



FLUXUS[®]

Non-Invasive Liquid Flow Measurement



- Chemical Industry
- Petrochemical Industry
- Oil Exploration
- Pharmaceutical Industry
- Semiconductor Industry
- Food and Beverage Industry
- Water and Wastewater Industry
- Power Generation
- District Energy

**Measure from outside
what's flowing inside**



FLUXUS® is ...



FLUXUS® ADM measures the flow of liquids using FLEXIM's proven clamp-on transit-time correlation technique. Special ultrasonic transducers are simply clamped onto the outside of the pipe and never come in direct contact with the liquid. No cutting into the pipe or process interruption is required for the installation.

Due to the robust clamp-on design of the transducers and the advanced metering electronics, FLUXUS® ADM suits an unmatched range of applications. The measurement system, consisting of a transmitter and one or two transducer pairs, can be configured to optimally meet the most demanding metering requirements. The FLUXUS® ADM flowmeter series consists of a broad variety of transmitters and transducers: from basic models for standard applications up to robust measuring solutions for offshore use or for hazardous metering locations.



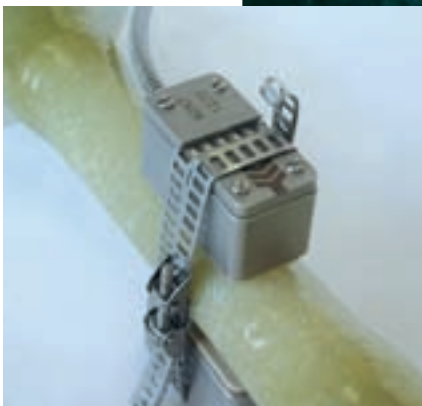
Adaptive signal processing

FLUXUS® ADM series instruments feature an exceptionally robust dual- μ P technology core together with the latest digital signal processing. They produce stable and reliable results even under the most difficult application conditions. FLUXUS' measurement algorithm automatically adapts to the varying application conditions. The very high measurement rate of 1000 single measurements per second allows for a real time statistical analysis. All this make the FLUXUS® unsurpassed in performance and one of the most capable ultrasonic flow meters available on the market today.

Our tradition is innovation

Ever since its inception, FLEXIM has been innovator in the field of ultrasonic flow measurement. Each FLUXUS® ADM embodies the wealth of expertise and application experience of our engineers. FLEXIM rises to meet the challenge where others have already failed. Put FLEXIM's experience and expertise to work for you. Submit your application to us and we will find the solution!

Flexible.



FRP pipe acid flow

From 1/4 inch tubing to 20 foot penstocks

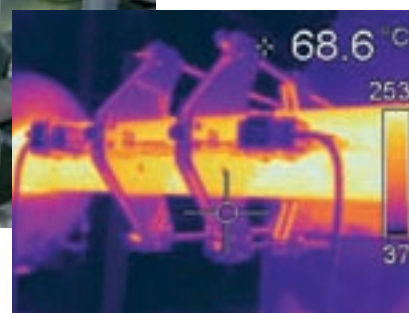
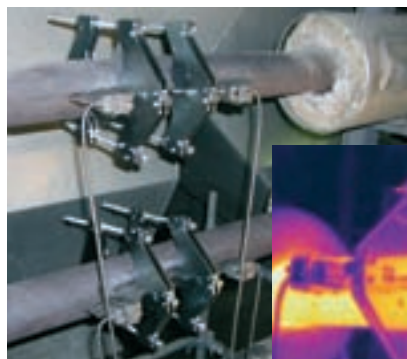
FLEXIM's non-invasive technology offers reliable measurement on the smallest of pipes (eg 1/4 inch tubing in paint finishing systems) as well as very large pipes (eg large penstock measurements in hydro-electric plants).

For nearly every liquid and pipe material

Measurement is possible on just about every liquid medium and pipe material, regardless of the conductivity. Steel, iron or plastic pipes; sludge, sand, acids or tar: FLUXUS® F is up to the challenge!

Extreme temperature solutions

Standard transducers may be used at temperatures from -22°F to 266°F, the temperature range of the high temp versions extends up to 392°F. The patented WaveInjector® system expands the measurement range of FLEXIM's standard transducers from cryogenic temperatures up to 752°F.



Regardless of pressure levels

Since the ultrasonic transducers are mounted on the outside of the pipe, the measurement is not pressure sensitive. Measurements at high operating pressures do not result in any extra costs whatsoever.

