

Always a safe haven - 18 FAQs about refuge chambers

In case of an emergency in an underground mine, the escape way to the surface or a meeting point might be blocked or the conditions underground too difficult to initially escape. Refuge chambers provide mine workers access to clean air and temporary protection until they can be rescued. This list of FAQs offers a few facts to consider when incorporating refuge chambers in your emergency response plan.



Refuge chambers as an integral part of a mine emergency response plan

Each mine has its unique characteristics – the mining method, mine plan, personnel onsite per shift or the availability of a mines rescue team. These are all important factors when considering the use of refuge chambers as a part of the mine emergency response plan and when determining its' ideal location.

1. What are the most relevant international regulations and/or guidelines for mine refuge chambers?

Well known in the industry is the Australian "Guideline Refuge Chambers in Underground Mining" from the Western Australian government's Department of Mines and Petroleum Resources. An additional resource is the "Guidance and Information on the role and design of safe havens in arrangement for escape from mines" from the British institution HSE (Health and Safety Executive). Both guidelines are not binding, neither regionally or internationally. Dräger recommends that the specific requirements are defined based on the individual mine's including an adequate risk assessment.

2. In what kind of mines are refuge chambers an option?

Refuge chambers are an integral part of a mine's emergency escape and rescue concepts. They provide a secondary escape solution in case the primary one is blocked. An emergency escape and rescue concept is highly dependent upon the size and composition of the mine as well as the type of resource mined and how that mineral is processed. Additional aspects such as the existing mine plan with the corresponding escape routes and the distribution of manpower and equipment are important factors to consider.

3. What is the ideal position for refuge chambers in a mine?

Generally, anywhere with a strong and stable surface could be considered. However, the surroundings should be free of fire loads. Because the chamber design is variable, the chamber's shape can be adapted to better suit the mine e.g. semi-circular to adapt to a slope. It is rather unlikely that an additional foundation will be needed. The exact positioning of the chamber is defined by the mine's emergency response plan. Mobile refuge chambers may follow the mine's heading.

4. Why do refuge chambers need to be transported in a mine? What is the procedure to do so?

This is related to the characteristics of a mine. A chamber that follows the heading might be a necessity. How the transportation is actually done is related to the chamber's transport system. Mobile refuge chambers are equipped with either a skid or sleigh-type system and can be moved with help of a wheel loader.

5. What is the average expected lifetime of a refuge chamber?

An estimated lifetime of ten years is not unusual with the proper operation of the refuge chamber. Subsystems or -components such as the batteries and compressed air cylinders need to be checked, maintained or exchanged according to the service plan of the chamber and/or local regulations.



6. What influences the lifetime of a refuge chamber?

The refuge chamber's lifetime depends on a variety of factors such as the underground atmosphere/climate, the number of transports, corrosive influences caused by water or salts, as well as the compliance to the manufacturer's service plan.

7. What measure prevents the ingress of contaminated air into the chamber?

Generating positive pressure inside the chamber reduces the ingress of contaminated air into the chamber to a minimum. The choice of the ideal breathing air supply system depends upon the specific requirements of the mine.

8. Does a mine refuge chamber protect against rock fall?

It may be that the individual mine requires protection against rock fall. The chamber's steel construction can be adapted accordingly to meet these requirements.

9. Is the power supply secured?

The refuge chamber is connected to the power grid of the mine. In case of a disruption in that connection, the refuge chamber is equipped with a battery back-up system supplying electricity for the intended duration of operation.

10. Who needs to be trained and what training is needed?

This is at the discretion of the mine. The decision over frequency and scope of such trainings is defined in the valid regional safety regulations. Dräger offers training material and technical trainers if needed. However, the activation of the chamber and its use are rather self-explanatory.

11. Which training or skills are necessary to conduct the maintenance?

The service manual is structured and understandable and therefore a mine employee can conduct the weekly and monthly maintenance. Some of the service tasks with a long-term interval such as the inspection of compressed air cylinders should be carried out by qualified personnel as are the industry requirements.

12. How many occupants can a chamber accommodate?

This highly depends on the requirements of the mine and its safety concept. The mine operator knows how many miners are at a specific location during their shift and plans the mine emergency response plan accordingly. Local regulations may define additional safety measures.

13. Which communication tools inside the chamber are available to contact the mine rescue team or control station?

The refuge chamber is supplied with cable outlets and inlets with fasteners for the installation of specific communication devices. The complete assembly of the communication components can also be pre-installed in the chamber, if required.

14. How is the maximum occupation time per person calculated?

This is defined by the mine's own safety concept: How much time does the mine's rescue team need in an emergency situation to reach the chamber? The features and occupation time is adapted to the specified concept accordingly.

15. What is the total anticipated cost?

The full costs are calculated by adding the initial purchase price together with maintenance costs. The chamber must be checked at regular intervals. In the stand-by mode, it is important to conduct maintenance tasks such as filling compressed air cylinders or replacing seals. But also inspecting, maintaining or even replacing batteries and compressed air cylinders on a regular basis must be done.

16. What is the estimated timeline from decision to purchase to actual operational readiness?

Refuge chambers are delivered after an average of 12 weeks. Special requirements demand a so-called "engineered-to-order" solution and have an expected delivery time of around 15 weeks.

17. What are some examples of special requirements?

Dräger offers a customer-specific portfolio ranging from high-tech and full-automatic refuge chambers to pragmatic solutions optimizing the use of space or entertainment offerings. An additional option is the air curtain which reduces the ingress of contamination and smoke into the chamber when the chamber's doors are opened.

18. What are the main differences within the Dräger portfolio of refuge chambers?

Dräger refuge chambers are customized solutions based solely on a mine's requirements. The "engineered-to-order" solution is fully tailored to an individual customer's safety concept. The Dräger-Simsa MRC 5000 is based on a standard layout. It is extendable through optional system components and therefore it can often be configured to meet a mine's requirements.



Notes

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