



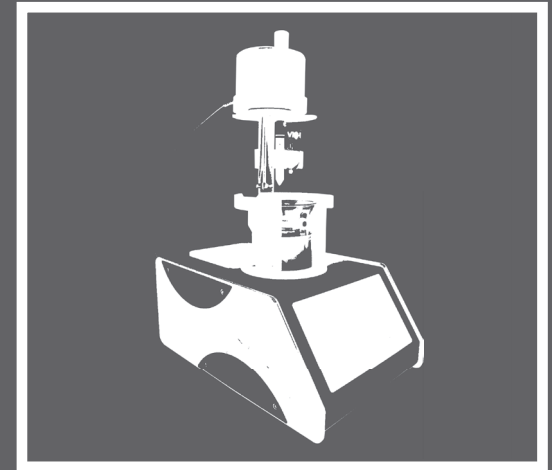
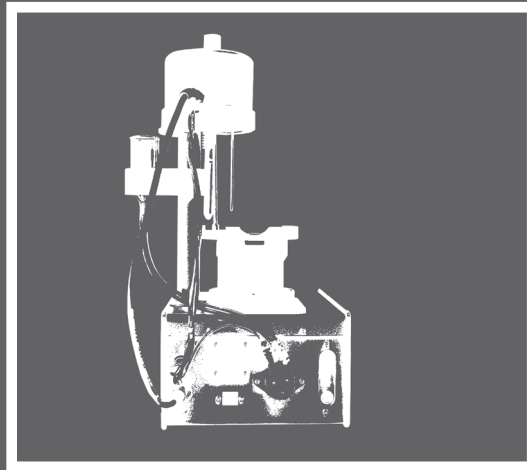
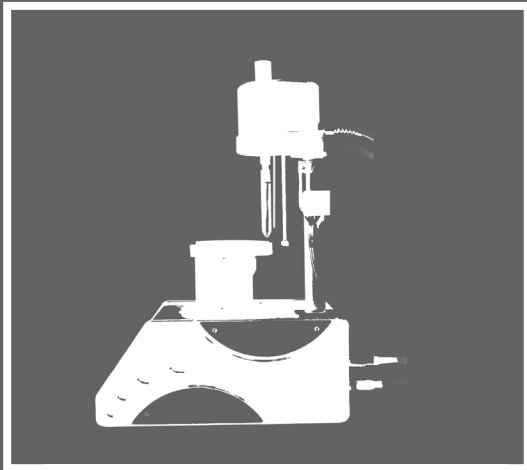
# ANA

Automated NACE/Rust Apparatus



## Iron Digital Detection Imaging Preparation

Sensors in modern automotive fuel systems often use iron or ferrous alloys, which are susceptible to corrosion from sulfur and other hetero compounds present in gasoline. In the past decade, refiners have shifted to producing lower-sulfur gasoline, but the process requires more severe hydro-treating that destroys naturally occurring compounds that give some protection against sulfur-based corrosion. Ensuring that fuel stays within acceptable corrosion limits requires constant and accurate testing. Unfortunately, modern corrosion test methods rely heavily on user's individual assessment which are inherently biased, as the operator must evaluate corrosiveness by interpreting the color and intensity level of an iron specimen after it has been bathed in a fuel sample. Corrosion to iron has become a critical indicator of mainly sulfur compounds present in crude oils that persist even after refining processes. Measuring corrosiveness to iron continues to be a challenge, as no accurate standardized test has been developed to date. Current corrosivity tests involve manual and visual evaluation and rating, resulting in human error and bias. The petroleum industry calls for a high-level, high-tech standard for iron corrosion detection.



Corrosion testing equipment, from VISAYA Inc, uses a four-step automated vision algorithm and classification process to eliminate user bias. After evaluating the iron rod specimen for corrosivity, the algorithm assigns the sample an integer between the different levels of corrosion as: 0 corrosion, Light rust, Moderate rust and Severe rust showing significant blackening. FeDDI provides standardization to the current visual iron rod corrosion test as referred in ASTM D665, Accelerated Method D7548 and NACE TM 0172.

## Principle

The ANA (Automated NACE Apparatus) is a fully automated single position test apparatus designed to determine the corrosive properties of lubricants and other petroleum products that are not water soluble.