... even in hazard area locations

Transducers and transmitters are available in FM certified version.

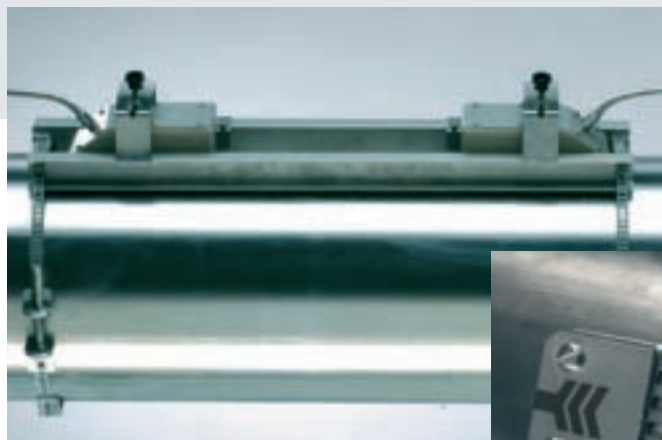
Non-Invasive.



The Advantages

Non-invasive measurement

- No contact with the medium, eliminating any risk of corrosion. No need for expensive special materials.
- No wear mechanism



Laser scribed transducers – solid couplant – no grease!



The transducers are mounted on the pipe

- Very cost-effective installation
- Easy installation without process interruption
- No welding, no cutting into the pipe
- No risk of leakage or release of fugitive emissions
- Absolutely no pressure loss, thus low operating costs
- No clogging of small bore impulse lines
- Cost-advantageous, especially in high pressure applications and for very large pipe diameters

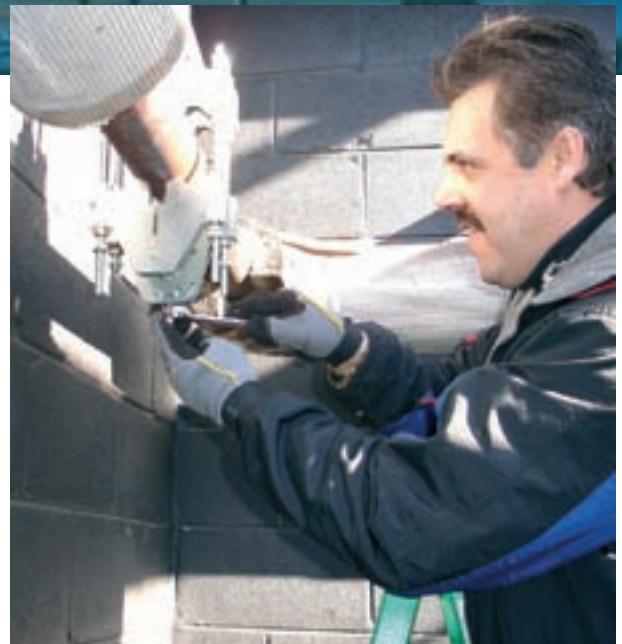
No moving mechanical or pressure loaded parts

- Long-term stable, maintenance-free operation due to permanent coupling pads
- Measurements can be made even at high operating pressures
- Unaffected by pressure peaks or solid content in the flow



Precise, hysteresis-free, bi-directional flow measurement with large dynamic range

- Long-term stable drift free measurement results
- Large measurement range including “live” zero and bi-directional/back-flow detection
- Fast response time
- Even minute flows are measurable
- Not sensitive to pulsations, vibrations, velocity peaks, swirling flows or cross-flow conditions
- Actual zero and measured flow values are not affected by variations in static pressure



Waveinjector installation on heat transfer oil (HTO)

User-Friendly.



"Plug & Play" calibrated transducers

Each pair of transducers undergo a rigorous wet-flow calibration at the factory and is shipped with traceable calibration documentation. All calibration data (including the transducer identification and parameters) is stored in a transducer-resident non-volatile memory. It is automatically transferred to the transmitter upon connection. Consequently, programming errors are eliminated and there is never need for a zero adjustment or calibration.

