

**The Twister® Multi-Purpose Manway**  
*featuring a Submerged Jet Mixer (patent pending)*

**Case Study - Twisters cleaning Asphalt Tank**

A major refiner used 4 Twisters to clean an asphalt tank when it was taken out to change tank service. The tank is 134' D and had about 5,000 bbls of cold tar in the bottom (12" inches above floor), including about 2,000 bbls as a heel in the cone bottom. Cold tar is notorious for being very difficult to remove once it cools. Previous cleanings of tanks like this involved cutting door sheets and mining it out, taking weeks to months, and costing >\$1 million dollars. This case study shows how introducing kinetic energy via Twisters, along with using heat and adding cutter stock to reduce viscosity, cleaned the tank well beyond customer expectations, at a fraction of the time and cost.

To set up the job, they installed a 30" Twister on a loop powered by an 8" x 6" pump and circulated by taking suction through a 6" port on the Twister, through a rented steam heat exchanger, and back into the tank through a shell nozzle to heat it up. Using this heating loop, they were able to get the temperature on the tank up to 140° F. They also installed two 24" Twisters and another 30" Twister into existing manways (total of 4 Twisters, each spaced roughly equidistant around the circumference of the tank). They added pre-heated VHO (virgin heating oil) as cutter stock, and used a 2200 gpm pump for each Twister that was capable of putting up 150 psi (ran 100-125 psi at Twister inlet). They took suction from a normal low point through a 20" line and split the stream to the two pumps, so that two Twisters were operating at the same time. They valved the hoses from the pumps to the Twisters, so that they could direct the output of the



pump to whichever Twister they wanted.

The operators kept each Twister in a fixed nozzle position for 30 minutes, and then manually advanced the nozzle to the next stop for 30 minutes, until all the nozzle positions were cycled through (4 hrs). Then they switched valves and rotated the pumps to feed the other pair of Twisters, and followed the same protocol. They kept the tank circulating for 4 days.



They described the results they achieved as "amazing"....they had cleaned down to the floor. Only hand lines were needed to finish the water wash. Asphalt is very hard to refluidize once it "cools/solidifies/crystallizes", and they had expected to have to do much more manual cleaning once the recirculation with the Twisters was finished.

The cost of the project was <\$200,000, and duration was just a couple of weeks (including job setup), vs months previously....drastic reductions both in time and money. They didn't have the danger of personnel exposure involved with mining the tar out, didn't have the equipment rentals and dozens of vac boxes staged, and were very pleased with the safe and simple operation. They were then able to proceed with opening the tank to allow repairs to the floor.

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