

### Density Measurement of Petroleum Products by Hydrometer Method

ASTM D287 - ASTM D1298 - ASTM D1429 - IP 160 - API 2547 - ASTM D3142 - ASTM D6822 - ISO 3675



- ⊕ **Small footprint**
- ⊕ **Detachable spill tray**
- ⊕ **Easy to drain and clean**
- ⊕ **Stainless steel**
- ⊕ **Hydrometer visible over full length**
- ⊕ **Wide temperature range**

#### General

The ASTM D1298 method covers the laboratory determination using a glass hydrometer of the density, relative density (Specific gravity) or American Petroleum Institute Gravity of crude petroleum and liquid petroleum products. Products must have a Reid vapor pressure of 14.696 psi or less. With our apparatus, tests conform ASTM D3142 are also possible. The apparatus can also be used for the specific gravity of water and brine (ASTM D1429, test method D).

#### Construction

A Tamson TLC15-5 refrigerator circulates a (cold) flow through the double walls of the cylinders. The TLC15-5 maintains the bath temperature within  $\pm 0.25^\circ\text{C}$  of the test temperature required by the method.

The PTFE valves ensure fast drainage and cleaning of the cylinder. The easy detachable spill tray prevents that portions of the sample are spilled on the workbench.

The rack offers full view on the hydrometer. Our special support eliminates the problem of mounting brackets or portions of a thermostatic bath blocking the view to read the hydrometer scale.

Item	Unit	TLC15-5		
		230V /50Hz	230V /60Hz	115V /60Hz
P/N		00T2000	00T2001	00T2002
Reading	$^\circ\text{C}$ or $^\circ\text{F}$	Menu selectable		
Interface		RS232		
Setting	$[\text{C}/\text{F}]$	0.01		
Bath volume	[L]	5		
Opening bath	[mm]	85 x 150 (effective use)		
Depth bath	[mm]	150		
Length	[mm]	420 (460 incl. drain)		
Width	[mm]	265		
Height	[mm]	565		
Weight	[Kg]	30		
Power	[Watt]	1100 (1 Heater)		
Item	Unit	Rack		
Length tripod	[mm]	360 (front to back)		
Width tripod	[mm]	320 (left to right)		
Height tripod	[mm]	800		
Weight tripod	[Kg]	9 (glass cylinders included)		
Ambient temperature	$[\text{C}]$	18 .. 26		
CE		Products conform to CE regulation		

The apparatus contains of three glass cylinders with lids, a rack, and a TLC15-5 circulator. The Tamson D1298 apparatus offers an interesting price advantage compared to other solutions based on a combination of a thermostatic bath and an external chiller.

The apparatus can also be used for ASTM D287, standard test method for API gravity of crude petroleum and petroleum products having a Reid vapour pressure of 26 psi (180 kPa) or less. For this method the gravities are determined at  $60^\circ\text{F}$ . The apparatus can also be used when using a thermo-hydrometer conform to ASTM D6822.

#### Accuracy

The system keeps the sample within  $0.25^\circ\text{C}$  of the test temperature.

#### Fine adjustment and offset

After the temperature has become stable, the set point may be more accurately adjusted in the range of  $-5.00^\circ$  to  $+5.00^\circ$  by programming the offset, if necessary.

### Density Measurement of Petroleum Products by Hydrometer Method

#### Apparatus

##### Ambient condition

For proper cooling performance to stay within the specifications it is preferred that the ambient temperature is within 18°C...23°C.

##### Hydrometers

The precision hydrometers are manufactured conform to BS 718 or DIN 12791.

##### Six positions

One TLC15-5 circulator is able to control the temperature of six double wall cylinders and thus an additional rack can be connected in series. Part number for an additional rack with three cylinders is P/N 00T1260.

