

Silicone vs. PVC & PU



Why Silicone

Silicone leather is a unique fabric and its properties are different compared to traditional polyurethane (PU) and polyvinyl chloride (PVC) fabrics. Silicone leather does not use plasticizers, which are often found in PVC products. Silicone has many advantages over PU and PVC as it does not break down under UV light, deteriorate in cold temperatures, has no odors, and maintains consistency and shape over time.

General Characteristics of Silicone

We encounter silicones in our lives every day - they protect electronics from moisture and dirt. In the kitchen they provide heat resistance and ease of cleaning, and for medical they are used to deliver high-performance and hypoallergenic materials.

- Silicone is versatile, tough, benign to health and the environment.
- Silicone combines the stability of inorganic materials with the elastic and plastic properties of organic matter.
- Low surface tension provides resistance to stains and hydrolysis.
- Molecular structure provides excellent elongation and elasticity.
- Molecular bonding provides UV resistance, extreme temperature resistance (high and low) and chemical resistance
- Silicone naturally meets or exceeds all ASTM, ISO, ACT, and CFFA standards without the need for flame retardants, antimicrobials or topcoats.
- Its softness and suppleness intrinsically suggest luxury.
- Superior scratch resistance

Health and Sustainability Aspects of Silicone

In 1979, the US FDA determined that silicon dioxide, the raw material that is used to make silicone products, was safe for food-grade applications. It has been determined that there are no known health hazards associated with the use of silicone cookware. Silicone rubber does not react with food or beverages nor produce any hazardous fumes.

- Processing is very efficient. It is powered by clean electricity; there is no off-gassing, no pollution and very little water is used. Silicone's base material, silica, does not contain the same types of chemicals that are found in petroleum-based plastics.
- Silicone processing offers the least environmental impact of any coated fabric.
- Silicone does not contain BPA, BPS or phthalates.
- Silicone is not a skin sensitizer, and does not bioaccumulate – it contains zero toxins.
- Silicone does not break down into micro-particles – it has far greater structural integrity than plastic, so does not find its way into waterways and marine animals.
- Silicone can be downcycled into an oil that can be used as industrial lubricant or as playground mulch.
- Silicon is found readily in sand. However, to turn silica into silicone, the silicon must be extracted and processed.
- First the silica is heated with carbon in an industrial furnace to extract the silicon, which is then passed through hydrocarbons to create a new polymer with an inorganic silicon-oxygen backbone and carbon-based side groups.
- This means that while the silicon in silicone comes from a plentiful resource like sand, the hydrocarbons in silicone come from non-renewable resources like oil and natural gas.
- This makes silicone a hybrid material, meaning that it's much better than plastic in terms of resource extraction, but it not 100% renewable, and is not biodegradable.

Silicone vs. PVC & PU



Health and Sustainability Aspects of PVC & Polyurethane (Plastics)

Consumers are becoming increasingly aware of the toxic aspects of plastics due to their BPA, BPS and phthalate content. Bisphenol A (BPA) is an endocrine disruptor. It can imitate the body's hormones, and it can interfere with the production, secretion, transport, action, function, and elimination of natural hormones. BPA can behave in a similar way to estrogen and other hormones in the human body. Bisphenol S (BPS) has been shown in animal studies to induce cardiac arrhythmias and cause cardiac developmental deformities. These phthalates are linked to increased incidences of asthma, attention-deficit hyperactivity disorder, breast cancer, obesity and type II diabetes, low IQ, neurodevelopmental issues, behavioral issues, autism spectrum disorders, altered reproductive development and male fertility issues.

- Due to its high chlorine content, PVC creates toxic pollution in the form of dioxins, which accumulate in animals' fat and upwards through the food chain.
- Isocyanates in PU cause irritation of the eyes, nose, throat, lungs and skin.
- BPA, BPS and phthalates are subject to FDA limits and restrictions in the US – with even stronger restrictions in the EU, Canada and other countries.
- Higher-end PU/PVC manufacturers market phthalate-free products, but many avoid mentioning BPA and BPS.
- Plastics break down into microplastics which are bad for the planet and bad for our health.
- Microplastics bioaccumulate
- Plastics are made from crude oil, a non-renewable resource that's extracted from the Earth and transformed into plastic by altering the oil's carbon compounds.
- Some plastics can be recycled - many can not be recycled.
- Plastics do not biodegrade.