Voltage-stabilised elastomers with increased relative permittivity and high electrical breakdown strength by means of phase separating binary copolymer blends of silicone elastomers - DTU Orbit (17/01/2019)

Voltage-stabilised elastomers with increased relative permittivity and high electrical breakdown strength by means of phase separating binary copolymer blends of silicone elastomers

Increased electrical breakdown strength and increased dielectric permittivity of silicone-based dielectric elastomers are achieved by means of the addition of so-called voltage-stabilisers prepared from PDMS–PPMS copolymers as well as PDMS–PEG copolymers in order to compensate for the negative effect of softness on electrical stability of silicone elastomers. The voltage-stabilised elastomer, incorporating a high-permittivity PDMS–PEG copolymer, possesses increased relative permittivity, high electrical breakdown strength, excellent network integrity and low dielectric loss and paves the way towards specialised silicone elastomers for dielectric elastomer transducer products with inherent softness and electrical stability, and thus increased actuation at a given voltage.

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