



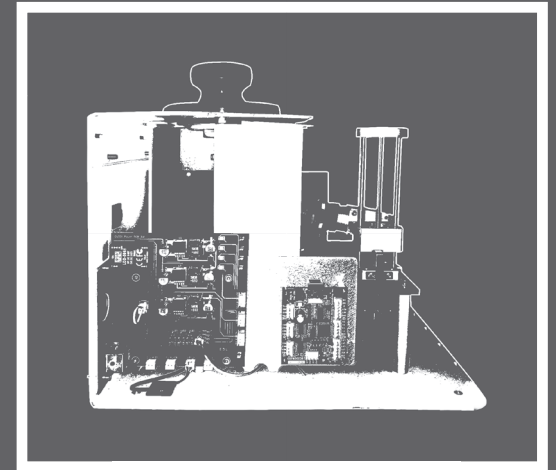
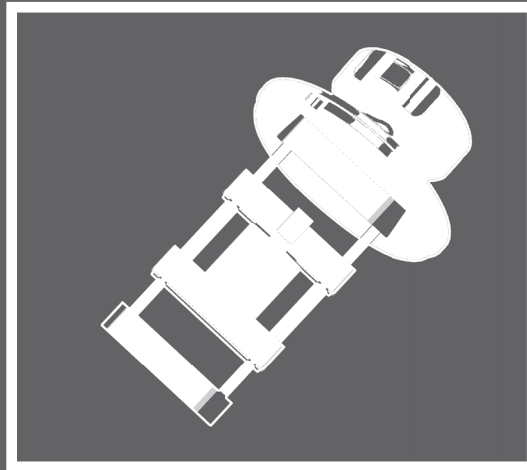
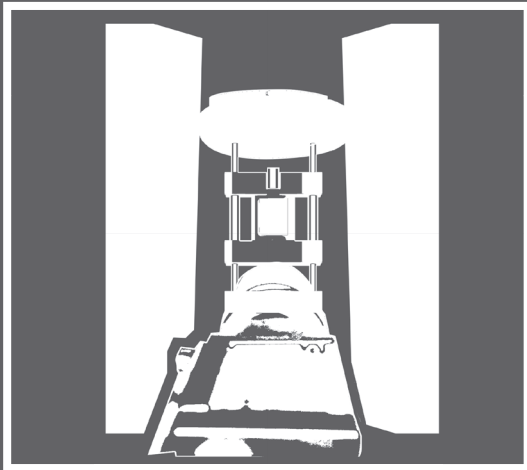
# AgDDI

Silver Digital Detection Imaging



## Silver Digital Detection Imaging

Sensors in modern automotive fuel systems often use silver or silver 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 silver strip corrosion test methods rely heavily on user's individual assessment which are biased, as the operator must evaluate corrosiveness by interpreting the color and tarnish level of a silver specimen after it has been bathed in a fuel sample. Corrosion to silver has become a critical indicator of mainly sulfur compounds present in crude oils that persist even after refining processes. Measuring corrosiveness to silver continues to be a challenge, as no accurate standardized test has been developed to date. As mentioned before, 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 copper corrosion detection.



AgDDI corrosion testing equipment, from VISAYA Inc, uses a four-step automated vision algorithm and classification process to eliminate user bias. After evaluating the silver strip for corrosivity, the algorithm assigns the sample an integer between 0 and 4, with 0 being no corrosion at all and 4 showing significant blackening. AgDDI provides standardization to the current visual silver strip corrosion test as referred in ASTM D7671 and gasoline fuel specification ASTM D4814.

## Principle

AgDDI's exclusive, patented design takes the guesswork out of silver corrosion detection. Its unique vision algorithm and light box records, calculates and displays accurate corrosivity coverage ratings in a matter of seconds. A high-resolution camera with sophisticated optics provides higher precision machining and motors for the rotation of the silver specimen. The results are not only a ground breaking improvement on the rating, methodology and sample handling of current laboratory procedures; they are the new standard for corrosion rating.

## The AgDDI Method

Corrosion digital detection imaging is a simplified process requiring minimal steps that effect maximum efficiency and accuracy:

