

ClampOn Company Profile

DIGITAL SIGNAL PROCESSING

PIG DETECTION
LEAK MONITORING
CRACK MONITORING
VIBRATION MONITORING
CONDITION MONITORING
BIRD CONDITION MONITOR
WELL COLLISION DETECTION
SAND/PARTICLE MONITORING
FLOW TEMPERATURE MONITORING
CEM® CORROSION-EROSION MONITORING

Company Introduction

ClampOn is a privately owned Norwegian company. The company was founded in 1994. ClampOn has become the leading worldwide supplier of topside and subsea non-invasive ultrasonic intelligent sensors for sand/particle monitoring, pig detection, leak monitoring, vibration monitoring, corrosion-erosion monitoring, well collision detection and flow temperature monitoring. We work with our customers in the oil & gas industry to optimize their well productivity and to safeguard their investments.

Uncomplicated technology, modular design, easy installation and little or no calibration are watchwords for ClampOn's range of instruments.

Our approach to the market has been very well received by all our clients world-wide. Our leading-edge technology has made ClampOn capable and competitive in offering the products that customers are looking for. Our reference list is an expression of this. We regard sales to companies such as BP, ConocoPhillips, Petrobras, Chevron, ExxonMobil, Equinor, Total and Shell as proof that we offer what the market needs. Some of these have selected ClampOn as its main supplier of sand monitoring systems after extensive testing of all systems available today on the market.

Sand Management & Support is part of our service available for oil companies. ClampOn can monitor and maintain installed sand monitoring systems from the ClampOn office, giving the operators all the information they need to produce safely with regards to sand. Our personnel have long experience in the petroleum industry and we offer first-class expertise in this sector.

ClampOn has grown to be the largest supplier of passive ultrasonic systems to the petroleum sector. Concentrating on our core technology has enabled us to sell user-friendly, cost-effective products all over the world.

We are currently represented in all major regions where the oil business is of any importance. Subsidiary ClampOn, Inc., in Houston handles the American continent for sales and service. In other areas we have agents representing us. More than 85% of our products are exported to the international market. All production of the instruments takes place in Norway.

Our promise is to offer all our customers the best possible solutions from our range of products.

Quality Assurance & HSE

ClampOn is ISO 9001 Certified by DNV GL and has high focus on HSE in our day-to-day business.

Quality Assurance

ClampOn has prepared a quality assurance system which is geared to our organization. This includes our commitment to fulfill these requirements in order to maintain the continuous improvement of our quality system.

HSE

Health, safety and environment (HSE) issues are key factors at ClampOn. We, as a company and individuals, are committed to playing a part in the global awareness regarding health, safety and environment issues. And, by having included HSE in our systems, we contribute to the local and global awareness on HSE matters



Sustainability

Being sustainable has always been important to ClampOn. Our products help the energy industry to produce safely and effectively. They help operators maintain the environment by providing them with means to accurately monitor activity in pipes, structures and valves on subsea and topside structures. This provides security for both man and nature, and prolongs the life of existing wells without risking leakages.

ClampOn's Representatives and Agents

- Alaska, Engineered Equipment Company of Alaska
- Argentina, Fluid Technical Solutions S.A.
- Australia, Aquip Systems Pty. Ltd.
- Bolivia, Tekon Ltda.
- Brazil, IEC – Instalacoes e Engenharia de Corrosao Ltda.
- Canada, Vanko Analytical and Instrumentation Specialists
- Canada, New Foundland, & Nova Scotia, K&D Pratt Group Inc.
- Chile, Morken Chile S.A.
- China, Top-Kylin Industry and TRade Co., Ltd.
- Colombia, Latina Energy
- Egypt, Obelisk Petroleum Services
- Ecuador, Petroleos Summa pet C.A.
- Indonesia, PT. Acoustic Instrument Indonesia
- Italy, Mepeco Srl.
- Kuwait, TBA
- Korea, WorldOcean Co., Ltd.
- Malaysia, Matco Sdn Bhd.
- Mexico, Metromex
- New Zealand, Accord Technology Ltd.
- Nigeria, Permian Oil & Gas Services Limited
- Oman, Rukun Al Yaqeen International L.L.C.
- Pakistan, Midtown Star, Oilfield Services
- Peru, Resertec
- Qatar, Integrated Technical Services Co. W.L.L
- Saudi Arabia, EnTech
- Taiwan, Your Solutions Engineering Co., Ltd.
- Thailand, Prompt Solutions Co., Ltd.
- Trinidad & Tobago, Analyser Services Inc.
- United Arab Emirates, Emdad L.L.C

