

Dräger Engineered Refuge Solutions Unmatched flexibility and mine safety

Mine safety is a key priority for every mining organization. Dräger Engineered Refuge Solutions (ERS) provide a safe haven for miners in emergency situations. Each engineered chamber is fully customized to the requirements of the individual mine. It can be adapted to mine conditions, mine emergency plans, and official requirements. This provides the highest flexibility in meeting your needs, while maintaining our primary goal: maximum mine safety.



Benefits

Customized to meet your mine safety requirements

The requirements of a mine refuge chamber can be as diverse as the mine itself. For example, a comprehensive risk assessment or the mine conditions may demand a specially designed refuge chamber or additional features. At Dräger, we have decades of engineering experience in tailoring refuge chambers to specific mine safety requirements. We also have a worldwide service network—which enables us to provide timely support and helps reduce the cost of ownership.

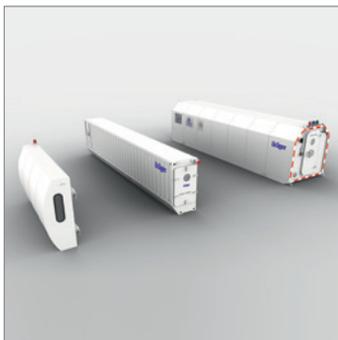
Incorporates local standards and regulations

Local mine regulations around the world can vary considerably. Dräger's engineered chamber solutions offer the highest flexibility to meet the required standards and best practices. Regardless of whether the requirements are imposed by official regulations, mine requirements, or environmental conditions, Dräger refuge chambers provide the highest levels of flexibility in their design. The concept considers all requirements, including life support systems, electrical systems, and general conditions.

A safe haven without compromise

In emergency situations, miners taking refuge need a life support system they can rely on to protect them from danger. This might include protection against heat stress or falling rock, an uncompromised supply of safe and clean breathing air or gas detection system, and a reliable, independent electrical system. Dräger's engineered chamber solutions offer the highest quality and safety standards to keep miners safe until mine rescue teams can reach them.

Configurations: Prerequisites



D-46867-2015

Chamber design meets space or shaft restrictions

Shaft restrictions are no hurdle to providing a safe haven underground. The chambers can be designed in segments with underground installation, without compromising on air supply. Underground mines often lack space, so the steel hull's design can be adapted to integrate the chamber into the mine's infrastructure and provide adequate space for the miners.

Configurations: Prerequisites



D-43308-2015

Steel structure design addresses underground conditions

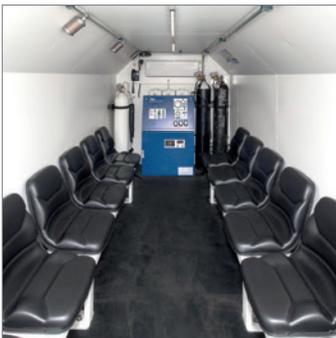
Emergency situations such as falling rock or heat stress place specific requirements on the refuge chamber's design engineering. In such situations, structural purlins and insulation can help provide a high level of protection to miners and the chamber.



D-43285-2015

Mobile or fixed solutions

Fixed and portable chambers have different benefits and meet different mine emergency scenarios. A portable chamber can follow the expansion of the mine, which makes it ideally suited for fast-expanding mines. Fixed chamber solutions can meet greater capacity demands and are adaptable to different requirements. If required, all subsystems can be integrated into the mine media supply systems.



D-43270-2015

Occupant capacity and operation time requirements

The safety concept of a mine determines the capacity requirements of each mine refuge chamber. Dräger's engineered chamber solution can flexibly meet these conditions without compromise.



D-38501-2015

Airlock

An airlock helps minimize the ingress of contaminated air into the main room. Because the size, shape and features might be subject to local regulations or mine requirements, its design is as flexible as the whole system. Durable gas-tight doors, a reciprocal interlocking system to the main room, an air purging system, or different breathing air supply systems are examples of possible configurations.

Configurations: Requirements and Features



D-10864-2011

Breathing air supply systems

Different systems are available based on the operating time and occupant capacity. For example, the Dräger Breathing Protection Unit (BPU) is a redundant breathing air supply system with integrated CO₂ scrubbing, CO conversion, oxygen replenishment, and sustained automatic positive pressure.