Guaranteed to be user friendly

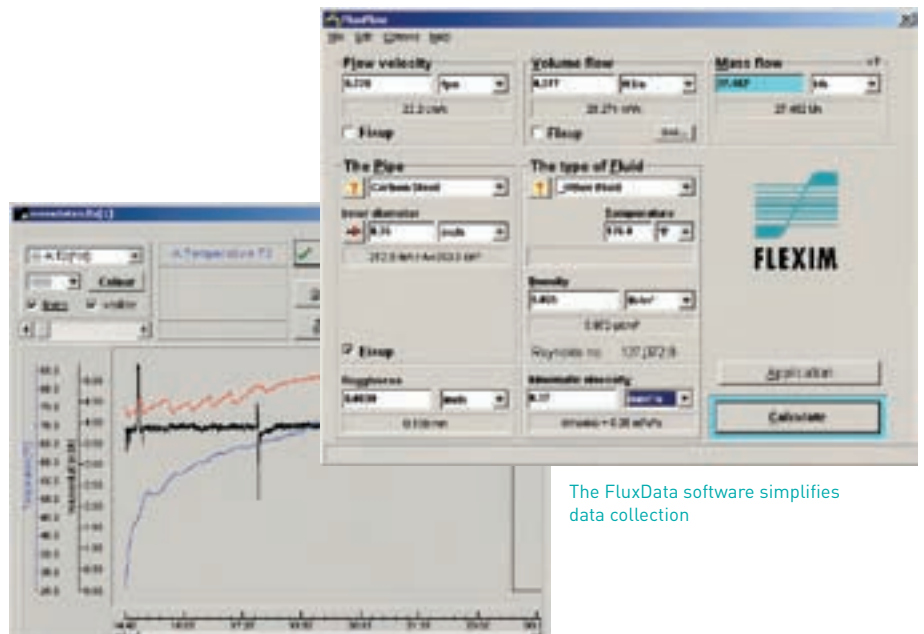
No elaborate instructions are required in order to use FLUXUS®'s intuitively structured menus. The pipe and materials parameters are easily found due to the internal liquid media and pipe materials database. The measurement is started with just a few key strokes. Explosion-proof instruments can be operated without opening the housing and without requiring any additional programming devices.



Plug & Play transducer identification

A "Straight-Shot" from pipe to PC

FluxData connects FLUXUS® to any PC. This optional software package with graphical user interface takes care of the data exchange between the transmitter and the computer. With FluxData, you can readily transfer your measurement data from the transmitter to a PC, analyze and visualize the measuring results and manage the data files directly or easily export to an external data management program.



The FluxData software simplifies data collection



General Technical Data

Measuring principle:	Transit time difference correlation principle
Quantities of measurement:	Volume flow, mass flow, flow velocity, thermal energy (requires optional temperature input module)
Flow velocity:	(0.01 to 80) ft/s
Resolution:	0.0008 ft/s
Repeatability:	0.15% of reading \pm 0.03 ft/s
Accuracy*:	
with standard calibration:	\pm 1.6 % of reading \pm 0.03 ft/s
with extended calibration (option):	\pm 1.2 % of reading \pm 0.03 ft/s
with field calibration**:	\pm 0.5 % of reading \pm 0.03 ft/s
Gaseous and solid content:	< 10%

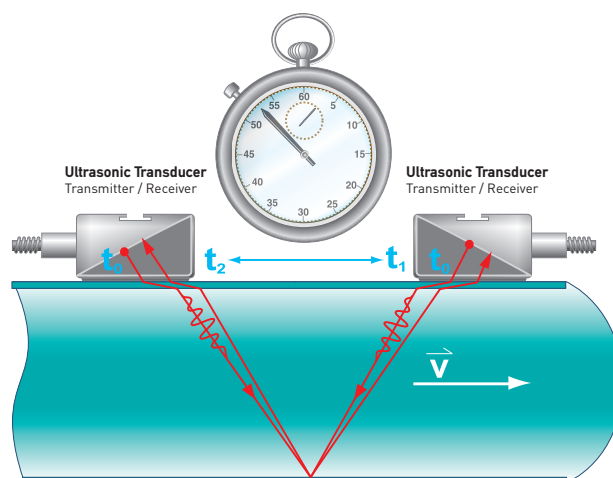
* for measurement acc. to transit time difference principle, under reference conditions and at $v > 0.5$ ft/s

** reference uncertainty < 0.2 %

Measuring principle

The Transit Time Difference Correlation Principle makes use of the fact that the time-of-flight of an ultrasonic signal is affected by the flow velocity of the carrier medium. Like a swimmer working his way across a flowing river, an ultrasonic signal travels slower upstream than downstream.