**Table 1: D1298 Apparatus P/N 00T2000, 00T2001, 00T2002 consists of:**

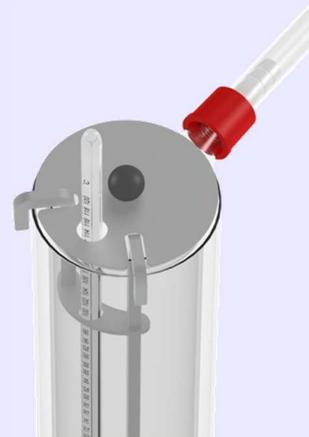
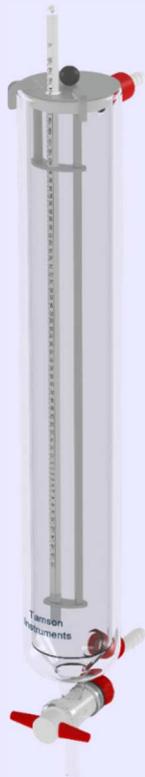
P/N	Picture	Quantity	Description
00T0565		1	TLC15-5 circulator 230V/50Hz
00T0567			TLC15-5 circulator 230V/60Hz
00T0570			TLC15-5 circulator 115V/60Hz
00T1260		1	Complete rack with frame and cylinders
09T0000		3	Jacketed glass hydrometer cylinder with stopper valve.
13T1860		3	Lid for cylinder.
08T0100		3	Silicone tubing 8 x 12 mm per 1 mtr
08T0126		2	T-split polypropylene.
08T0125		2	Y-split polypropylene.

### Density Measurement of Petroleum Products by Hydrometer Method

#### Apparatus

Continued table 1: D1298 Apparatus P/N 00T2000, 00T2001, 00T2002 consists of:			
P/N	Picture	Quantity	Description
08T0121		3	Plastic hose connection straight GL14.
08T0122		3	Plastic hose connection angle GL14.
08T0120		6	Plastic screw cap red with opening GL 14.

# D1298



### Density Measurement of Petroleum Products by Hydrometer Method

Suggested accessories and option

**Table 2: Suggested accessories**

P/N	Picture	Suggested quantity	Description
25T0911BW		3	ASTM S12C thermometer, range from -20 to +102°C with non-hazardous blue filling and works certificate.
25T2153		3	Thermometer holder D1298.

**Table 3: Option**

P/N	Picture	Suggested quantity	Description
00T1260		1	An additional complete rack with frame and cylinders.

# D1298



### Density Measurement of Petroleum Products by Hydrometer Method

#### Hydrometers

#### ASTM D1298

Hydrometer at 15°C, length 270 mm		
Part no.	Description	General info
25T2450	Hydrometer M50 @15°C 0.600-0.650	<p>M 50 series acc. to BS 718/DIN 12791                      Ref. temperature (Tp.): 15 °C                      Measuring span: 0.050 g/cm<sup>3</sup>                      Scale units: 0.001 g/cm<sup>3</sup>                      Total length (L): 270 mm</p> <p><b>Hydrometer is supplied without certificate.</b></p> <p>The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a 'W' should be added to the part number. Prices for both types of certificates are on request.</p> 
25T2451	Hydrometer M50 @15°C 0.650-0.700	
25T2452	Hydrometer M50 @15°C 0.700-0.750	
25T2453	Hydrometer M50 @15°C 0.750-0.800	
25T2454	Hydrometer M50 @15°C 0.800-0.850	
25T2455	Hydrometer M50 @15°C 0.850-0.900	
25T2456	Hydrometer M50 @15°C 0.900-0.950	
25T2457	Hydrometer M50 @15°C 0.950-1.000	
25T2458	Hydrometer M50 @15°C 1.000-1.050	
25T2459	Hydrometer M50 @15°C 1.050-1.100	

