

# Refining Measurement Solutions

Superior flow and density measurement

Best-in-class measurement



# “It’s difficult to meet demand efficiently, cost-effectively, and responsibly.”

Worldwide fuel consumption is increasing, presenting refineries, like yours, with a tremendous opportunity—along with significant risk: Not only are you expected to meet this rising demand, you’re expected to do so as efficiently and cost-effectively as possible.

But the growing complexity of your operation makes it difficult for you to meet your production targets, let alone at an acceptable cost. Maintenance is an ongoing concern, with the risk of an unplanned shutdown a constant threat. Meanwhile, production costs—particularly the cost of energy—are consuming an ever-increasing portion of your budget, placing further pressure on your margins. And, due to the public nature of your role, the whole world is watching how responsibly you manage the refinery with which you are entrusted.

## What if you could ...

### Keep your employees safe and maintain compliance with environmental regulations?

- ✓ Reduce or supplement manual sampling through continuous online density measurement, keeping refinery personnel in a safe working environment.
- ✓ Ensure product blends are optimized and on-spec, every time.
- ✓ Have confidence in your measurements with Smart Meter Verification and onboard diagnostics.

### Meet production volume targets by reducing maintenance-driven downtime?

- ✓ Increase throughput with long-term reliability and maintenance-free meter technology, reducing the risk of process shutdown caused by meter failure.
- ✓ Eliminate rework due to measurement drift or inaccuracies caused by changing fluid properties, process, and field conditions.

### Minimize cost from energy inefficiency, undiagnosed refinery loss, and excess maintenance?

- ✓ Optimize fuel usage, improve heater performance and lower emissions.
- ✓ Identify real losses that you can address and minimize.
- ✓ Reduce maintenance-driven downtime and limit pull and inspect events with built-in meter diagnostic capabilities.

**MEASUREMENT PRECISION**  
for refining applications



Refineries worldwide are choosing Micro Motion® and Rosemount® measurement technologies to meet production volume targets and reduce costs, all while minimizing the risk to workers and the environment.

- Simultaneous flow and density measurement, allowing for continuous, real-time quality control.
- Direct measurement outputs include standard curves (degrees API) and the ability to input process-specific information into the transmitter. This allows for custom outputs like concentration.
- Measure more accurately over a wide range of conditions, helping you stay in compliance even as process conditions change.
- Increase flow rate flexibility, accommodating a wider range of customer demands without placing undue pressure on your infrastructure.
- Gain access to on-line, process and performance diagnostics, giving you confidence that you are operating within safety and regulatory limits.
- Improve sustainability and cost of ownership with long-term reliability and maintenance-free technology.
- Increase safety by reducing potential leak points.

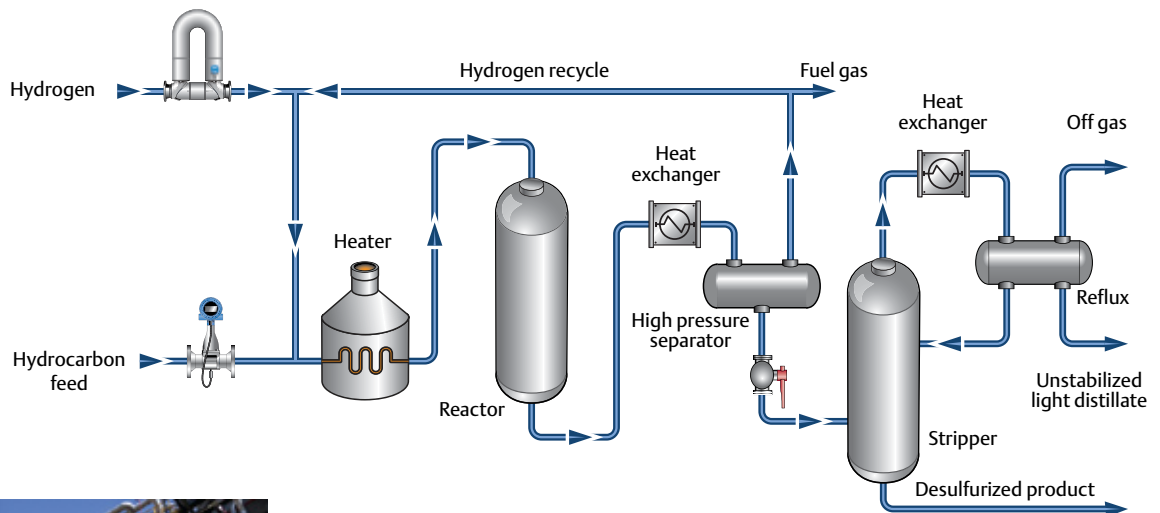
## Refining Applications

### Custody transfer / Material balance

- Achieve best-in-class transfer capabilities through unparalleled long-term measurement accuracy and repeatability.
- Identify real losses in your material balance that you can address and minimize, achievable through accurate measurement with meters immune to changing process conditions.
- Gain insight into utility distribution throughout the refinery, enabling you to identify and correct inefficiencies.

### Hydrotreating

- Meet clean fuels requirements through accurate measurement and management of your hydrogen stream.
- Achieve the correct hydrogen to sulfur ratio across the entire flow range to meet sulfur content requirements.
- Increase catalyst life and unit throughput with sufficient, but not excessive, hydrogen to reduce coking on the catalyst.



