

### 3. Analytical measurement and testing Density determination/Density meter

#### 1 LIG-Precision-Hydrometer, Alcoholmeters, with thermometer, calibratable

Measuring range, graduation: 0.1% vol, with thermometer 0 to +30°C, graduation: 0.5°C, calibrated at 20°C.  
Filling: blue. Overall length: 380mm

Type	Measuring range % vol	PK	Cat. No.
1	0 - 10	1	9.236 810
2	10 - 20	1	9.236 811
3	20 - 30	1	9.236 812
4	30 - 40	1	9.236 813
5	40 - 50	1	9.236 814
6	50 - 60	1	9.236 815
7	60 - 70	1	9.236 816
8	70 - 80	1	9.236 817
9	80 - 90	1	9.236 818
10	90 - 100	1	9.236 819

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#### 2 Hydrometers, relative density (S.G.)

Shot poised. Without thermometer. Reference temperature: +20°C.

Length mm	Measuring range g / ml	Sub-divisions g / ml	PK	Cat. No.
280	0.600 - 0.800	0.002	1	9.004 006
280	0.800 - 1.000	0.002	1	9.004 008
280	1.000 - 1.200	0.002	1	9.004 010
280	1.200 - 1.400	0.002	1	9.004 012
280	1.400 - 1.600	0.002	1	9.004 014
280	1.600 - 1.800	0.002	1	9.004 016
300	0.700 - 1.000	0.005	1	9.004 057
300	1.000 - 1.500	0.005	1	9.004 060
300	1.500 - 2.000	0.005	1	9.004 065

Further models available on request.

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#### 3 Hydrometers, Baumé

Baumé type. Shot poised. Without thermometer. Reference temperature: +15°C.

Length mm	Measuring range Bé	Sub-divisions Bé	PK	Cat. No.
260	0 - 5	0.1	1	9.004 305
220	0 - 10	1.0	1	9.004 310
230	0 - 15	1.0	1	9.004 315
230	0 - 20	1.0	1	9.004 320
250	0 - 30	1.0	1	9.004 330
250	0 - 40	1.0	1	9.004 340
280	0 - 50	1.0	1	9.004 350
300	0 - 70	1.0	1	9.004 370

Further models available on request.

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#### 4 Hydrometers, density

DIN 12791 (and BS718). M100 series. Shot poised.  
Without thermometer. Reference temperature: +20 °C.

Length mm	Measuring range g / ml	Sub-divisions g / ml	PK	Cat. No.
250	0.800 - 0.900	0.002	1	9.004 108
250	0.900 - 1.000	0.002	1	9.004 109
250	1.000 - 1.100	0.002	1	9.004 110
250	1.100 - 1.200	0.002	1	9.004 111
250	1.200 - 1.300	0.002	1	9.004 112
250	1.300 - 1.400	0.002	1	9.004 113
250	1.400 - 1.500	0.002	1	9.004 114
250	1.500 - 1.600	0.002	1	9.004 115

Further models available on request.

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## Density determination/Density meter



### 1 Hydrometers, density

Shot poised. Without thermometer. Reference temperature: +20°C.

Length mm	Measuring range g / ml	Sub- divisions g / ml	PK	Cat. No.
160	0,760 - 0,820	0.001	1	9.004 153
160	0,820 - 0,880	0.001	1	9.004 154
160	0,880 - 0,940	0.001	1	9.004 155
160	0,940 - 1,000	0.001	1	9.004 156
160	1,000 - 1,060	0.001	1	9.004 157
160	1,060 - 1,120	0.001	1	9.004 158
160	1,120 - 1,180	0.001	1	9.004 159
160	1,180 - 1,240	0.001	1	9.004 160
160	1,240 - 1,300	0.001	1	9.004 161
160	1,300 - 1,360	0.001	1	9.004 162
160	1,360 - 1,420	0.001	1	9.004 163

Further models available on request.



### 2 ASTM Hydrometers

Precision hydrometers acc. to ASTM E2995-14 for determination of density for mineral oil, with thermometer "mercury free".

Ludwig Schneider

Hydrometer with thermometer, error-limit for density:  $\pm 0.5 \text{ kg/m}^3$ , with thermometer -20 to +65°C in 1°C, blue filling, error-limit  $\pm 1^\circ\text{C}$ . With works calibration on request. With blue, environmental friendly filling of thermometers. Each item packed in plastic tubes for breakage protection.

