TECHNICAL BRIEF

Conco Fin Fan Mechanical Tube ID Cleaning & Bridging System

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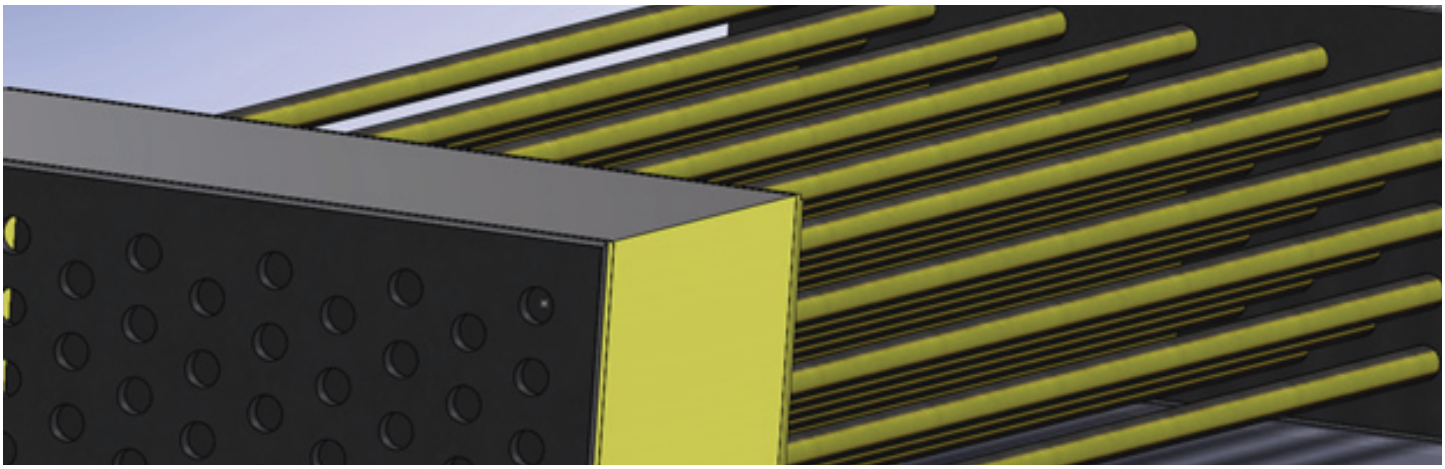
Conco Fin Fan Cooler Mechanical Tube ID Cleaning Solution Summary

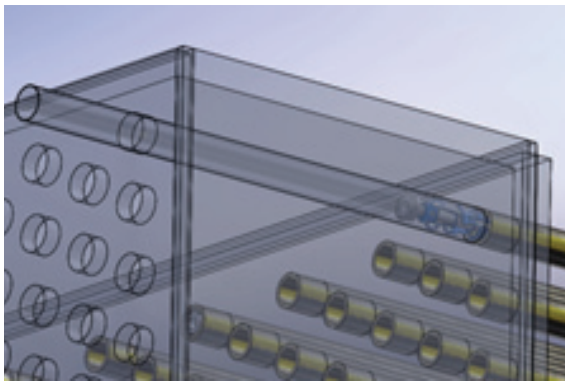
The fouling of Fin Fan Cooler Tube ID's not only has a negative impact on heat transfer efficiency, but also may restrict the output or production capacity of the facility and data acquisition for non destructive testing of the unit. Traditional tube ID cleaning methods include the use of high pressure water and or chemicals. However, this can not only be dangerous, it also does not completely remove the majority of the deposit from the unit. As a result, Conco has developed and facilitated a mechanical cleaning method that can completely remove the deposit from the unit that is safe, efficient and cost effective. The following storyboard will illustrate this method.