D-46866-2015

Climate and gas monitoring

Mine emergencies can involve various dangers. For example, heat or noxious vapors might pose a serious risk to the occupants inside the chamber. This is why the interior equipment—which may include air conditioning to address heat stress or a gas monitoring system to eliminate contact with hazardous materials—is considered for each chamber design based on specific risk analysis.



D-46865-2015

Uninterruptable power supply (UPS)

In emergency situations, the external power supply may fail. Dräger offers a dedicated battery-powered backup system with maintenance-free batteries. The UPS provides all electrical systems, including air conditioning, with electrical power required by the chamber to protect miners.

Electrical system

Local regulations, which determine requirements of the electrical standards, can be addressed in the chamber's design without compromising the interior features or power supply.

Accessories and Service



D-16557-2009

Consumables

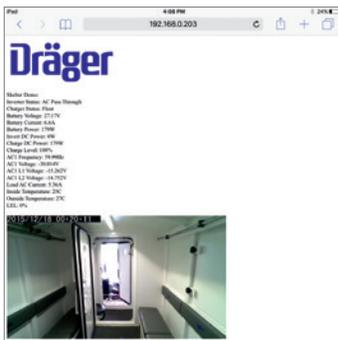
To meet the needs of occupants while they are in the chamber, there is a storage area for necessities such as water, food, a chemical toilet, and a first aid kit—all of which can be supplied with the chamber. All consumables needed to operate the chamber and breathing air supply systems are available from a single source—Dräger.



D-43291-2015

Service you can rely on

The operational readiness of the chamber is essential for your miners' safety. Dräger's worldwide service network ensures that a technician can be on-site quickly for all your maintenance and repair needs, helping to reduce downtime. We offer a regular maintenance plan that includes on-site technical assistance—as well as all required consumables, such as Dräger soda lime and filters.



D-2392-2016

Remote Monitoring

This iPad app lets you remotely monitor the systems and status of the shelter and its accessories on your company network. You can continually see the internal and external temperatures of the shelter, as well as information from the inverter/charger, cameras, fixed gas detectors and more.

Related Products



D-884-2016

Dräger FRS 4800

This easy-to-use CO₂ fixed refuge shelter scrubbing system has two independent soda lime bins, each with its own fan. The system includes a Dräger X-am® 7000 device for monitoring oxygen, carbon dioxide and carbon monoxide. A 48-hour battery backup system comes standard, with an option for an additional set of batteries with an external case. A standard plug-in accepts most 120 VAC extension cords.



D-38302-2015

Dräger MRC 5000

The MRC 5000 is a configurable mine refuge chamber with a standard layout that offers high safety and quality levels at an affordable price. Additional features and configurations to the occupant capacity and operating time make the chamber a flexible part of the mine emergency plan.



D-40444-2015

Dräger MRV 9000

The Dräger MRV 9000 is the answer to safety in an ever-changing mining environment. This heavy-duty mine rescue vehicle extends the mission time for mine rescue teams by providing safe transportation to and from an incident. Created in response to a customer request, this innovative mine rescue vehicle is a unique solution in the field of mine rescue worldwide.



D-35121-2011

Dräger Oxy 3000/6000

The state-of-the-art Dräger Oxy 3000/6000 provides immediate oxygen supply for up to 30 or 60 minutes upon donning, and is backed by a ten-year service lifetime without requiring testing and maintenance.



D-838-2016

Dräger is technology for life

At the beginning of the 20th century, Dräger developed the revolutionary Model 1904/09 respiratory protective device. From that point on, rescue teams used it to save workers in the mines. The emergency responders in America were so thrilled by the product's quality that they proudly called themselves "Draegermen". Since then, the term "Draegerman" has been used as a synonym in America and Canada for a member of a mine rescue team. You can still find it in dictionaries today. The term achieved great notoriety in the world of entertainment, too. In one of the first Superman comic books in 1938, "Draegermen" come to the aid of the hero rescuing people trapped by a collapse in a mine.

Notes

X-am is a trademark of Dräger.
Not all products, features, or services are for sale in all countries.

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

www.draeger.com

Customer Service:
USA
+1 800-4DRAGER
(+1 800-437-2437)

CANADA
+1 877-DRAGER1
(+1 877-372-4371)

Technical Service:
USA
+1 800-4DRAGER
(+1 800-437-2437)

Locate your Regional Sales
Representative at:
www.draeger.com/contact