Product Introduction

All products supplied by ClampOn are based on the same well proven technology platform. Both the topside and the subsea instruments incorporate Digital Signal Processing (DSP), complete digitalization eliminating analogue filters, circuits and amplifiers.

The ClampOn Ultrasonic Intelligent Sensor processes all data in the sensor itself (patented principle), thus enabling the instrument to discriminate between sand-generated and flow-generated noise. This is of importance to the user since changes in flow rates and the gas/oil ratio do not affect the performance of the system.

A good signal-to-noise (s/n) ratio is vital for quality measurements of this sort, and ClampOn's sensors are the very best in this respect; external noise has been completely eliminated.

Condition Monitoring

Through its acoustic and vibration sensors, ClampOn has grown from being an instrument manufacturer, to a condition monitoring specialist. ClampOn offers engineering services and monitoring solutions which are essential for safeguarding the integrity of subsea and topside assets.

ClampOn DSP Particle Monitor

All sensors are identical and interchangeable, which is a real advantage if sensors need to be moved/relocated or in case of service. The DSP's increase in processing capacity enables the sensor to combine signals from several frequency ranges when analysing the flow. ClampOn sensors are versatile, and are the only instruments on the market that offer two-way communication between sensors and control system. This solution enables future upgrades of the sensor to be installed via a simple download of new software. When using digital output from the sensors, they can be installed in a "multi-drop" system. The sensor is installed after a bend, where the particles (chalk or sand) are forced out of the flow and impact the inside of the pipe wall, generating an ultrasonic pulse. The ultrasonic signal is transmitted through the pipe wall and is picked up by the acoustic sensor itself. The signal is processed internally in the sensor and sent to computer or controlsystem where the user can monitor and evaluate the data in real-time.

ClampOn DSP PIG Detector

The ClampOn DSP PIG detector is a non-intrusive pig detection system designed to act as a first-stage alarm system for pig detection. It provides accurate and reliable registration of the time when a pig is passing and transmits the signal to the operator. The detector can also indicate the amount of debris preceding the pig during cleaning operations.

ClampOn DSP Leak Monitor

The ClampOn DSP Leak Monitor detects small and medium leaks or flow-troughs, even with low differential pressure over the measuring point on pipes and valves. The sensor has been developed with the aim of offering a product that can quantify a leak through a closed valve. It helps operators identify and quantify the sources of gas/liquid leakages, thus enabling them to take appropriate actions. Customers have successfully used the ClampOn leak monitor to identify cross-flow in valves connected to the manifold.



ClampOn (CEM) Corrosion-Erosion Monitor

The CEM® provides real-time measurements of changes in the wall thickness of pipes and other metal structures. It is non-intrusive and employs active ultrasound. It clamps on and can be retrofitted or preinstalled to monitor pipe wear rates over a large area. Up to 32 transducers operate to provide data on average mutual wall thickness. Wall thickness trends are generated automatically and can be observed in real-time on a computer running ClampOn CEM® software, or logged internally in a data logger. It can also detect the location and extent of erosion, and it can monitor any metal structure, including pipelines, flowlines, jumpers, manifolds and subsea production templates.