Step 1: Insert specimen into specialized holder

Step 2: Place holder into instrument

Step 3: LED light source is automatically activated and regulated

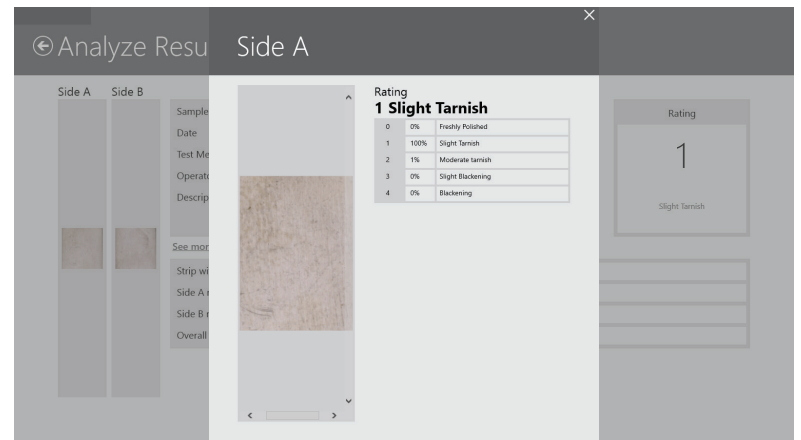
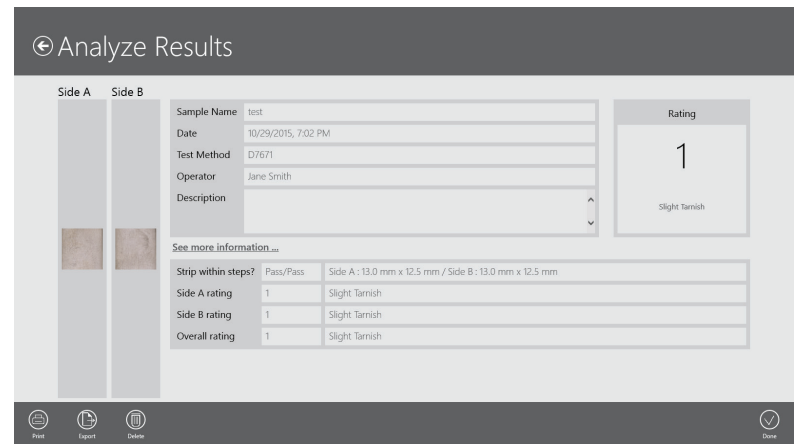
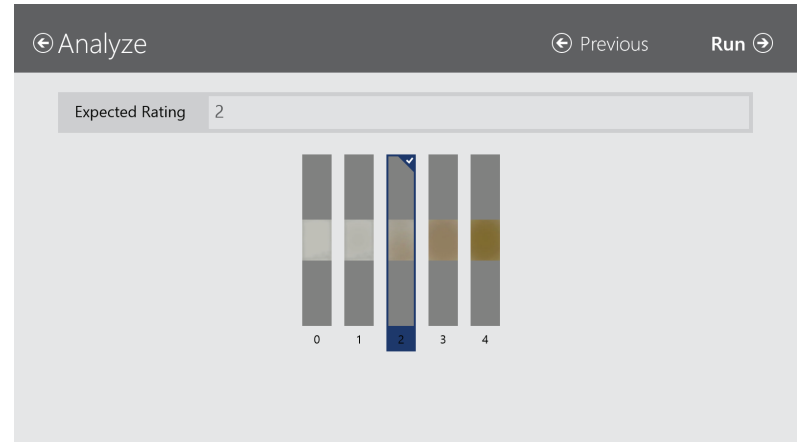
Step 4: Software identifies dimensional data

Step 5: Software then rotates specimen in specific degree increments

Step 6: Readings are tabulated and processed through AgDDI algorithm

Step 7: Final results are displayed on a high-resolution touch screen

Final results are clear, concise and cutting-edge.



## A Better Rating

AgDDI'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 lins connectivity
- USB, ethernet and hdmi outputs

## A Better Method

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

- Removes inherent bias with manual rating
- Voltage and current controlled light box for consistent ambient light environment
- Automatic detection of silver specimen size
- Long-lasting led light source
- Auto rotation of specimen for full 360 recording

## A Better Sample handling

AgDDI'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 strips
- Slide holder doubles in functionality as tool for manual verification
- Prompts operator when strip shrinks to unusable size
- Provides auto recognition of proper dimensions



## Technical Specifications

Applicable Test Methods	ASTM D4814, ASTM D7671, IP 611,
Corrosion Detection Range	0, to 4 & Levels
Display Units	Color, ASTM Rating and Strip Size
Detection Method	Patent Pending CMOS Digital Detection
Precision	+/- 0.25% of Raw Reading
Optical Design	Patent Pending Optical Arrangement
Light Source	LED, 4,500K
Measuring Time	2.5 minutes
Calibration	Vision Calibration with Standard
Display	10.1" Projective Capacitance Touch (Multi Touch)
Interface	Ethernet x2, USB 3.0 x1, USB 2.0 x4, HDMI, VGA, USB Printer, USB Mouse and Keyboard
Memory / Storage	64 GB SSD Storage
Temperature Range	10° to 35° C
Humidity	Up to 85% Non Condensing
Power	Auto-switching 90 ~ 264VAC, 47 ~ 63Hz, 280 Watt Power Supply
Space Requirements	80 mm (3") on Sides and Back
Dimension	350x300x270mm (14x12x11")
Gross Dimensions & Weight	Weight 10 Kg. (22 lbs.) ; 400x350x530mm, 15 Kg. (15x14x21" 33lbs.)

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

## Accessories

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

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Silver test coupon for D7671, IP227, ea.

Polishing VISE – Holds 6 Strips

D7671 Cradle, PTFE, Silver Strip Holder, Procedure A.

Test Tubes, 25-mm x 150-mm, Dozen

Viewing Test Tube, Each

Silicon Carbide Sheets, 240-Grit, 50 Pack

Silicon Carbide Grains/Powder, 150 mesh, 450 grams

CuDDI/AgDDI calibration standard. Used as daily QC/Validation and calibration of camera & motor position. Supplied in storage case with certificate valid for one year.

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

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Test Pressure Vessels

Replacement NFX Handle (Integrated Motor)

Replacement Glass Overlay – VISAYA

Replacement Power Board – Universal Input

Replacement Z-Drive – Supplied with Camera Mount

# 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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