



# FLEXIM Technology Addresses Oil and Gas Flow Measurement Needs

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## FLEXIM Technology and the Worldwide Market for Ultrasonic Flow Meters

On the occasion of its 20<sup>th</sup> anniversary FLEXIM looks back on an impressive history. The company has grown from humble beginnings to a network of subsidiaries spanning the globe, and so has its core business of engineering and manufacturing clamp-on ultrasonic flow meters (USFMs). FLEXIM started by offering a single portable meter model in the early 90's, and now offers comprehensive liquid and gas flow meters applying shear wave as well as lamb wave technologies.

Industry experts estimate growth rates for USFMs and coriolis mass flow technologies to be around 10%, which are mainly driven by applications in the oil and gas industry. FLEXIM believes that this number is too low. It does not take into consideration all of those applications where USFMs should be used but currently are not. FLEXIM's modern USFM technology has opened the door to applications which were either thought to be technically impossible, or which were not considered to be accurate enough. These limitations need to be rethought.

### The Oil & Gas Industry

The hydrocarbon industry is also in a state of change. Despite efforts made in the fields of renewable and nuclear energy, the fossil fuel portion of the world's energy supply is predicted to remain steady over the next 20 years. This implies growing expenditures in all sectors of the oil & gas industry: exploration, production, refining and petrochemical. There are several recognisable trends. LNG production will increase and crude oil will be more of the sour heavy kind (tar, sand, etc.). This, combined with a falling demand for residual fuel oils, will increase the demand for upgrading (visbrakers, cokers, hydrotreaters etc.). Environmental regulations will force refineries to produce cleaner fuels (ultra low sulfur diesel) and will become more complex by adding pre-feed and post-feed product treatment processes (hydrocracking, hydrotreating, alkylation, gasification, etc.). Increased expenses combined with higher oil prices could shrink refinery margins.

The latest twist is that there is an environmental need to pump and measure the CO<sub>2</sub> generated back into the ground. This process, which is now being pioneered by major oil & gas companies, is known as Carbon Capture Sequestration (CCS)

Poorer quality energy supplies, more complex refining processes and a lack of a sufficiently skilled engineering and labor pool all point to a need for higher efficiency, less maintenance and more up-time. Efficiency, of course, starts with proper measuring procedures.

While the operating environment of the hydrocarbon industry is changing, its old operating procedures have been stagnant for some time. With regard to flow measurement, high maintenance DP devices (orifice plates, wedges, venturis) and vortex shedding meters are still the norm. FLEXIM believes this can and should change.

### The perfect match: FLEXIM Oil & Gas Division

The hydrocarbon processing industry has special demands: high temperatures, high safety requirements,



and aggressive fluids just to name a few. FLEXIM has met these demands in many successful installations and in May 2009 decided it was time to serve the industry in a more focused approach by forming a global Oil & Gas Division.

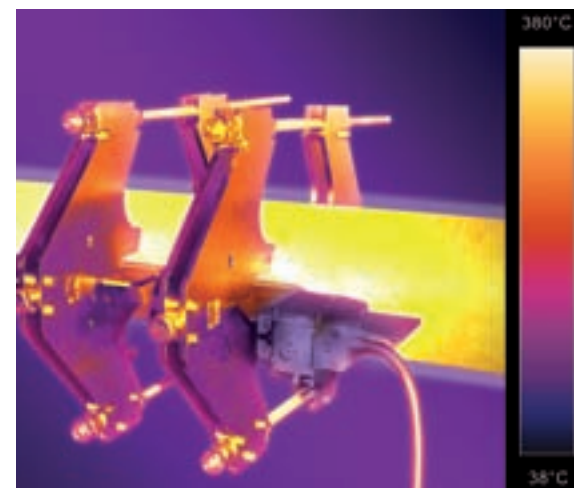
This new division is run by Division Manager Claus Huebel. The efforts in North America are focused in the Houston, TX location with supporting offices in California and New York. FLEXIM's company headquarters in Berlin, Germany will address the European and Russian markets with support from offices in the Netherlands and France, given the strong presence of the hydrocarbon industry in those countries. FLEXIM subsidiaries in Singapore, Shanghai and Dubai work with the growing Asian and Middle East markets. The purpose of this division is to better serve the needs of the hydrocarbon industry. This is done by making use of many years of experience and a wide acceptance by some of the world's major oil & gas companies.

Some examples of FLEXIM's clamp-on meter applications include the following: crude oil delivery, hot and viscous coker / FCC / visbreaker feed operations, hydrogen gas production, HF or H<sub>2</sub>SO<sub>4</sub> in alkylation, desalting, deasphalting, water injection and recovery, pipeline leak detection, methane and nitrogen gas, multi product liquid interface detection, pipeline batching processes, gas storage in / out flow, custody transfer check metering, line balancing and liquid quality / concentration monitoring. FLEXIM meters feature actual up to standard volume compensation (API and AGA tables) with temperature and pressure inputs, Reynold's number compensation, and more.

The general advantages of USFM technology, such as no process interruption during installation, non-contact measurement, and no pressure loss, are commonly known. What is not commonly known are some of the very special and presumably "impossible" applications in which FLEXIM meters perform or the operational and efficiency advantages

FLEXIM USFMs offer. The following example illustrates this: A Canadian upgrader operation used to measure coker feed with vortex and orifice meters. The vortex shedders frequently broke on impact with solid matter carried in the medium. The DP meter pressure impact lines plugged up during the summer months and froze in the winter. Maintenance was high, up-time was affected, the measurement range and accuracy were unreliable and replacement costs were high. The problems were solved with FLEXIM high temperature clamp-on USFMs. Maintenance is almost non-existent, there are no replacement part costs, accuracy is high, and with its non-intrusive design potential safety hazards are eliminated.

A gas storage facility needed to monitor the balance of ingoing and outgoing gas flows at various wells. The meters had to be bi-directional and a wide dynamic range was thus required for periods of low in-flow velocities and faster out-flow velocities. The gas tended to be wet during the out-flow and even contained sand particles. DP orifice plates have a limitation in their range. The plates eroded over time and the meter accuracy was unreliable. The readings of inline (wetted) ultrasonic meters were influenced by the wetness of the gas. Maintenance, accuracy and reliability were negatively affected. FLEXIM clamp-on USFMs were the perfect answer: no maintenance, bi-directional wide dynamic range and unaffected by moisture.



Successful and convincing installations such as these have landed FLEXIM on the approval lists of major companies involved in the oil & gas industry. It is also obvious that FLEXIM meters have an immediate impact on a company's bottom line.

So why are USFMs not yet the preferred standard for flow measurement in the industry? We at FLEXIM believe that the initial answer lies in the adage that old habits die hard.