# Critical Erosion/Corrosion Piping Wall Thicknesses Under Static and Fatigue Stress Conditions According to ASME Guidelines

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The purpose of this project was to show the updated procedures and to make additions to the computer program called *Tmin* designed by E. I. DuPont De Nemours and Company. This program is used as a screening tool for determining the largest of the minimum pipe-wall thicknesses in a piping system.

This project involved several additions that will be released in the next version of the *Tmin* computer program. The first major additions to be implemented are four alternating Stress-to-Number of cycles curves: Aluminum 1100, Aluminum 3003-0, Aluminum 6061-T6, and Nickel 200. In addition, procedures of the ASME for fatigue curve analysis and implementation of fatigue data were investigated. These four stress-to-number of cycles (S-N) fatigue curves were added to *Tmin's* internal Microsoft Access® database. Next, a 2-D vertical piping span configuration was incorporated. Finally, DuPont required a Microsoft Word® document output of the pipe-wall thickness data including the piping span model information. Other user-friendly additions were included.

Since this computer program was to be American Society of Mechanical Engineers (ASME) compliant, a study of the ASME Pressure Vessel and Piping standards and codes was made to determine how pipe-wall thickness calculations were to be processed. The 2-D vertical piping span calculation procedures were investigated. Once the 2-D vertical piping span analysis was complete, the largest pipe-wall thickness value calculated were passed to a Microsoft Word® document. The last implementation is the inclusion of help files. Help file button additions in all input boxes allowed for the user to know exactly what was needed before a data entry was made.