Appendix A

Portal-Pack™ Self-Contained Self Rescuer
TECHNICAL INFORMATION

<table>
<thead>
<tr>
<th>Size:</th>
<th>Height</th>
<th>8 inches (20.3 cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Width</td>
<td>7 inches (17.8 cm)</td>
</tr>
<tr>
<td></td>
<td>Depth</td>
<td>4 inches (10.2 cm)</td>
</tr>
<tr>
<td>Weight:</td>
<td>In case</td>
<td>5.4 lbs (2.5 kg)</td>
</tr>
<tr>
<td></td>
<td>As used</td>
<td>4.6 lbs (2.1 kg)</td>
</tr>
<tr>
<td>Bag Volume:</td>
<td></td>
<td>15 litres</td>
</tr>
<tr>
<td>Gas Life:</td>
<td></td>
<td>1 Hour or more under approval test conditions. 4 Hours or more with user at rest.</td>
</tr>
<tr>
<td>Low Limit Operating</td>
<td></td>
<td>-25°C</td>
</tr>
<tr>
<td>Temperature:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>Inhalation</td>
<td>Less than 115°F (46 °C) in a 75°F (24 °C) ambient</td>
</tr>
<tr>
<td>Characteristics:</td>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CO₂ Concentration</td>
<td>Less than 1.5%</td>
</tr>
<tr>
<td></td>
<td>O₂ Concentration</td>
<td>Greater than 21%</td>
</tr>
<tr>
<td></td>
<td>Resistance to</td>
<td>1.9 inches (4.8 cm) H₂O maximum when measured at a breathing rate of 40 litres/min.</td>
</tr>
<tr>
<td></td>
<td>Inhalation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Field Life</td>
<td>10 years-Max In Service Life: 8 years in service.</td>
</tr>
</tbody>
</table>

PRINCIPLES OF OPERATION

The 60 Minute Portal-Pack Self-Contained Self Rescuer.

1. When pulling the mouth bit away from its stored position, a cord activates an oxygen generating chemical (chlorate candle). The candle produces approximately 10 litres of oxygen over a 2 to 3 minute period. This is sufficient time to fill the system gradually with a supply of uncontaminated gas. Although the bag does not fill instantaneously, the gas supplied allows time for the primary chemical in the canister to become activated.
2. As the user breathes on the apparatus, he exhales CO₂ (carbon dioxide) and water vapour. The CO₂ and water vapour react with the KO₂ BDE in the canister to produce oxygen and simultaneously remove CO₂ from the breathable gas. The chemical reaction is demand sensitive - the harder the user breathes, the more CO₂ and water vapour are produced and thus, the more oxygen is generated. As the breathing slows or becomes more shallow, the opposite effect occurs.

3. Although unlikely, if the candle does not activate and fill the breathing bag with oxygen, it is possible to start the unit by simply breathing into the mouthpiece. This does require that the user remove the nose clip, breath in ambient air and discharge that air into the mouthpiece. Six (6) breaths will activate the primary chemical. The procedure for verifying failure of the candle to function, and discussion of the manual starting method is detailed in the candle failure starting procedure of the operating instructions.

DESCRIPTION OF APPARATUS

The apparatus consists of the following major components. (see Figure 1).

1. Two canister covers constructed of stainless steel.
2. Rubber gaskets between the two canister covers are secured by a latch.
3. A rubber jacket to protect the canister and act as an insulator when in use.
4. A canister containing the chlorate candle and the primary KO₂ (potassium superoxide) bed.
5. A breathing bag that forms an oxygen reservoir.
6. A breathing tube assembly with a mouthpiece, nose clips, mouthpiece plug, voicemitter and heat exchanger.
7. A breathing bag vent valve to automatically prevent buildup of any excess system pressure.
8. Goggles to protect the eyes from smoke.
9. Pouch to carry and protect the apparatus (if worn or carried).
10. A shoulder or neck strap and waist strap.
11. Moisture indicators to indicate fitness for use.
MOISTURE INDICATORS

There are two indicators on the apparatus, one on each cover. They indicate the readiness for use of the apparatus. When viewing the indicator, if it is blue (see Figure 2A) the apparatus is ready to use, if either indicator is pink even with a small amount of blue remaining (see Figure 2B), the apparatus must be removed from service.

OPERATING INSTRUCTIONS

Three critical steps to isolate your lungs:

1. Grab canister with your right hand then grab the mouthpiece with your left hand and extend it fully. You will hear a "POP" sound, this action automatically fires the chlorate candle. Remove the mouth piece plug before inserting mouthpiece.
2. Immediately insert the mouthpiece into your mouth and exhale into the unit. The flange of the mouthpiece goes between the teeth and the lips. Bite down on the two lugs extending into the mouth to hold the mouthpiece in place.

NOTE: At cold temperature, rubber parts are stiff, but will become more flexible as the unit operates.