Our instruments work according to this transit-time principle: an ultrasonic pulse is sent downstream through the medium, another pulse is sent upstream. By measuring the transit time difference, the average flow velocity can be determined. The volume flow can then be calculated from the flow velocity and the pipe parameters.



Industry Hardened.

The Transducers

"Fit for the Purpose" construction

All FLEXIM clamp-on transducers are watertight and suitable for use in harsh industrial environments. The robust stainless steel construction and the rugged integrated cables guarantee reliable measurement results over long periods of extensive use.

Robust transducer mounting fixtures

Whether for easy and quick magnetic mounting of a short-term measurement solution or a long-term permanent installation, for large pipes or for small tubes: FLEXIM offers you transducer mounting fixtures for the broadest range of applications.

The PermaLok track mounting system provides complete protection for the transducer – not only for extreme environments like offshore platforms but also for all applications. The track is made of 304 stainless steel and fully gasketed for water tightness in harsh environments. It ensures a maintenance free installation.

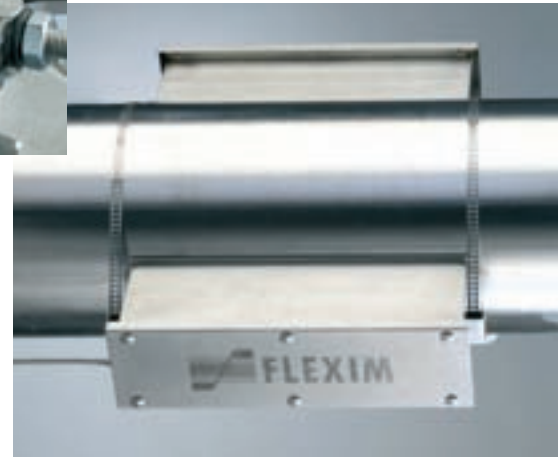
For FLEXIM, clamp-on does not mean temporary. PermaLok contains all of the mounting elements necessary to effectively lock the transducer into place.



Submersible transducers, simple "arrow point" mount



The installation of FLEXIM flow transducers with permanent acoustic coupling pad and the PermaLok Track creates the robust installation required for demanding liquid metering applications. It is as solid as a spool meter without its inconvenience and cost.





General Technical Data of the Transducers

Operating temperature,
standard transducers: -40°F to + 266°F

Operating temperature,
high temperature
transducers: -22°F to + 392°F

Operating temperature
with WavelInjector®: up to 752°F

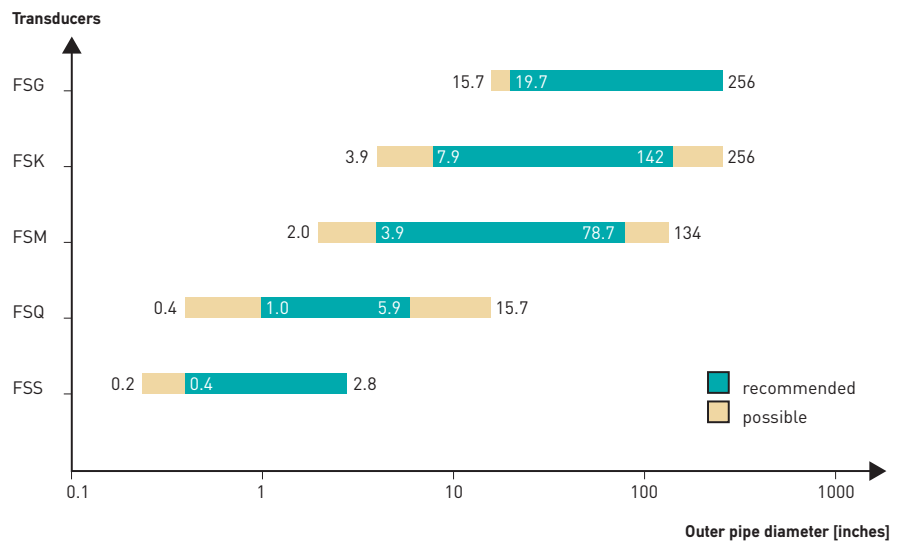
Degree of protection: NEMA 4X; IP68
(submersible acc. to EN60529) optional

Material: Stainless steel or PEEK with
stainless steel protective cap

Hazardous area
classification: FM Class I Div II and
ATEX Zone 1 & 2 types available



Diameter Range of the Transducers



One for All.

FLUXUS[®] F601

Unmatched in performance, this flexible and easy to use instrument is ideal in support of service and maintenance activities. It can also be used for the control or even for the temporary replacement of permanently installed meters.