#### ASTM D1298

Hydrometer at 15°C, length 335 mm		
Part no.	Description	General info
25T2401	Hydrometer L50 @15°C 0.600-0.650	<p>L 50 series acc. to BS 718/DIN 12791                      Ref. temperature (Tp.): 15 °C                      Measuring span: 0.050 g/cm<sup>3</sup>                      Scale units: 0.0005 g/cm<sup>3</sup>                      Total length (L): 335 mm</p> <p><b>Hydrometer is supplied without certificate.</b></p> <p>The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a 'W' should be added to the part number. Prices for both types of certificates are on request.</p> 
25T2402	Hydrometer L50 @15°C 0.650-0.700	
25T2403	Hydrometer L50 @15°C 0.700-0.750	
25T2404	Hydrometer L50 @15°C 0.750-0.800	
25T2405	Hydrometer L50 @15°C 0.800-0.850	
25T2406	Hydrometer L50 @15°C 0.850-0.900	
25T2407	Hydrometer L50 @15°C 0.900-0.950	
25T2408	Hydrometer L50 @15°C 0.950-1.000	
25T2409	Hydrometer L50 @15°C 1.000-1.050	
25T2410	Hydrometer L50 @15°C 1.050-1.100	

D1298

### Density Measurement of Petroleum Products by Hydrometer Method

#### Hydrometers

#### ASTM D1298

Hydrometer at 20°C, length 335 mm		
Part no.	Description	General info
25T2500	Hydrometer L50 @20°C 0.600-0.650	L 50 series acc. to DIN 12791/BS 718 Ref. temperature (Tp.): 20 °C Measuring span: 0.050 g/cm <sup>3</sup> Scale units: 0.0005 g/cm <sup>3</sup> Total length (L): 335 mm  Hydrometer is supplied without certificate.  The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a 'W' should be added to the part number. Prices for both types of certificates are on request.
25T2501	Hydrometer L50 @20°C 0.650-0.700	
25T2502	Hydrometer L50 @20°C 0.700-0.750	
25T2503	Hydrometer L50 @20°C 0.750-0.800	
25T2504	Hydrometer L50 @20°C 0.800-0.850	
25T2505	Hydrometer L50 @20°C 0.850-0.900	
25T2506	Hydrometer L50 @20°C 0.900-0.950	
25T2507	Hydrometer L50 @20°C 0.950-1.000	
25T2508	Hydrometer L50 @20°C 1.000-1.050	
25T2509	Hydrometer L50 @20°C 1.050-1.100	
25T2510	Hydrometer L50 @20°C 1.100-1.150	
25T2511	Hydrometer L50 @20°C 1.150-1.200	
25T2512	Hydrometer L50 @20°C 1.200-1.250	
25T2513	Hydrometer L50 @20°C 1.250-1.300	
25T2514	Hydrometer L50 @20°C 1.300-1.350	
25T2515	Hydrometer L50 @20°C 1.350-1.400	
25T2516	Hydrometer L50 @20°C 1.400-1.450	
25T2517	Hydrometer L50 @20°C 1.450-1.500	



#### ASTM D1298

Hydrometer at 20°C, length 270 mm		
Part no.	Description	General info
25T2550	Hydrometer M50 @20°C 0.600-0.650	M 50 series acc. to DIN 12791/BS 718 Ref. temperature (Tp.): 20 °C Measuring span: 0.050 g/cm <sup>3</sup> Scale units: 0.001 g/cm <sup>3</sup> Total length (L): 270 mm  Hydrometer is supplied without certificate.  The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a 'W' should be added to the part number. Prices for both types of certificates are on request.
25T2551	Hydrometer M50 @20°C 0.650-0.700	
25T2552	Hydrometer M50 @20°C 0.700-0.750	
25T2553	Hydrometer M50 @20°C 0.750-0.800	
25T2554	Hydrometer M50 @20°C 0.800-0.850	
25T2555	Hydrometer M50 @20°C 0.850-0.900	
25T2556	Hydrometer M50 @20°C 0.900-0.950	
25T2557	Hydrometer M50 @20°C 0.950-1.000	
25T2558	Hydrometer M50 @20°C 1.000-1.050	
25T2559	Hydrometer M50 @20°C 1.050-1.100	



