6

FILLERS AND POTTING COMPOUNDS

J. L. Montague

DEVELOPMENT DIVISION

JULY - SEPTEMBER 1971

Normal Process Development
Endeavor No. 201

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED **MASTER**

Mason & Hanger-Silas Mason Co., Inc.
Pantex Plant

P. O. BOX 647
AMARILLO, TEXAS 79105
806-335-1581

operated for the
ATOMIC ENERGY COMMISSION
under

U. S. GOVERNMENT Contract DA-11-173-AMC-487 (A)

NOTICE

~~This report was prepared as an account of work sponsored by the United States Government. Neither the United States nor the United States Atomic Energy Commission, nor their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately-owned rights.~~

FILLERS AND POTTING COMPOUNDS

J. L. Montague

DEVELOPMENT DIVISION

This project is a continual review of materials and process techniques.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

July - September 1971
Endeavor No. 201
Acct. Nos. 22-2-44-01-201
 & 22-34-11-203

Section A

DISCLAIMER

**Portions of this document may be illegible
in electronic image products. Images are
produced from the best available original
document.**

FILLERS AND POTTING COMPOUNDS

ABSTRACT

The work this period concentrated on packaging RTV silicones in "SemKits"^a. The Falling Ball Viscosity Test and Durometer Test indicated there was insignificant difference between those samples packaged in the SemKit (Fig. 1) and the control samples. However, a cured toroidal-shaped polymerized silicone material was observed in some samples when the catalyzed fluid was removed.

DISCUSSION

In using the SemKits, the dasher rod must be cleaned with extreme care to remove all catalyst, especially around the valve. Where this procedure was not practiced, small pieces of toroidal polymerized silicone were observed. (Fig. 2)

Close observations revealed minute amounts of resin leaked past the wiper plunger and had collected on the bottom cap. This leakage occurred over the 10-month storage period.

Each sample contained a small air pocket inside the compartment containing the resin which is difficult to remove unless the samples are packaged under vacuum. Upon mixing, the small air bubble is converted into many tiny ones, dispersed throughout the system. Due to the snug fit of both the dasher rod and the wiper plunger, vacuum was created inside the cartridge and no outside air was drawn inside the system.

The falling ball and durometer test results indicate that Dow Corning 93-119 and catalyst can be stored together inside the SemKit. The same tests indicate an insignificant difference as to how each sample is stored, i.e., whether up-right or on its side.

Fig. 3 shows that each sample of material acted in an identical manner for at least one hour. After one hour the points became erratic. It is not known how much heat is generated in the mixing process, but a test conducted with the Brookfield Viscometer showed that a temperature gradient of 4° greatly distorted the upper end of the viscosity/time curve. The falling ball curves indicate that viscosity readings taken after 60 minutes are totally unreliable.

FALLING BALL VISCOSITY TEST

The falling ball viscosity test consists of a glass vial (inside diameter 0.7912 inch) and a steel ball (diameter 0.4999 inch). The outside of the vial is marked with centimeter tape. The ball is placed inside the vial and the vial is

^aRegistered trademark by Semco, Los Angeles, California

filled as full as possible in an attempt to remove all air. Before placing the cap on the vial it is allowed to set about 10 minutes in order that trapped air might escape.

The vials are kept in an inverted position so that the ball rests on the cap. The vial is then tilted and an attempt is made to keep the ball in the center of the vial. So that a more accurate reading may be obtained, the ball is allowed to fall 5 centimeters. By watching the scale on the vial, and with the aid of a stop watch, consistent readings can be obtained.

DUROMETER TEST

The Type A durometer is used for testing nonrigid and some semirigid materials; for this reason the Shore A gage was selected. The procedure along with additional information can be obtained from ASTM D1706-61 and D2240-64T. (See Table I)

LOADING PROCEDURE

The valve at the end of the dasher rod is pushed inward, using slight pressure of the fingers. The tube is then turned upward, with the bell shaped end up, while the desired amount of catalyst is added (5 or 10 grams). The cylinder-shaped piston is inserted with the tube still in its original position. The rod is then inverted causing the valve to be at the top and the cylinder at the bottom. Pushing the piston in the direction of the valve, it is moved forward until all air is removed from the rod and a small amount of fluid appears at the end of the valve. The valve is then pushed down flush with the surface of the dasher rod end. All excess material is wiped from the dasher rod end.

After the dasher rod has been placed into the smaller opening of the cartridge the combined lengths of the two should be about eleven inches. The open end of the cartridge is held upwards while the dasher is screwed onto the dasher rod and the desired amount of resin is added (50 or 100 grams).

CONCLUSION

The SemKit may be used to package 2000 cps two component RTV silicone systems for use in production. Care must be taken to prevent leakage of resin or catalyst such as at the dasher rod valve.

Fig. 1

Fig. 2

- 50 g Stored Upright
- ▲— 100 g Stored Upright
- 50 g Stored on its Side
- 100 g Stored on its Side
- 50 g Control Sample
- 100 g Control Sample

FIG. 3. Viscosity Time Curves

TABLE I. SemKit Samples

Material	Lot #	Kit Size (grains)	Storage Position	Mixing Cycle (strokes)	Durometer Shore A (24-hours)
93-119	001348	100	Side	50	20 19 19 21 20
93-119	001348	100	Upright	50	18 21 20 19
93-119	001348	50	Side	100	17 20 20
93-119	001348	50	Upright	100	18 20 19 20 20
93-119	001348	100	Control Sample	50	20
93-119	001348	50	Control Sample	100	19