To be profitable in custody transfer applications, it is critical to have reliable and accurate measurement. FMC Technologies’ LACT/ACTs ensure that the quantity and quality of the merchantable oil is accurately measured from oilfield production to trucks, rail, storage tanks and pipeline. Our broad range of measurement products and accessories, along with our skid design experience, ensure that all key components are properly packaged for the most accurate performance at the lowest cost to you. Additionally, our measurement expertise and dedicated fabrication team can manage and advise on your project from initial design through startup and commissioning.

- Standard designs are available for quick turnaround to meet rapidly changing project approvals and tight deadlines
- Customizable solutions to meet unique regional or application requirements are also available
- FMC Technologies has over 90 years experience in hydrocarbon measurement with an extensive understanding of all flow metering technologies
- Quality design and fabrication to avoid penalties for delivering out-of-spec product
- Direct, local factory service available from commissioning to aftermarket support ensures that there will be no startup delays, meaning that your project timelines are met and the unit will always be up and running
<table>
<thead>
<tr>
<th>Skid Size</th>
<th>2&quot; - Class 150</th>
<th>3&quot; - Class 150</th>
<th>4&quot; - Class 150</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Flow Rate</strong></td>
<td>65 - 120 GPM (2,230 - 4,110 BPD)</td>
<td>160 - 275 GPM (5,485 - 9,430 BPD)</td>
<td>275 - 500 GPM (9,430 - 17,140 BPD)</td>
</tr>
<tr>
<td><strong>Product</strong></td>
<td>Crude Oil</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>30-70 API (0.90-0.70 SG)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating Pressure</strong></td>
<td>30-65 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Design Pressure (Max.)</strong></td>
<td>125 - 250 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Design Temperature</strong></td>
<td>-20° F - 120°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>2-20 cP</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Pressure Drop</strong></td>
<td>10 - 20 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>15'</td>
<td>16' - 4'</td>
<td>18' - 6'</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>6'</td>
<td>6'</td>
<td>6'</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>8'</td>
<td>8' - 9'</td>
<td>9'</td>
</tr>
<tr>
<td><strong>Estimated Weight</strong></td>
<td>4,100 lbs.</td>
<td>5,500 lbs.</td>
<td>7,000 lbs.</td>
</tr>
<tr>
<td><strong>Voltage at Final Destination</strong></td>
<td>230/480 volt - 3 Phase - 60 Hz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LACT units allow dynamic custody transfer of merchantable liquid hydrocarbons by:**

- Dynamically measuring all the key variables to determine the quantity (volume, temperature, pressure) and the quality (BS&W/water content, density and composite samples) of the product being transferred
- Directly controlling all equipment on the skid
- Rejecting product that is out of specifications by either recirculating back to tanks or back to processing for further treatment
- Interfacing to a dedicated or portable prover to verify the accuracy of the system under actual operating conditions

1 FMC Technologies skids are designed to all relevant ASME, API, ASTM, AWS and National Electric Code standards. Note: Actual weights and dimensions may vary to accommodate special requirements and options.
FEATURES AND BENEFITS

**Standard Design** - FMC Technologies offers a standard LACT unit design in 2", 3", and 4" sizes that meets the functionality requirements needed in the majority of applications.

**Customizable Designs** - Different regions, shale plays and corporate requirements often require unique functionality. FMC Technologies easily accommodates unique requirements through our dedicated design and fabrication team who can advise on how to meet your unique requirements.

**Accuracy** - With over 80 years of experience in the area of custody transfer measurement in the hydrocarbon industry, FMC Technologies is the premier supplier of accurate and precise measurement solutions. The basis for a good LACT unit design starts with the selection of the right flow meter for the application. The right flow meter ensures that accuracy is not only obtained at a given moment, but it is consistently kept in time and under changing operating conditions. Our full range of measurement technologies ensure that the right solution is proposed for your application.

**Quality Control** - Quality is one of the FMC Technologies core values and we strive for zero defects in everything we do. The FMC Technologies skid team fully understands the implications of non-conformance and quality check points are present in all phases from the design, fabrication, startup, to commissioning, and all the way to aftermarket support.

**Direct, Local Factory Support** - FMC Technologies direct offices provide aftermarket, startup, commissioning and consultation services along with local equipment and spare parts inventory.