D1298

### Density Measurement of Petroleum Products by Hydrometer Method

#### Hydrometers

#### ASTM D287

API hydrometer at 60°F, length 330 mm			General info
Part no.	Description		
25T3800	API Gravity hydrometer ASTM, 1H-62,	-1+11:0,1°API	<p>API Gravity hydrometer ASTM D287 REF. temperature (Tp.): 60°F Measuring span: API Scale units: 0.1 degrees API Total length (L): 330 mm</p> <p><b>Hydrometer is supplied without certificate.</b></p> <p>The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a 'W' should be added to the part number. Prices for both types of certificates are on request.</p> 
25T3801	API Gravity hydrometer ASTM, 2H-62,	9+21:0,1°API	
25T3802	API Gravity hydrometer ASTM, 3H-62,	19+31:0,1°API	
25T3803	API Gravity hydrometer ASTM, 4H-62,	29+41:0,1°API	
25T3804	API Gravity hydrometer ASTM, 5H-62,	39+51:0,1°API	
25T3805	API Gravity hydrometer ASTM, 6H-62,	49+61:0,1°API	
25T3806	API Gravity hydrometer ASTM, 7H-62,	59+71:0,1°API	
25T3807	API Gravity hydrometer ASTM, 8H-62,	69+81:0,1°API	
25T3808	API Gravity hydrometer ASTM, 9H-62,	79+91:0,1°API	
25T3809	API Gravity hydrometer ASTM, 10H-62,	89+101:0,1°API	

#### ASTM D287

API hydrometer at 60°F, length 163 mm			General info
Part no.	Description		
25T3810	API Gravity hydrometer ASTM, 21H-62,	0+6:0,1°API	<p>API Gravity hydrometer ASTM D287 REF. temperature (Tp.): 60°F Measuring span: API Scale units: 0.1 degrees API Total length (L): 163 mm</p> <p><b>Hydrometer is supplied without certificate.</b></p> <p>The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a 'W' should be added to the part number. Prices for both types of certificates are on request.</p> 
25T3811	API Gravity hydrometer ASTM, 22H-62,	5+11:0,1°API	
25T3812	API Gravity hydrometer ASTM, 23H-62,	10+16:0,1°API	
25T3813	API Gravity hydrometer ASTM, 24H-62,	15+21:0,1°API	
25T3814	API Gravity hydrometer ASTM, 25H-62,	20+26:0,1°API	
25T3815	API Gravity hydrometer ASTM, 26H-62,	25+31:0,1°API	
25T3816	API Gravity hydrometer ASTM, 27H-62,	30+36:0,1°API	
25T3817	API Gravity hydrometer ASTM, 28H-62,	35+41:0,1°API	
25T3818	API Gravity hydrometer ASTM, 29H-62,	40+46:0,1°API	
25T3819	API Gravity hydrometer ASTM, 30H-63,	45+51:0,1°API	
25T3820	API Gravity hydrometer ASTM, 31H-62,	50+56:0,1°API	
25T3821	API Gravity hydrometer ASTM, 32H-62,	55+61:0,1°API	
58T3822	API Gravity hydrometer ASTM, 33H-62,	60+66:0,1°API	
25T3823	API Gravity hydrometer ASTM, 34H-62,	65+71:0,1°API	
25T3824	API Gravity hydrometer ASTM, 35H-62,	70+76:0,1°API	
25T3825	API Gravity hydrometer ASTM, 36H-62,	75+81:0,1°API	
25T3826	API Gravity hydrometer ASTM, 37H-62,	80+86:0,1°API	
25T3827	API Gravity hydrometer ASTM, 38H-62,	85+91:0,1°API	
25T3828	API Gravity hydrometer ASTM, 39H-62,	90+96:0,1°API	
35T3829	API Gravity hydrometer ASTM, 40H-62,	95+101:0,1°API	