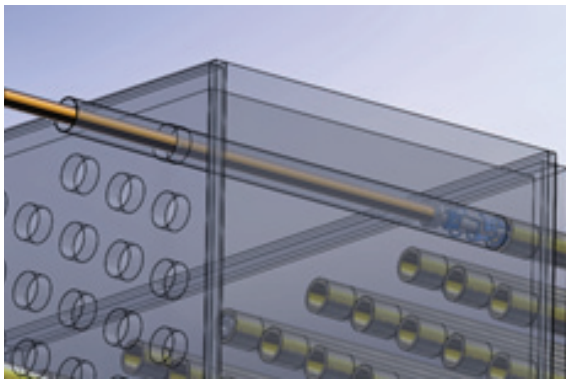
I. *Inlet Preparation*

Typically, most fin fan coolers have a header box that interferes with and restricts open access to the tube sheet. This presents several issues, as the only access method is through the manifold bolt plugs exposed on the outside of the unit(s). Additionally, it restricts how the deposits that are removed from the tube IDs are completely removed from the header box(s). As a result, Conco developed a bridging system that basically extends the tube from the tube sheet to the manifold plugs once the plugs are removed. The image below shows a fin fan cooler with plugs removed from the inlet or outlet.



Once the guide tube is inserted, a cleaner is inserted inside the guide tube by hand using a loading rod as illustrated in the images below.