**Standardized designs** provide a cost effective package with quick delivery times using field proven solutions.

Specific customer and market requirements are met with tailor made solutions. FMC Technologies design expertise ensure that the cost and delivery impact of these specific requirements are minimized.

Accuracy is a key element in minimizing monetary losses due to bad measurement. Even the smallest biased errors can accumulate to millions of dollars in losses in a year. Accurate measurement provides the best determination of the quantity and quality of product being transferred in a way that is fair for all parties involved in the transaction. Also, a well designed LACT unit using the right measurement technology and related equipment reduces the measurement uncertainty and the risk of potential disputes.

Project requirements, time lines and expectations are met to full satisfaction.

Quick response and local service close to your operations ensure maximum uptime and productivity.
Standardized skid designs provide a cost-effective package with quick delivery times using field proven solutions.
FMC Technologies Specified Equipment

METERS

Smith Meter® Positive Displacement Meters (PD)

The Smith Meter® PD meter sets the standard for measurement accuracy, performing with unsurpassed accuracy, durability, high measurement stability, low pressure drop, and unmatched record of reliable service. From petroleum production, transportation to marketing terminals, the Smith Meter® PD meter is the most trusted name of positive displacement meters in the field.

» SC13 and SD30 (2" and 3") single case PD meters with standard trim, seals and 100% gearing/dummy calibrator

» C2, E3, E4, and F4 (2", 3", and 4") double case PD meters with standard trim and seals and 100% gearing/dummy calibrator

Units can be equipped with:

» UPT-1000 pulse transmitter

» RAD – Right Angle Drive to connect portable transmitters during proving

» SM-200 AB Horizontal non-reset counter (barrels) with stack monitor

» LNC counters and ticket printers

» Smith Meter PD meters are the best suited metering technology when wax/paraffin is present in the oil

Proline® Promass Coriolis Meter

High accuracy, low pressure drop and diverse interface capabilities make the Proline Promass Coriolis meter the perfect solution for petroleum metering applications that demand custody transfer accuracy and repeatability.


3" – 83F80-C-AAS-A-9-P-A-B-B-C-N – ANSI 150 Promass

4" – 83F1H-C-AAS-A-9-P-A-B-B-C-N – ANSI 150 Promass

STRAINERS

Smith Meter® In-Line strainers protect the metering system against dirt and other contaminants. Meets design requirements of ASME B31.3 and NACE MR-01-75 compliance for products with hydrogen sulfide concentrations. The removable perforated plate basket design makes cleaning easy.

Inlet Strainer

» E-Type-30A-40-B-0-0-00 40 Mesh Basket

» E-Type-40A-40-B-0-0-00 40 Mesh Basket

» 6" Inline SG-1-ST-N-40-00-0
**VALVES**

**DuraSeal™ Double Block and Bleed Valve**
ANSI 150 RF flanges

The DuraSeal is a high integrity, double block and bleed valve that has been considered the standard of quality since 1951. Its reliable stem seal design provides improved performance and longevity.

- 2" D711-100 DBB Valve with Viton seals and DTR (Differential Thermal Relief)
- 3" D711-100 DBB Valve with Viton seals and DTR (Differential Thermal Relief)
- 4" D711-200 DBB Valve with Viton seals and DTR (Differential Thermal Relief)

**FMC Technologies Model 200-60A**
Back Pressure Valve

The Model 200-60A Pressure Sustaining Valve is a hydraulically-operated, globe-pattern, diaphragm actuated control valves used to maintain a constant upstream pressure, typically at a pump discharge. This back pressure valve has a full ANSI Class 150 body pressure rating.

**FMC Technologies 210 Set-Stop Valve**

The Model 210 Digital Electro-Hydraulic Set-Stop Valve is used in loading and unloading applications in conjunction with the microLoad.net Preset Controller provide a controlled ramp up and ramp down pre-set load or unload at truck racks, bulk plants, or processing installations.

**INVALCO WCM 7300**

The Model WCM 7300M is designed to provide the highest possible sensitivity, resolution, and accuracy for water content determination in crude oil, other hydrocarbons, or other low dielectric liquids from a max of 25% to levels below 1000 parts per million (ppm). In oil and natural gas (condensate) production, water cut and S&W measurements are significantly improved with the WCM 7300M technology. Enhanced digital signal processing and full product temperature compensation are two of the technological advancements utilized by this device. Probe sizes from 2” through 12” are available. 4-20 mA and 0-5 volt outputs are available for remote readout. Water cut, process temperature or probe electrical value can be selected for viewing without removing conduit cover by use of a supplied magnet to operate an internal reed switch.

