

DETAPIPE™ - CHANGING REACTIVE METAL PIPE SYSTEMS FOR HPAL AND POX OPERATIONS

By

Edgar E. Vidal

NobelClad, U.S.A.

Presenter and Corresponding Author

Edgar E. Vidal

ABSTRACT

Availability and supply chain concerns around titanium are always in the minds of designers and end users of High-Pressure Acid Leaching (HPAL) and Pressure Oxidation (POX) circuits. Because of the extreme conditions of temperature, pressure, and acidity, titanium alloys are often selected for components of these circuits, such as the autoclave itself, valves, pipe straights and elbows. Because of the relatively thick walls needed for these pipes and elbows, the cost of these components can become an economic concern for the project. Additionally, handling, fixturing, and repairing a solid titanium pipe adds technical challenges, particularly in remote operations.

NobelClad has developed a proprietary cylindrical cladding process to produce a titanium, zirconium, or tantalum clad surface inside carbon or stainless-steel pipes – called DetaPipe™. In combination with explosion-cladded flanges (DetaClad™), these pipe spools and elbows utilize significantly less amount of titanium alloys, where these alloys become just a corrosion barrier and not part of the pressure boundary. Because of the unique characteristics of the cladding process, many different titanium alloys can be used, including those that have increased corrosion, erosion, and ignition resistance, which tend to be significantly more expensive when compared to pure titanium. Examples of combinations produced, along with mechanical, thermal, and fatigue characterizations performed, are presented.

Keywords: Clad pipes, explosive cladding, titanium, zirconium, tantalum, HPAL, POX, nickel extraction, refractory gold, acid leaching, autoclaves