Air Cleaning solutions for sufferers of MCS

Air cleaning systems for MCS sufferers need to be able to control a wide range of chemicals and not themselves be a source of chemical contamination. IQAir® has with the GC series and GCX series two product lines which meet these and other MCS requirements.

What is MCS?

Multiple chemical sensitivity (MCS) is marked by multiple symptoms in multiple organ systems (usually the neurological, immune, respiratory, skin and/or musculoskeletal) that recur chronically in response to multiple chemical exposures.

What can cause MCS?

MCS usually starts with either an acute or chronic toxic exposure, after which this initial sensitivity broadens to include many other chemicals and common irritants (pesticides, perfumes and other scented products, fuels, food additives, carpets, building materials, etc.). In non-industrial workplaces, a number of common products and processes are often identified as contributing to the onset of MCS:

- offgasing of new carpets
- gas stoves
- cleaning supplies
- house paints
- pesticides and wood preservatives
- vehicle exhaust fumes
- new building materials and furnishings
- toxic chemicals used in art, photography, printing, etc.
- formaldehyde in new clothes, books, and other products
- carbonless paper, inks, copying machines, and laser printer toner
- second-hand tobacco smoke

Symptoms of MCS

MCS symptoms commonly include difficulty in breathing, sleeping and/or concentrating, memory loss, migraines, nausea, abdominal pain, chronic fatigue, aching joints and muscles, and irritated eyes, nose, ears, throat and/or skin. In addition, some MCS show impaired balance and increased sensitivity not just to odors but also to loud noises, bright lights, touch, extremes of heat and cold, and electromagnetic fields. MCS is more common in women and can start at any age, but usually begins in late puberty to mid-life.

Treatment

Avoiding the chemicals which may trigger reactions is an essential part of treating MCS. Those with MCS who are able to strictly avoid exposures often experience dramatic improvement of their health over the period of a year or more. Yet the profusion of new and untested synthetic chemicals makes this extremely difficult.

MCS and air cleaning

The removal of materials which generate chemical exposure is an essential part of creating a "sanctuary" relatively free from chemical emissions. Suitable air cleaning measures can help further reduce the background levels of residual chemicals. Since chemicals are present in the air both in the form of gaseous molecules as well as particle-bound, only air cleaners which offer both particulate filtration and significant gas phase filters will be able to make a meaningful contribution to reducing background levels of chemicals in the air.

Most off-the-shelf air cleaners on the market today are not suitable for MCS sufferers, because their gas phase filters are too small. MCS sufferers should avoid products which use carbon pads or similar low carbon containing filters. Air cleaners with granular media, such as granular activated carbon, provide better removal efficiencies for gaseous chemicals. Coconut-based carbon should be avoided since it has been reported by some users to trigger allergies. But carbon alone does not offer complete removal of gaseous chemicals. Activated carbon works well with volatile organic compounds (VOCs) but not well with some semi-volatile organic compounds (SVOCs) such as formaldehyde or inorganic chemicals such as hydrogen sulfide.

The widest range of chemicals can be removed by air cleaners which offer both granular activated carbon and a chemically active alumina. Air cleaners which offer a combination of granular activated carbon and zeolite on the other hand bring no such advantage. Zeolite has been marketed by some air cleaner manufacturers in air cleaners for MCS sufferers, but no sound scientific evidence has been presented that makes it preferable to activated carbon or chemisorbant media.

The gas phase filter in an air cleaner for MCS should be protected by a high-efficiency pre-filter. This guards against premature particle contamination which drastically reduces the effectiveness of the gas phase filters by clogging the micro-pores of the media. This decreases effectiveness, service life and may lead to cross contamination.

Air cleaners themselves can present sources of chemical contaminants, which present a serious problem to MCS sufferers. Many air cleaners contain sealants, gaskets, glues and softeners, which can release chemicals into the air. Inspection of various air cleaning systems on the market has shown that there is no significant difference in the amounts of chemicals released between air cleaners with metal housings and those with plastic housings. This may be due to the fact that most of the off-gasing of the air cleaners at room temperature comes from gaskets and sealing compounds which may be contained both in units with metal and plastic housings. Fan motors have also been reported by MCS sufferers to release chemicals and odors. This is due to the varnish which is used on the motor windings.

MCS sufferers should look for air cleaners that are sold with varnish free fan motors and have the fan motor located before the gas phase filter. This way the gas phase filter is able to take up any chemicals (from lubricants etc.) released by the fan motor as it heats up. MCS sufferers should also ensure that the fan motor and the gas phase filter are followed by an efficient particulate post-filter to capture dust which can be generated by the gas phase media and metal dust from the motor. Air cleaners which have the fan motor located at the last stage in an air cleaner should for these reasons be avoided.

Suitable IQAir® systems for MCS sufferers

The IQAir® GC Series was specially developed for the removal of gaseous chemicals. Depending on the specific sensitivities of the MCS sufferer, the systems are available in four configurations, each targeting specific gaseous compound groups. In most MCS cases, the IQAir® MultiGas™ GC unit is the best choice, because its wide sprectrum gas phase filter is able to capture a wide array of gaseous chemicals. Other features of IQAir® GC Series systems important to MCS sufferers are:

Contains no gaskets or sealants which leak chemicals The housing is made of fully cured, non-off-gasing premium ABS plastic. The IQAir® fan motor is located before the gas phase filter and before the particle post filter. The fan motor is varnish free. The gas filter is followed by a particulate post-filter that holds back any particles from the gas phase filter. The gas filter cartridges can be changed independently of the other filters in the air cleaner. This avoids cross contamination and allows for independent replacement. The gas phase filter is protected by a high-efficiency pre-filter against premature particle contamination.

If larger areas are to be covered or chemical concentrations are elevated, multiple IQAir® GC systems should be used. The IQAir® GCX Series due to its even larger gas phase filter is able to deal with even higher chemical concentrations. In most cases, the use of multiple GC systems will be preferable over the use of a single GCX system.

IQAir® is a worldwide leader in providing targeted and localised air cleaning solutions for critical applications. IQAir®'s fields of application range from residential allergen control to biological contamination control in hospitals. IQAir® advanced air cleaning systems are designed, engineered and manufactured in Switzerland. They are available through authorised dealers in over 70 countries around the world.