

Refuge Chambers

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CONTENTS

Inspection Procedures

Training : Moving Chamber/Activation

Summary/Comments

Roof Control Plan

- ❖ The area where refuge alternatives are installed shall be fully bolted according to the latest Approved Roof Control Plan. This also applies to the areas where the refuge alternative will be deployed. Supplemental support shall be installed as needed.

When and how often do we inspect refuge chambers?

- ❖ The refuge chambers will be examined as part of the pre-shift examination.
- ❖ The scope of this examination covers what the manufacturer recommends on a weekly examination.
- ❖ Refuge chambers will be inspected each time they are moved. This includes opening the entrance, inspecting contents, door, and replacing the seal tag.

What is required during the pre-shift examination?

- ❖ Pressure Gauges need to be inspected
- ❖ A chart will be posted on the chamber that indicates initial pressure readings and minimum pressure readings based on temp.
- ❖ Check for consistent loss or gain in pressure readings.
- ❖ In the event that a consistent loss or gain in pressure is discovered, notify the shift foreman immediately.

What is required during the pre-shift examination?

- ❖ Red zone is free of debris
- ❖ Tamper proof seals are intact and seal number is correct.
- ❖ Entrance door not damaged.
- ❖ No physical damage to unit.
- ❖ Life line clearly indicates location of refuge chamber.
- ❖ Communications / Tracking visual exam

Oxygen

- ❖ To record the **Oxygen Pressure**, look in the right sight glass. There will be three gauges check the pressure on the right gauge and record it.
- ❖ The thermometer will be in this glass also.

Oxygen Pressure Gauge



DEPLOYMENT AIR

- ❖ To record the **Deployment Air Pressure**, you will need to look in the left sight glass. It will be read on the far left gauge.

Deployment Air



PURGE AIR

- ❖ To record the **Purge Air** you will read it in the left sight glass on the far right gauge.

Purge Air



MINIMUM ALLOWABLE PRESSURE CHART

OXYGEN

Temp. F	Pressure PSI	Temp. F	Pressure PSI	Temp. F	Pressure PSI	Temp. F	Pressure PSI
0	2770	26	3134	52	3498	78	3862
2	2798	28	3162	54	3526	80	3890
4	2826	30	3190	56	3554	82	3918
6	2854	32	3218	58	3582	84	3946
8	2882	34	3246	60	3610	86	3974
10	2910	36	3274	62	3638	88	4002
12	2938	38	3302	64	3666	90	4030
14	2966	40	3330	66	3694	92	4058
16	2994	42	3358	68	3722	94	4086
18	3022	44	3386	70	3750	96	4114
20	3050	46	3414	72	3778	98	4142
22	3078	48	3442	74	3806	100	4170
24	3106	50	3470	76	3834	102	4198

MINIMUM ALLOWABLE PRESSURE CHART

AIR

Temp. F	Pressure PSI	Temp. F	Pressure PSI	Temp. F	Pressure PSI	Temp. F	Pressure PSI
0	2847	26	3182	52	3518	78	3853
2	2873	28	3208	54	3544	80	3879
4	2899	30	3234	56	3569	82	3905
6	2924	32	3260	58	3595	84	3931
8	2950	34	3286	60	3621	86	3956
10	2976	36	3311	62	3647	88	3982
12	3002	38	3337	64	3673	90	4008
14	3028	40	3363	66	3698	92	4034
16	3053	42	3389	68	3724	94	4060
18	3079	44	3415	70	3750	96	4085
20	3105	46	3440	72	3776	98	4111
22	3131	48	3466	74	3802	100	4137
24	3157	50	3492	76	3827	102	4163

Red Zone



Red Zone

- ❖ The **Red Zone** must be kept clear at all times
- ❖ The **Red Zone** is not a parking lot or a supply area
- ❖ The **Red Zone** should be clearly marked for easy identification

Tamper Proof Seals

- ❖ The **Tamper Proof Seals** are numbered
- ❖ Take the number of the seal from the last inspection to insure that the numbers match
- ❖ Record the new seal number when you replace it



Tamper Proof Seals

- ❖ If tamper proof seal is damaged or missing:
 1. Notify the Shift Foreman.
 2. Check seal tape on supply box. Make complete inspection of supply box, and first aid contents inside.
 3. Upon finding required contents to be present and in good condition, replace seal and record new tamper proof seal number.