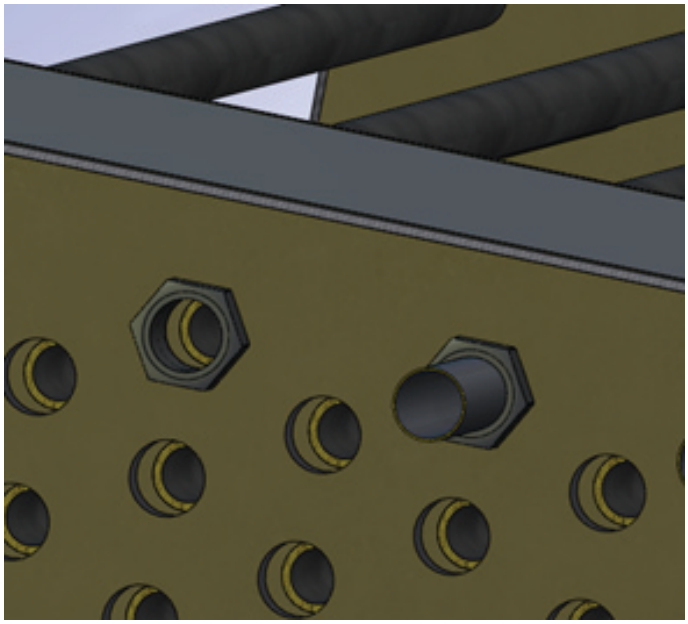


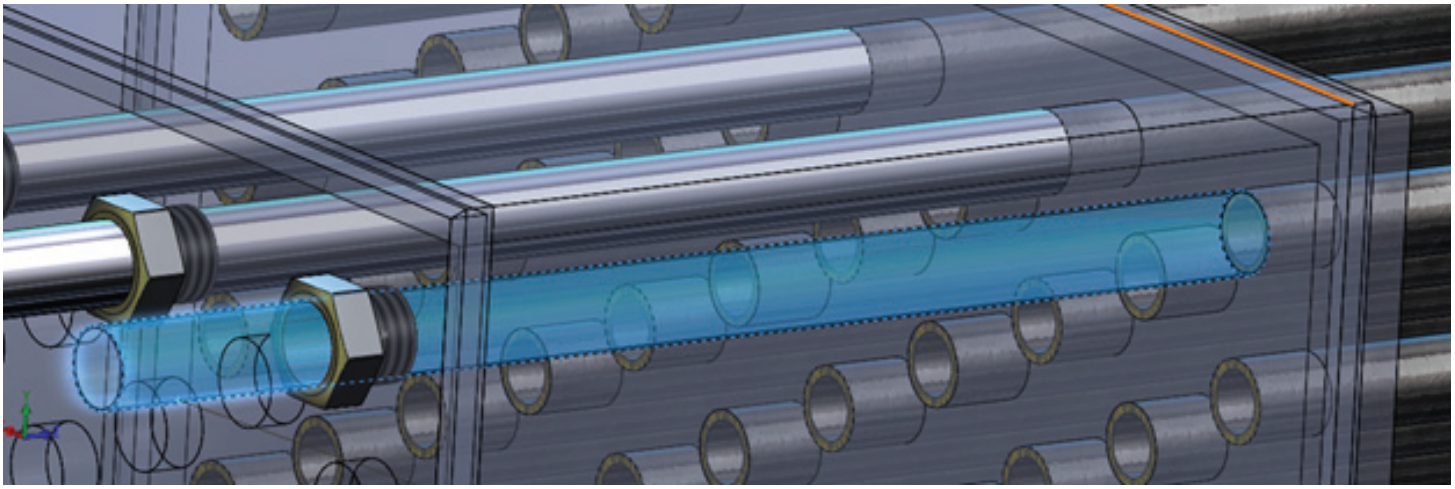


II. *Outlet Preparation*

The next step is to prepare the outlet end to receive the cleaners. Again, this requires all header bolts to be removed. First the outlet sleeve nut is threaded into the existing hole, as shown in the picture to left. Then the receiver tube is pushed through the sleeve, flush against the tube sheet inside the box to receive the cleaner. In the bottom picture you can see the blue highlighted receiver tube. That tube ID is oversized to allow the cleaner, water, and removed deposit to flow freely across the box and to the outside as each tube is being cleaned.

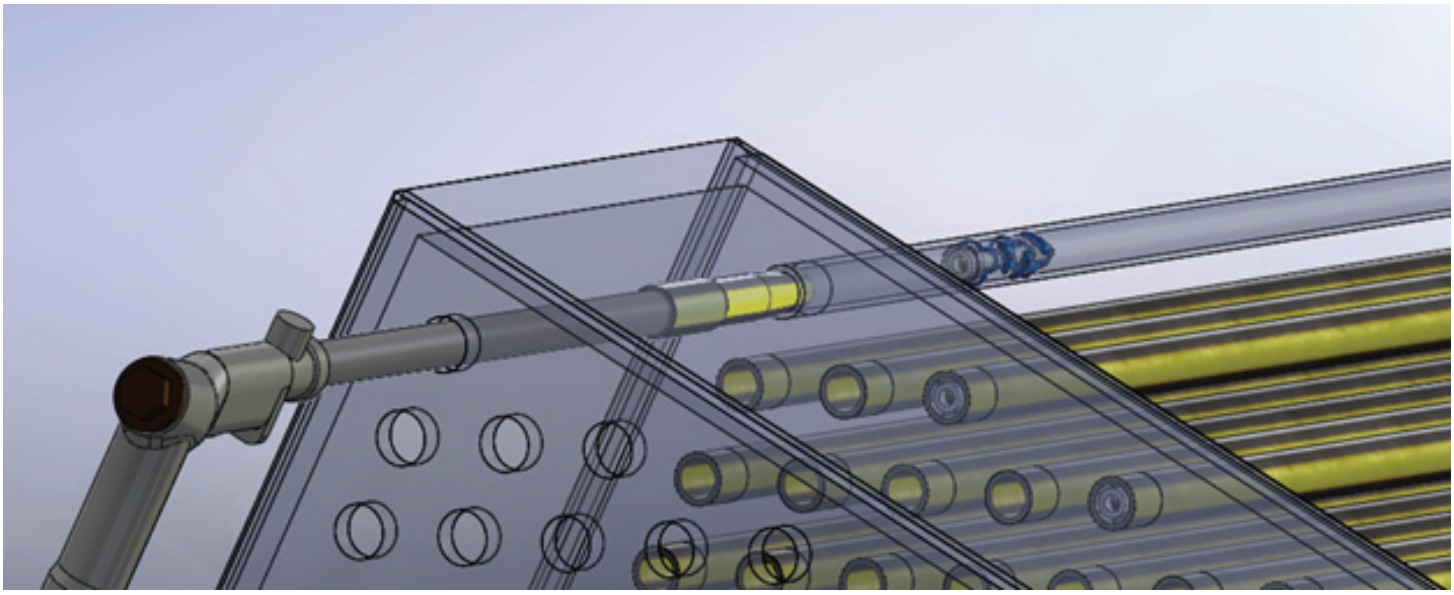
The receiver tube is a resistive fit, but can still be installed by hand. This is sufficient force to capture everything coming out of the tube and transport it out of the outlet box.



