

Density Measurement of Petroleum Products by Hydrometer Method

ASTM D287 - ASTM D1298 - IP 160 - API 2547 - ASTM D6822



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

General

This specific method covers following laboratory determinations by hydrometer method:

- Density,
- Relative density (Specific gravity),
- American Petroleum Institute Gravity of:
- Crude petroleum,
- Liquid Petroleum products,

Products must have a Reid vapor pressure of 26 lb or less.

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 tube. The easy detachable leakage 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.

| Item | Unit | TLC15 | | |
|---------------------|--------------------------------------|-----------------------------------|------------|------------|
| Ordering code | | 230V /50Hz | 230V /60Hz | 115V /60Hz |
| | | 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 .. 23 | | |
| CE | | Products conform to CE regulation | | |

The measuring set-up contains three glass cylinders with lids, a support, and a TLC15-5 circulator. Our system offers an interesting price advantage compared to other solutions based on a combination of a thermostatic bath and an external chiller.

This set-up 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°F . The set-up can also be used for the thermo-hydrometer conform ASTM D6822.

Accuracy

The system keeps the sample within 0.25°C of the test temperature.

Fine adjustment and offset

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

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Accessories

Ambient condition




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

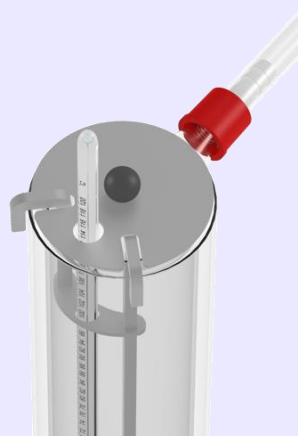
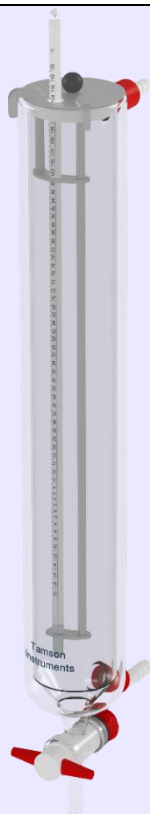
Hydrometers

The precision hydrometers are manufactured conforming 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. Ordering code for an additional rack with three cylinders is P/N 00T1260.









| Part no. | Picture | Description |
|----------|---|--|
| 25T0911 |  | ASTM thermometer (12C), range from -20 to +102°C with certificate of conformity. |
| 25T0911W | | ASTM thermometer (12C), range from -20 to +102°C with works certificate. |
| 25T2153 |  | Thermometer holder D1298. |
| 00T1260 |  | Complete rack with frame and cylinders. |



D1298

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Spareparts


| Part no. | Picture | Description |
|----------|---|---|
| 13T1860 |  | Lid for cylinder. Standard three lids are included in the set-up. |
| 09T0000 |  | Jacketed glass hydrometer cylinder with stopper valve. In total three per D1298 apparatus are included as standard. |
| 08T0100 |  | Silicone tubing 8 x 12 mm per 1 mtr -60.. +180, Approx. 3 mtr per set is needed. |
| 08T0126 |  | T-Split polypropylene. In total two per D1298 apparatus are needed. |
| 08T0125 |  | "Y" split polypropylene. In total two per D1298 apparatus are needed. |
| 08T0121 |  | Plastic hose connection straight GL14. In total three per D1298 apparatus are needed. |
| 08T0122 |  | Plastic hose connection angle GL14. In total three per D1298 apparatus are needed. |
| 08T0120 |  | Plastic screw cap red with opening GL 14. In total six per D1298 apparatus are needed. |




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Hydrometers

ASTM D1298

| Hydrometer calibrated at 15°C, length 270 mm | | |
|--|---------------------------------------|--|
| Part no. | Description | General info |
| 25T2450 | Hydrometer M50 cal @ 15°C 0.600-0.650 | <p>M 50 series acc. to BS 718 Ref. temperature (Tp.): 15 °C Measuring span: 0.050 g/cm³ Scale units: 0.001 g/cm³ Total length (L): 270 mm</p> <p>Hydrometer is supplied without certificate.</p> <p>The hydrometers can also be supplied government verified, with a verification certificate, with 3 test points. Then a "C" should be added to the reference number. Prices are on request.</p>  |
| 25T2451 | Hydrometer M50 cal @ 15°C 0.650-0.700 | |
| 25T2452 | Hydrometer M50 cal @ 15°C 0.700-0.750 | |
| 25T2453 | Hydrometer M50 cal @ 15°C 0.750-0.800 | |
| 25T2454 | Hydrometer M50 cal @ 15°C 0.800-0.850 | |
| 25T2455 | Hydrometer M50 cal @ 15°C 0.850-0.900 | |
| 25T2456 | Hydrometer M50 cal @ 15°C 0.900-0.950 | |
| 25T2457 | Hydrometer M50 cal @ 15°C 0.950-1.000 | |
| 25T2458 | Hydrometer M50 cal @ 15°C 1.000-1.050 | |
| 25T2459 | Hydrometer M50 cal @ 15°C 1.050-1.100 | |


