

Gilian® Dustlight

Personal Dust Monitor

Overview of Material Configurations

Currently, the following configurations are available for selection in the specified plans directly via the Gilian Dustlight app or web app (internet connection required). In future updates, additional configurations will also be made available.

Note: A configuration adjusts the Gilian Dustlight measurement to take the different densities and optical properties of the respective materials into account. In addition, Gilian Dustlight automatically adopts the country-specific limit values for the selected material, provided these are regulated by law in that country. This means that the respective national occupational safety regulations (e.g., EU, OSHA, Safe Work Australia) are directly incorporated into the assessment.

Mixed Dusts

The standard configuration, which is preset on every Gilian Dustlight, has been calibrated with a dust mixture that delivers very good results for almost all Gilian Dustlight applications within the scope of indicative measurement. This dust mixture consists largely of crystalline quartz- containing dust, but also includes other materials to represent a representative dust mixture for many industrial applications.

It should be noted that the warning thresholds are preset to the general dust limit value. If you work with substances for which even stricter limit values apply (such as carcinogenic or toxic substances), you must adjust these warning thresholds downwards in accordance with the applicable occupational exposure limits.



The following material configurations are included at no extra charge in the **Professional** and **Enterprise** software subscription plans:

Silica Dust

The quartz dust calibration is based on measurements with quartz-containing Arizona Road Dust, an internationally established reference material for quartz particles. It was developed to reliably detect quartz-containing fine dusts – especially in working environments where quartz particles occur in dust, such as when processing rock, concrete, cement, or sand.

The occupational exposure limit for respirable quartz dust is stored as the limit value, enabling this configuration to provide a realistic assessment of exposure to quartz dust under typical industrial conditions.

Since the composition of dust can vary in practice – for example, due to differences in material, humidity, or particle shape – the measured concentration should always be interpreted in the context of the specific working conditions. For a particularly precise adjustment of the limit value, a gravimetric measurement can be carried out, followed by laboratory evaluation of the dust composition with regard to the quartz content.

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Welding Fumes

The welding application specification was created based on reference measurements taken in numerous welding tests at the IGF in Dortmund. Various welding processes such as TIG, MIG, and electrode welding were used on different materials such as steel and stainless steel. The general dust limit value is also stored in this configuration. If, for example, gravimetric comparative measurements are available that have determined the proportion of particularly hazardous substances in the air, such as chromium or manganese, the limit values for respirable dust can be corrected accordingly to these limit values.

Wood Dust

The wood dust specification is based on comparative measurements taken during sanding, sawing, and drilling of various types of wood – from spruce to beech and oak to chipboard. The general dust limit value for respirable dust of 1.25 mg/m³ is stored as the limit value. This configuration provides reliable results for both hard and soft woods.

However, caution is advised when working with hardwoods classified as carcinogenic: a separate limit value of 2 mg/m³ applies to inhalable dust for these woods. Gilian Dustlight measures respirable dust only, not inhalable dust. Users are therefore responsible for adjusting the limit value.

Gravimetric measurements that have already been carried out can provide information about the ratio of respirable dust to inhalable dust in certain work steps and help to determine an adjusted, realistic limit value for respirable dust. Experience has shown that this is below the general limit value of 1.25 mg/m³, but can only serve as an approximate value, as the legal requirements are defined exclusively for inhalable dust.

Oil Mist

The oil mist calibration is designed for working environments in which fine oil droplets from cooling lubricants are released into the air, for example during milling, turning, or grinding with oil-based coolants. This configuration takes into account the optical properties of typical oil and emulsion mists as they occur in the metalworking industry.

The general dust limit value for respirable dust is stored, which enables a practical assessment of the exposure to oil mist. However, depending on the composition of the cooling lubricant used, an adjustment may be necessary – especially if it contains toxic or carcinogenic components. In such cases, the occupational exposure limits specified in the safety data sheet should be consulted and the threshold value in Gilian Dustlight adjusted accordingly.

Aluminum Oxide Ceramics

The aluminum oxide configuration was developed based on measurements with fine aluminum oxide dust, which is often produced during grinding, polishing, and coating processes. Aluminum oxide is a very hard, reflective material with a high density, which is why specific calibration is necessary to ensure precise measurement results.

The general dust limit value for respirable dust is stored, which enables a realistic assessment of exposure. In certain industrial applications, it may be advisable to adjust the setting if aluminum oxide dust is mixed with other substances that are potentially hazardous to health. In such cases, the limit values specified in the safety data sheet or in the relevant hazardous substance guidelines should be taken into account and the threshold value in Gilian Dustlight adjusted accordingly.

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Diesel Particulate Matter (DPM)

The diesel particulate matter (DPM) calibration was developed for environments where diesel exhaust gases are present, such as tunnels, mines, or factory buildings with diesel-powered vehicles. It considers the optical properties of typical diesel particulate matter, which consists of fine, carbon-based agglomerates.

The general dust limit value for respirable dust is stored, which serves as a guide for evaluating the particle concentration. In countries with their own legal limits for diesel particles, Gilian Dustlight automatically adopts the nationally applicable limits.

Since the composition and concentration of DPM can vary greatly depending on the engine, load, and filter technology, the measured exposure should always be evaluated in the context of the respective working conditions. When using particularly polluting fuels or older engines, it may be advisable to adjust the limit value.



Special Configurations

The following material configurations have been created in response to customer requests and can be made available to all customers for an annual fee. If you would like to book a special configuration, please contact Aaron Apostolico AApostolico@Sensidyne.com.

Silica Gel

Silica gel is a porous, amorphous form of silicon dioxide with a high surface area that is often used as a desiccant for moisture absorption and in chemical processes. It consists of solid, spherical particles or granules with microscopic pores that can absorb water and other molecules.

- Silica Gel (reference: *Grace Syloid AL-1FP*)
- Silica Gel Fine (reference: *Grace Syloid_244FP*)

Pyrogenic Silicon Dioxide (Fumed Silica)

Pyrogenic silica is produced by the hydrolytic decomposition of silicon tetrachloride in a flame, resulting in an extremely fine, amorphous powder. It is used as a thickening agent in liquids, as a filler in plastics and rubber, and in the electronics industry.

- Silica Fumed 150 (reference: *Evonik Aerosil 150*)
- Silica Fumed Hydrophobic (reference: *Evonik Aerosil R972*)
- Silica Fumed HMDS (reference: *Evonik Aerosil R812*)

Precipitated Silica

Precipitated silica is produced by the chemical reaction of sodium silicate and acid in an aqueous solution, resulting in a fine powder. It is used as a filler in paints, rubber, and plastics, and as a flow agent in powders.

- Silica Precip Hydrophobic (reference: *Evonik Sipernat D17*)
- Silica Precip LS (reference: *Evonik Sipernat 22*)
- Silica Precip Granulated (reference: *Evonik Sipernat 2200*)

