

From **MONSANTO CHEMICAL COMPANY**

At Texas City

Date February 26, 1953

To S. B. Wilson

Reference

At Texas City

Subject

22T9 - VCM Storage Tanks
Materials Test for Level Gauge Valve Plug

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The level measuring device for each of the spherical VCM storage tanks (22T9) consists of a float connected to the indicating device by means of a tape. This tape moves in a $1\frac{1}{2}$ " pipe from the top of the tank to the indicating device. A valve with a rubber plug is provided at the top of the tank to permit working on the exterior portion of the level gage without emptying the tank. The plug of this valve must be resilient to permit sealing over the tape. The original valve plug was Hycar rubber.

Soon after start-up, these valves ceased to function properly. Examination of the plug which was removed from one valve leads to the belief that the rubber swelled as a result of absorbing VCM. This caused the valve seat to freeze in place and be twisted off in an effort to open or close the valve.

Tests have been run with a number of rubber-like materials in an effort to find a suitable material. Samples of Hycar, Silastic X-4928, Silastic X-8655A, Silastic X-8000A, Silastic 152, Thiokol, and polyethylene were exposed to liquid VCM (22D7 OH) at room temperature for six days. At the end of this period, all of the materials, except polyethylene, were swollen, due to VCM absorption. No chemical attack was noted on any of the materials. The Silastics (silicone rubbers) were all very badly swollen. The Hycar (nitrile rubber) and Thiokol (polysulfide rubber) samples were swollen to about 110% of their original size.

The tendency to absorb chlorinated materials, with resultant swelling, is very general with natural and synthetic rubber. For this reason, it is doubtful that natural or synthetic rubber will be entirely satisfactory. The physical properties of a calcium fluoride filled teflon appear to be satisfactory for this application. It is believed that the chemical resistance of this material will be satisfactory for this service. An effort is being made to determine if this material can be molded to the shape required.

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