Cleaning Techniques for Silicone Residue and Oil on Equipment and Flooring

Silicones are used across numerous industries. At Polymer Science, our P-DERM® silicone products are used within the medical industry as skin contact adhesives. Our P-THERM® silicone products are broadly used to manage heat dissipation in many applications including electronics, batteries and automotive manufacturing. Finally, our P-SHIELD® products are widely used throughout electronics markets to provide electromagnetic shielding & grounding. There are far more general uses for silicones as cosmetic materials, construction adhesives, elastomers to provide support or a flexible optical lens. In short, silicone is a common material in everyday life and manufacturing.

In a manufacturing setting, it is common that the converting environment may become contaminated with residual silicone oils as part of the normal handling process. Our business partners frequently ask Polymer Science, "How do I clean the equipment after processing?" or "How do I clean the floors if they do become slippery during handling?"

Please Note: While our team encounters this question from manufacturers, and our approach is designed for these settings, our process can be followed in other settings. With the prevalence of silicone products across many industries, many people likely need a safe and effective solution to remove silicone residue in many other applications, including commercial settings and residential spills with silicone materials.

3 Steps to Cleaning Silicone Residue

Polymer Science utilizes a tiered approach when it comes to the cleaning of silicone residue and oil residuals on equipment, floors and other surfaces. Following each step, silicone residue and cleaning supplies should be properly collected for safe disposal. In manufacturing settings, elastomers including platinum-cured silicones, thermal greases, dispensable gap fillers and foams should be carefully cleaned and removed to prevent damage to equipment and floors. Following our process reduces mess and protects surfaces.

Dry cleaning

Silicones will adhere to a variety of surfaces. So the first step is to remove any solids away from the surface. A putty knife or other flat tool is most effective at quickly removing large areas. These solids should be disposed of prior to the removal of liquid residue and oils. In some cases, waiting for silicone to cure to room temperature makes it easier to remove as a solid.

Cured silicone, liquid residue and oils may require a cloth rag or paper towel. A soft cloth or a paper towel that will not damage painted surfaces is recommended. A putty knife may damage surfaces, while a scouring pad and too much elbow grease can damage sensitive equipment. The most important step to cleaning silicone is patience and escalating steps. Dry cleaning does not remove all silicone residue in most cases.

Liquid Cleaning

Once the majority of solid residual is removed, Isopropyl Alcohol at >90% concentration should then be used as a cleaning solvent. Prior to cleaning with isopropyl alcohol, check compatibility with the surface being cleaned as some polymeric materials may be damaged with exposure to alcohol.

This isopropyl alcohol solvent is gentle enough not to damage metal surfaces and is readily available throughout most manufacturing facilities. The >90% isopropyl alcohol should be applied to a cloth and wiped until the surface is clean. The surface will air dry so a number of applications are often required.

As in dry cleaning, avoid aggressive scrubbing. Using a generous amount of isopropyl alcohol helps to remove the silicone residue that remains. Using soft cloths and cleaning using circular motions helps to clean silicone from painted surfaces and delicate equipment. To access all the nooks of complex equipment, use a spray bottle and gently scrub with a sponge or small brush. Liquid cleaning with isopropyl alcohol may be sufficient to clean silicone in many situations.

Before moving to other cleaners, we recommend using multiple applications of this simple cleaning solution. A number of applications may be required to remove silicone residue completely. If the surface still has a residue, other cleaners may be needed.

Industrial Cleaner

Water-based cleaners are an option within industrial solutions. An industrial cleaner such as Alconox® or Detonox® may also be an alternative water-based option when alcohol does not clean silicone residue completely. The detergent solution should be heated to about 80C and then rinsed at 80C or higher with water prior to wiping. The use of a water-based surfactant allows for the emulsification of the silicone into the hot solution. A hot rinse will prevent thermal shock and mitigate the risk of breaking the emulsion which would redeposit silicone fluids to the surface being cleaned.

When you follow the instructions of these water-based cleaning solutions, they are effective but may not remove silicone completely. A possible final wipe with a lower concentration of isopropyl alcohol to expedite the drying process may be needed. Allow the surface to air dry completely.

Silicone-specific cleaners are also an option. Many products on the market are designed to depolymerize and dissolve silicone resins in solvent and aqueous varieties. Products that are known to dissolve silicones include organic acids such as dodecylbenzenesulfonic acid in a petroleum distillate or aqueous solvent mixtures which may contain a blend of inorganic and organic compounds such as monomethyl ethers, higher molecular weight ethoxylated alcohols and quaternary ammonium salts. Dow Corporation® offers Dowsil™ DS-2025 Silicone Cleaning Solvent and Dowsil™ DS-1000 Aqueous Silicone Cleaner specifically designed for this purpose.

Further Technical Support

When you need to clean silicone and remove silicone residue, Polymer Science recommends a progressive approach. Our vast experience manufacturing silicones both for highly specialized applications and general industrial purposes has instilled the most effective processes resulting in practical solutions. If additional technical support is required, please reach out to our team of highly skilled engineers.

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