most important is that fast and precise results are readily available.

## AREA MONITORING

Above ground, stationary transmitters or transportable area monitors signal leaks, process anomalies, and detect the dangerous accumulation of gases in the production area. Whether it is in waste water treatment facilities or nearby refrigeration plants. This means that all the necessary measures can be taken in the event of an alarm.



### Dräger X-am® 8000

The Dräger X-am® 8000 measures up to seven toxic as well as flammable gases, vapours and oxygen all at once – either in pump or diffusion mode. Innovative signalling design and handy assistant functions ensure complete safety throughout the process.



### Dräger X-zone® 5500

The Dräger X-zone® 5500 in combination with the Dräger X-am® 5000 or 5600 gas detector can be used to measure up to six gases and extends the portable gas detection technology to a unique and innovative area monitoring system.



### Dräger Polytron® 8000 series

The Dräger Polytron® 8000 explosion proof transmitters are equipped with one DrägerSensor for the detection of toxic and flammable gases, vapours or oxygen. Upon request, the transmitters can also be supplied with three integrated relays to be used in an independent gas detection system.



### FIRE PROTECTION

Fires can have a devastating effect in mines and the associated processing facilities. Thermal imaging cameras, gas monitoring systems, and flame detection systems are important instruments for identifying hotspots when monitoring conveyor systems and tanks in solvent extraction plants.

### MACHINERY MAINTENANCE

The amount of ventilation needed is also dependent upon the performance of diesel engines. Therefore, engine checks have to be carried out at regular intervals to ensure that emission levels are within permissible limits. These checks should be firmly embedded in the machinery maintenance plan.

Find out more at: [www.draeger.com/application-plant-safety](http://www.draeger.com/application-plant-safety)  
[www.draeger.com/spotlight-ohs](http://www.draeger.com/spotlight-ohs)



#### Dräger UCF® 7000

The Dräger UCF® 7000 thermal imaging camera is intrinsically safe (ATEX category M2 and 2G) and offers the maximum level of safety and reliability when using in potentially explosive atmospheres.



#### Dräger Flame 2350

The Dräger Flame 2350 combines UV and IR sensors for the detection of hydrocarbon-based fires. This combination of sensors offers more security and fewer false alarms.



#### Dräger MSI EM 200-E

Equipped with three electrochemical sensors, CO, NO and NO<sub>2</sub>, the Dräger MSI EM200-E diesel exhaust gas tester allows accurate measurement of CO and nitrous fumes in the undiluted diesel exhaust gas.

# Our solutions for Emergency Escape



## ESCAPE ABOVE GROUND

In the event of fire, gas leaks or explosions in an open-pit mine, workers escape by donning their self-escape units. They leave the site of the incident along the designated escape route, which leads to a pre-arranged assembly point.

## ESCAPE UNDERGROUND – COAL

In underground coal mining, it is important to get to the surface as quickly as possible in the event of a fire, gas leak or explosion. Changeover stations allow for brief breaks, as well as the chance to replace spent oxygen self-rescuers or to charge compressed air breathing apparatuses.



D-85039-2013

### Dräger PARAT®

Dräger PARAT® Escape Hoods are designed to be easily donned, protecting users from toxic industrial and fire-related gases, vapours and particles during escape. Different packaging and accessories are available to suit the specific needs.



D-33844-2011

### Dräger Saver CF

Simple to put on and featuring practically automatic operation, the Dräger Saver CF is a hood-based, positive-pressure breathing device that can be used with minimal training as an escape set in surface operations.



D-35118-2011

### Dräger Oxy® 3000/6000 MK II

Thanks to the robust and state-of-the-art design, the Dräger Oxy® 3000/6000 MK II ensure not only immediate oxygen supply for 30/60 minutes upon donning, but also a ten-year service lifetime without additional testing and maintenance.



### ESCAPE UNDERGROUND – METAL/NON-METAL MINES

Here as well, the aim is to get to a place of safety as quickly as possible using an oxygen self-rescuer. If the escape route is too long or is obstructed, refuge chambers or rooms can provide a safe haven. Miners can wait there for the mines rescue team to reach them.

Find out more at: [www.draeger.com/application-emergency-escape](http://www.draeger.com/application-emergency-escape)  
[www.draeger.com/spotlight-emergency-escape](http://www.draeger.com/spotlight-emergency-escape)



**Dräger D-7000**  
The Dräger Quick Fill Station opens up a new possibility to enhance self escape and first response capability of underground personnel. It offers good communication possibilities and allows the simultaneous charge of up to five SCBAs in minutes.



