G00002

ABSTRACT

Magnetorheological fluids, which solidify in response to a magnetic field, offer the ability to simplify many of the valves and control systems used downhole in the search for and production of oil and gas. They lessen the need for moving parts, provide solid-state valves, and can provide a differential movement of fluid through the valves by varying the strength of the magnetic field. Combinations of permanent and electro-magnets can improve safety by providing valves that fail, when power is lost, in either an open or closed position, depending on design. A number of examples are given.

162162