Custom Metal Tubing

MW Components

Cost-Effective and Efficient Solutions for Well Interventions

Custom metal tubing and custom coil assemblies are often used in oil well testing and are a cost-effective and efficient way to provide well intervention solutions. Operations such as clean out and perforating the well bore (the hole that creates the well), in addition to retrieving and replacing damaged equipment, can be efficiently performed with coiled tubing.

By Kenneth Wlodkowski – Engineered Spring Products, an MW Components company

Nitrogen coils comprise one type of coiled tubing, primarily used in exploration as a heat exchanger to keep heat away in a high-temperature application, and/or to control pressure to open and close a valve. High pressure and high temperature are huge challenges to the oil exploration industry. Such coils are used to regulate differential pressures to help close "flapper springs" on sub-surface safety valves in deep well applications.

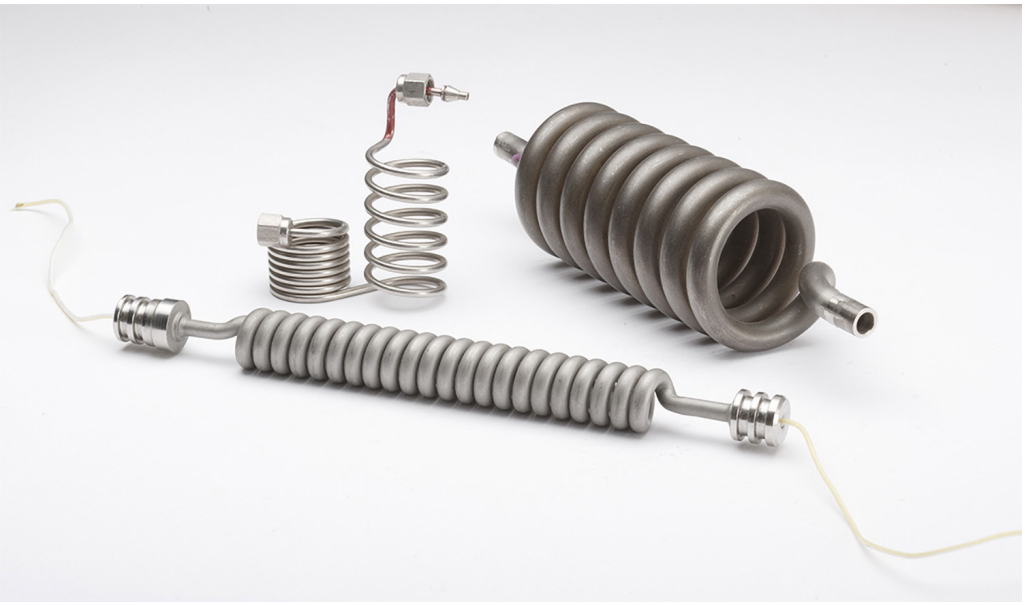

Figure 1: Electronic extender springs like these made from custom metal tubing are used as a communications link in the well sampling process. (Source: Engineered Spring Products)

When a valve is opened to allow either natural gas or crude oil to flow out, a safety valve is necessary. The flammable nature of what flows through the tubing requires precise and rugged manufacture. For example, during Operation Desert Storm during the Gulf War, the Kuwaiti oil fields caught fire when Iraqi soldiers blew off the wellheads, the component at the surface of an oil well with the structural and pressure-containing interface for the drilling and production equipment. The wellheads had no subsurface safety valves; if they had, the oil would have automatically stopped flowing, and the enormous amount of environmental damage could have been avoided. Today, nitrogen coils are used to close the valve and prevent such disasters from occurring.

The tubing varies in length from deep to shallow wells, depending on whether the application is for natural gas or crude oil. The amount of well pressure put onto the valve is determined by the nitrogen coil. Deep drilling results in higher temperatures, and companies are drilling increasingly further into the earth. Engineered Spring Products, an MW Components company, built one of the largest nitrogen coils it has ever produced: a safety valve for a very high-pressure application rated at greater than 40,000 psi. That is the type of challenge customers often ask for help with: Companies need nitrogen coils that can handle more pressure and more heat than older ones.

Other challenges pertain to getting information from the drilling hole itself. Electronic extender springs are used by drilling companies as a communication link between two instrumentation housings in the drilling or sampling process to take measurements while drilling (MWD). Customers use MWD to evaluate the production value of the reservoir during and after drilling.

Wire is fed through the coiled body, which acts as a spring that connects the housings. This extender spring stabilizes the tool string and allows it to compress and extend in both directions. Again, this type of device must withstand high pressure and temperature.

An electronic extender spring gets real-time data to operators on the surface in minutes. Prior to this component design, it would take up to weeks to get the same information.

New technology has allowed down hole drilling to reduce downtime and increase output. The more uptime drillers have, the greater their output. And more output means higher profits.

ABOUT THE AUTHOR

Ken Wlodkowski is the Energy & Valve Market Manager for Engineered Spring Products, an MW Components company. Ken has over 35 years of experience in helping customers enhance existing products, new product development and application engineering. Ken also supports diverse market industry knowledge in automotive, plastics, ship building, aerospace, steel casting, die casting, stamping, oil & gas exploration, mine extraction, power generation, and resistance welding.

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or contact us at 704.837.0331| sales@mwcomponents.com