Length mm	Measuring range kg/m <sup>3</sup>	Reference temperature °C	Scale	PK	Cat. No.
380	600 - 650	15	0,5	1	6.267 132
380	650 - 700	15	0,5	1	6.267 133
380	700 - 750	15	0,5	1	6.267 134
380	750 - 800	15	0,5	1	6.267 135
380	800 - 850	15	0,5	1	6.267 136
380	850 - 900	15	0,5	1	6.267 137
380	900 - 950	15	0,5	1	6.267 138
380	950 - 1000	15	0,5	1	6.267 139
380	1000 - 1050	15	0,5	1	6.267 140
380	1050 - 1100	15	0,5	1	6.267 141
380	775 - 825	15	0,5	1	6.267 142



### 3 Hydrometers, high-quality plastics, PC

Hydrometers made of high-quality plastics (polycarbonate).

Ludwig Schneider

- Breakage protected (no glass breakage)
- Fully made of resistant polycarbonate (PC)
- High transparency (like glass), easy-to-read scales
- High precision and reproducibility
- Suitable for applications in food, pharmaceutical and cosmetic industries as well as many others
- Measuring units: specific gravity, density, Oechsle, % mass, Brix, saturation, ° Baumé, etc.
- Made in Germany
- Works certificate available on request (option)
- Food safety according to HACCP

For	Length mm	Measuring range	Reference temperature °C	Scale	PK	Cat. No.
Density	300	1,000 - 1,220 g/cm <sup>3</sup>	20	0,002 g/cm <sup>3</sup>	1	9.236 840
Density	300	1,200 - 1,420 g/cm <sup>3</sup>	20	0,002 g/cm <sup>3</sup>	1	9.236 841
Density	300	1,400 - 1,620 g/cm <sup>3</sup>	20	0,002 g/cm <sup>3</sup>	1	9.236 842
Salt saturation	300	0 - 100°	20	1°	1	9.236 843
Sodium chloride	300	0 - 26,4 %mas.	20	0,2 %	1	9.236 847
Sugar / Salt	250	0 - 12 °Bé	15	0,2 °Bé	1	9.236 844
Sugar / Salt	250	0 - 12 °Bé	20	0,2 °Bé	1	6.291 763
Sugar / Salt	300	0 - 25 °Bé	15	0,2 °Bé	1	7.658 786
Sugar / Salt	250	9 - 21 °Bé	15	0,2 °Bé	1	9.236 845
Sugar / Salt	250	19 - 31 °Bé	15	0,2 °Bé	1	9.236 846
Sugar / Salt	250	29 - 41 °Bé	15	0,2 °Bé	1	6.273 071
Sugar / Salt	250	49 - 61 °Bé	15	0,2 °Bé	1	7.980 963
Sugar	300	0 - 35 %mas./Brix	20	0,5 %mas.	1	9.236 848
Sugar	300	0 - 50 %mas./Brix	20	0,5 %mas.	1	9.236 849

#### 1 Hydrometer jars, glass

With spout and base.

Diam. mm	Height mm	PK	Cat. No.
38	150	1	9.950 034
38	200	1	9.950 035
50	200	1	9.950 036
50	250	1	9.950 037
50	300	1	9.950 038
63	350	1	9.950 039



#### 2 Pycnometers, BLAUBRAND®, Borosilicate glass 3.3.

DIN ISO 3507, gay-lussac type. Including individual certificate. Adjusted. BRAND  
 Reference temperature 20°C. With NS10/19 capillary stopper. Stopper top ground and polished. Inscription in highly contrasting blue enamel. The volume in cm<sup>3</sup> is specified to a precision of 3 decimal places. Calibrated to contain. Every pycnometer is calibrated with its own stopper; hence, stoppers are not interchangeable. Each bottle and its stopper is marked with a unique matching identification number.

