

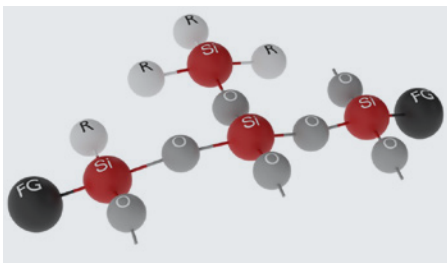
RESINS FOR FIBER-REINFORCED COMPOSITES

PUSHING THE FRONTIERS OF FIRE-RESISTANT COMPOSITES WITH SILRES®

Outperforming Organic Resins as Composite Binders

Innovations are the engine of silicone chemistry. The outstanding heat resistance of silicone resins is particularly striking. Plus, their dielectric behavior is ideal.

Silicone resins consist of highly branched polymer structures. Considered in detail, they are networks of irregular, mainly tri- or tetrafunctional structural units. As you may already know, the Si-O-Si bond is stronger than the C-C bond.

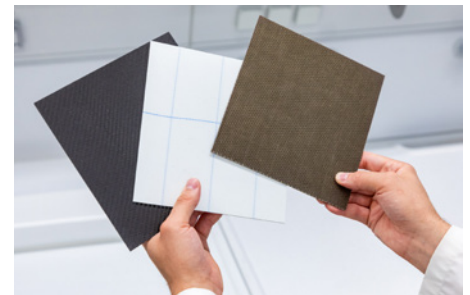


Consequently, silicone exhibits excellent thermal stability over a wide range of temperatures, giving your products a potential advantage in hostile environments. The latest developments prove this in the event of exposure to fire, too.

WACKER is working with the automotive industry on innovative fire-protection concepts for the safe operation of electric vehicles. Silicone resins entail a low fire load, can interact with fillers and fibers and can form ceramic materials. Silicone resins protect material integrity during a fire. Fiber-reinforced silicone resins develop a low thermal conductivity when heated by a flame (high temperature difference between the hot and cold side). Moreover, in the event of a fire, smoke emissions are significantly reduced. Additionally, by using the novel fiber composites as a battery enclosure or heat shield, the passenger cabin can be protected from high temperatures caused by thermal runaway.

Properties of composites with silicone resins:

- Low fire load (high SiO₂ content)
- Formation of ceramics (Si/O/C) results in material integrity during/after a fire
- Excellent thermal and fire resistance, up to 7 h @ 1,500 °C for 2-mm composite
- Only trace smoke and toxicity emissions
- Superior thermal insulation
- Thin and 3D formable
- Suitable for lightweight design
- Several OEM-specific tests passed for battery-safety applications, e.g. hot particle impact



Composite plates manufactured in the lab using carbon fibers (left), glass fibers (middle) and basalt fibers (right).

Watch Our Videos



Revolutionizing Fire Protection for Battery Packs
Interview



Battery Safety Testing According to UL2596
Test results

Product Recommendations

Solid resins and resin solutions

- SILRES® MK
- SILRES® REN 168
- SILRES® K

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Wacker Chemie AG, 81671 Munich, Germany, info@wacker.com, www.wacker.com

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