**Dräger MRC 5000**  
The Dräger MRC 5000 refuge chamber has a standard layout which can be extended through optional system components. The robust and highly portable construction, as well as a low cost of maintenance, makes them ideally suited for diverse conditions.



**Dräger Refuge Chamber**  
The Dräger Refuge Chamber can be designed as modular systems according to the specific escape and rescue plan on the mine site to offer the highest possible protection to the occupants.

# Our solutions for Emergency Response and Rescue



D-112925-2013

## SITE SURVEYING

If an incident occurs, the mines rescue captain must come to a quick assessment of the situation and decide on the rescue measures that need to be taken. Closed-circuit breathing apparatus, thermal imaging cameras, mobile gas detectors and modern communication units are necessary for an effective site survey.

## SEARCH AND RESCUE

The mine rescue vehicle allows for the safe and quick transport of mines rescue teams in contaminated environments. Thermal imaging cameras help with orientation in smokey areas. Fire pockets and injured people can also be located.



D-13225-2010

### Dräger UCF® 9000

The Dräger UCF® 9000 is a thermal imaging and digital camera in one. With its integrated video camera the Dräger UCF® 9000 can be used to record operations and training situations underground for in-depth analysis after the mission.



D-40444-2015

### Dräger MRV 9000

The Dräger MRV 9000 is the answer in an ever-changing mining environment. This robust vehicle extends the mission time for mine rescue teams by providing safe transportation closer to the incident. Innovative and customer driven – this vehicle is a unique solution in the field of mine rescue.



D-28795-2015

### Dräger FPS®-COM 5000

The Dräger FPS®-COM 5000 ensures clear communication through a voice amplifier unit or radio device. Even under extreme conditions like underground mines rescue, the users rely on communication to focus on their mission. It is intrinsically safe to ensure safe operation even in EX classified areas.

\* Offered in collaboration with Hermann Paus Maschinenfabrik GmbH





### FIREFIGHTING

Firefighting underground not only requires special strategies but also special equipment. For smaller fires, trained, on-site employees take over firefighting tasks. For larger fires, the mines rescue team from the surface is called. Either way, respiratory protection and helmets are compulsory.

### PROTECTION AGAINST CONTAMINATION

Whether during transport, refills or transfers, leaks or operating errors, they can all lead to the escape of toxic or potentially explosive processing chemicals. Appropriate detection and personal protection solutions help ensure safe handling of hazardous substances.

Find out more at: [www.draeger.com/application-mines-rescue](http://www.draeger.com/application-mines-rescue)  
[www.draeger.com/spotlight-mines-rescue](http://www.draeger.com/spotlight-mines-rescue)



#### Dräger PSS® BG 4 plus

Equipped with a fully electronic signal and warning unit the Dräger Bodyguard II, the Dräger PSS® BG 4 plus provides the user maximum comfort and flexibility for long duration operation up to four hours, even in a toxic environment.



#### Dräger PSS® 7000

The Dräger PSS® 7000 is designed to withstand high level wear and tear, while enabling easy service and maintenance. A range of optional components can be selected to meet the specific needs of emergency response teams.



#### Dräger CPS 7900

The reusable Dräger CPS 7900 (type 1a) provides excellent protection against mechanical influences and multiple gaseous, liquid, aerosol and solid hazardous substances and offers increased flexibility even for work in EX classified areas.

# Our solutions for Equipment Maintenance



## CLEANING/TESTING

Contaminated protective equipment increases the risk of infection for the next wearer. In addition to cleaning and disinfection, it is essential to carefully test for leaks and functionality.

## BREATHING AIR LOGISTICS

Flexible breathing air logistics support the quick provision of oxygen or breathing air cylinders at the moment they are needed. This is especially important during training exercises or in actual emergencies. Prefilled soda lime cartridges can also easily be replaced within a breathing apparatus in just a few steps.



D-388695-2015

### Dräger RZ 7000

With the Dräger RZ 7000 function and leak tests of the Dräger PSS® BG 4 plus can be carried very fast and easy. After the test device is switched on, it is ready to use promptly and the built-in pump produces positive pressure immediately.



