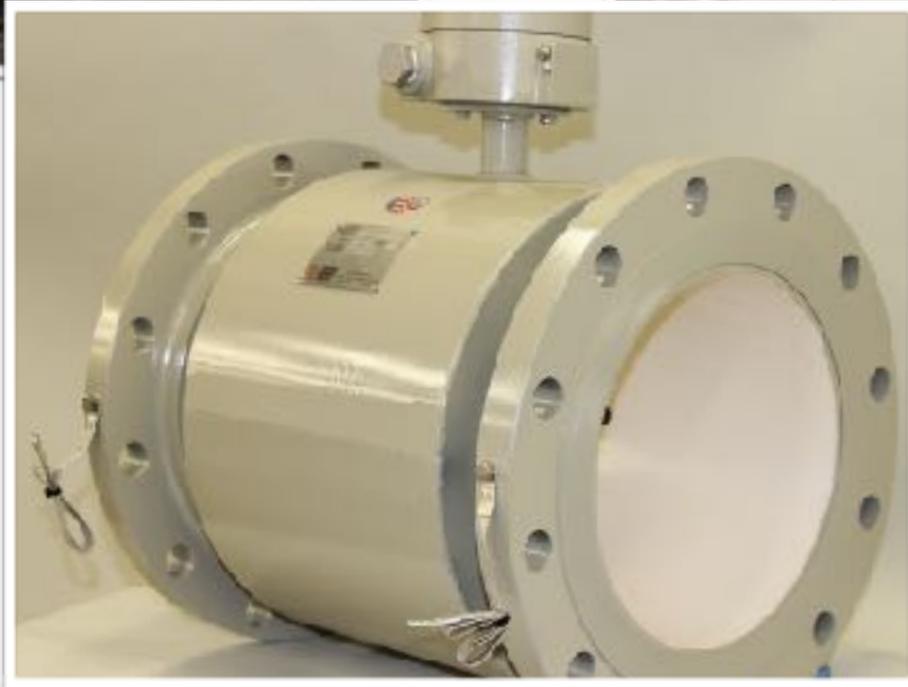


SEVERE SERVICE MAGMETERS FOR FRACING OPERATIONS

TECO SEVERE APPLICATION METER™ (SAM)



Flow Measurement of Extremely Abrasive Slurries

Proven in the heat of a West Texas summer, and the cold of an Alberta winter, this TECO magmeter is designed from the ground up to withstand corrosive slurries, acids, bases and solvents.



Uptime and operational efficiency are critical to oil and gas operators. Billing rates can rise upwards of \$20,000 per hour. Failure of process equipment causes long delays in fracing progress and decimates equipment budgets.

Magnetic flow meters (magmeters) installed on blender trucks are of particular concern. The application involves accurately measuring the flow of an extremely erosive slurry comprised of sand and "frac water" (a mixture of water and harsh chemicals). Replacing failed magmeters can take up to 4 hours, and requires the shutting down of the entire frac spread.

Calling upon sixty-plus years experience in magmeter application, failure analysis, repair, and design, TECO developed several innovative magmeter features intended to improve longevity in fracing operations.

First, TECO developed a ceramic sleeved liner made of "magnesia partially stabilized zirconia", a very tough ceramic used in severe-service applications that provides corrosion resistance and durability.

Second, TECO developed electrodes built from a solid tungsten carbide billet, which afford unparalleled wear resistance. Given the sand density in the frac fluid, noise reduction is critically important; so, the tungsten carbide is polished leaving a hard, smooth finish that significantly reduces noise in the electrode circuit.

Finally, TECO designed the magmeter as a drop-in replacement. It operates with a variety of secondaries and matches the "lay length" of the meter being replaced. There is no need for a new transmitter and no need for repiping, allowing for simple retrofit in existing installations.

In 2017 TECO introduced the SAM (Severe Application Meter) magmeter as a flow meter designed specifically for hydraulic fracturing operations. By specifying SAM, operators save money through increased uptime; decreased health, safety and environmental risk; and reduced costs related to magmeter purchase and repair.



This TECO SAM had 500,000,000 pounds of sand flow through its core. Upon inspection, the customer found the flow tube to be looking "brand new".