The wide pipe diameter range of each transducer type is one of its greatest assets: two pairs of transducers are sufficient to cover the most common pipe diameter range (1/2 inch to 4 feet).

In addition, the optional thermal energy measurement capability makes it possible to carry out an uncomplicated analysis of thermal energy usage in any facility. The collected data can be used to perform a complete energy balance or to assist process monitoring and optimization.



Applications



General

- Service and maintenance
- Replacement of defective devices
- Support of commissioning process and installation
- Performance and efficiency measurement
 - Evaluation and assessments
 - Capacity measurement of pumps
 - Monitoring of regulating valves
- Energy efficiency audits

Food and beverage industry

- CIP and SIP optimization
- Consumption optimization

Chemical industry

- Portable flow controls at start-up and/or inspection of facilities
- Helpful tool for facility optimization
- Flow measurement of heat transfer media

Water supply / wastewater services

- Leakage control
- Treatment dosage
- Flow control in water supply networks



F601: The Portable Multi-Functional Meter

Flow channels :	2
Degree of protection:	Electronic unit: NEMA 4X / IP65 acc. to EN60529 Transport case: NEMA 4X / IP65 acc. to EN60529
Battery:	Li-Ion, 7.2 V/4.5 Ah, > 14 hours operating time
Inputs and outputs :	
Standard:	Outputs: 2 x current, 2 x binary
Energy:	Inputs: 2 x Pt 100/Pt1000; Outputs: 2 x current, 2 x binary
Multifunctional:	Inputs: 2 x Pt 100/Pt1000, 2 x current; Outputs: 4 x current, 2 x binary

Refrigeration and air conditioning systems

- Measurement of inlet and outlet flow for service work and maintenance
- Pump preventative maintenance and checks
- Optimization of energy efficiency
- Detection of fouling processes in heat exchangers

Facility management

- Optimization of heating and air conditioning systems in large building complexes
- Pump control

Aeronautical industry

- Monitoring of hydraulic and cooling systems of airplanes

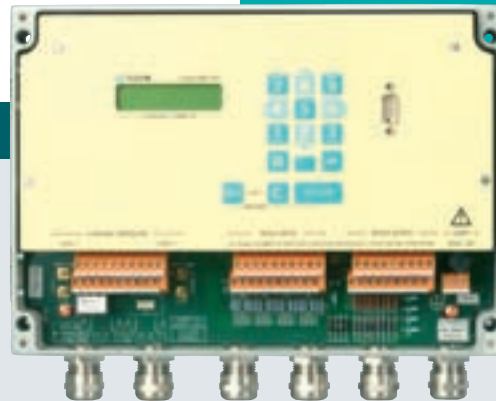


Permanently installed, freely configurable.

FLUXUS® ADM 7XX7

FLUXUS® ADM 7XX7 is designed for permanent installation. With one or two flow channels and versatile electrical inputs and outputs, it can be optimally configured for your measuring application. A variety of process parameters can be measured and handled.

ADM 7407 features a robust metal field housing. Although technically identical, FLUXUS® ADM 7907 is designed for permanent installation in 19" rack systems.



Applications

Chemical industry

- Measurement of
 - corrosive or toxic media
 - non-conductive media
 - highly viscous media
 - media containing fibers or solid particles
 - long-chained polymers
 - highly concentrated sulfuric acid
- Measurement of heat transfer media such as water/glycol (480°F) and thermal oils
- Measuring on PVC or FRP pipes and tubes

Petrochemical industry

- Measurement of basic materials as well as intermediate and final products
- Measuring at high temperatures, for example tar, bitumen, quench liquids

Power plants

- Measurements in the cooling water, boiler feed water, condensate and heat circuits

Oil and gas

- Measurement of all hydrocarbon liquids
- Measurement on high pressure systems
- Measurement of bitumen
- Measuring of injection media
- Flow measurement of water for injection

Pharmaceutical and semiconductor industry

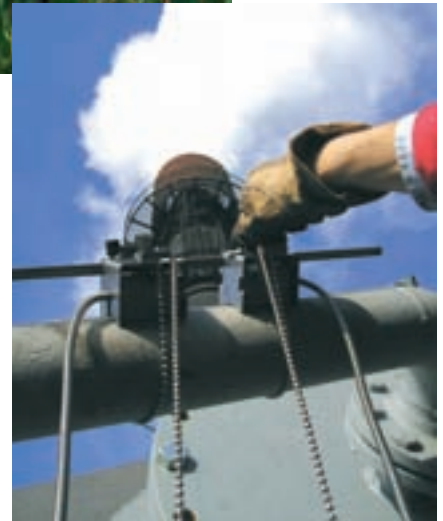
- Non-invasive measurement of ultra pure fluids, even in PVC, PFA and glass pipes