Nom. capacity cm <sup>3</sup>	PK	Cat. No.
5	1	9.277 305
10	1	9.277 310
25	1	9.277 325
50	1	9.277 350
100	1	9.277 400



#### 3 Pycnometers, Borosilicate glass 3.3., incl. DAkkS calibration certificate

BLAUBRAND®. The volume in cm<sup>3</sup> is specified to a precision of 3 decimal places. Every pycnometer is calibrated with its own stopper, hence, stoppers are not interchangeable. Each bottle and its stopper is marked with a unique matching identification number. All BLAUBRAND® density bottles are supplied with one accompanying individual certificate in the original packaging. BRAND

- DIN ISO 3507
- Gay-lussac pattern calibrated
- Calibrated to contain (TC, In)
- Reference temperature 20°C
- With NS10/19 capillary stopper
- Top of stopper ground and polished
- Inscriptions in high contrast blue enamel

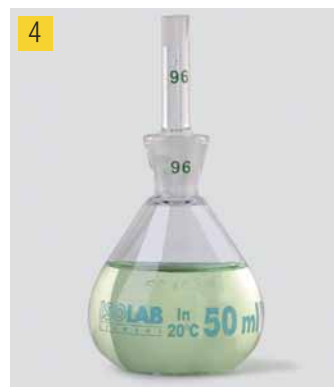
Nom. capacity cm <sup>3</sup>	PK	Cat. No.
5	1	6.238 790
10	1	6.258 623
25	1	6.801 879
50	1	6.073 163
100	1	4.667 799



#### 4 Pycnometers, calibrated, Borosilicate glass 3.3.

ISO 3507. Individually calibrated to contain (In) to 0.001ml. Net volume capacity is engraved on the body. Each bottle is calibrated together with its stopper. In order to differentiate easily, both the body and the stopper have the same code numbers printed on themselves. ISOLAB

Capacity ml	PK	Cat. No.
5	1	4.008 327
10	1	6.241 602
25	1	4.008 328
50	1	6.241 603
100	1	4.008 329



## Density determination/Pycnometer-Density meters

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### 1 Pycnometers

According to ISO 2811, DIN 53 217, ASTM D1475.

Capacity ml	Material	PK	Cat. No.
100	Stainless steel	1	6.223 204
50	Stainless steel	1	6.205 559

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### 2 Pycnometer heads with/without wide-neck bottle

For density determinations (raw density) of bitumen-like materials and mineral materials. Consists of 1000ml wide-neck bottle with conical shoulder and NS joint neck, and pycnometer head. Material: head made of DURAN® tubing, bottle: DURAN®

Lenz

Type	NS	Capacity ml	PK	Cat. No.
Pycnometer head with conical shoulder bottle	45/27	500	1	6.235 849
Pycnometer head with conical shoulder bottle	60/37	1000	1	6.070 510
Pycnometer head without conical shoulder bottle	45/27		1	6.401 224
Pycnometer head without conical shoulder bottle	60/37		1	6.079 436

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4



6.291 652

6.291 653

### Density meters Densito/DensitoPro

Robust density meters for mobile use with easy handling and user guidance. Ideal for rapid and accurate routine measurements in quality assurance, incoming and outgoing goods inspection.

Mettler-Toledo Online

DensitoPro equipped with RFID and barcode reader for rapid and reliable tracing of samples.

- Automatic sampling pump
- Available measurement scales: API, °Baumé, Brix, density, Ethanol, H<sub>2</sub>SO<sub>4</sub>, proof (US and IP), °Plato, specific gravity, user-defined concentration
- Automatic temperature compensation
- Memory for up to 1100 results
- Backlit measuring cell
- Adjustable limits with customisable colours in the display
- Bright display with good readability

#### Specifications

Density range:	0 ... 3 g/cm <sup>3</sup>
Resolution:	0.0001 g/cm <sup>3</sup>
Accuracy:	±0.001 g/cm <sup>3</sup>
Sample temperature range:	0 ... 50 °C
Resolution:	0.1 °C
Accuracy:	±0.2 °C
Sample volume:	2 ml
Memory:	1100 samples
Display:	2.4" colour display, backlit
Interfaces:	USB-A, USB-C
Power supply:	Removable and rechargeable Li-Ion batteries

Type	PK	Cat. No.
Densito	1	6.291 652 <b>3</b>
DensitoPro with RFID and barcode reader	1	6.291 653 <b>4</b>

## 1 Density meters DMA 35

**NEW**  
Anton Paar

1



Portable, digital measuring device for the determination of density, relative density and concentration. DMA 35 EX and DMA 35 EX Petrol are certified according to ATEX for applications in hazardous environments.

