

API Gravity – Petroleum – Digital Density Meter Application Note

Digital Density Meter Application Report; Petroleum Industry Research Analytical DDM 2911

Introduction:

Understanding API Gravity – Crude oil is an indispensable starting material for all types of products and characterization of these products is most complex and often impractical. Therefore, the measurement of vapor pressure, and viscosity have become standard chemical analysis procedures in nearly all petroleum applications. Density has become one of the most important and frequently used physical properties used within the

Measure API Gravity

The API Gravity (American Petroleum Institute) is a value which is supposed to make it easier to compare the densities of different petroleum liquids. The determination of API Gravity is done in an exact manner as prescribed and detailed in [ASTM D-1250](#).



In the United States, API Gravities are usually determined at 60 °F whereas in Europe and other parts of the world it is more common to use 15 °C and/or 20 °C. The DDM 2911 Automatic Density Meter may be configured to measure at these temperatures and make the required measurement. However, for the more viscous hydrocarbons,

elevated temperature and this value is then used to mathematically correct back to the proper API Gravity. This mathematic calculation is done using Volume Correction Factors (VCF). Each different type of petroleum

The historical method for the measurement of API Gravity has been the hydrometer. However, the low viscosity crude oils increase make this method obsolete. Additionally, the large sample volume required, the large size of the hydrometer column, and the need for a dozen or more different hydrometers to cover the entire range is completely impractical in today's petroleum laboratories.

Rudolph Research Analytical DDM 2911 Automatic Digital Density Meter

The DDM 2911 Density Meter provides the fastest, most accurate, and easiest means for the measurement of density that is built-into the DDM 2911 makes the use of external tables unnecessary. The measurement result is displayed on a color screen and the results may be saved locally or saved to your server. Results can also be printed. Further, the printouts may be customized and used as your certificates of analysis. Numerous and simple examples include, the API Gravity at 60 °F, 15 °C and 20 °C along with the results at these same temperatures for a sample determined in one simple and fast measurement.

Multiple measurements made on the same sample can also be made automatically and the statistical results are calculated. The sample size is small; typically 1 to 2 ml is all that is required. The subsequent cleaning of the sample is simple using a solvent. The DDM 2911 Density Meter is robust and requires very little maintenance. All wetted parts are compatible with the chemicals and solvents used in this industry. Measurements are fast, normally requiring 2 to 3 minutes.

The simple operation makes it easy to train lab personnel in its use. The DDM 2911 operates in a familiar manner. Navigation through the various menus is intuitive and easy to do without the need for studying the manual. The DDM 2911 has 2GB memory! The availability of having 3 USB ports and a Cat 5 cable connection will become a necessity of peripherals as needed for an efficient and up to date laboratory.

The most common source of error in measurements using digital density meters has been made easy to avoid with the DDM 2911. Rudolph Research Analytical exclusive VideoView™ ensures that your sample is bubble free. Results are clear. Bubbles can now even be seen in dark and cloudy samples.

Certified liquid density standards come with each DDM 2911 making it easy to validate the accuracy of the meter. The DDM 2911 is developed and customized to meet the specific requirements of your laboratory.

Rudolph Research Analytical's optional auto-sampler, the ASX 1400, may be utilized with any of our Density Meters. The ASX 1400 provides cleaning, and drying of up to 240 samples per run. Our pressurized filling method ensures that light ends are not lost. No spills happen with auto-samplers using a suction mode.

ASTM & DIN – Industry Standards:

ASTM D4052 – Standard Test Method for Density and Relative Density of Liquids by Digital Density Me
ASTM D5002 – Standard Test Method for Density and Relative Density of Crude Oils by Digital Density
ASTM D1250 – Standard Guide for Petroleum Measurement Tables
ASTM D5931 – Density and Relative Density of Engine Coolant Concentrates and Aqueous Engine Co
DIN 51 757 – Testing of Mineral Oils and Related Materials; Determination of Density
DIN ISO EN 12185 – Petroleum Products – Determination of Density – Digital Density Meter Method

Tags: [API Gravity](#), [ASTMD1250](#), [ASTMD4052](#), [ASTMD5002](#), [ASTMD5931](#), [Automatic](#), [benchtop](#), [Density Meter](#), [density-m](#)
[12185](#), [measure API Gravity](#), [oil](#), [petro chemicals](#), [petroleum](#)

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