- 2" WCM7300 200-BFP
- 3" WCM7300 300-BFP
- 4" WCM7300 400-BFP

**INVALCO BACK PRESSURE VALVE**

510 Series ANSI 150 RF flanges

- 2" RDFG-201-510 (P/N-80006242) with 20-40# spring range
- 3" RDFG-301-510 (P/N-80006246) with 20-40# spring range
- 4" RDFG-401-510 (P/N-80006250) with 20-40# spring range
Quality equipment means that all project requirements, time lines and expectations are met to full satisfaction.
**FLOW COMPUTER/TEMPERATURE AVERAGER**

The Smith Meter® microLoad.net combines flexible control with precise measurement in a rugged explosion proof package. With easily customizable control of sampler, diverter valve, charge and sales pump and flow rates the microLoad.net can be tailored to meet the needs of the application. In addition the microLoad.net calculates a wide range of measurement data in accordance with API standards including the gross and net volumes, average temperature, S&W, density etc. automatically printing a report and storing a record of each transaction. In a standalone setting, the microLoad.net can provide access control based on its built-in authorization database (with or without the optional card reader) but the microLoad.net can also be integrated into a supervisory or SCADA system with either serial or Ethernet communications using Modbus or Smith Meter® protocols.

» Model – ML-XP-STD-1

**TEMPERATURE PROBE**

Temperature Probe with explosion proof J-Box and Thermowell

» 2" Model - TP-W-4-1.5
» 3" Model - TP-W-4-2.5
» 4" Model - TP-W-4-2.5

**STATIC MIXER**

FMC Technologies 2-Element Static Mixing Spools optimize LACT/ACT performance by increasing turbulence and mixing of the oil immediately upstream of automatic or manual sampling points. The Static Mixing Spools are designed to generate a homogenous mixture while minimizing pressure drop and overall dimensions. The mixer is used in the turbulent and transitional flow regimes to intensify mixing between immiscible fluids. In addition, the threaded connections are placed at the correct locations to ensure manual and automatic sample location compliance with API 11N and API Manual of Petroleum Measurement Standards Chapter 8.

**FIELD SERVICE RESPONSE CENTER**

Our Field Service Response Center's toll-free number is dedicated to handling your requests to ensure your calls are routed quickly and efficiently to the right Field Service Technician, 24 hours a day, 7 days a week.

Whether it's an urgent request for service, or a technical inquiry, we know your call is critical. Our Field Service Response Center gives you the assurance that your requests will be resolved, and quickly.

**+1 844.798.3819**

24 Hours/7Days
The FMC Technologies Low Pressure Sample System sets
the standard for measurement accuracy, performing
with unsurpassed durability, low pressure stability for
the collection, storage, and recirculation of crude based
products. The FMC Technologies Low Pressure Sample
System is designed per API 8.3 and is applicable for most
LACT/ACT units, truck loading/unloading, pipeline systems,
and marine terminals.

» Available in 10, 15, and 20 gallon
  (custom sizing upon request)
» ASME Code or Non-Code versions

Standard Options
» Single Phase or Three Phase motors
» 5gpm pump for 10/15 gallon,
  10gpm pump for 20 gallon
» Internal Spray Bar assembly and Vortex Breaker
» Internal Epoxy Lining
» Manual Sample Port
» Thermometer
» Pressure Safety Valve
» Vessel and Pump Discharge pressure gauges

Additional Options
» High Level Switch
» Inline Static Mixer
» Heat Tracing
» Insulation
» Sight Glass
» Level Gauge
» Stainless Steel Piping

