

# MOLECULITE®



## DESCRIPTION

Moleculite® is a highly active transition metal oxide catalyst, formulated for oxidation of unwanted or harmful contaminants.

## APPLICATIONS

Moleculite® removes contaminants from breathable gases by catalytic oxidation in a wide variety of critical filtration applications.

### Specific uses include:

- Conversion of carbon monoxide in compressed air and filter respirators
- Ozone control
- Removal of hydrogen within enclosed environments
- Control of ethylene oxide emissions
- Abatement of gaseous and volatile components (VOCs)

## PROPERTIES

In the form of dark coloured, amorphous granules, Moleculite® combines high catalytic activity with good abrasion resistance.

### Properties include:

- Large surface area, giving high oxidation efficiency
- Optimised copper oxide/manganese dioxide ratio
- Very low dust content
- In VOC applications operating temperature should be in excess of 20°C above the boiling point of the least volatile component

## PRODUCT DETAILS

Moleculite® is available in two particle sizes: 4-8 Mesh and 8-14 Mesh. Particle size has an influence on pressure drop in gas flow streams and on the speed of catalytic reaction which will affect catalyst bed depth/volume.

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## TYPICAL PERFORMANCE

Product	Contaminant	Concentration (ppm)	Operating temperature (°C)	Residence time (seconds)	Removal (%)
Merculite® 0.5 (8-14 mesh)	Ethylene oxide (C <sub>2</sub> H <sub>4</sub> O)	1000	150	0.2	>95
Merculite® 0.5 (8-14 mesh)	Carbon monoxide (CO)	100	20	0.2	>95
Merculite® 0.5 (8-14 mesh)	Hydrogen (H <sub>2</sub> )	1%	250	0.2	>95
Merculite® 0.5 (8-14 mesh)	Ethane (C <sub>2</sub> H <sub>6</sub> )	400	260	0.3	>75
Merculite® 0.5 (4-8 mesh)	Carbon monoxide (CO)	100	20	0.3	>95

## SPECIFICATION

	4-8 mesh 4.75-2.36 mm	8-14 mesh 2.36-1.40mm
<b>Particle distribution</b>		
Retained 2.36mm Sieve (wt%)	>90.0	<10.0
Retained 1.70mm Sieve (wt%)	N/A	N/A
Retained 1.40mm Sieve (wt%)	<5.0	>75
Passing 1.40mm Sieve (wt%)	N/A	<5
<b>Bulk Density (g/cm<sup>3</sup>)</b>	>0.7	>0.8
<b>Moisture (%)</b>	<0.5	<0.5

## HOW IT WORKS

Merculite® is an oxidation catalyst that acts as a substrate to combine an absorbed gaseous material with oxygen in the surrounding gas stream to produce oxidised products.

**Merculite® + target material + [O<sub>2</sub>]g = Merculite® + oxidised target material**

Providing the process is carried out at sufficiently high temperature VOCs are often only carbon dioxide and water.

The Merculite® copper/manganese couple is able to both receive and donate oxygen to gas molecules at its surface and hence acts as a catalyst to oxidise materials whilst operating at temperatures much lower than would normally be the case.

**Examples include:**

- Carbon monoxide to carbon dioxide
- Ethylene oxide to carbon dioxide and water
- Hydrogen to water
- Ethane to carbon dioxide and water
- Ozone to oxygen
- Volatile hydrocarbons to carbon dioxide and water (or other oxidised products depending on the temperature of operation)

Merculite® can also oxidise many materials without the presence of oxygen in the gas stream but in doing so it is consumed and cannot act catalytically. This can be useful for example to remove small amounts of minor contaminants in a closed system

## ADDITIONAL INFORMATION

Drum size	Number of drums on pallet	Gross weight of pallet (kg)	Dimensions of fully laden pallet (W x D x H) cm
15kg (3 x 5kg bags)	24	433	120 x 100 x 98

**Quality:** Molecular Products Ltd's aim is to manufacture chemical products which satisfy completely the needs of our customers. All products are rigorously tested to ensure conformance to the specification. Our activities comply to the requirements of ISO 9001.

**Note:** this technical data sheet indicates physical properties that are standard and typical. Molecular Products will meet customer specifications as required.

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