

# MineSpec MPOG™

Chemical oxygen generator providing 2600 litres of breathable oxygen



## **Introduction**

The MineSpec MPOG is a chemical oxygen generator that produces high purity oxygen suitable for breathing. The oxygen is produced by the thermal decomposition of a chlorate block using an iron promoter. The generators consist of a chemical block sealed inside a stainless steel canister. The generator is initiated using a separate igniter match which is screwed into the top of the unit to initiate the chemical reaction. Once a unit has been started it cannot be stopped and will deliver 2600 litres of breathable oxygen over a 60 to 90 minute reaction period. During this oxygen delivery time the unit will heat up and the casing temperature will reach up to 500°C. At the end of this time the outside of the unit will remain hot for several hours.

## **WARNINGS**

- The unit(s) will get very hot during use – ensure the unit is not used where skin contact or contact with flammable materials can occur.
- Pure oxygen is not flammable but will lower the ignition temperature of many flammable substances and make them burn faster if the concentration is allowed to increase significantly above normal air concentrations (21.5%) - ensure that the oxygen concentration will stay within acceptable limits for the application.
- Oil contamination in a pure oxygen environment is dangerous and can cause fast reaction, gaseous impurities or even explosions. It is therefore important that any hydrocarbon contaminated oxygen generators or accessories must not be used.
- Each unit provides 2600 litres of chemically pure breathable oxygen – ensure the enclosed volume it is used in is sufficient to avoid any issue of unacceptable over pressure.

## **General safety**

It is the responsibility of the facility managers to carry out a risk assessment of the operating procedures to be used for the deployment of chemical oxygen generators before they are put into service. The units must be stored in a designated clean, dry, sealed environment prior to use and must not be used if contaminated. The units require visual checking before use – this may require the provision of suitable emergency lighting (chemiluminescent stick or torch) for safe operation. These instructions should be available at the point of operation.

The MineSpec MPOG is intended to be used only by trained personal that are familiar with the local operating procedure(s).

An operational generator consists of two parts – the ‘oxygen generator canister’ and a separate ‘igniter match’. Each unit requires an igniter match – ensure there is one igniter match for each generator available.

### Instructions for use

- Ensure an ‘igniter match’ is available before opening this canister (may be stored separately – e.g. not included in this canister) – see Figure 1.
- Check the package is undamaged and the match has not exceeded its expiry date. Do not open the igniter match packaging at this stage.

Figure 1 – igniter match



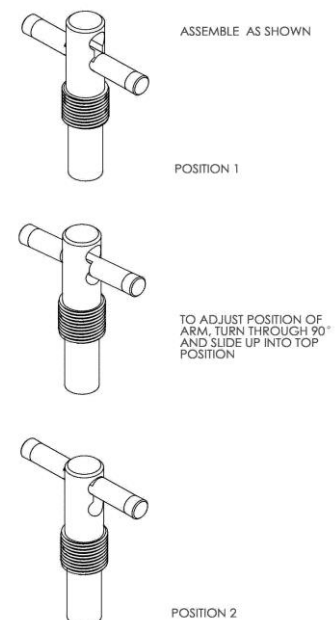
Figure 2 – exposing the ignition port

### Starting the generator

- The canister should be clean and dry - visually examine for seal damage or oil contamination. Do not use damaged or contaminated units.
- Lift the ‘T’ handle to break the tear seal and completely remove the seal to expose the ignition port – (see Figure 2).  
**WARNING – exposed sharp edges to tear off seal.**
- Once the seal has been removed the unit should be started within 15 minutes. Unsealed unused units should be marked as ‘unused’, placed in box, marked ‘do not use’ and returned to stores for proper disposal. The top should be taped over to prevent contamination during storage and disposal.
- Place the unit in a position away from flammable material or skin contact as determined by the operating procedure for the area.
- The unit is now ready to start: remove the igniter match from its packaging and ensure the red phosphorous end is present and has not been damaged. Avoid unnecessary contact with the red phosphorous end whilst handling.
- Place the toggle bar in the lower position hole (position 1 in Figure 3).
- Screw the ‘igniter match’ down into the central threaded ignition port in the top of the unit until resistance is felt then turn another half turn or until it can go no further – the unit will start (Figure 4).
- **DO NOT** remove the igniter match, as this would allow unfiltered gas to leave the unit.
- The unit will take a few minutes to become hot but will start delivering oxygen as soon as the igniter is screwed in.
- If after about 15 minutes the unit has not started (no oxygen being delivered or the unit not getting hot), unscrew the igniter match a couple of turns (do not completely remove) and place the toggle bar in the upper position (position 2 in Figure 3) then screw fully in until it can go no further – the unit should start.



Figure 3 – toggle bar



- The unit will deliver oxygen from the top ports for between 60 and 90 minutes.
- The unit will remain hot for several hours after it has stopped delivering oxygen but can be handled if necessary with suitable heat resistance gloves.
- The used unit should be marked as 'USED' on the generator and can then be disposed of.
- See separate instructions below for management of contaminated or failed units.

Figure 4 – Positioning the igniter Match



### **Management of used, failed or contaminated units:**

- A status panel is provided on the canister to allow easy recording of use.

Descriptions of status:

**Used** - a unit that has been successfully started and operated to exhaustion and is no longer hazardous.

**Unused** - a unit that has been opened and not used – this may be due to damage to the canister(s) rendering the unit unserviceable – such units are considered a hazardous material for transport and disposal.