ASTM D1298

| Hydrometer calibrated at 15°C, length 335 mm | | |
|--|---------------------------------------|---|
| Part no. | Description | General info |
| 25T2401 | Hydrometer L50 cal @ 15°C 0.600-0.650 | <p>L 50 series acc. to BS 718 Ref. temperature (Tp.): 15 °C Measuring span: 0.050 g/cm³ Scale units: 0.0005 g/cm³ Total length (L): 335 mm</p> <p>Hydrometer is supplied without certificate.</p> <p>The hydrometers can also be supplied government verified, with a verification certificate, with 3 test points. Then a "C" should be added to the reference number. Prices are on request.</p>  |
| 25T2402 | Hydrometer L50 cal @ 15°C 0.650-0.700 | |
| 25T2403 | Hydrometer L50 cal @ 15°C 0.700-0.750 | |
| 25T2404 | Hydrometer L50 cal @ 15°C 0.750-0.800 | |
| 25T2405 | Hydrometer L50 cal @ 15°C 0.800-0.850 | |
| 25T2406 | Hydrometer L50 cal @ 15°C 0.850-0.900 | |
| 25T2407 | Hydrometer L50 cal @ 15°C 0.900-0.950 | |
| 25T2408 | Hydrometer L50 cal @ 15°C 0.950-1.000 | |
| 25T2409 | Hydrometer L50 cal @ 15°C 1.000-1.050 | |
| 25T2410 | Hydrometer L50 cal @ 15°C 1.050-1.100 | |
| 25T2411 | Hydrometer L50 cal @ 15°C 1.100-1.150 | |
| 25T2412 | Hydrometer L50 cal @ 15°C 1.150-1.200 | |


Density Measurement of Petroleum Products by Hydrometer Method

Hydrometers

ASTM D1298

| Hydrometer calibrated at 20°C, length 335 mm | | |
|--|--------------------------------------|---|
| Part no. | Description | General info |
| 25T2500 | Hydrometer L50 cal @20°C 0.600-0.650 | <p>L 50 series acc. to DIN 12791 Ref. temperature (Tp.): 20 °C Measuring span: 0.050 g/cm³ Scale units: 0.0005 g/cm³ Total length (L): 335 mm</p> <p>Hydrometer is supplied without certificate.</p> <p>The hydrometers can also be supplied government verified, with a verification certificate, with 3 test points. Then a "C" should be added to the reference number. Prices are on request.</p>  |
| 25T2501 | Hydrometer L50 cal @20°C 0.650-0.700 | |
| 25T2502 | Hydrometer L50 cal @20°C 0.700-0.750 | |
| 25T2503 | Hydrometer L50 cal @20°C 0.750-0.800 | |
| 25T2504 | Hydrometer L50 cal @20°C 0.800-0.850 | |
| 25T2505 | Hydrometer L50 cal @20°C 0.850-0.900 | |
| 25T2506 | Hydrometer L50 cal @20°C 0.900-0.950 | |
| 25T2507 | Hydrometer L50 cal @20°C 0.950-1.000 | |
| 25T2508 | Hydrometer L50 cal @20°C 1.000-1.050 | |
| 25T2509 | Hydrometer L50 cal @20°C 1.050-1.100 | |
| 25T2510 | Hydrometer L50 cal @20°C 1.100-1.150 | |
| 25T2511 | Hydrometer L50 cal @20°C 1.150-1.200 | |
| 25T2512 | Hydrometer L50 cal @20°C 1.200-1.250 | |
| 25T2513 | Hydrometer L50 cal @20°C 1.250-1.300 | |
| 25T2514 | Hydrometer L50 cal @20°C 1.300-1.350 | |
| 25T2515 | Hydrometer L50 cal @20°C 1.350-1.400 | |
| 25T2516 | Hydrometer L50 cal @20°C 1.400-1.450 | |
| 25T2517 | Hydrometer L50 cal @20°C 1.450-1.500 | |


ASTM D1298

| Hydrometer calibrated at 20°C, length 270 mm | | |
|--|--------------------------------------|---|
| Part no. | Description | General info |
| 25T2550 | Hydrometer M50 cal @20°C 0.600-0.650 | <p>M 50 series acc. to DIN 12791 Ref. temperature (Tp.): 20 °C Measuring span: 0.050 g/cm³ Scale units: 0.001 g/cm³ Total length (L): 270 mm</p> <p>Hydrometer is supplied without certificate.</p> <p>The hydrometers can also be supplied government verified, with a verification certificate, with 3 test points. Then a "C" should be added to the reference number. Prices are on request.</p>  |
| 25T2551 | Hydrometer M50 cal @20°C 0.650-0.700 | |
| 25T2552 | Hydrometer M50 cal @20°C 0.700-0.750 | |
| 25T2553 | Hydrometer M50 cal @20°C 0.750-0.800 | |
| 25T2554 | Hydrometer M50 cal @20°C 0.800-0.850 | |
| 25T2555 | Hydrometer M50 cal @20°C 0.850-0.900 | |
| 25T2556 | Hydrometer M50 cal @20°C 0.900-0.950 | |
| 25T2557 | Hydrometer M50 cal @20°C 0.950-1.000 | |
| 25T2558 | Hydrometer M50 cal @20°C 1.000-1.050 | |
| 25T2559 | Hydrometer M50 cal @20°C 1.050-1.100 | |


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Hydrometers

ASTM D287

| API hydrometer calibrated 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>Hydrometer is supplied without certificate.</p> <p>The hydrometers can also be supplied government verified, with a verification certificate, with 3 test points. Then a "C" should be added to the reference number. Prices 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 calibrated 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>Hydrometer is supplied without certificate.</p> <p>The hydrometers can also be supplied government verified, with a verification certificate, with 3 test points. Then a "C" should be added to the reference number. Prices 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 | |