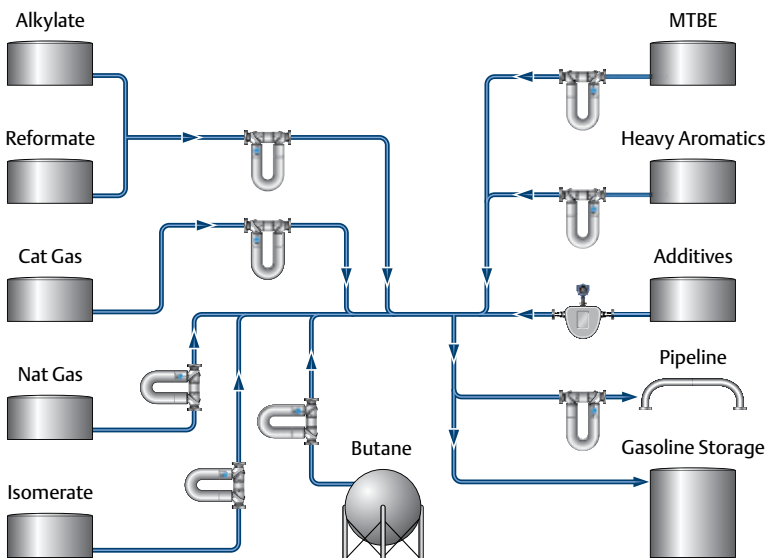


## Micro Motion and Rosemount measurement technologies are ideal for a range of refinery applications

- Material balance
- Unit optimization / yield
- Crude receipt and blending
- Product blending and loading
- Additive injection
- Energy / emissions management

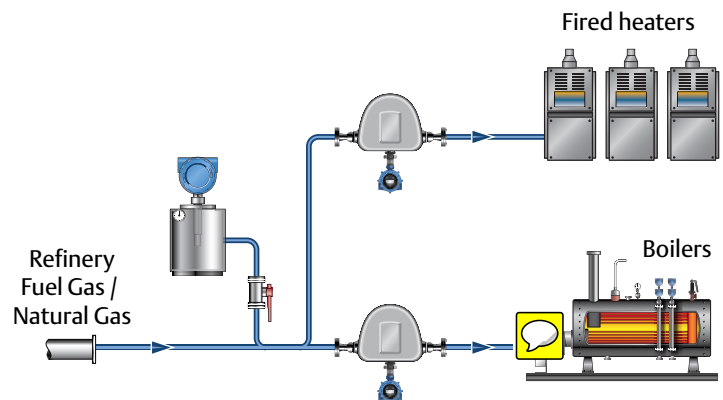
## Gasoline blending

- Eliminate rework or downgrading of off-spec blends by optimizing every blend, every time.
- Accurately measure a wide range of flows and multiple products with one meter, without recalibration.
- Achieve in-situ stream quality assurance with simultaneous flow and density measurement. Changes in density alert you to a change in the process stream.



## Energy management

- Increase throughput and efficiency by running boilers and fired heaters closer to capacity, possible with more stable control from accurate fuel heating value measurement.
- Minimize the effect of variations in fuel composition.
- Reduce emissions, and regulatory compliance costs, through improved combustion control.
- Increase efficiency through saturated steam and condensate measurement.



# Micro Motion® and Rosemount® Flow and Density Meters



## Micro Motion® ELITE® CMFS Coriolis Flow and Density Meters

Flow range	0.07 to 1980 lb/min (2 – 54000 kg/hr)
Liquid mass flow accuracy	±0.05%
Liquid volume flow accuracy	±0.05%
Gas flow accuracy	±0.25%
Liquid density accuracy	±0.0002 g/cm <sup>3</sup>
Nominal line size	1/10" to 2" (2 to 50 mm)



## Micro Motion® F-Series Coriolis Flow and Density Meters

Flow range	6.5 to 10,000 lb/min (180 to 272,000 kg/hr)
Liquid mass flow accuracy	±0.10% to 0.20%
Liquid volume flow accuracy	±0.15% to 0.30%
Gas flow accuracy	±0.50%
Liquid density accuracy	±0.001 to 0.002 g/cm <sup>3</sup> (+/-1.0 to 2.0 kg/m <sup>3</sup> )
Nominal line sizes	¼" to 4" (6 to 100mm)



## Micro Motion® 3098 Gas Specific Gravity Meter

Gas specific gravity accuracy	Up to ±0.1% of reading
Specific gravity range	0.1 to 3 typical



## Rosemount® 8800 Series Vortex Flowmeter

Liquid mass flow accuracy	±0.65%
Gas mass flow accuracy	±1.0%
Nominal line sizes	0.5" to 12" (12 to 300 mm)



## Rosemount® E-Series Magnetic Flowmeter

Volume flow accuracy	±0.15%
Nominal line sizes	0.15" to 48"



EMERSON WORLD-LEADING  
FLOW AND DENSITY  
technology

SETS THE STANDARD FOR  
RELIABLE, REPEATABLE,  
HIGH PERFORMANCE  
MEASUREMENT



Emerson's Micro Motion and Rosemount devices are known globally in over 85 countries for quality, reliability, application expertise, and support not available elsewhere.



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