



# THE NEXT EVOLUTION IN TANK HEATING

**C**irculating steam or hot oil through internal heating coils in bulk storage tanks has long been used to heat and maintain temperature of liquid asphalt and bitumen.

The QMax QFin is a clamp-on horizontal fin that is strapped to the internal tank coils that heat asphalt, bitumen and other high viscosity fluids. It dramatically increases the coil's heating footprint and withstands coking far better than traditional spiral welded fins.

## LIMITATIONS OF TRADITIONAL OPTIONS

Agitating asphalt or high viscosity fluids inside a storage tank increases its convection coefficient, improving the overall heat transfer from a heating medium to process. However, agitation is already commonly used whenever it is practical.

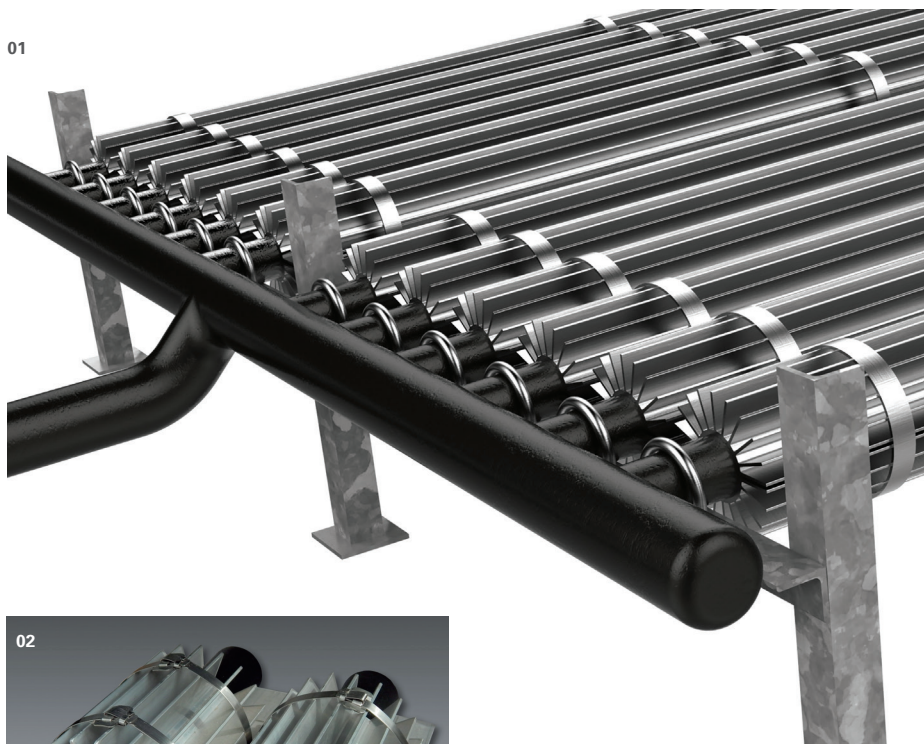
Increasing the heating medium temperature can improve performance and process control, but carries higher energy costs and can accelerate coking.

Increasing the thermal coils' heating surface can also substantially enhance heating performance and control. However, traditional options of increasing the heating surface have limited practicality. Adding length to an internal heating coil:

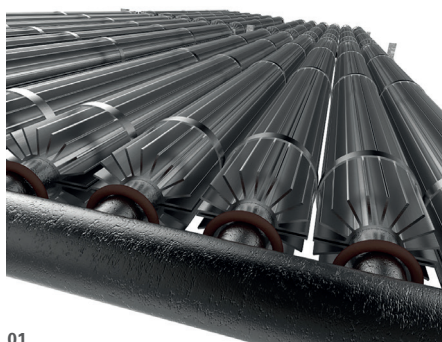
- Increases capital cost – labour and materials.
- Increases maintenance costs – particularly regular cleaning, which is exacerbated by a coking event.
- Burdens the heating system – requires additional heat transfer liquid and creates higher-pressure loss associated with the greater length of pipe and associated fittings.

Adding spiral welded fins to a pipe to create what is known as fin tubes is the most practical way to increase the heating surface area – that is until the problem of coking is considered. Just one coking event can fill the gap between every single fin. At this point the fins will lose nearly all of their effectiveness, while the layer of coke actually acts as an insulator further decreasing heat transfer from

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the coil. This type of fin tube is not a long-term solution and can result in having to replace the entire heating coil.

## BREAKTHROUGH PERFORMANCE

QMax QFin incorporates several unique design innovations to deliver breakthrough performance when compared to traditional fins.

QFin is not welded on, so it can be removed and replaced without removing the internal heating coil. This eliminates the need for costly hydro blasting or total coil replacement after a coking event. Instead the fins are removed by



cutting straps so new fins can be installed.

QFin's horizontal design increases heating footprint dramatically. For example, a 2" pipe coil with QFin is 5.57" in diameter - that kind of heating surface gain is crucial when heating high viscosity fluids.

The horizontal direction of QFin also allows for much greater circumferential distance between the fins. A thin layer of coke will not close the gap between fins as it does in traditional spiral welded style fins. This means QFin can deliver longer service life.

The design maximises the heat input of carbon or stainless steel heating. It is a bolt-on heating fin that attaches to any size pipe. The highly conductive aluminum material of QFin increases the heating surface area by 1,000%, which allows for greater heating capabilities or decreased total footage of the heating coil. It has been specifically designed for high viscosity fluids such as asphalt, bitumen and heavy oils to allow for easy removal and reinstallation of fins if the product cokes on the fins.

Bill Diamond, vice president of Western Asphalt Products, says: 'We are using the QFin product on different grades of asphalt and we have had zero problems. Compared to putting 2" pipe in the tanks, QFin offers 4 to 7 times more heat transfer.'

The largest impact of using the QFin is the reduction of internal coil structure (up to four times reduction in needed coil length).

QFin protects the heating coil in a coking event. Only the removable fins have to be replaced. This significantly reduces down time and maintenance costs.

#### FOR MORE INFORMATION

This article was written by Thomas Perry, president of QMax Industries