Density and Relative Density (Specific Gravity) of Viscous Materials by Bingham Pycnometer

ASTM D1480 - ASTM D1217

Item	Unit	TV2000
P/N 230V/50-60Hz		**00T0782**
P/N 115V/60Hz		**00T0784**
Range	°C °F	ambient ..230°C (446°F)
Reading		°C or °F (menu selectable)
Interface		RS232
Setting	[°C]	0.01
Stability*±	[°C]	0.01
Uniformity*±	[°C]	0.01
Heating	[kW]	230V: 2.8 / 115V: 1.75
Heaters		2
Bath volume	[L]	20
Cover		1 cover with 3 x ø51 mm
Window	[mm]	140 x 285
Opening bath	[mm]	130 x 165
Depth	[mm]	300
Length	[mm]	350
Width	[mm]	475
Height	[mm]	590
Weight	[kg]	40
Power	[kW]	2.9 max
CE	All models conform to CE regulation	
*Measured in water @40°C		

- **Small footprint**
- **Internal LED light**
- **Ultra-high stability**
- **Bath drain & standard cooling coil**
- **Low power consumption**
- **Small bath volume**
- **Position for four pycnometers**

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General

The ASTM D1480 method covers two procedures for the measurement of the density of materials which are fluid at the desired test temperature. Its application is restricted to liquids of vapor pressures below 80 kPa (600 mm Hg) and viscosities below 40 000 mm²/s (cSt) at the test temperature. The method is designed for use at any temperature between 20°C and 100°C. It can be used at higher temperatures.

For this test method, The liquid sample is introduced into the pycnometer, equilibrated to the desired temperature, and weighed. The density or specific gravity is then calculated from this weight and the previously determined calibration factor, and a correction is applied for the buoyancy of air.

TV2000 visibility bath is specially designed for tests that require ultra-precise temperature control, or processes that need to be followed visually. The TV2000 can also be used for ASTM D1217 to cover the measurement of the density of pure hydrocarbons or petroleum distillates boiling between 90°C and 110°C that can be handled in a normal fashion as a liquid at the specified test temperatures of 20°C and 25°C.

Construction

The stainless steel construction ensures exceptionally stable temperatures which is further improved by an ingenious stirring mechanism with baffle plates. All wetted parts are made of stainless steel and brass, providing resistance against all usual bath fluids. The bath is fitted with adjustable feet for leveling. The cover of the bath has 3 round ø51 mm openings with lids, for suspending Bingham pycnometers in Bingham pycnometer holders. To work at sub-ambient temperatures, use of cooling must be made. Cooling fluid can be pumped through the cooling coil inside the TV2000. The external TLC10-3 can be used for this purpose. The bath is fitted with a double window of which the front pane is detachable for cleaning purposes. The windows are formed with two panes of tempered safety glass separated by 20 mm air space. A bath overflow outlet protects against expanding bath oil when the bath filling is too high.

Accuracy

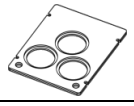
Agitation
A vane type stirrer with maintenance free bearings moves the bath fluid past a special heater then from under the main baffle plate, thus specifically directing the fluid creating an optimal temperature and excellent uniformity.

Span
TV2000 can be operated from ambient +5 up to +230C (..446°F). With the use of the built-in cooling coil, span lies 5°C above the temperature of the cooling liquid.

Safety
The bath conforms to CE-regulation. Further the bath is equipped with a mechanical over temperature device which trips when in case of malfunction the bath exceeds the pre-set maximum temperature. This feature guarantees safe around the clock operation.

Accuracy
The system overall accuracy is within ± 0.01°C*.

Fine adjustment and offset
After the bath temperature has become stable the set point may be more accurately adjusted in the range of – 5.00° to + 5.00°, if necessary.

Apparatus TV2000 consists of:		
P/N	**Picture**	**Description**
00T0782		TV2000 230V/50-60Hz
00T0784		TV2000 115V/60Hz
23T2404		Cover with 3 openings: - 3 x ø51 mm opening - 2 x ø12.5mm opening for thermometer
		3 * lid for ø 51 mm opening

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Accessories and options

Additional necessary accessories for D1480			
P/N	**Picture**	**Quantity**	**Description**
00T0565		1	Cooling circulator TLC15-5 (230V/50Hz)
00T0567			Cooling circulator TLC15-5 (230V/60Hz)
00T0570			Cooling circulator TLC15-5 (115V/60Hz)
12T1075		1	Tubing with connectors and clamps to be used between a TLC and a TV
10T6343		4	10mL Bingham Pycnometer holder for ASTM D1480
31T2025		4	10mL Bingham Pycnometer for ASTM D1480

Optional accessories:		
P/N	**Picture**	**Description**
31T2022		2mL Bingham Pycnometer for ASTM D1480
31T2024		5mL Bingham Pycnometer for ASTM D1480
31T2026		25mL Bingham Pycnometer for ASTM D1480
31T2027		15mL Bingham Pycnometer for ASTM D1480

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Accessories and options

Optional accessories (continued):		
P/N	**Picture**	**Description**
31T2028		20mL Bingham Pycnometer for ASTM D1480
10T6342		Holder Bingham Pycnometer ASTM D1480 2…5 mL
10T6344		Holder Bingham Pycnometer ASTM D1480 15…25 mL
31T2029		25mL Bingham Pycnometer for ASTM D1217
10T6345		Holder Bingham pycnometer ASTM D1217 25 mL

Accessories and options:		
P/N	**Picture**	**Description**
10T6094		TT3B thermometer with external probe, three decimal reading, precision ± 0.01°C, short PT-100 probe with range -40 .. +140°C including a works calibration certificate. (Please see specification sheet "TT3B thermometer")
14T0303		Adapter to insert a TT3B thermometer in the opening of the cover

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