## Test Method:

The ANA saves you time by automating the sequencing process. This instrument features an embedded controller with easy-to-use software, LCD display, and simple single button control for all functions.

Multiple ANAs can be used to increase sample throughput as well. ANA saves time for the sequencing required as detailed below:

- Step 1: Insert baffle beaker with 300mL sample
- Step 2: Load Polished Cylindrical Steel Specimen onto holder
- Step 3: Load 30mL of water into reservoir at top
- Step 4: Lower head down onto the beaker
- Step 5: Select the test method (i.e.: D665), and press Start

### *After reaching a set point temperature...*

ANA will automatically lower the Specimen into the beaker

30 minutes later, water will be dispensed.

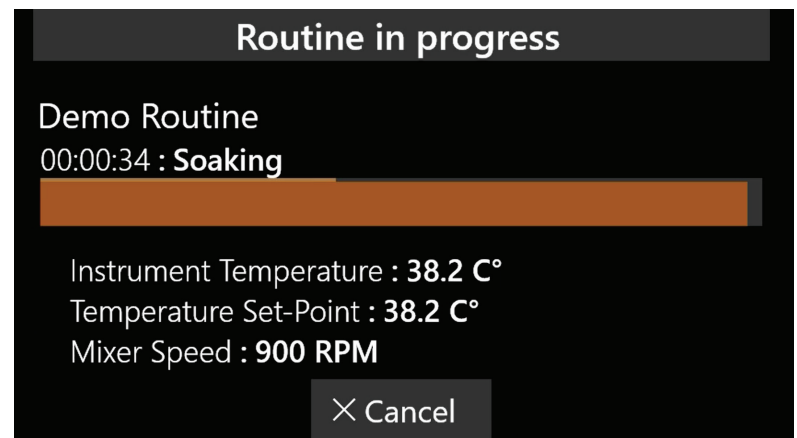
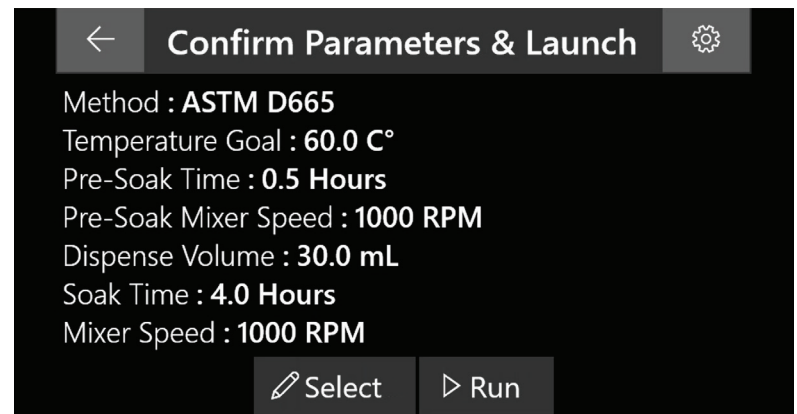
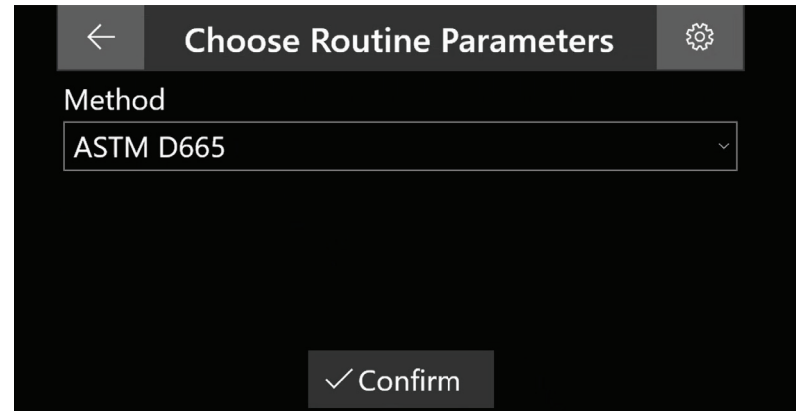
Test will continue to run for 3.5 hours of exposure

After soak time, ANA will automatically raise the Specimen to halt exposure

ANA will alert operator to retrieve specimen for rating

Step 6: Specimen can be rated manually or with supplied FeDDI Analyzer

Final results are clear, concise and cutting-edge.