3. Apply the nose clips to seal both nostrils. Assist breathing bag to unfold with your hands while breathing normally through your mouth.

CAUTION

COUGHING MAY OCCUR MOMENTARILY DURING START-UP, DUE TO SLIGHT AMOUNT OF DUST.

DO NOT REMOVE MOUTHPIECE

Three (3) Finishing steps before escape:

4. Put on goggles which are located in the top cover. Adjust the neck strap so the unit is comfortable and there is no undue force pulling or pushing on the mouthpiece.
5. Grab the waist strap with your left hand and wrap it around yourself. Fasten the buckle on your right side and adjust it for comfort. DO NOT tighten excessively. This will restrict your breathing and impede your escape.

6. Replace your cap and lamp. Escape to fresh air.

While breathing into the Portal-Pack Self-Contained Self Rescuer, you will experience a slight increase in resistance. Also, during your escape the breathing gas will be dry and warm. All these sensations are normal and indicate that the unit is operating properly. DO NOT REMOVE THE MOUTH PIECE.

Although the unit is provided with a voicemitter which can augment hand signals for communications, you should TALK ONLY WHEN NECESSARY. Too much talking can cause excess saliva to run down the breathing tube, and shorten the lift of the unit.

If escape is not feasible, sit down and remain calm. The Portal-Pack Self-Contained Self Rescuer will automatically adjust to your lower demand for oxygen. The unit will last for 4-5 hours.

A decrease in the breathing bag volume indicates the end of gas lift for the Portal-Pack Self-Contained Self Rescuer. At the same time there will be an accompanying increase in breathing resistance and breathing gas temperature.

Although the unit is provided with a voicemitter which can augment hand signals for communications, you should TALK ONLY WHEN NECESSARY. Too much talking can cause excess saliva to run down the breathing tube, and shorten the life of the unit.

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CANDLE FAILURE STARTING PROCEDURE

Although unlikely, should the candle fail to activate, the breathing bag will not inflate. Remember this inflation occurs gradually over a 2 to 3 minute period. The bag does not inflate instantaneously. If the bag does not appear to start inflating properly within the first 30 seconds and there is not enough bag volume to breathe from, follow the starting procedure.

1. Remove nose clip.
2. Inhale from ambient through nose.
3. Exhale into mouth bit.
4. Repeat above 6 times with full breath each time.
5. Reapply nose clip.
7. Continue to escape.

CONDITIONS OF USE

When in storage, units shall be visually inspected every 90 days to ensure the indicators are blue.

When being carried or worn, units shall be visually inspected daily for external damage and to ensure the indicators are blue. Any unit in which either indicator shows any change to pink should be removed from service, even if there is a small amount of blue remaining.

Any unit in which either indicator changes to pink while being carried or worn during a shift, with no evidence of physical damage, may be carried for the remainder of the shift before taking it out of service.

Any unit which has visible external damage at the seal area, has a visible puncture in the case, or either indicator has turned pink (see Figure 2B) must be removed from service immediately.

POUCH USAGE

Protective Carrier Kits, 807078 (horizontal) or 807079 (vertical), are required when wearing or carrying the Portal Pack SCSR. Check the pouch fabric for excessive wear. The plastic covers must also be inspected for damage. If any damage is visible, replace the damaged component.
STORAGE TEMPERATURE

Do not store at temperature below -25 degrees F (-32 °C) or above 100 degrees F (38 °C). Short term (less than 24 hours) must be limited to temperatures between -40 degrees F (-40 °C) and +130 degrees F (54 °C).

SERVICE LIFE

The Portal-Pack apparatus from MSA has a total service life of 10 years. Of this, 8 Years may be carried. The start of the carried life is to be the In-Service date.

The date that each unit or group of units is removed from storage above ground and introduced into the mine environment for use or storage is the In-Service date. The month and year of this date is to be permanently inscribed on the sealing brand by the owner. The location of the In-Service date is to be immediately after the date of manufacture and serial number already present on the brand as shown below. Any unit in Service without an In-Service date will be considered to have been placed in service on the date of manufacture.

<table>
<thead>
<tr>
<th>MFG 9-99</th>
<th>SN 1234</th>
<th>ISD 10-99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture month and year</td>
<td>Serial number</td>
<td>In-Service date</td>
</tr>
</tbody>
</table>

DISPOSAL OF USED UNITS

1. Disconnect breathing bag and breathing tube.
2. Place one canister in at least 4 gallons (16 litres) of water with a gloved hand or hand tool. Water must cover canister.
3. When the bubbling stops, the KO₂ is expended.
4. Dilute the water at least 2 to 1 and add 1 pound (0.45 kg) of bicarbonate of soda (baking soda).
5. Contact your local Hazardous Waste Disposal company or local governmental authority for proper disposal of canister and solution.

WARNING

Do not allow contact with eyes or skin or clothing because the solution is caustic. Avoid direct breathing of fumes. Work in area with adequate ventilation to prevent accumulation of fumes.