Dust Monitors are designed to monitor the amount of airborne particulates in the environment over a period of time. They can be used to show OSHA Compliance, ensure worker safety, or for research purposes. Because exposure to dust and particulates is hazardous to human health, organizations such as the National Ambient Air Quality Standards and OSHA have exposure guidelines in place to guarantee the safety of workers and others who may be exposed to airborne particulates. The standards can be based on the size or type of the particulates as shown in the examples below:

National Ambient Air Quality Standards

Particle Matter	Level	Averaging Time
PM 10	0.15mg/m3	24 hours
PM 2.5	0.015mg/m3	Annual
PM 2.5	0.35mg/m3	24 hours

Examples of Exposure Limits:
OSHA PEL/TWA 8 hour: 15mg/m3
OSHA Ceiling Value: 10mg/m3 (Silica)
OSHA IDLH(Immediately dangerous to life or health): 25mg/m3 (Silica)

Kanomax offers two distinct dust monitoring solutions, model 3443 is a light-scattering dust monitor while model 3521 is a piezobalance dust monitor. Each type has its benefits and limitations and understanding those is the key to deciding which one is right for a specific application.

Light-Scattering Dust Monitor

Light Scattering Monitors are the most common in the industry. Dust is introduced to the monitor via a particle inlet which funnels the particulates toward a laser beam. The particles pass through the beam in single file and the instrument measures the concentration via the amount of light that is scattered as the particle passes through the beam.

These monitors are simple to operate, and can be used for long-term monitoring making this the better choice for applications such as calculating worker exposure in an 8-hour period or research studies that require 24 hours of monitoring. The disadvantage of light scattering models is they require a K-factor (also called the calibration factor) in order to provide an accurate count. In order to get the K-factor, a gravimetric analysis of the particulate(s) being measured must be performed. This involves taking a sample of the dust at the site and sending it to a qualified lab for analysis to determine the mass concentration. Once the mass concentration is known the following formula can be used to determine the K-factor: $K = C / R$, where C is the mass concentration of the sample and R is the counts per minute from the dust monitor.

It is possible to estimate the K-factor if the mass concentration of the particulates being monitored is known, but as each environment is unique this method will not provide the greatest possible accuracy. For precise measurements it's always best to sample the particulates at the actual measuring site at the exact location the dust monitor will be placed when monitoring.

The light-scattering monitor is a good choice for long-term measuring applications, such as area monitoring, indoor air quality investigation, point source monitoring (such as welding), and personal exposure monitoring. The Kanomax model 3443 is compact and lightweight, has built-in datalogging for up to 100,000 measurements, PC USB interface, and an analog output that can be used to control other devices.

Piezobalance Dust Monitor

In contrast, a piezobalance dust monitor operates by electrically charging the particulates it takes in. The charged particulates are then deposited on a piezocrystal. By measuring the change in frequency of the crystal the monitor is able to determine the mass concentration of the particulates. Since the actual mass concentration is measured there is no need for a K-factor with this type of monitor.

The piezobalance monitor can also measure some particulates, such as oil mist, that cannot be measured with a light-scattering monitor. The drawback to this type of monitor is that the crystal must be cleaned every hour which makes it unsuitable for long-term measurements. It's a good choice for applications such as milling, honing or boring operations. The Kanomax model 3521 is designed to be simple to operate and clean. It requires no special training to use and comes with an RS232 interface for downloading data to a PC. The unit itself can store up to 500 measurements.

Product specifications for our dust monitors and other products can be downloaded from our website at www.kanomax-usa.com. If you have any questions about dust monitors, need help selecting the right product for your application or would like to request a quote please contact us at info@kanomax-usa.com.