### Density Measurement of Petroleum Products by Hydrometer Method

#### Hydrometers

#### ASTM D287

API thermo-hydrometer at 60°F, length 380 mm, with special red or blue filling		
Part no.	Description	General info
25T3830B	API Gravity thermo-hydrometer ASTM, 51H-62, -1+11:0,1°API	API Gravity hydrometer ASTM D287 REF. temperature (Tp.): 60°F Measuring span: API Scale units: 0.1 degrees API Total length (L): 380 mm  <b>Hydrometer is supplied without certificate.</b> The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a "W" should be added to the part number. Prices for both types of certificates are on request.
25T3831B	API Gravity thermo-hydrometer ASTM, 52H-62, 9+21:0,1°API	
25T3832B	API Gravity thermo-hydrometer ASTM, 53H-62, 19+31:0,1°API	
25T3833B	API Gravity thermo-hydrometer ASTM, 54H-62, 29+41:0,1°API	
25T3834B	API Gravity thermo-hydrometer ASTM, 55H-62, 39+51:0,1°API	
25T3835B	API Gravity thermo-hydrometer ASTM, 56H-62, 49+61:0,1°API	
25T3836B	API Gravity thermo-hydrometer ASTM, 57H-62, 59+71:0,1°API	
25T3837B	API Gravity thermo-hydrometer ASTM, 58H-62, 69+81:0,1°API	
25T3838B	API Gravity thermo-hydrometer ASTM, 59H-62, 79+91:0,1°API	
25T3839B	API Gravity thermo-hydrometer ASTM, 60H-62, 89+101:0,1°API	



#### ASTM D6822

Thermo-hydrometer at 15°C, length 380 mm, with special red or blue filling		
Part no.	Description	General info
25T3850B	Density thermo-hydrometer ASTM, 300H-82, 0.600-0.650	Density thermo-hydrometer ASTM D6822 REF. temperature (Tp.): 15°C Measuring span: 0.5kg/m³ Total length (L): 380 mm  <b>Hydrometer is supplied without certificate.</b> The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a "W" should be added to the part number. Prices for both types of certificates are on request.
25T3851B	Density thermo-hydrometer ASTM, 301H-82, 0.650-0.700	
25T3852B	Density thermo-hydrometer ASTM, 302H-82, 0.700-0.750	
25T3853B	Density thermo-hydrometer ASTM, 303H-82, 0.750-0.800	
25T3854B	Density thermo-hydrometer ASTM, 304H-82, 0.800-0.850	
25T3855B	Density thermo-hydrometer ASTM, 305H-82, 0.850-0.900	
25T3856B	Density thermo-hydrometer ASTM, 306H-82, 0.900-0.950	
25T3857B	Density thermo-hydrometer ASTM, 307H-82, 0.950-1.000	
25T3858B	Density thermo-hydrometer ASTM, 308H-82, 1.000-1.050	
25T3859B	Density thermo-hydrometer ASTM, 309H-82, 1.050-1.100	



### Density Measurement of Petroleum Products by Hydrometer Method

#### Hydrometers

ASTM D1429, Test method D

Thermo-hydrometer at 60°F, length 350 mm, with special red or blue filling		
Part no.	Description	General info
25T3880	Density thermo-hydrometer ASTM, 1.000-1.1000	Density thermo-hydrometer ASTM D1429, test method D REF. temperature (Tp.): 60°F Measuring span: 0.5kg/m <sup>3</sup> Thermometer: designation F, 30+90:2°F Total length (L): 350 mm  <b>Hydrometer is supplied without certificate.</b> The hydrometer can also be supplied with an ISO 17025 verification certificate with three test points. Then a "C" should be added to the reference number. A works certificate is also available. Then a 'W' should be added to the part number. Prices for both types of certificates are on request.
25T3881	Density thermo-hydrometer ASTM, 1.100-1.2000	
25T3882	Density thermo-hydrometer ASTM, 1.200-1.3000	



# D1298