D-88827-2013

### Sekusept® Cleaner

Sekusept® Cleaner is a concentrated liquid cleaning agent for manual cleaning of respiratory masks, breathing protection equipment, diving apparatus and chemical protective suits before disinfection.



D-85359-2013

### Dräger DOB 200 ECO

Fitted in a robust roller case, the Dräger DOB 200 ECO is a mobile, robust and effective booster pump, which allows the simultaneous refilling of up to four oxygen cylinders used in the Dräger PSS® BG 4 plus.



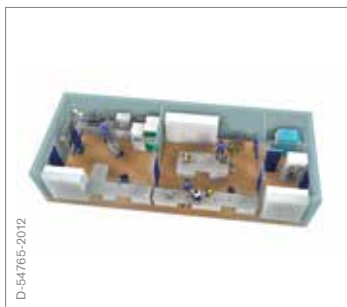
### WORKSHOP PLANNING

Every mine has its own maintenance guidelines for safety equipment. The workshop set-up must be guided by these policies as well as the structural environment. A system that is adapted to the real-life requirements makes it easier to organize, clean and maintain safety equipment.

### DOCUMENTATION

Software systems specifically developed for the mining industry allow for complete documentation in accordance with legal requirements. Specially tailored data logging and queries are available for internal reporting. Furthermore, the software supports optional resource planning.

Find out more at: [www.draeger.com/application-maintenance](http://www.draeger.com/application-maintenance)



**Customized workshop system**  
Dräger's customized workshop system can be equipped with service and testing devices, washing and cleaning/disinfection systems and recharging compressors with air quality monitoring and safety filling ramps.



**Dräger X-dock® 5300/6300/6600**  
The Dräger X-dock® series enables automated and simultaneous tests and calibration of up to ten instruments at high speed with low gas consumption and facilitates the management of relevant data for subsequent evaluation.



**Dräger Workshop Software 5000/7000**  
With its extraordinary degree of flexibility, Drägerware Workshop software is the ideal complete solution for workshop management. The innovative, user-friendly software solution provides more transparency, improved processes and increased efficiency.

# Our solutions for Training



## PRODUCT TRAINING

From gas measurement equipment to personal protective equipment: Experienced trainers show the basic features and functions of Dräger devices and systems in compact, product-specific training sessions. The content goes beyond a simple "user manual": It is designed to provide users with a true understanding of the capabilities.

## APPLICATION TRAINING

Dräger training simulates mining applications and hazardous situations so authentically that all of the participants are well prepared for real-life situations. It contains practical training exercises to follow until every move becomes automatic. So in an emergency, you can make important decisions calmly and sensibly.



**Gas detection training courses**  
Dräger gas detection training courses range from use and appreciation, gas detection for use in confined spaces to calibration and maintenance.



**Confined Space Entry**  
The hands-on simulation-based training prepares workers for entry into confined spaces and containers. Participants acquire all knowledge required to perform CSE work safely and efficiently.



**Tank exercise facilities**  
Perfect training for the case of an emergency: the Dräger tank exercise facilities offer ideal simulation conditions for rescuing people out of tanks or narrow shafts.



### TRAINING GALLERIES

In the mining industry, work can be very physically demanding – particularly when using respiratory protection. Dräger training mazes help miners build agility and confidence in tight spaces wearing full breathing gear. Our live fire training systems give miners real firefighting experience in a controlled and repeatable setting.

### SERVICE TECHNICIAN SEMINAR

Performing function tests, recognising faults, taking corrective action – all of these factors depend on the technician's thorough knowledge. Dräger training imparts all the theory needed with as much practice as possible. Because a competent workshop team is extremely important for running a smooth operation.

Find out more at: [www.draeger.com/application-training](http://www.draeger.com/application-training)



#### Stationary training gallery

Designed and constructed according to the specific customer requirements, the Dräger stationary training gallery offers breathing apparatus users a perfect platform to practice their tasks under mental and physical stress situations.



#### Fire simulation trailer (mobile)

Specifically designed for the customer, the Dräger mobile fire simulation trailer allows rescue drills to be simulated and conducted independent of location.



#### Seminar for service technician for self contained breathing apparatus

The training provides comprehensive knowledge and expertise regarding maintenance and repair works of a broad range of Dräger full face masks and SCBA units.

# Our solutions for your Service Needs & Requirements



## PRODUCT SERVICE

You have to be able to rely on your safety equipment. Dräger takes care of that, with exactly the right service packages, efficient and meeting with Dräger quality standards.

