Effects of fillers on the properties of liquid silicone rubbers (LSRs)

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Effects of Fillers Depend On

- **Particle Size**: Smaller is Better
  - >10μm: Degradants
  - 1-10μm: Diluents
  - 0.1-1μm: Semi-reinforcing
  - 0.01-0.1μm: Reinforcing

- **Particle Surface Area**: Bigger is Better

- **Particle Shape**
  - Broader (and Longer) is Better
    - Platy
    - Fiber
    - Acicular

- **Particle Surface Activity**: More is Better
  - Matrix wetting
  - Matrix adhesion
SiO$_2$ reinforces the networks with no increase in permittivity ($\varepsilon_r^{\text{SiO}_2} \sim 3.9$).

The inhomogeneous compatibility of the unmodified multiwalled carbon nanotubes (MWCNTs) causes the risk of conductivity.

Micron-sized CaCu$_3$Ti$_4$O$_{12}$ CCTO ($\varepsilon_r^{\text{CCTO}} \sim 10000$) decreases the mechanical properties of the composites.
1.2.3 Effects of fillers on the properties of liquid silicone rubbers (LSRs)

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