- On-site measurements for fast reactions
- Oscillator principle (borosilicate glass oscillator)
- Sample filling via manual filling pump or syringe
- Complete data control through traceability
- Viscosity correction for measurements also on highly viscous samples
- Gesture control for one-handed measurement
- Recognition of results outside the tolerance limit
- Measuring of density, relative density, alcohol concentration, sugar/extraction concentration, API functions, H<sub>2</sub>SO<sub>4</sub> concentration, ten programmable custom-specific measuring units
- Robust case with exchangeable cell
- 3 years warranty

**Scope of supply:** Density meter, filling tube, adapter for syringe filling, syringes, transportation case, rubber protection for measuring cell, 3 x batteries, allen key, instructions.

### Specification

Density range:	0 ... 3 g/cm <sup>3</sup>
Resolution:	0.0001 g/cm <sup>3</sup>
Accuracy:	±0.001 g/cm <sup>3</sup>
Sample temperature range:	0 ... 100 °C
Temperature measurement range:	0 ... 40 °C
Resolution:	0.1 °C
Accuracy:	±0.2 °C
Reproducibility standard deviation (acc. to ISO 5725):	0.0007 g/cm <sup>3</sup>
Sample volume:	2 ml
Data memory:	1024 measurement results, 250 sample IDs, 30 measuring methods
Display:	coloured LCD, self-rotating
Interfaces:	Bluetooth®, RFID
Dimensions (W x D x H):	103 x 245 x 126 mm
Weight:	660 g
Power supply:	3 x Mignon alkaline batteries, 1.5 V LR06 AA
IP code:	IP 54

Type	PK	Cat. No.
DMA 35 Standard	1	6.313 803
DMA 35 EX	1	6.313 804
DMA 35 EX Petrol	1	6.313 805



## 2 Standards for density, kinematic and dynamic viscosity

**NEW**  
Reagecon

2

To calibrate, control or validate all types of viscometers including capillary, flow cup, rotational, falling ball, falling/rising object, stabinger and vibrational viscometers. Tested and certified according to ASTM method D 2162, ASTM method D4052 and ISO 17025 (INAB Ref. 264T).

- Usable for fluids up to 100 °C
- In 500 ml glass bottle



**Warning**

H phrases: H413

Type	Density at 20 °C	Kinematic viscosity at 20 °C	Dynamic viscosity at 20 °C	PK	Cat. No.
N10	0.84	22.00	18.00	1	4.675 405
N100	0.87	320.00	280.00	1	4.675 406
N250	0.84	790.00	660.00	1	4.675 407
N35	0.87	88.00	76.00	1	4.675 408
N75	0.83	210.00	170.00	1	4.675 409
S20	0.84	43.00	36.00	1	4.675 410
S200	0.84	540.00	460.00	1	4.675 411
S60	0.86	160.00	140.00	1	4.675 414

Further products can be found in our online shop.





## Density determination/Density meters

1



### 1 Density meter DMA 501

**NEW**

Anton Paar

Density meter for measuring of chemicals, pharmaceuticals, cosmetics and food. Suitable for samples with difficult properties like paste, inhomogeneous, sedimenting and particulate samples or aerosol sprays.

The DMA 501 contains all relevant concentration tables and formulas for calculating product specific parameters and the results are displayed in the appropriate unit. Automatic filling and measuring with the optional available industrial peristaltic pump possible.

- Camera image of the measuring cell (U-view™) for viewing the correct sample filling, whereby potential filling errors due to inhomogeneous samples, gas bubbles or particles are automatically detected with the FillingCheck™ function
- Splash-proof front
- Fanless temperature control of the sample
- User-defined layouts of the measurement display with result outputs for individual requirements
- Documentation and traceability of data
- Elimination of external influences through the implementation of a standardised sample handling
- Integrated temperature and humidity sensor
- Integrated pressure sensor for adjustment
- Automatic full-range viscosity correction of results
- 3 years warranty