Check Entrance Door

- ❖ When you open the **Entrance Door** check it to insure proper latch and hinge operations
- ❖ Check the door seal for wear and tear

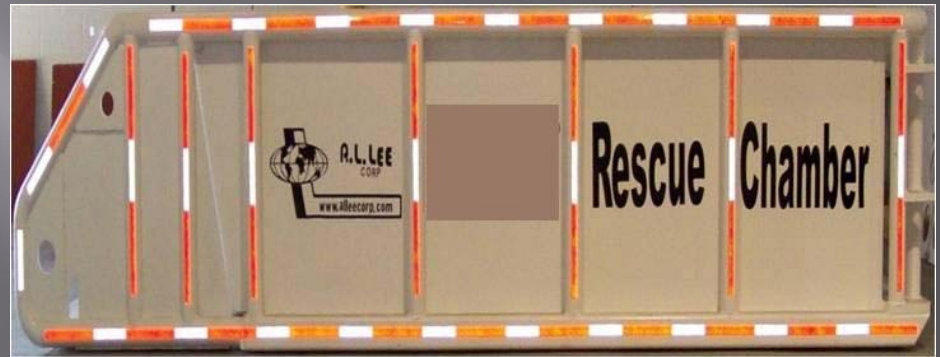


List of Shelter Contents

- ❖ Portable Dry Toilet
- ❖ Waste Kit
- ❖ Carbon Monoxide (CO) Monitor
- ❖ 2 Oxygen Monitors
- ❖ Repair Tape and Tube Repair Kit
- ❖ MSHA Approved First Aid Kit with Stretcher and Backboard
- ❖ Flashlights
- ❖ Food
- ❖ Gas Detector Tube Pump
- ❖ Carbon Dioxide (CO₂) Detector Tubes
- ❖ CO Detector Tubes
- ❖ Methane Detector Tubes
- ❖ Oxygen Detector Tubes
- ❖ CO₂ Scrubber Curtain Package Assembly
- ❖ Drinking Water and Cups
- ❖ Operating Instructions

Inspect Shelter Exterior

- ❖ Do a walk around of the Shelter to check for any damage to the exterior container



Inspect Deployment Door

- ❖ Visually check Deployment Door for any Damage of the door and hinge area



Pre-shift Examination

- ❖ Any deficiencies found during the pre-shift exam that makes the unit inoperable requires immediate action including notifying the Shift Foreman.

Recording Examination Information

- ❖ Date Board located at each refuge chamber
- ❖ Record pressure gage readings and tamper proof seal number in book provided at refuge chamber.
- ❖ Make entry in pre-shift book that refuge chamber is ok.

Training

- ❖ All miners required to move refuge alternatives must have specialized task training completed and documented.
- ❖ All miners inspecting and performing repairs on refuge alternatives must have specialized task training completed and documented.

Training

- ❖ Refuge chambers must be located on the sections within 1000 feet of the working faces.
- ❖ Refuge chambers cannot be located within direct line of sight of the working face (they must be located in a crosscut).

Training

❖ Rescue chambers cannot be across from, nor closer than 500 feet from the following:

1. Belt drives
2. Take-ups
3. Transfer points
4. Air Compressors
5. Explosive Magazines
6. Seals
7. Entrances to abandoned areas
8. Fuel, oil, or other flammable material storage

Activation Steps

1. Check Red Zone, Must be Clear
2. Pull pin and raise lever
3. Make sure TENT is off door, if not Roll the tent off the door.
4. Move RED KNOB down, Deployment of the TENT will begin.
5. After deployment, enter air lock, remove supplies and erect the SCRUBBER CURTAINS on designated areas. Go to CONTROL PANEL.

Activation Steps

6. Turn **TUBE FILL** from **ON to OFF**. Turn Oxygen supply from **OFF to ON**.
7. Adjust Oxygen Flow Meter **Counter-Clock Wise** to the number of miners in Tent.
8. Monitor Oxygen levels with Oxygen Gas Monitor and keep between **19.5% and 22%**.

Summary / Comments

- ❖ Maintaining and properly positioning the refuge chamber is imperative for proper deployment.
- ❖ A responsible person, such as the section foreman should always oversee the movement of a refuge chamber.

Summary / Comments

- ❖ Upon the completion of each and every move, a complete examination of the refuge chamber is required including opening of the entrance door and replacing the seal.
- ❖ This examination after the move is to be conducted in the same manner as a pre-shift examination.

Summary / Comments

- ❖ Accurate records should be kept both outside and at each refuge chamber location.
- ❖ Training should be incorporated that includes both quarterly reviews and annual realistic training of deployment and use of the refuge chambers.

Summary / Comments

- ❖ Mine ventilation and escapeway maps must include locations of all refuge chambers. Maps must be updated within 24 hours of moving a refuge chamber.
- ❖ A six month inspection by the manufacturer is required.