## RENTAL SERVICE

Dräger rental options offer the flexibility you need in your business. The cost of owning equipment doesn't end with its purchase of the equipment. There are other considerations to be made such as maintenance, storage and general asset management. Renting equipment can often be a more attractive option.



### Device service

DrägerService or authorized service partners perform inspection, testing, maintenance and repair of your Dräger safety devices according to the maintenance plan or as required to ensure the device is always in the best condition for usage.



### Customised service package

Tailored to your specific needs and requirements, DrägerService offers a range of service contracts to ensure you can have the best possible service packages for the maintenance and management of your Dräger safety equipment.



### Rental professional packages

Rental Professional packages offer significantly higher level of service – at only marginally higher costs: Comprehensive customer care including providing ready-to-use equipment and performing all necessary maintenance, calibration and repair work at your location.



#### ON-SITE-SAFETY SERVICE

Whether you need an external specialist for your everyday operations to deal with complex safety topics or someone who looks after the maintenance, repair and servicing of safety technology, our Dräger On-site Safety Service experts are there for you – directly on-site. With competent consulting around the clock and a central contact for all needs.

#### SHUTDOWN SERVICE

With the Dräger Shutdown Safety Service, you can trust in the highest safety standards and reliability. This applies to planned and unplanned maintenance work in equal measure. We ensure that the return to normal operations goes smoothly.

Find out more at: [www.draeger.com/services](http://www.draeger.com/services)



#### Consulting

Dräger's expansive global experience in equipping your operations with the necessary safety equipment and preventive measures can help reduce the likelihood of safety incidents.



#### Safety Shop

The Dräger Safety Shop is a fully equipped mobile container with safety and personal protective equipment. The specific issue of materials and their optimized servicing reduces costs and ensures that fully functional equipment is always available.



#### Rental Robot

The Dräger Rental Robot provides automated material logistics for your safety equipment, allowing registered users to obtain the correct safety equipment and the required consumables – at any time and close to the location of use.

Not all products, features, or services are for sale in all countries.  
Mentioned Trademarks are only registered in certain countries and not necessarily in the country in which this material is released. Go to [www.draeger.com/trademarks](http://www.draeger.com/trademarks) to find the current status.

#### CORPORATE HEADQUARTERS

Drägerwerk AG & Co. KGaA  
Moislinger Allee 53–55  
23558 Lübeck, Germany

[www.draeger.com](http://www.draeger.com)

#### REGION DACH

Dräger Safety AG & Co. KGaA  
Revalstraße 1  
23560 Lübeck, Germany  
Tel +49 451 882 0  
Fax +49 451 882 2080  
[info@draeger.com](mailto:info@draeger.com)

#### REGION EUROPE

Dräger Safety AG & Co. KGaA  
Revalstraße 1  
23560 Lübeck, Germany  
Tel +49 451 882 0  
Fax +49 451 882 2080  
[info@draeger.com](mailto:info@draeger.com)

#### REGION MIDDLE EAST, AFRICA

Dräger Safety AG & Co. KGaA  
Branch Office  
P.O. Box 505108  
Dubai, United Arab Emirates  
Tel +971 4 4294 600  
Fax +971 4 4294 699  
[contactuae@draeger.com](mailto:contactuae@draeger.com)

#### REGION ASIA PACIFIC

Draeger Singapore Pte. Ltd.  
25 International Business Park  
#04-20/21 German Centre  
Singapore 609916  
Tel +65 6308 9400  
Fax +65 6308 9401  
[asia.pacific@draeger.com](mailto:asia.pacific@draeger.com)

#### REGION CENTRAL AND SOUTH AMERICA

Dräger Panama S. de R.L.  
59 East Street, Nuevo Paitilla,  
House 30, San Francisco Town  
Panama City, Panama  
Tel +507 377 9100  
Fax +507 377 9130  
[servicioalcliente@draeger.com](mailto:servicioalcliente@draeger.com)

#### REGION NORTH AMERICA

Draeger, Inc.  
3135 Quarry Road  
Telford, PA 18969  
Tel +1 800 4DRAGER  
(+1 800 437 2437)  
Fax +1 215 723 5935  
[info.usa@draeger.com](mailto:info.usa@draeger.com)

Locate your Regional Sales  
Representative at:  
[www.draeger.com/contact](http://www.draeger.com/contact)

