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UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ENGINEERING
INSTITUTE, WEST VIRGINIA

MEMORANDUM

October 3, 1979

MATERIALS
ENGINEERING
CENTRAL FILE

TO: Mr. E. E. Baez
Ms. J. E. Ballard
Mr. S. J. Kubisen
Ms. D. A. Montivideo
Mr. R. Ocejo
Mr. L. L. Madestau

CC: [redacted]
Mr. G. B. Elder
Mr. L. N. Garcia
Mr. G. E. Rutzen

FROM: A. J. Montero

SUBJECT: Recommendations for the Use of Haveg and/or Chemtite in the Cumene Unit at the Ponce Plant - Cumene Corrosion Team

The Cumene Unit personnel asked if Haveg and/or Chemtite piping could be used in the reaction area in place of the Teflon lined steel piping to control external corrosion. The chemicals which are present in the reaction system are propylene, benzene, DIP, aluminum chloride catalyst, hydrogen chloride, and cumene. The operating temperature in the reaction system is about 50°C. The question whether Haveg and/or Chemtite can be used in the reaction area was prompted by the use of a furan resin which was used to patch the glass-lined steel catalyst mix tank and degasser.

Haveg piping is produced by loading a mixture of asbestos and resin (phenolic or furan) into molds and then applying heat and pressure. Haveg piping can be supplied with or without an external reinforcing which consists of filament wound fiberglass impregnated with an epoxy resin. The purpose of the external reinforcement is to give the Haveg material the mechanical strength and impact resistance of the armoring or external reinforcement. The unreinforced Haveg material does not possess high mechancial strength nor high impact resistance. The Chemtite piping, which is also manufactured by Haveg, is also a material produced by pressure molding asbestos fibers with a resin (epoxy or phenolic resin). The Chemtite piping and fittings are not supplied with an external reinforcement such as in the Haveg. The mechanical and impact properties of the Chemtite are similar to that of the unreinforced Haveg material.

PLAINTIFF'S EXHIBIT
UC-2410

A review of the chemical resistance of the Haveg 41 (phenolic resin), Haveg 61 (furane resin) and of the Chemtite phenolic and epoxy shows the following: 1) the Haveg 41, the Haveg 61, and the Chemtite phenolic are resistant to all of the chemicals present in the reaction system, 2) the Haveg 41 and the Chemtite phenolic have better chemical resistance to aqueous hydrochloric acid streams, and 3) the Chemtite epoxy is not resistant to all the chemicals present in the reaction system.

A review of Haveg equipment and piping and of Chemtite piping at the Institute Plant was made to establish what the field experience has been with these materials. The Institute Plant was chosen because Haveg is used and has been used for many items of equipment in the SEVIN Complex and Chemtite piping has been used at the Plant. The experience at the Institute Plant has shown that Haveg equipment can be used successfully provided that the equipment is designed properly, installed properly, and not physically abused. The review also reveals that: 1) Some of the Haveg equipment has experienced breakage of nozzles and section flanges caused by improper handling of the Haveg columns and by piping stresses on the nozzles, 2) Haveg equipment has also experienced weeping caused by permeation of hydrochloric acid through the Haveg, and 3) there have been several instances where either Chemtite pipe or Haveg pipe due to their low mechanical strength have broken due to someone stepping on the line in the case of the Chemtite pipe and pressure surges in the case of the Haveg pipe. (The Haveg equipment used at Institute is all externally reinforced.)

The use of Haveg and Chemtite pipe in the reaction system at the Cumene Unit is not recommended because Haveg and Chemtite are subject to mechanical damage due to their low mechanical strength and brittle nature. Leaks caused by breakage of Haveg or Chemtite piping cannot be tolerated because there are chemicals in the reaction system which are toxic and flammable. Another reason for not recommending these materials of construction for the reaction system is that there are other materials of construction which can be used successfully in the reaction system.

For other areas in the Cumene Unit where Haveg equipment or piping or Chemtite piping may be used, it is recommended that these materials be evaluated for the specific application. These materials can be used successfully in the Cumene Unit in corrosive areas provided that the equipment and piping is designed properly, installed properly, and not mechanically abused.

If you have any questions or comments concerning the above recommendations, please feel free to call.

A. J. Hunter

INDEX: 22A,31, 32, 43, 112, 116,121,131,132,133,155,176B,182,184,184B,336

ABSTRACT: These MOC not recommended for reaction system. In other areas, it was proposed that they be evaluated for each application.