ClampOn Vibration Monitor

The Vibration Monitor monitors three directional vibrations on structures and pipelines with either high frequency shear waves or low frequencies. It is suitable for early detection of vibrations in objects such as; flow lines, jumpers, pumps, rotary machinery and subsea structures.

ClampOn DSP Well Collision Detector

This instrument is designed to prevent collisions involving sidetrack drilling with the proximity of existing wells. It provides the operators with real time data to assist with determining the bit's proximity to existing wells.

ClampOn Subsea Flow Temperature Monitor

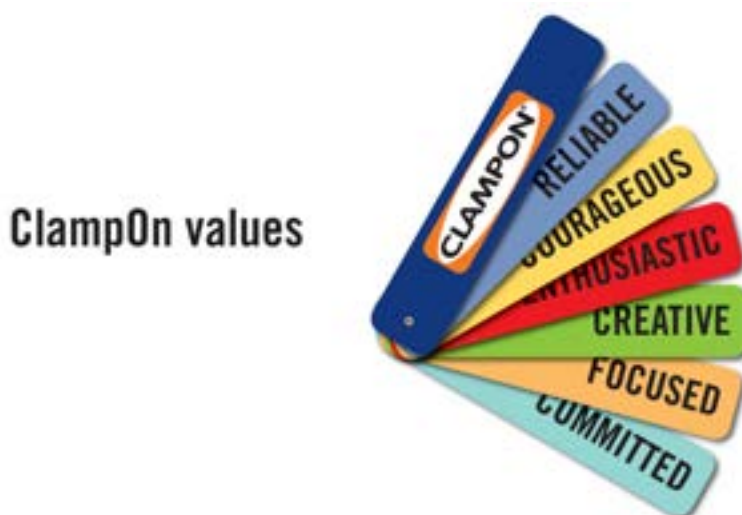
The Flow Temperature Monitor calculates and monitors the temperature of the flow medium from the outside of the pipe.

ClampOn BIRD Condition Monitor

Wireless acoustic sensor for the downstream and unconventional market.

Philisopy & Values

ClampOn's basic philosophy is to develop, produce and sell top quality instrument solutions based on ultrasonic intelligent sensors (our core technology) and to offer services based on the use of these.



ULTRASONIC INTELLIGENT SENSORS

Subsea Sensors

The subsea sensors were developed in close collaboration with Shell Deepwater Development Inc. in Houston and FMC Technologies in Norway. The successful outcome of the project was a sand monitoring system that combined an extremely long working life with excellent acoustic properties, offering reliability in the high pressure deepwater environment. ClampOn has since 1998 supplied approximately 12000 subsea sensors to the oil and gas industry. The subsea monitors have been under a continuous development in order to optimize quality and performance, and to meet the requirements in the market.

The subsea sensors (sand) are installed two pipe diameters after a bend, where the particles/solids impact the inside of the pipe wall, generating an ultrasonic pulse. The ultrasonic signal is transmitted through the pipe wall and picked up by the acoustic subsea sensor. In the patented "intelligent" ClampOn sensor the signal is processed internally by a DSP engine and filtered before being sent digitally and/or analogically to the topside computer or control system. Here the user can monitor and evaluate the data in real time and make the required decisions for profitable production.

The sensors can be supplied with a built in vibration element that enables the monitor to act as a vibration monitor at the same time as sand monitor or pig detector. Flow temperature monitoring can also be integrated in subsea sand or pig sensors.

The subsea corrosion-erosion monitor (CEM®) has been developed in a Joint Venture Project with BP and Innovation Norway. The product's development started with a topside version and was under development for subsea applications for three years. The subsea CEM measures changes in wall thickness in pipes, plates or other metal structures, based on the same principles as for the topside version. It can be mounted with an ROV or diver to already existing pipelines or as non-ROV solution for new applications. The system has been installed in several locations world wide and is giving the operators vital information about the condition of the pipes where they are installed.



ULTRASONIC INTELLIGENT SENSORS