

## Asphalt & Heavy Oil **TANK HEATING** High Performance, Capital Savings

**QFIN** - a clamp-on horizontal fin strapped to internal tank coils that heat asphalt, bitumen, and other high viscosity fluids – dramatically increases the coil's heating footprint and withstands coking far better than do spiral welded fins. **QFin** is easy to remove and replace, eliminating the need for costly hydroblasting or total coil replacement after a major coking event. Circulating 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. Now, a new product called **QFin** offers a revolutionary solution for heating liquid asphalt.

**"We're using the QFin product on different grades of asphalt and we've had zero problems. Compared to putting two inch pipe in the tanks, QFin offered four to seven times more heat transfer."**

**– Bill Diamond  
Vice President  
Western Asphalt Products**

### Limits Of Traditional Options

Agitating asphalt inside a storage tank increases its convection coefficient, improving the overall heat transfer coefficient from 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 internal coils' heating surface can also substantially enhance heating performance and control.

However, traditional options for increasing the heating surface have limited practicality. Adding length of internal heating coil:

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

Adding spiral welded fins to pipe to create what is known as fin tubes seems the most practical way to increase the heating surface area – that is, until the problem of coking is considered. Traditional spiral welded fins (figure 2) are often about one inch tall, with three to four fins welded to each inch of pipe length. 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 acts as an insulator, further decreasing the heat transfer coefficient from the heating medium. It is easy to see that this type of fin tube is not a longterm practical solution for asphalt heating.



Figure 2



**QMax Industries, Inc.** is a technology company based in Charlotte, NC, with several patents in the field of process heating.

Our specialties include:

- >High Performance Steam Tracing
- >High Performance Electric Tracing
- >Equipment Jacketing
- >Tank Heating

**"We're committed to be the world leader in steam tracing technologies"**

Thomas W. Perry  
President

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# QFin: Breakthrough Performance

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

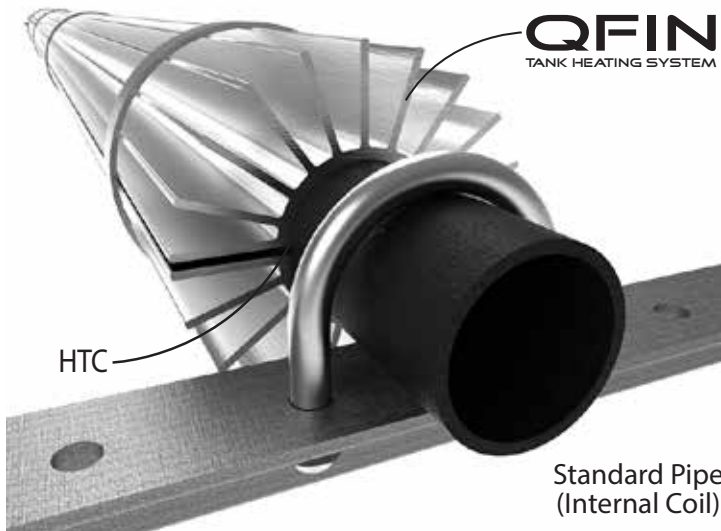
**QFin** is not welded on and so can be removed and replaced without removing the internal heating coil itself, eliminating the need for costly hydroblasting or total coil replacement after a coking event. Instead, the fins are simply removed by cutting straps, so new fins can be applied. Removability is a huge operational and cost advantage when heating asphalt, bitumen, and other high viscosity fluids that are prone to coking.

Yet **QFin's** advantages are not limited to removability. Its horizontal design increases heating footprint dramatically. For example, a two inch pipe coil with **QFin** is 5.75 inches in diameter. That kind of gain in heating surface 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 so often will in a traditional spiral welded style fin. This means **QFin** can deliver longer service life.

**"The QFin System improved the heating performance in our tanks and helped us make better product"**

**– George Mariani**  
Terminal Manager  
Mariani Asphalt  
(An Associated Asphalt co.)



**QFin's** patent-pending design maximizes the heat input of a carbon or stainless steel internal heating coils and it is fully removable and replaceable. **QFin** 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 internal coil. **QFin** is 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.

## Estimated Cost Savings

Companies that implement **QFin** as an improvement to standard internal tank coil heating systems often realize significant capital and maintenance costs savings. The largest impact is the **reduction of internal coil infrastructure** (up to 4 times reduction in needed coil length). The following example demonstrates the potential savings based on historical prices. The material savings alone more than offset the cost of the **QFin** system. To run a more detailed analysis of savings, please send us the unit prices that apply to your site specifications.

### Scenario "A" - Traditional 2" Internal Heating Coil

- 2400 lf of Heating Coil x \$50 per foot = \$120,000 Total Install Cost

### Scenario "B" - QFin Installed on 2" Internal Heating Coil

- 600 lf\* of Heating Coil x \$80 per foot = \$48,000 Total Install Cost

**Total Cost Savings with QFin = \$72,000**

\*Adding **QFin** to the system results in a 4X REDUCTION in coil length.



> **QFin** is not a one size fits all system for all areas of industry. It is specifically designed for heating asphalt, bitumen, and other high viscosity fluids.

> **QFin** increases the heating surface area to reduce capital and energy costs.

> **QFin** continues to perform even after it is subjected to thin layers of coke.

> **QFin** is removable to reduce down time and maintenance costs associated with major coking events.