



OUR PERSPECTIVE

PURCHASING A TREATER

What to consider:

- Is there a lot of water being produced? Consider adding a free-water knockout.
- How will you manage corrosion?
- Is a vertical or horizontal treater best suited to your production needs?
- Is the emulsion light or heavy?
- Have you done the lab work to determine the emulsion type?

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GET YOUR TREATER TO TREAT YOU RIGHT

“Treating systems have long been one of the most expensive and troublesome of all lease surface equipment. Also, there is little data available to accurately size treating equipment, and as a result, treating equipment is frequently over or undersized,” according to C. Richard Sivalls, owner of Sivalls Inc., manufacturer of onshore and offshore production equipment since 1947.

Treaters are some of the least understood among production equipment and yet most common piece of equipment used in oil batteries. Contributing to this dichotomy are the many designs of treaters. For the purposes of this article, a treater is defined as a heated, lower-pressure (50-100 psi) vessel that treats mostly oil (70 per cent or more), and some (30 per cent or less) entrained water.

Treaters separate streams of gas, pipeline specification of oil and water that is clean enough to re-inject into the ground.

It’s hard to see what’s inside a treater, but picture a bottle of Italian salad dressing. If left without shaking, you’ll notice that it settles in distinct layers according to the weight of the ingredients. The same thing happens inside a treater. The treater separates oil, water and gas instead. However, a treater speeds up separation by using heat, pressure, chemicals and sometimes electrical mechanisms. The treater separates streams of gas, pipeline-specification oil and water that is clean enough to re-inject into the ground.

When large amounts of water are produced, a free-water knockout, installed at the front-end of the treater, helps reduce the treater size requirements by disposing of all of the non-entrained water from the emulsion, and greatly reduces fuel requirements for the treater.

A free-water knockout may look similar to treaters, but is designed to handle more water than oil. Typically the firetube (if any) is located higher in the vessel, so the lighter emulsion and oil is heated, not the heavier water residing below.

Treaters are designed to handle emulsions in different ways. Emulsions can range from loose to moderate to tight and a lab test can determine the specific type of emulsion. For example, if the emulsion is tight, more heat, residence time, electrostatic grids, coalescing packs, or a combination of each is usually required.

Another consideration for treater design is corrosion. There are a number of ways to protect a treater against corrosion.

Vertical treaters are better suited for looser emulsions and horizontal treaters can handle tougher emulsions better. Horizontal treaters are often used in heavy oil operations, where oil and water can often weigh about the same, but don't separate easily. In these situations, specialized controls may also be required, such as floats.

Protection against corrosion

- **Coatings** – used to protect against harmful chemicals such as H₂S, and CO₂.
- **Cathodic protection** – uses anodes and offers additional protection against galvanic corrosion. Anodes are used instead of the metal that is similar to the metal used in manufacturing the treater.
- **Thicker vessel shell** – add a corrosion allowance. This provides some degree of protection, but increases significantly costs. The effectiveness of corrosion allowance can be debated as typical corrosion does not limit itself to a small amount over a large area. Instead, it tends to focus on a relatively small area.
- **Combination** – a combination of coating and anodes is one of the best ways to protect the inside of the treater.
- **Coat the firetubes** – be careful the coating doesn't get damaged during insertion and extraction from the vessel. If there is damage, corrosion has a better opportunity to happen.

Therefore, 1/16" or 1/8" may have bought you some time, but not as much as a good coating job or good cathodic protection might have provided. It is not unusual for an uncoated treater that has only been used for only a few months to return with fist-sized holes after being exposed to corrosion.

To get your treater to treat you right, involve your equipment vendor to determine the right size and corrosion requirements. If you're buying used equipment, buy from a vendor who is knowledgeable about treaters. And do the lab work to determine residence time and temperatures required to "break" your specific emulsion. Competent advice and testing will help determine suitability, optimal performance and produce an early payout of your oil battery.