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FINAL REPORT FOR W.B. RIN

MAY 11 1955

MATERIALS OF CONSTRUCTION

GASKET MATERIALS FOR ETHYLENE OXIDE-BUTANOL PROCESS EQUIPMENT

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SUMMARY Based on a laboratory test and a consideration of the properties of the polymer, it is recommended that Teflon be tried as a gasket material in mixtures of butanol and ethylene oxide at 160-190° Centigrade.

DISCUSSION Recent difficulties in the use of U. S. Rubber No. 899 asbestos gaskets, in mixtures of butanol and ethylene oxide at high temperatures in the No. 1 CELLOSOLVE Unit, required that consideration be given to a change of materials for this service. The asbestos gaskets used in the bonnet of 300-pound Powell steel valves slowly deteriorate in contact with this chemical mixture at temperatures of 160-190°C, probably as a result of ethylene oxide attack on the binder in the gasket materials. The No. 899 and Garlock No. 7735 asbestos gasket materials are as chemically inert and as heat-stable as any material available with the exception of Teflon.

The Teflon is resistant to all chemical attack and has been used in many applications at temperatures near 250° Centigrade. A test in the laboratory was devised to determine the strength of the resin at 180° Centigrade. A specimen was suspended in an oven maintained at this temperature for 34 hours with an applied load of 15.22 pounds per square inch. No deformation of the specimen occurred during this time, and the resin appeared hard and tough at the test temperature.

It is suggested that the Teflon material be tested as a gasket material in one of the valve bonnets.

Notebook Reference: D-2439-129

vmc

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INDEX LIST

Ethylene Oxide -1
Butanol -1
Materials of Construction
Teflon -6
Gaskets -6
Asbestos -6