**Contaminated** - a unit that has been contaminated and as such is not serviceable – it needs to be marked as such and returned to stores for safe disposal as a hazardous waste.

**Failed** - a unit that has failed to start or has stopped for some reason prematurely.

#### **Used units**

These need to be placed somewhere safe away from flammable materials and allowed to cool. They should be marked with their status in the box provided and can then be returned to their storage packaging and stored prior to disposal. They are not considered hazardous waste but do need to be disposed of via a licensed approved waste contractor.

#### **Unused units**

These **MUST NOT** be stored with the igniter match in place. If the igniter has been partly inserted it must be removed and stored separately prior to storage of the unit. These should be marked with their status in the box provided and returned into their storage packaging – the top should be taped over to prevent ingress of contamination. The units must be returned to stores for proper disposal as hazardous waste via an appropriately approved waste contractor. These units are still classified as a UN 1479 oxidising material. If the igniter match has been removed from its packaging and not used, it should be returned to the packaging and taped back in place then marked as 'not to be used'. It will then remain a UN 1944 match, safety for transport and disposal.

#### **Failed units**

In the unlikely event of a unit failing prematurely (e.g. less than 30 minutes burn time) it should be treated similarly to an unused unit. When the unit has been allowed to cool and it is clearly not working, the igniter match **must be removed** before the unit is returned to its outer packaging

and taped up ready for return to storage. The unit should then be treated the same as an unused unit.

### **Contaminated units**

Any unit that has been identified as contaminated **MUST NOT BE USED** and should be marked as 'contaminated' in the status box provided. The igniter match must not be inserted into a contaminated unit. Such units should remain in the box or be replaced in this if already removed and any open seals taped over to prevent further contamination. These units must be returned to stores with a note of the likely contaminant and treated as a potentially hazardous material. The units must be transported and disposed of as hazardous waste via an appropriately approved waste contractor. These units are still classified as a UN 1479 oxidising material but should be segregated from uncontaminated units.

**Note: any oxygen generator contaminated with hydrocarbons may explode if initiated.**

### **Traceability – through life management**

Each generator has a unique lot number as well as an 'Expiry' date to allow traceability and management of the units. This data is indelibly engraved on the canister of the units. The units also have a status box that can be used to show the status of used units as documented above. It is therefore recommended that used units should always be returned to their original outer packaging after use to allow easy management of the units. The unique lot number allows recording of the movement of the units through storage, transfers to and from the place of use and subsequent disposal. It is recommended that the users set up a recording system capable of recording the status of the individual units throughout their use, up to the point of disposal.

### **Transport classification**

The generator block is supplied and transported to the customer as a UN 1479 oxidiser block. It does not form an oxygen generator until the other components necessary for its use are present. The igniter matches are supplied and shipped separately from the oxidising block. Contains 0.1g phosphorous amorphous (UN1338) per initiator. Exempt from regulation as per IATA 2.6.10 'De Minimis'.

### **Handling and storage**

The units are supplied fitted with a handle to facilitate safe manual handling and movement of the units. The handles are designed for simple manual handling and are not suitable for crane lifting of single or multiple units and are not designed to withstand a tethered drop.

The units are supplied in boxes that can be palletised to facilitate shipping. Each MineSpec MPOG has a gross weight of circa 11 kg and are supplied 2 units to a box. The units should be stored in the boxes as supplied or in a sealed purpose built storage that ensure the units stay clean and dry.

The 'igniter matches' are supplied in sealed pouches in boxes suitable for long term storage in clean dry conditions. It is recommended that the igniter matches are stored in the boxes until needed. The facility will require one igniter match for each generator canister. Consideration should be given to provide a small number of additional igniter matches to allow for damage in storage and use that may occur. The expiry date of the matches should be the same or later than the MineSpec MPOG units they are intended to be used with at the time of supply / installation.

It is recommended that the 'igniter matches' are securely stored close to the canisters to provide easy access within the facility when the units are needed.

### **Responsibilities and liability statement**

The MineSpec MPOG oxygen generator is designed to be a single use item. The MineSpec MPOG oxygen generator is designed to be used as part of a purpose built air purification system that can operate within the documented design parameters. No liability can be accepted for generators that are used outside the designed operating mode.

If the MineSpec MPOG has been damaged by abuse in storage or transport, or is contaminated by hydrocarbons, moisture or any flammable contaminant, then units **MUST NOT BE USED** and should be disposed of.

Only remove the seals immediately before use. The seals are designed to protect the unit in storage and prior to use. Units left unsealed for extended periods may not start and are prone to contamination and can absorb atmospheric water vapour. Once the seals have been removed the unit should normally be used or discarded within 15 minutes.

The MineSpec MPOG should only be used as part of a refuge or enclosed environment system specifically designed for its use. The manufacturer's advice for MineSpec MPOG use should be used when planning the operating procedures.

The performance is guaranteed only if the units are used and stored within the declared operational limits set by the manufacturer and documented for the MineSpec MPOG. Used, or discarded unsealed oxygen generators must be disposed of via a suitably qualified waste disposal contractor in accordance with local legislation.

The way that the units are used is the responsibility of the user and /or facility operator. It is strongly recommended that the facility operator should carry out a risk assessment of the way in which the unit(s) are to be used before they are deployed

Failure to follow the guidance above is entirely at the user's risk and discretion. Molecular Products Ltd can give no guarantee of the MineSpec MPOG performance outside of the above conditions.

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