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Scrubber Enhancements

Ti-Coating, Inc.'s continuous product improvement quality program has produced the following enhancements on our standard off gas management scrubber systems. These enhancements are the result of the on-going effort to improve the operator and maintenance personnel friendliness of the scrubber system and deliver improved performance of the product over the life expectancy. The requirement of the scrubber system is to operate in a hostile environment to neutralize hot acid gasses from the process using NaOH or KOH as the active ingredient in the neutralizing process.

Scrubbing systems by their nature are prone to accumulation of process salts with plugging of the system a possibility. The scrubber system must be easily accessible for inspection and cleaning between production runs to maintain the efficiency of operation. Preventive and routine maintenance should be easily performed to avoid the possibility of not being performed at all.

Product Quality Improvements

A: Replace specific PVC manufactured parts with Stainless Steel and Polypropylene

Venturi Up-Grades:

- The first process gas venturi scrubber is now manufactured with a Stainless Steel Sleeve and Polypropylene venturi insert. This configuration provides higher temperature ratings for the venturi assembly and decreases the incidents of PVC distortion caused by overheating.
- The second process gas venturi scrubber is now manufactured completely of polypropylene in place of the PVC.
- All venturi are installed utilizing O-Rings for seals in place of standard tapered pipe threads. The O-Rings provide a superior seal against caustic liquid and/or process gas leaks on the scrubber along with providing easier access for preventive maintenance.

The Venturi Up-Grades allow the scrubber to be disassembled, inspected, cleaned and re-assembled between production runs with minimal maintenance time. Most routine maintenance between runs can be performed by the equipment operators. The O-Ring seals provide superior sealing day in and day out compared to the threaded connections.

B: Improve ability to readily clean the scrubber system

Fresh Water Up-Grades:

- The fresh water fill circuit is designed from ½" to 1" copper tube. This allows the scrubber tank to fill faster and reduces the preventive maintenance time.
- The fresh water fill control circuit is designed to allow the refill to be automated. The operator can initiate the process and the tank will fill properly unattended.
- The 1" fresh water supply line provides additional water capacity to operate a rotary spray nozzle in the center compartment to assist in cleaning the scrubber tank. This is manually controlled at the time of tank cleaning.
- The caustic supply line to the venturi and packed towers is now assembled with a 3-way valve to allow a manual fresh water flush of the venturi and packed towers at the completion of the process run. The fresh water flush assists in cleaning the spray nozzles and packed towers and reduces caustic build-up within the piping system.

The fresh water improvements to the scrubber system facilitate the routine maintenance process and reduce the time required to perform the preventive maintenance. The overall scrubber efficiency is thereby easier to maintain and reproduce day to day. Total scrubber tank cleaning is greatly enhanced.

C: Reduce system complexity and improve operation

Miscellaneous Scrubber Up-Grades:

- Agitation of pH chamber is now designed to utilize a liquid bleed line from the caustic recirculation pump and eliminate the small 120-volt AC stir motor. The change reduces the components on the scrubber and thereby reduces maintenance.
- The caustic piping circuit flow monitoring is reduced from three flow sensors to one flow sensor located to monitor total flow. This results in fewer items to maintain in operating condition and provides the same safety of operation in knowing that the caustic is flowing through the scrubber.
- The packed tower bottom support screen has been up-graded from plastic to alloy construction.