

AUTOMATIC AND PORTABLE DISTILLATION FOLLOWING D86 PRINCIPLE



**GRABNER
INSTRUMENTS™**

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MINIDIS

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AUTOMATIC AND FAST MINI-D86 DISTILLATION

- Excellent correlation to ASTM D86, ISO 3405 and IP 123 (groups 0 to 4), ASTM D850 and ASTM D1078
- True atmospheric distillation
- Dry point detection
- Fully automated and easy to use stand-alone analyzer
- Automatic temperature controlled sample introduction system
 - Measuring sample volume of only 6 mL
 - Disposable metal sample cups
 - Optional built-in balance for an accurate residual determination
 - 20 different pre-installed programs for each group (0 to 4)
- Laboratory and field applications for gasoline, naphthas, diesel fuel, kerosene, jet fuel, solvents and similar petroleum products



True portability for all applications

The easy to use and stand alone design of the MINIDIS proves to be ideal for the measurement of standard atmospheric distillation characteristics of gasoline, diesel and jet fuel with excellent correlation to ASTM D86 (groups 0-4). MINIDIS features true portability, a rugged metal housing and optional 12V vehicle battery operation, making it the perfect solution for applications where standard laboratory instrumentation is not readily available - like measurements in the field or mobile laboratories.

Technical Data

Test temperature:	0 - 400 °C (32 - 752 °F)
Temperature resolution:	+/- 0.1 °C (0.18 °F)
Measuring sample volume:	6 mL
Rinsing sample volume:	9 mL
Measuring time (gasoline):	15 minutes
Power supply:	100/120/230/240 V, 50/60 Hz, 150 W
W x H x D:	200 x 320 x 220 mm (7.8" x 12.6" x 8.7")
Weight:	13 Kg (38.7 lbs)

True atmospheric distillation in a safe and portable design

■ Revolutionizing ASTM D86 testing

The new mini-D86 distillation analyzer MINIDIS is revolutionizing ASTM D86 testing. It is a true atmospheric distillation analyzer with extremely small size. Automation significantly improves the repeatability and reproducibility to achieve highly precise results. The MINIDIS offers detailed ASTM D86 compliant reports and prints and/or transmits results via a serial PC link.

■ Full automation for highest productivity

MINIDIS performs a complete distillation run and test report in 15 minutes using only 6 mL of sample. Automatic operation means simply placing the filling tube into the sample and pressing "RUN". No special programming of test conditions or prior distillation test knowledge is required. With automatic sample introduction, a pre-programmed rinsing cycle and the use of disposable sample cups, any test preparation or manual cleaning of glass parts is avoided.

■ Dry Point Detection & Driveability Index

The heating element is equipped with a built-in thermocouple that constantly monitors the temperature at the bottom of the sample cup. The Dry Point is the temperature reading at the instant, when all liquid has evaporated and a sudden rise in temperature of the cup occurs. The Driveability Index is calculated from the distillation curve (T10, T50 and T90).

■ Improved safety

Laboratory fires due to standard ASTM D86 instrumentation are all too common. In most cases this is due to a broken glass flask filled with the highly flammable liquid above the heating element. MINIDIS uses unbreakable, disposable low-cost metal sample cups (6mL) rather than expensive glass flasks (100 mL). Furthermore, the entire system is made of metal and is continuously closed (automatic pressure leak check) to avoid the escape of flammable liquids. All these features significantly improve the safety of the mini-D86 distillation analyzer compared to standard D86 testers, as a fire outbreak is impossible.



■ Optional built-in balance for exact residual determination

Due to the small sample volume, the residual is determined by gravimetry, using a standard density for each group. The compact built-in balance is the ideal solution for all kinds of applications, where space is limited (eg. in mobile laboratories). It allows to accurately determine the residual in the test cup after the measurement and includes the readings in the report without further operator intervention.

■ Fast & easy automatic cleaning

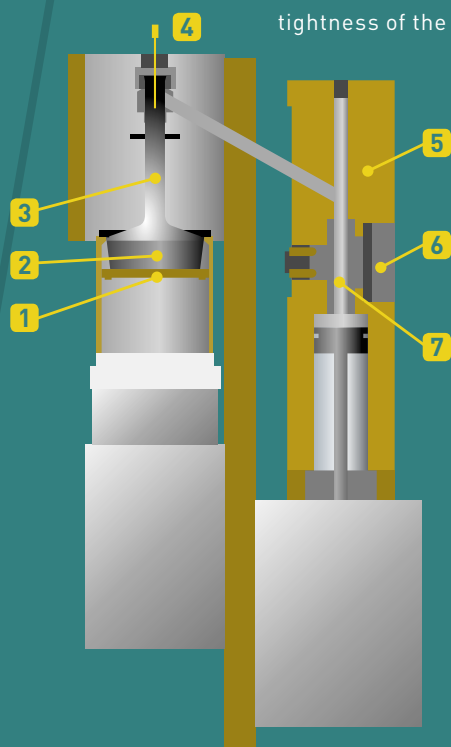
Only 9 mL of sample are used to rinse the receiver cell for the volume measurement and the internal tubings, which connect the filling system with the condenser chamber/receiver cell and the distillation column. After a pre-defined number of distillations, the MINIDIS prompts the operator to start an automatic cleaning cycle. Cleaning is performed by an automatic acetone distillation cycle, which effectively cleans the entire system (tubings, distillation column, condenser tube and receiver cell) from any previous sample deposits within minutes.

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■ MEASURING PRINCIPLE

A disposable sample cup (2) is filled with anti bumping granules to avoid a boil-up effect of the sample. The cup is placed into the cup holder that contains the heating element (1). Finally the filling tube of the MINIDIS is placed into the sample and the RUN button is pressed.

The cup is automatically lifted and pressed against the stainless steel distillation column (3). By moving down the piston of the receiving system, a vacuum is generated and monitored for a few seconds to verify the precise positioning and tightness of the sample cup, ensuring no escape of flammable



vapors. A 6 mL sample is transferred from the temperature controlled filling system to the sample cup (2) and heated with the low mass electric heating element (1).

The temperature of the released vapor is measured with a NiCr/Ni thermocouple (4). Vapor passes through a condenser tube into a thermostated chamber (5), whose temperature is controlled by a Peltier element.

The vapor condenses and the volume of the condensate is monitored using a combination of a stationary optical meniscus detector (6) and a receiver cell (7), whose volume can be changed by a piston driven by the high precision stepper motor.

Once the final boiling point is reached, the sample cup is cooled down to a safe temperature, then removed and weighed using the optional built-in balance or any other analytical balance in the lab. Residue is determined from the weight difference before and after the distillation.