

Industry: Electric Utilities

Application: High Pressure Flue Gas Quench/Dust Control

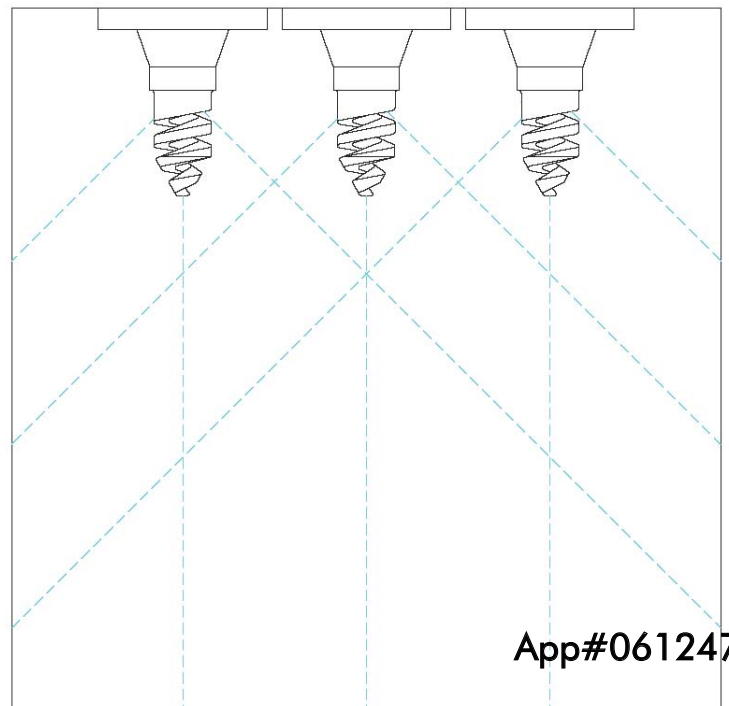
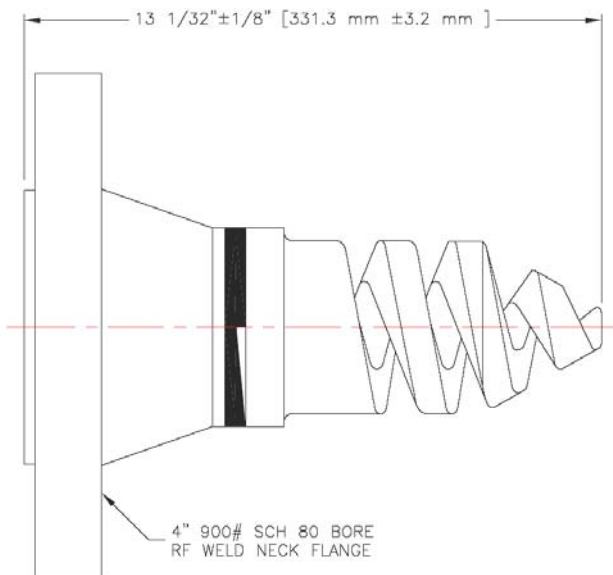
Product Descriptions: 4" FLTF 160 FFCN with 4" 900lb Nickel Alloy C22 Flange

Situation: A BETE customer called with an inquiry to cool an effluent flue gas stream and knock down the fly ash present in the gas. The high-pressure flue gas system operates at approximately 750 psi (51.71 bar). The spray consists of recycled cooling water with a low concentration of fly ash. The desired flow per nozzle was 6635 lbs/min (525 gpm, 1987 L/min) with an applied pressure drop of 10 psi (0.69 bar). The customer requested an all-nickel alloy construction with a flange that would be more than capable of handling the system pressures.

Technical Questions?

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BETE's solution: Quenching and dust control applications generally require small drop sizes. Quench applications require the smaller drop sizes to provide as much surface area as possible for heat transfer and dust control applications require the smaller drop sizes to avoid building up a large boundary layer of air that prohibits adhesion of the dust particles to the droplet surface. Large capacity flows are usually characterized by larger drop sizes, which would be detrimental to both applications trying to be achieved. The drop size requirement and the clogging issue due to the presence of fly ash in both streams lead BETE Applications Engineers to recommend the TF 160 FFCN nozzles with 900lb (408.23 kg) flanges to hold up to the system pressures. The TF nozzles were chosen because they provide much finer drop sizes than equivalent whirl nozzles and also produce approximately 50% more flow with 14% less pumping power than whirl nozzles



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