

Industry: Petroleum Processing

Application: Injection Washing

Product Descriptions: MaxiPass and WT nozzles

Situation: Engineering firms and refineries often contact BETE for assistance in selecting nozzles for the wash zone of their coker fractionator tower. The wash zone removes entrained coke fines and non-distillable oil, while also serving to fractionate the heavier end of the vapor.

The coker fractionator is part of the delayed coking unit, which converts heavy hydrocarbon products (vacuum tower bottoms) into lighter, higher value products through thermal cracking. The lighter components can be further processed into products such as gasoline and jet fuel. Petroleum coke is formed as a by-product, most of which can be consumed in coal fired power plants.

The feed is heated to around 900°F (482°C) and transferred to coke drums where it is given sufficient time (delayed) to thermally crack into lighter components. Polymerization also occurs in the coke drums. This reaction combines smaller hydrocarbon molecules to form very large ones in the form of coke. A vapor stream at approximately 800°F (427°C) is then fed to the fractionator, where the components are separated out.

BETE's solution: Both the BETE MaxiPass and WT series nozzles can be used for injection washing, depending on the piping design and preference of the engineering firm or refinery. Nozzles in this application need to have good free passage to prevent clogging due to coke fines in the oil being sprayed. A coarse dropsize is also recommended to minimize droplet entrainment. Both 316 SS and Nickel Alloy C nozzle materials are commonly used. The table below summarizes a typical wash zone application.

Typical Coker Fractionator Wash Zone	
Nozzle	3/4MP343W
Material	316 SS
Headers	2
Nozzles per header	7
Flow rate per nozzle	10.7 gpm at 10 psi (40.5 L/min at 0.69 bar)
Liquid SG	0.74
Liquid viscosity	0.32 cP
Vapor temperature	780°F (416°C)
Vapor pressure	20 psig (1.4 barg)
Vapor Velocity	Upwards at 3.3 ft/s (1 m/s)

Technical Questions?

Please contact:

Applications Engineering

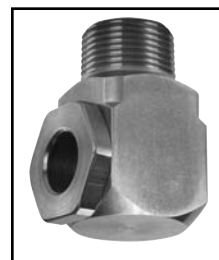
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MaxiPass



WT

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