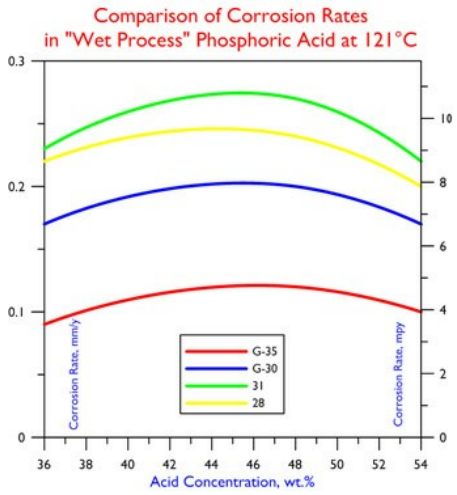
HASTELLOY® G-35® alloy

Resistance to â€œFertilizer-gradeâ€ Phosphoric Acid

“Fertilizer-grade” phosphoric acid (P_2O_5), which is made by reacting phosphate rock with sulfuric acid, is one of the most important industrial chemicals, being the primary source of phosphorus for agrichemical fertilizers. As produced, it contains many impurities, and has a P_2O_5 concentration of only about 30%, because of the large amount of rinse water needed to separate it from the other main reaction product, calcium sulfate. Typical impurities include unreacted sulfuric acid, various metallic ions, fluoride ions, and chloride ions. The fluoride ions tend to form complexes with the metallic ions, and are therefore less of a problem than the chloride ions, which strongly influence electro chemical reactions between “fertilizer-grade” phosphoric acid and metallic materials. Particulate matter (for example, silica particles) can also be present in “fertilizer-grade” acid.

The main use of metallic materials is in the concentration process, where the “fertilizer-grade” acid is taken through a series of evaporation steps, involving metallic tubing. Typically, the P_2O_5 concentration is raised to 54% during this process. The concentration effect upon the corrosivity of the acid is somewhat offset by the fact that the impurity levels drop as the concentration increases.

The following chart, comparing G-35® alloy with competitive materials, is based on tests in three concentrations (36, 48, and 54%) of “fertilizer-grade” phosphoric acid (supplied by a producer in Florida, USA) at 121°C (250°F).



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