ADM 7407 / ADM 7907: The Multi-Function Meters

Flow channels:	1 or 2
Degree of protection:	ADM 7407: NEMA 4X ADM 7907: NEMA 1
Hazardous Area Classification:	FM Class I Div II / ATEX Zone 2 optional for ADM 7407
Outputs:	A variety of combinations are available from the following: current (0/4 mA ... 20 mA), voltage, frequency, pulse, alarm
Inputs:	Maximum 4. Available are: Temperature (PT 100 4-wire), current, voltage



Food and beverage industry

- Hygienic contact-free measurement of liquids
- Thermal energy measurement in the energy supply of central boilers and sanitizing machines

Water and waste water industry

- Flow measurement on large diameter pipes (influent, effluent, sludges)
- Consumption and distribution measurements
- Measurement on underground or underwater pipes
- Chemical flows (small pipe and low flows)

Mechanical engineering and plant engineering

- Leak detection on hydraulic systems
- Measurement of cooling lubricant
- Monitoring of heat and cooling circuits and of pumps

Aeronautical industry

- Flow measurement of hydraulic fluid
- Monitoring hydraulic systems of airplanes
- Monitoring cooling lines of airplanes

Experts for Hazardous Areas.

FLUXUS® ADM 8X27

FLUXUS® ADM 8027 is ATEX certified for stationary use in hazard areas. Its terminal enclosure and its electronics enclosure are hermetically sealed. It can be operated without opening the enclosure and without any additional devices.

The all-stainless-steel and seawater-resistant FLUXUS® ADM 8127 is also ATEX-certified and thus ideally suited for offshore applications.



Applications



Petrochemical industry

- Monitoring the flow of heat transfer oil in distillation columns
- Measurement of basic materials as well as intermediate and final products
- Measurement at high temperatures, for example tar, bitumen, quench liquids

Chemical industry

- Flow measurement in hazard areas
- Measurement of preliminary products in the production of polyurethane

Oil extraction

- Flow measurement of injection media, for example methanol
- Flow measurement of injected water
- Measurement of the feeding process into sand separators for process management
- Flow measurement of condensate

Oil exploration

- Measurement on high pressure systems



ADM 8027 / ADM 8127: The Explosion-Proof Experts

Flow channels:	1 or 2
Protection degree:	NEMA 4X
Hazardous area classification:	ATEX zone 1 and 2; ATEX mining certification optional
Outputs:	1 current output, 1 binary output (OC). Also available: 1 or 2 binary outputs (relay), 1 binary output (OC) and 1 current output
Inputs:	-



© Pål Renning



Refineries

- Flow measurement of bitumen at high temperatures
- Measuring of crude oil during sampling for quality analysis

Natural gas extraction and processing

- Measuring of injection media (monoethylamine, triethylene glycol, etc...)





FLEXIM

A short portrait



FLEXIM's North American Operations Center in Edgewood, NY

For over 15 years FLEXIM has been an active leader in many areas of process instrumentation in both national and international markets. In addition to non-invasive flow measurement, FLEXIM specializes in innovative online process analysis using ultrasonic technology and refractometry.

Year after year, FLEXIM continues its substantial investment in research and development in order to maintain and further improve its position as an industry leader. As a result, our customers benefit greatly from our cutting edge patented technology.

Competent and professional associates in our sales offices and regional headquarters in Europe, North America, Asia and all over the world ensure the worldwide distribution of FLEXIM's proven technology and guarantee you qualified service.

FLEXIM AMERICAS Corporation

Headquarters
250-V Executive Drive
Edgewood, NY 11717
Phone: (631) 492-2300
Fax: (631) 492-2117
Toll free: 1-888-852-7473

West Coast Office
Berkeley CA 94704
Phone: (510) 704-8353
Fax: (631) 492-2117

Texas Office
Houston, Texas
Phone: (281) 635-2423

usinfo@flexim.com
www.flexim.com



BULIQUIDV5-1US

2009/03
Subject to change without notification