Silicones Simplified
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XIAMETER® *from* DOW CORNING

Product Guide

Injection Molding of XIAMETER® High Consistency Silicone Rubber

In injection molding, a high-speed ram or reciprocating screw forces the unvulcanized rubber from a cylinder through a nozzle and into a closed heated mold, by a pressure independent of the pressure that holds the mold closed. The two halves of the mold are attached to heated platens. The ram injects only enough material to completely fill the mold, then retracts so rubber for the next cycle can be loaded into the cylinder.

Advantages of this process include short molding cycles (much shorter than for compression molding), little or no preform preparation, little or no flash to remove, and low scrap rate.

For any given XIAMETER® silicone rubber, the following production factors must be properly balanced for best results, through experience and experimentation:

Cylinder Temperature

For most silicone rubber products the cylinder or the screw and the barrel should be at room temperature.

Molding Time

This will vary according to the type of rubber and size of the part. The normal range for peroxide cured materials is 30 to 90 seconds, for addition cure products 15 to 45 seconds.

All vulcanizing agents normally used with silicone rubber can be used for injection molding. However, the higher temperature peroxides are preferred because they are less likely to scorch.

Injection Pressure

This should be from about 500 to 2000 psi (3.45 to 13.78 MPa), depending on the viscosity of the rubber, size of injection nozzle, mold design and desired injection time. Under most conditions, most rubbers inject satisfactorily at about 800 psi (5.51 MPa)

Injection Time

This depends on the mold cavity size, injection pressure, and viscosity of the rubber. It is usually between 5 and 10 seconds – 7 seconds being the average for most conditions. A short injection time is desirable, to minimize scorch and total molding time. Since it is important to keep injection time as short as possible higher pressures should be used with high viscosity rubbers. Fig. 1 shows the relationship between viscosity and injection pressure for a typical molding setup.

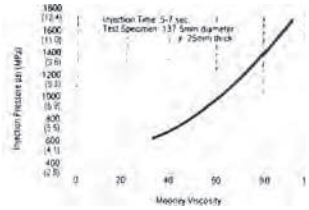

Fig. 1 : Mooney viscosity versus temperature for a silicone rubber with various vulcanizing agents

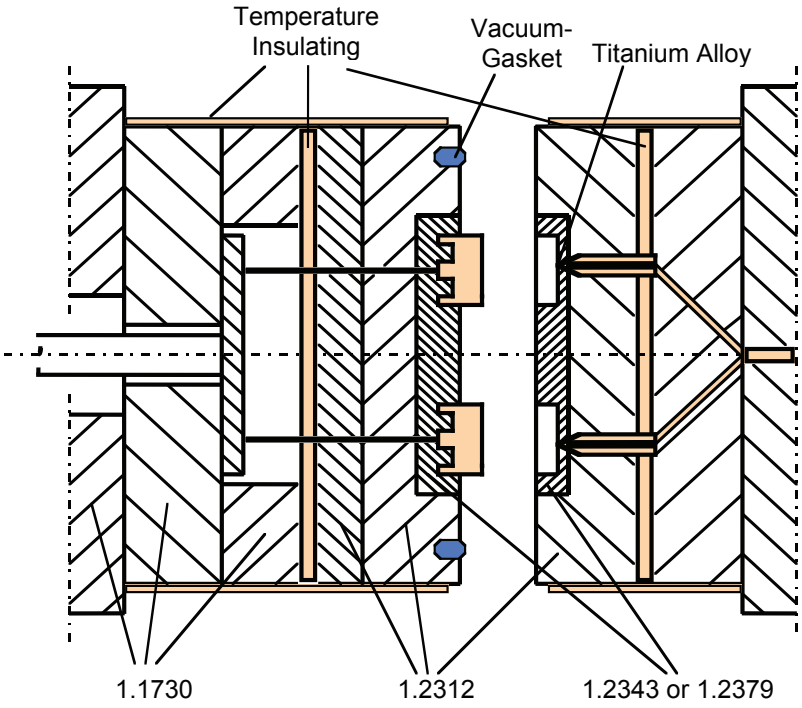

Fig. 2. Sketch of a coldrunner mold for silicone rubber

In addition to the XIAMETER® brand materials showcased in this guide, Dow Corning Corporation offers a wide variety of *Silastic*® brand specialty silicone and fluorosilicone elastomers, as well as service options to help you keep your innovative edge in the marketplace. Visit **www.dowcorning.com** to learn more about additional options available from Dow Corning.

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Printed in USA AGP9790 Form No. 95-561-01

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