

LEAK-FREE STOPPER FOR A SYRINGE ASSEMBLY HAVING LOW BREAKLOOSE AND SUSTAINING FORCES

Abstract

A thermoplastic elastomer stopper that meets the desired material properties of a stopper for a syringe assembly is disclosed. The compression set of the thermoplastic elastomer stopper of the present disclosure is $\leq 50\%$ when measured at 25% compression for 22 hrs at 70 degree C. The hardness of the thermoplastic elastomer stopper of the present disclosure is 40-70 Shore A. The viscosity of a thermoplastic elastomer stopper of the present disclosure is ≥ 70 Pa.s at $1,000 \text{ s}^{-1}$ shear rate, ≥ 12.0 Pa.s at $10,000 \text{ s}^{-1}$ shear rate, and ≥ 3.0 Pa.s at $50,000 \text{ s}^{-1}$ shear rate when measured using a capillary rheometer at 205 degree C (Die: Roundhole 20 mm length / 1 mm diameter / 180 degree inlet, Piston: d = 15 mm, and melting time = 7 min). The present non-lubricated stopper exhibits the required functional performance of a lubricated stopper.

No suitable fig.