



Weatherford®

Frequently Asked Questions

What is the *ClearWELL* device?

The *ClearWELL* device is a patented electronic, physical water-treating device that keeps wells producing at peak efficiency by dramatically reducing deposition of scale and paraffin on the surface of production conduit (downhole tubulars, flowlines and pipelines) and, over time, removing pre-existing carbonate scales. The device is attached at the surface, not downhole.

How does the *ClearWELL* device control scale deposition?

The device works by inducing a random, varying electromagnetic field throughout the complete production conduit system. The rapidly changing field causes homogeneous scale crystal formation in produced fluids, deterring scale deposition on the interior walls of the conduit. The scale is then carried away with the produced fluids.

Is the *ClearWELL* device effective against calcium carbonate and barium sulfate scale?

Yes, the device controls deposition of both calcium carbonate and barium sulfate scale.

Does the *ClearWELL* device remove pre-existing scale?

The device slowly removes pre-existing calcium carbonate but does not remove pre-existing barium sulfate or other hard scales.

Does the *ClearWELL* device inhibit wax deposition?

Yes, the device can inhibit wax deposition on production conduit walls. Paraffin deposition is thermally driven. Cooling during oil and gas production causes wax to precipitate as the temperature drops below the cloud point. The paraffin deposits on the seed crystals that have formed in the produced fluids, all of which continues to flow with the crude.

Will I see any scale or paraffin if I use the *ClearWELL* device?

By using the device, your operation will improve, but not all scale or paraffin will necessarily be eliminated. Well conditions and downhole flow parameters vary significantly. Results from long-term field testing have shown that well production is maintained even if small amounts of scale or paraffin are present.



Where has the *ClearWELL* device been used?

Though the technology is just now being introduced to the oil and refining industry, it was patented in the United States in 1997. More than 400,000 devices are in use in light industry and residences. The devices have been used primarily to control scale in industrial steam boilers, heat exchangers and residential hot-water units.

Where has the *ClearWELL* device been tested?

Weatherford tested the device for 18 months. An independent laboratory evaluated its effectiveness against calcium carbonate and barium sulfate scale and paraffin and asphaltene waxes. In each case the device achieved successful results. In addition, 26 pilot field applications with 13 different companies showed the effectiveness of the device against scales and waxes. The study included a variety of wells and pumping systems.

Frequently Asked Questions

Is the *ClearWELL* device just another magnet?

No, the device is not a magnet. Magnets and electromagnets cannot treat the whole production conduit system. To be effective, magnets depend on flow and its direction. The *ClearWELL* device is unique and patented. It operates by inducing a high-frequency AC signal throughout the conduit system, regardless of flow rate or direction.

How is the *ClearWELL* device connected?

The device is easily and conveniently strapped around the production conduit system with a ferrite ring. For a producing oil or gas well, the device can be placed around the casing, around a valve on the wellhead assembly, or on a flowline adjacent to the wellhead. For surface applications the device can be placed upstream of any large tanks or problem area. Location is critical for the success of the device, and loops, which short the signal, must be avoided.

What are the power requirements for the *ClearWELL* device?

The basic unit is powered by a 110- or 220-V, 60-Hz source. In remote locations, solar energy can be used. The unit continuously draws 33 W of energy.

How does the *ClearWELL* device treat the wellbore from the well surface?

The device emits its signal at 120 kHz. An oil production facility and the well tubing and casing are considered an open electrical circuit. Generating an adequate flow of electrons in an open circuit conductor requires a source of high frequency to a conductor long enough to generate a standing wave voltage over its length. The *ClearWELL* signal one-fourth wavelength is 2,048.8 ft (624.5 m). The standing wave voltage equals the source at one-fourth wavelength at every one-half wavelength thereafter. Typical wellbores are long enough for the device to establish a standing wave down their entire length.



Will the *ClearWELL* AC signal interfere with cathodic protection or other electronics?

No, the signal does not affect cathodic protection because the device emits a floating high-frequency, alternating-current signal. Other typical oilfield electronics are not affected; but in the rare case that it is needed, Weatherford can supply a high-frequency filter.

What is the electrical safety rating for the *ClearWELL* device?

The device is safe to use in hazardous areas. It has been certified to meet worldwide Class I, Zone 1 requirements.

How can I learn more about the *ClearWELL* device?

To learn more, contact your authorized Weatherford representative, or visit weatherford.com/clearwell.