Other LACT Skid Components

» Inlet – 3", 4", and 6" ball valve (full port)
» Charge pump – 2", 3", and 4" centrifugal with
  230-460 VAC 3-phase motor
» Air release vent (top of loop) with check valve
  on vent line
» FMC Technologies Static mixer on loop –
  2", 3", and 4"
» Sample system - 2", 3", and 4"
  – Probe -45° angle quill with 3-way explosion proof
    solenoid valve and volume regulator.
  – Container (15 gallon) – Complete with quick
    closure, internal coating, level indicator,
    circulating pump, spray bar, pressure gauge,
    relief valve, and miscellaneous valves and fittings.
» Instrument spool – 2", 3", and 4" with pressure
gauge and test thermowell with plug and chain
» Proving manifold – 2", 3", and 4" (3) valve with (2)
  ball valves (FP). Complete with drip pan and cover.
  Wing union and blind standard. Cam lock couplings
  and dust caps available. (Cam lock fittings will
de-rate skid pressure).
» Check valve – 2", 3", and 4"
» Outlet - 2", 3", and 4" ball valve (full port)

Electrical Control - Remote Mounted Panel
» Smith Meter® microLoad.net
» Class 1, Div. 2 termination panel
» Truck ground verification system (if required)
» Emergency shutdown button

Options
» Divert valve – With back pressure valve and check
  valve – 2", 3", and 4"
» Sample pot – Other sizes available –
  10, and 20 gallon
» Class 1 – Division 1 electrical upgrade
» Skid drip pan – containment
» PLC with HMI
» Building enclosure
» Multiple sample systems
» Multiple meter runs
Quality is one of our core values and we strive for zero defects in everything we do.
OPTIONAL EQUIPMENT

Large Numeral Counter (unit of registration barrels)
Features large, easy-to-read, five-digit 600 Series or six-digit 900 Series reset counter numerals, with fine graduations on right-hand wheel for an additional digit resolution.

Ticket Printer*
The accurately-recorded printer ticket takes the uncertainty out of liquid transfers. The tamper-proof system seals the ticket into the meter register printer while the transfer is taking place. The ticket is mechanically printed before it can be removed from the printer. Errors, doubts, and disputes are eliminated and the customer receives a meter register printed receipt.

*LNG Pulse Transmitter 1 or 10 PPR
The Model LNC (Large Numeral Counter) Transmitter provides a contact closure for signaling remote instrumentation. It chops a fixed level input voltage to form a square wave pulse (with minimum contact bounce) for use with transistorized circuits such as an electronic drive control.

The LNC Pulse Transmitter consists of a rugged die cast explosion-proof housing with a screw-type cover for easy access to the pulsing mechanism. The transmitter utilizes a dry reed switch, magnet, and gear train, synchronized to provide 1 or 10 contact closures per revolution of the right-hand wheel, as required.

Universal Pulse Transmitter
The Smith Meter® Model Universal Pulse Transmitter (UPT) is an infrared, quad-channel, high-resolution pulse generator driven by the output shaft of a positive displacement meter. It provides high-integrity pulse transmission and verification of signal and power for custody transfer measurement applications.

Truck Loading Options
For truck loading applications use Smith Meter® 210 Digital Set-Stop Valve.

Additional Notes
- Skid design: Open or closed frame design
- Flow: Left to right flow
- Electrical: Class I Division II Area
- Paint color options are available

OPTIONAL EQUIPMENT PRESSURE RATING

<table>
<thead>
<tr>
<th>Component</th>
<th>MAOP (PSIG at 100°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back Pressure Valve</td>
<td>2”, Class 150</td>
</tr>
<tr>
<td>Invalco 510 Back Pressure Valve</td>
<td>125</td>
</tr>
<tr>
<td>Orifice Plate</td>
<td>285</td>
</tr>
<tr>
<td>FMC Technologies 200-60A Valve</td>
<td>285</td>
</tr>
<tr>
<td>Kimray FMT BP-D Valve</td>
<td></td>
</tr>
<tr>
<td>Kimray FMT BP-S Valve</td>
<td>285</td>
</tr>
<tr>
<td>Pump</td>
<td></td>
</tr>
<tr>
<td>Centrifugal Pump - Ductile Iron</td>
<td>250</td>
</tr>
<tr>
<td>Proving Connection</td>
<td></td>
</tr>
<tr>
<td>Fig. 200 Wing Union</td>
<td>2,000</td>
</tr>
<tr>
<td>Cam Lock Fittings</td>
<td>250</td>
</tr>
</tbody>
</table>

2 All other equipment not listed rated for 285 psig at 100°F
3 MAOP = Maximum Allowable Operating Pressure