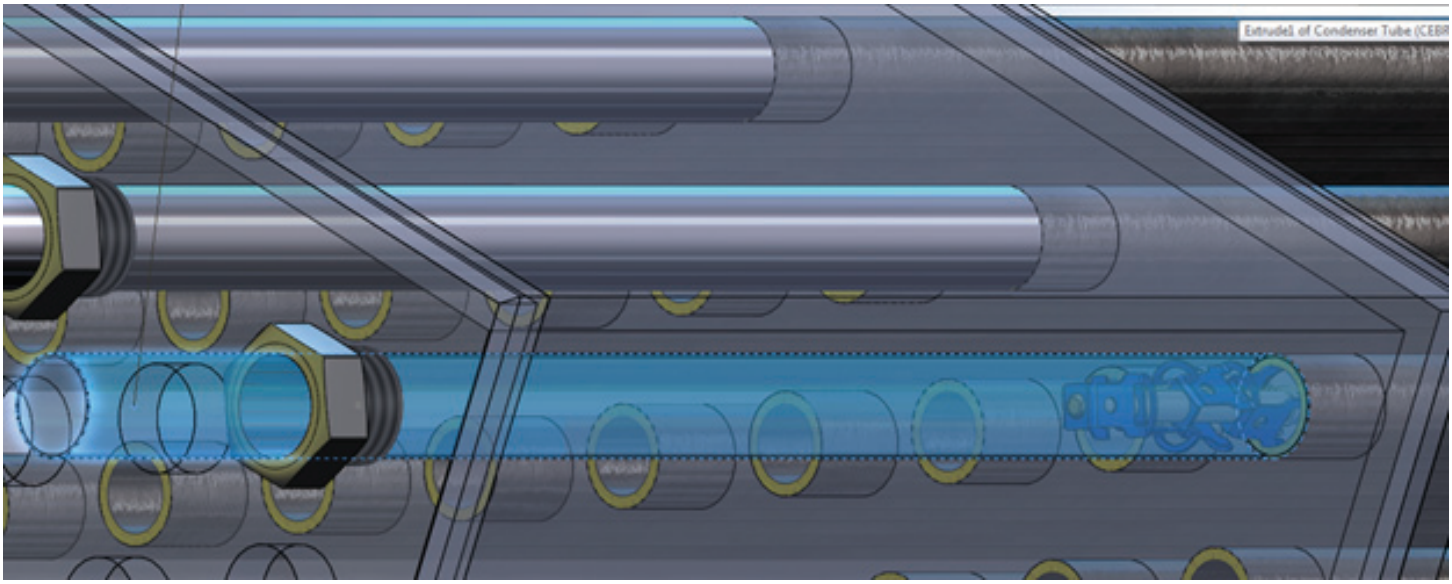


III. *Shooting the Tubes*

After the desired tubes are loaded with cleaners, and the corresponding outlets have been prepared with the receiver tubes, the cleaners are ready to be shot. A gun extension made of components small enough to reach through the existing header plug hole is used with the rest of the typical Conco tube cleaning system to propel the cleaner through the tubes with water as shown in the series of pictures below.



Above is the gun with the extension, shooting water to push the cleaner down the tube and flush deposit.



Above is the cleaner coming out of the tube and into the receiver tube shown in a blue tint.

Above you can see that the cleaner and removed deposit (not shown) is carried through the outlet box via the receiver tube and dropped on the other side.