#### Specifications

Density measuring range/Accuracy:	0 ... 3 g/cm <sup>3</sup> /0.001 g/cm <sup>3</sup>
Reproducibility standard deviation (acc. to ISO 5725):	0.0004 g/cm <sup>3</sup>
Minimal sample volume:	approx. 1 ml
Temperature range/Accuracy:	15 ... 40 °C/0.3 °C
Display:	7 inches, TFT WVGA (800 x 480 Px), PCAP touchscreen
Interfaces:	1 x Ethernet, 3 x USB, 1 x RS-232
Dimensions (W x D x H):	265 x 375 x 180 mm
Weight:	13.5 kg
Power supply:	100 .. 240 V, 47/63 Hz, 24 V, 3 A

Type	PK	Cat. No.
DMA 501	1	6.313 796

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### Accessories for Density meters DMA 501

**NEW**

Anton Paar

Description	PK	Cat. No.
Peristaltic pump	1	6.313 797 <b>2</b>
Peristaltic pump highly resistant	1	6.313 798
Calibration according to ISO 17025	1	6.313 799

6.313 797



### 1 Density meter DS7700/DS7800 sets

Each set contains all necessary accessories from tube sets to nozzles and adapters to a splash guard for the manual sample supply. The devices are suitable for almost all liquids, emulsions, pastes, etc. thanks to the chemical-resistant sample-contacting parts made of borosilicate glass and PTFE. Depending on the set, samples are fed manually via syringe, semi-automatically via peristaltic pump or fully automatically via autosampler.

A.KRÜSS Optronic



**Set 1:** Low sample volume, samples of any degree of viscosity, semi-automatic drying, small Tygon tube set

**Set 2:** Low sample volume, samples of any degree of viscosity, aggressive samples, splash protection for addition of aggressive samples, tube sets suitable for every type of samples, semi-automatic drying, small Tygon and PTFE tube set

**Set 3:** Moderate to high sample volume, low to slightly viscous samples, semi-automatic sample feeding and cleaning, semi-automatic drying, large Tygon tube set

**Set 4:** High sample volume, low-viscous to slightly viscous samples, fully automatic sample supply and cleaning, fully automatic drying (no interchange of tubes required), large Tygon tube set

**Set 5:** High sample volume, low-viscous to slightly viscous samples, tube sets suitable for any kind of sample, fully automatic sample supply and cleaning, fully automatic drying (no interchange of tubes required), large PTFE tube set

**Scope of supply:** Density meter with drying unit, waste container, operating instructions, test report, set-dependent tube set, set-dependent peripheral devices

#### Specifications

Measuring range:	0 ... 3 g/cm <sup>3</sup>
Sample volume by manual injection:	0.9 ml
Temperature range/Accuracy:	10 ... 40 °C/±0.02 °C
Measurement time approx:	1 s
Ambient temperature:	10 ... 40 °C
Housing:	aluminium, powder-coated
Display:	5.7"-TFT-Touchscreen, 640 x 480 Pixel
Interfaces:	1x USB, 1x RS-232, 1x Ethernet
Power supply:	100 ... 240 V, 47/63 Hz
Power consumption (measuring mode):	25 W
Power consumption (max.):	120 W
Methods:	practically unlimited number of methods adjustable
Dimensions (W x D x H):	220 x 220 x 430 mm
Weight:	5.3 kg

Type	PK	Cat. No.
DS7700-1	1	6.285 221
DS7700-2	1	6.285 222
DS7700-3	1	6.285 223
DS7700-4	1	6.311 902
DS7700-5	1	6.313 081
DS7800-1	1	6.285 224
DS7800-2	1	6.285 225
DS7800-3	1	6.285 226
DS7800-4	1	7.911 133
DS7800-5	1	6.311 903

### 2 Combined density and refractometry index standards

For density and refractometer calibration in one step. Bottles can directly be used in SC1 and SC30 automation units. Coded with barcodes for fully automatic verification procedure in METTLER-TOLEDO LiQC systems.

Mettler-Toledo Online



**Danger**

H phrases: H304|EUH066



Type	Refractive Index at 20 °C	Density at 20 °C g/cm <sup>3</sup>	PK	Cat. No.
Water	1.333	0.998	1	6.241 945
Dodecane	1.422	0.749	1	6.256 339

Further products can be found in our online shop.