## A Better Rating

ANA's improvements over current test rating output and analysis include:

- Easy-to-use touch screen driven software
- 1-2-3 button operation
- Digital image logging complete with operator notes and calculated results
- Integrated industrial computer for easy interface with network
- Direct lims connectivity
- USB, ethernet outputs

## A Better Method

ANA's improvements over current test procedures and end results include:

- Removes inherent bias with visual rating
- Automatic detection of iron specimen size
- Auto rotation of specimen for full 360 recording

## A Better Sample handling

ANA's improvements over current test sample handling and errors include:

- Enables single-hand loading via two part holder and clip
- Eliminates fingerprints and unwanted markings on spindles strips
- Specimen holder doubles in functionality as tool for manual verification



## Technical Specifications

Applicable Test Methods	ASTM D665 and TM0172
Test Temperature	30° to 100° C
Display Units	Time (HH:MM:SS) & Degrees ° C, RPM
Speed	10 to 1,000 RPM
Measuring Time	Configurable, Typical 3.5 Hrs.
Liquid Volume	5 to 40 mL
Calibration	Factory Supplied Calibration   Temperature, RPM Speed and Time
Display	Touch Screen
Interface	Ethernet for Communication and Firmware Upgrade
Power	Auto-switching 90~264VAC, 47~63Hz, 280 Watt Power Supply
Dimension	20"H x 8"W x 16"D
Weight	13 lbs. (6Kg)
Shipping Dimensions & Weight	16"H x 16"W x 16"D, 17 lbs. (7.7Kg)
Humidity	< 85% non condensing

FULL SPECS AND OPTIONS AVAILABLE AT [WWW.VISAYAINC.COM](http://WWW.VISAYAINC.COM)

## Accessories

### 1<sup>st</sup> Year

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FeDDI - Automated Iron/Rust Speciment Rater 110/240VAC 50/60Hz

Polishing device with chuck - 110/240VAC 50/60Hz

Steel test specimen for D665, NACE

400 mL beaker for D665, D3603, D5534, each (no baffle)

400 mL beaker for NACE test, each (with baffle)

Teflon holder (PTFE) for D665/NACE specimen

ANA Sample Holder compatible with FeDDI NFX

150 grit silicon carbide paper, 50 sheets

240 grit silicon carbide paper, 50 sheets

### 2<sup>nd</sup> Year

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Beaker Cover / Puck for 665 Test

Beaker Cover / Puck for D7548

Top Mount Mixer Stirrer / Material SS 304



# VISAYA Products



## AgDDI Silver Digital Detection Imaging

AgDDI provides standardization to the current visual determination as referred in ASTM D7671 and gasoline fuel specification ASTM D4814 while using a four-step automated vision algorithm and classification process to eliminate user bias.

## CuDDI Copper Digital Detection Imaging

CuDDI's simplified breakthrough procedure provides improved ratings, methodology and sample handling. Using a corrosion detection range of 1a through 4C, outcomes are digitally recorded and seamlessly integrate with LIMS software.

## FoamDDI Foam Digital Detection Imaging

FoamDDI accurately controls the air flow, temperature and sequence, which is then augmented using a unique VISION algorithm to accurately determine the height of static and dynamic foam, while greatly improving the precision and accuracy.

## FeDDI Iron/Rust Digital Detection Imaging

FeDDI provides a complete automated method, which replaces the inherently difficult visual quantification referenced in NACE TM0172 and ASTM D665 while using a four-step automated vision algorithm and classification process to eliminate user bias and provide repeatable results.

## ANA Automated NACE/Rust Apparatus

textANA (Automated NACE Apparatus), is a fully automated single position apparatus used in the process of determining the ability of inhibited mineral oils and petroleum products to prevent rusting of ferrous parts of automotive, processing, production and transport installations should water becomes mixed with the oil as referenced in D665, D7548 and NACE TM0172.

VISAYA



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