

## **The Application:**

The thermal requirements on motor oils in particular have risen considerably over the last few years. This consequently means that the testing of these motor oils and lubricants has nowadays become more important for reasons of quality control and operating safety.

Evaporation losses at high temperatures generally lead to an increase in the oil consumption and additionally cause a detrimental change in the lubrication properties of the oils.

## **The Test Method**

The test method is standardized in DIN 51581, CEC L-40-A-93 and ASTM D 5800. The oil sample is heated in a testing device, the evaporation crucible, and subsequently retained at the testing temperature for exactly 60 minutes. Whilst the testing temperatures can generally be as high as 400°C, motor oils are usually tested at 250°C ±0.5°C.

A constant flow of air, brought about by a differential pressure, extracts the resultant oil vapours. The airflow can be accurately regulated by means of a fine-adjustment valve and read-off using an inclined manometer. Or it can be automatically, and thus more exactly and easily, regulated by the differential pressure controller PPC2. According to CEC specifications, the partial pressure should be equal to 20 mm water column (1.96 mbar).

The evaporation crucible with the oil sample is weighed before and after the heating process. The evaporation loss is then calculated from the resultant weight difference and is expressed in percentage by mass.



## **The Technology**

The temperature control of the evaporation tester VP250 is carried out by a PID microprocessor controller. This control technique results in high level of reproducibility and repeatability of the test results. The limits quoted in DIN 51581, ASTM D5800 and CEC L-40-A-93 or can thus be easily observed with large safety margins.

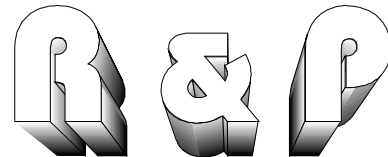
## **The VP250 features:**

- Vacuum pump with oil filter
- Port to document the temperature and pressure course
- microprocessor-controlled temperature control unit
  - ⇒ high control accuracy
  - ⇒ automatic adaptation of the control parameters
- wide temperature range from 150 to 300°C

⇒ also suitable for special lubricants (gear lubricant oil) or high-temperature oil

- PT100 probe calibrated against gauged mercury thermometer with 0.1°C scale
  - ⇒ deviation to real temperature is smaller than 0.5°C
- excess temperature protection
- LCD display for actual temperature / pressure and test time
- automatic test start
  - ⇒ test begin is always carried out at the same conditions
- timer with acoustic signal
  - ⇒ no separate stopwatch required
- faults are displayed acoustically and visually
  - ⇒ no measurement errors
- automatic sensor adjustment;
  - ⇒ no long-term drift

# Evaporation Tester VP250



Materials Testing & Laboratory Equipment

## Technical Specifications VP250

Order Text	Evaporation Tester VP250
Order Nos.	370-0001 370-0002
Mains Connection	230V 110V (selectable)±10% 50/60 Hz, 1300 VA
Heating power	950 VA at 250°C
Pressure range:	up to 21 mmWS
Accuracy:	± 0,2°C / ± 0,02 mmWS
Temperature Range	150.0°C to 300.0°C
Temperature Display	LCD, resolution 0.1°C
Temperature Setting	menue controlled,
Time Displays, Separate Timer	• for test time 60 min. countdown display can be called up
Type of Control	digital PID-control
Control Accuracy	±0.1°C at 250°C
Temperature Sensors	Pt100 (display / control)
Port	TTL
Excess Temperature Protection	independent safety circuit with separate sensor
Warning Signal	acoustic
Alarm Signal	for excess temperature: for faults: acoustic and shown on display
Dimensions, WxHxD	278x316x300 mm
Weight (net/gross)	14 kg / 23 kg
Standard Equipment	vacuum pump; evaporation crucible; tools, test balls, nozzle cleaner; crucible holder, cleaning brush, protective gloves; 300g Wood metal

The VP250 is equipped with

- differential pressure controller to control automatically differential pressure;  
standard set pressure: 20 mm H<sub>2</sub>O; long-term stabilised pressure sensor; tolerance extent ± 1%;
- Vacuum pump with air filter

## Accessories

The following accessories are available:

- documenting unit, for documenting and printing the temperature and pressure curve simultaneously on paper
- glassware set consisting of two 2 litre Woulf bottles with bungs, glass delivery tubes and silicon hoses
- cooling unit for cooling down the evaporation crucible after the test
- stable supporting unit including an inclined tube manometer 0-30 mm H<sub>2</sub>O
  - ⇒ provide correct positioning of glass bottles
  - ⇒ reading and manually controlling of pressure
- two officially gauged thermometers and a thermometer holder
- reference oil for testing the system
- balance, range 2000 g; accuracy 0.01g
- cooling unit for cooling down the evaporation crucible after the test
  - ⇒ increases reproducibility
  - ⇒ provides safe cooling down method as
  - ⇒ awkward splashing of water is thus avoided



## Accessories

## Order No.

Balance, 2000g ±0.01g	370-0041
Glassware Set CEC L-40-A-93	370-1001
Supporting Unit	370-1002
Documenting Unit	371-0010
Thermometer M260	370-1005
40...260°C:1°C, with official test certificate	
Thermometer M410	370-1006
200...400°C:1°C, with official test certificate	
Thermometer Holder	370-1007
Reference Oil RL-172, 1Litre	370-1004
Cooling Unit 230 V	370-0021
Evaporation Crucible	370-1003
Wood Metal	370-1010
Measuring liquid f. inclined manometer	370-1011

