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The information provided below is offered in good faith and believed to be reliable, but it is intended neither as legal advice nor as a comprehensive review of scientific information. The details of a particular situation should always be considered to identify any health and physical hazards and necessary safeguards.

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ACMA Advisory

Glass Fiber Dust from FRP Composite Utility Poles

The purpose of this ACMA Advisory is to provide information regarding the health impacts resulting from the exposure to glass fiber that may result from the field cutting, drilling or other mechanical processing of fiber reinforced polymer (FRP) composite utility poles.

Regulation and recommended practices for workplace exposure to glass fiber dust

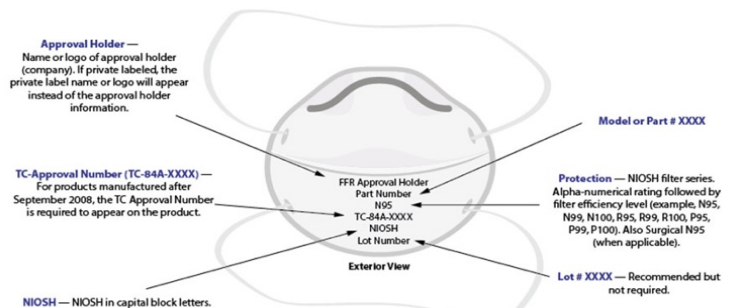
Inhalation of the dust from a composite pole can cause irritation of the respiratory system. OSHA considers these dusts to be “Inert/Nuisance Dusts” or “Particulates Not Otherwise Regulated (PNOR)” and has established a workplace Permissible Exposure Limit (PEL) of 5 mg/m³ for the PNOR respirable fraction and 15 mg/m³ for PNOR as total dust.¹

For dust comprised of the continuous filament glass fibers used to manufacture composite poles, the American Conference of Governmental Industrial Hygienists has established a Threshold Limit Value (TLV, a recommended workplace exposure limit) of 1 fiber/cm³ for respirable fibers and 5 mg/m³ for inhalable glass fiber dust.² Cal-OSHA has adopted the TLV in their state plan as a state permissible exposure limit.³

Glass fiber potentially contained in FRP dust can cause irritation or itching if it is in contact with skin or mucus membranes. This is due to mechanical abrasion and is not an allergic effect.⁴

Recommended PPE

When cutting and drilling composite poles, composite utility pole manufacturers recommend use of the following personal protective equipment (PPE): A particle mask, safety glasses, gloves, long sleeve shirt and long pants, safety footwear and a hard hat.



Generic filtering facepiece respirator with NIOSH markings.
www.cdc.gov/niosh/npptl/topics/respirators/disp_part/default.html

¹ OSHA Occupational Chemical Database: Fibrous Glass Dust; <https://www.osha.gov/chemicaldata/805>; see note in Exposure Limits table: “For General Industry, please see 29 CFR 1910.1000 Table Z-3, Mineral Dusts for Inert or Nuisance Dust”. Also see OSHA Occupational Chemical Database: Particulates Not Otherwise Regulated, Total and Respirable Dust; <https://www.osha.gov/chemicaldata/801>.

² <https://www.acgih.org/synthetic-vitreous-fibers/>.

³ Table AC-1. https://www.dir.ca.gov/title8/5155table_ac1.html.

⁴ “Continuous Filament Glass Fibre and Human Health”, Glass Fibre Europe. https://www.glassfibreeurope.eu/wp-content/uploads/2022/09/GFE_leaflet-Human-Health-November-2021.pdf.

The reinforcement fiber used in composite products is not glass wool

Glass wool and similar products have been classified as “reasonably anticipated to be a human carcinogen” by the National Toxicology Program.⁵ These are *respirable fibers*, with diameters less than 3 microns (3×10^{-6} meters), that can fit into the smallest spaces of the lung where they may cause lung cancer and other pulmonary diseases.

The *continuous filament reinforcement fibers* used in composites are made using a different process than glass wool and the resulting fibers are greater than 6 microns in diameter. This larger diameter means the fibers are not considered to be respirable and do not have the same potential to travel deeply into the lungs. Even when composite fibers are mechanically worked by processes like drilling or cutting, studies have shown that the reinforcement fibers break perpendicularly across the long axis and do not split into smaller-diameter fibers.⁶

Glass reinforcement fiber is not a form of crystalline silica

OSHA’s crystalline silica regulations require actions to limit workplace inhalation of *respirable crystalline silica*, which is reported to cause silicosis, lung cancer and other diseases.⁷ The glass reinforcement fiber used in composite products, however, is a form of *amorphous silica*. Unlike crystalline silica, amorphous silica does not fracture into the small-diameter crystalline particles that can travel into the small lung spaces where toxicity can occur. There are no studies linking exposure to amorphous silica to silicosis or lung cancer.⁸

⁵ Report on Carcinogens, Fifteenth Edition: Certain Glass Wool Fibers (Inhalable); <https://ntp.niehs.nih.gov/ntp/roc/content/profiles/glasswoolfibers.pdf>.

⁶ See the reference at Footnote 3, above.

⁷ OSHA standard for respirable crystalline silica. <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1053>.

⁸ Health hazards due to the inhalation of amorphous silica; <https://link.springer.com/article/10.1007/s002040100266>. See also the reference at Footnote 2, above.