

## 炭黑/硅橡胶导电复合薄膜传感特性研究

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摘要：

利用溶剂法工艺成功制作了炭黑/硅橡胶导电复合薄膜（厚度约0.1mm），对其进行了拉伸、压缩及温度敏感性试验。测试结果表明，试样具有优良的拉-敏传感特性，随着拉伸变形的增大（应变达到25%）试样电阻不断增大，且电阻-应变之间具有较好的线性关系。压缩过程中，随着压力的增大（压力达到30MPa）试样电阻增大，两者同样具有较好的线性关系。温敏试验表明，试样电阻随温度的下降而降低，且趋势相似。研究结果表明，薄膜结构的炭黑/硅橡胶导电复合材料具有优良的传感特性。

关键词：传感；炭黑；硅橡胶；力敏特性；热敏特性；薄膜元件

## The sensing properties test of carbon black / silicone rubber conductive composites thin-film sample

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**Abstract:**

The tensile, compression and temperature sensitivity test is carried out for carbon black/silicone rubber thin-film samples (thickness of about 0.1mm) produced with the method of solvent process. The results showed that the sample has excellent tension - sensitive characteristics; the resistance of sample increasing with tensile deformation (the strain up to 25%) and has a good linear relationship between the resistance and strain. The resistance increases at compression process as the pressure increases (up to 30MPa), both equally has good linear relationship. Temperature sensitive tests showed that the sample resistance is lowered with the decrease of temperature, and has a similar trend. The carbon black / silicone rubber conductive composites with thin-film structure have better sensing characteristics.

**Keywords:** sensing; carbon black; silicone rubber; force sensing properties; temperature sensing properties; thin-film element

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