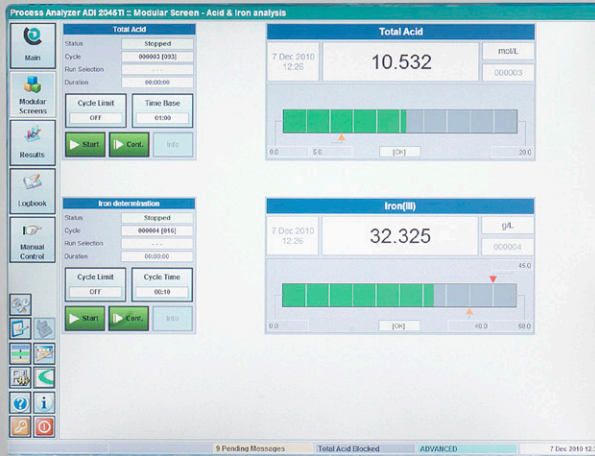


Process Analyzer

ADI 2045TI Ex



SYSTEM STATE



DISPLAY ON



# Online TAN Analyzer

Thermometric Total Acid Number Analysis (ASTM D8045)

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# Accelerate your Digital Transformation project with Online TAN Analyzer from Metrohm

Success within the oil & gas industry depends on efficient and reliable process control and operations. An expensive challenge to reliable operations in midstream and downstream oil & gas is achieving corrosion prevention and handling fluctuations in crudes and petroleum products. Corrosive contributors such as sulfur species and naphthenic acids are monitored by measuring the crude's Total Acid Number (TAN) using ASTM-approved methods. With the Online TAN Analyzer from Metrohm, the acidity in petroleum products can be monitored according to ASTM D8045 in near real-time. This enables timely decision-making for appropriate treatment of chemical profiles, which is crucial for regulatory compliance and quality control.

## Features

- Hazardous-area-rated and certified for explosion-proof electrical area classifications (ATEX, ClassI Div2/ ClassI Div1...)
- No «Hot work permits» needed for servicing
- 316 stainless steel housing with a built-in, intrinsically safe keyboard and trackball
- Rugged design including IP66/NEMA 4x ingress protection
- Maintenance-free temperature sensor
- Isolator packages for all discrete analog and digital input/output signals

## Benefits

- Deliver near real-time data that can be used to improve process performance and productivity, enhancing Industry 4.0 initiatives
- Harmonize the technology and methodology used in the laboratory and process by conforming to ASTM D8045 requirements
- Eliminate the need for process personnel to collect samples, improving plant and environmental safety
- Reduce reagents consumption by ~70% compared to ASTM D664



	ASTM D664 (Potentiometric)	ASTM D8045 (Thermometric)
<b>Titrant</b>	0.1 mol/L KOH in IPA	0.1 mol/L KOH in IPA
<b>Solvent</b>	Toluene/IPA/water	Xylene/IPA
<b>Solvent volume</b>	125 mL	30-35 mL
<b>Titration time</b>	~220 s	~60 s
<b>Conditioning of electrode</b>	3-5 min	none
<b>Sensor maintenance</b>	Solvent wash, rehydration, IPA dip, refill with electrolyte, store in LiCl in ethanol	Solvent wash is sufficient
<b>Sample size (expected AN of 0.05 - &lt; 1.0 mg KOH/g)</b>	20 ± 2 g	~10 g

# Metrohm's Online TAN Analyzer Key Components

The Thermoprobe is a robust, highly sensitive, and rapidly responding sensor. In contrast to potentiometric sensors used in ASTM D664 that require a lengthy cleaning and reconditioning period before the next titration, the Thermoprobe used in thermometric titration only needs a simple automated solvent rinse to prepare the electrode for the subsequent analysis.



Titration vessel with thermoprobe

The TAN Analyzer is equipped with heavy-duty Swagelok® sample valves to handle crude oil samples of varying temperatures and viscosities. The sample valve configuration decreases the time required to obtain a sample. Sample panels and shelters from Metrohm can also be integrated to improve sample preconditioning and protect the TAN Analyzer from harsh environmental conditions.



Swagelok® sample valve

During a thermometric titration, the enthalpy change associated with the chemical reaction is measured by the Thermoprobe. Because the energy change is so small, a paraformaldehyde slurry indicator is used to ensure proper detection of the endpoint. To stir the paraformaldehyde slurry in an explosion-proof environment, an air-powered mixer is included with the TAN Analyzer.



Air-powered mixer

# Technical Specifications

Technical specifications of ADI 2045TI Ex proof Process Analyzer	
Parameter	Total Acid Number (TAN)
Measuring Method	Thermometric titration according to ASTM D8045
Measuring Range*	0.1 – 16.0 mg/g KOH
Accuracy	Meets requirements of ASTM D8045
Repeatability	Meets requirements of ASTM D8045
Total Analysis Time	10 – 15 minutes
Sample Temperature	5 – 60°C
Sample Pressure	20 – 50 kPa
Flow Rate	100 – 300 mL/min
Maximum Particle Size	100 µm
Drain	Atmospheric pressure, vented
Instrument Air	Dry and oil-free according to ISA-S7.0.01-1996 quality standard for instrument air
Serial Communication	Modbus TCP/IP and Webservice (HTML) protocol through Ethernet
Discrete I/O Communication	Digital input, digital output, analog output; freely configurable; isolator packages included
Remote Connectivity	Yes
Power	110 – 120 VAC, 60 Hz; 220 – 240 VAC, 50 Hz
Display	15" laminated glass screen with integrated keyboard
Ambient Temperature	5 – 40°C
Instrument Housing	316 Stainless Steel
Dimensions cm (W x H x D)	27 x 99.06 x 114.3
Ingress Protection	IP66 / NEMA 4x
Certifications	CE compliant ATEX Zone-1 and Zone-2 versions according to EU Directive 2014/34/EU Class I Division 2 Group ABCD T4 NFPA 496-2017 CSA C22.2 NO. 213-17 (Optional)