

Density- & Refractometers



Density- & Refractometers

Portable Instruments

Bench Top Instruments

Automation and Accessories

Compact on Site

Reliable in the Laboratory

Efficient in the Network



Quality Control Tailored to Your Needs
From Mobile to Multi-Parameter

METTLER TOLEDO

Measure Anywhere Just Like in the Laboratory

Despite their compact size, the portable density meters and refractometers offer the features you would expect from a bench-top instrument: A wide array of configuration possibilities for perfect adaptation to your application, a minimum of keystrokes required to execute measurements and even the possibility to transfer the measured data to a printer or personal computer.

The PortableLab™ Open the Lid and You Open the Lab



Densito and Refracto are delivered in practical carrying cases which contain everything needed to do the measurements. Our portable instruments offer all the features required for successful on-site measurements:

- Automatic temperature compensation
- Direct display of the result in the desired unit
- Data capture via printer or PC – LabX® direct is included in the standard delivery
- Built-in clock for full GLP compliance

Case shown with both Densito and Refracto



Refracto 30PX/30GS Reliable Refractive Index

Refracto is quick and error free – just place a few drops of sample on to the cell or immerse the cell into the sample, push the button and in seconds you receive a refractive index reading with temperature displayed digitally. The 30GS boasts a wider measuring range and quicker temperature response than the 30PX.



Quick-Brix 60/90 Compact and rugged

Be it in the vineyard, near the production line or in the goods reception:
The **Quick-Brix™** refractometers are splash proof, fit into any coat pocket and are thus ideal tools for quick quality control checks wherever you need to perform them.



Densito 30PX The Hand-Held Density Pro

Densito is easy to use – simply immerse the sampling tube into the product and pull the trigger. It performs automatic temperature compensation and provides results in seconds – in units chosen by you.

Density and Refractive Index Simultaneously or One at a Time

The days of manual determinations with pycnometers, hydrometers and optical Abbe refractometers belong to the past. METTLER TOLEDO's digital instruments determine density and refractive index simply, with great accuracy and, depending on the instrument, even simultaneously.

RE Refractometers nD, Brix and Concentrations

Place the sample in the cell and press the button – you no longer need to rely on error-prone readings of dark/bright transitions when doing refractive index measurements with the RE.



RE40D / RE50 Refractometer



Commonalities Density Meters, Refractometers and Combined Meters

- Built-in Peltier thermostat
- Two operator levels prevent unauthorized modifications of measuring methods and instrument settings
- Bar code reader for instant input of user name and sample identification

DE Density Meters Density and Related Values – Quick and Easy

The DE density meters allow rapid density determinations of liquid samples and display the results directly as density, specific gravity or in other units such as Brix and API degrees. The DA-100M density meter is a compact three-decimal place density meter, equipped with a Peltier thermostat and an air pump to dry the measuring cell.



DE40 / DE45 DeltaRange / DE51 density meter

DR Combined Meter Two Instruments in One

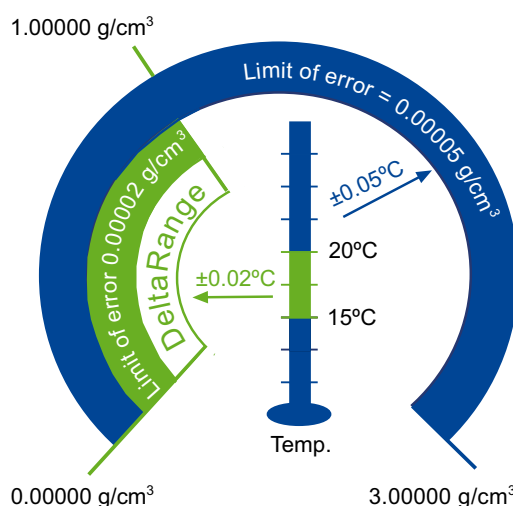
Simultaneous determination of density and refractive index: measuring both values with a DR combined meter increases speed, simplifies procedures and enhances the accuracy of results.



DR40 / DR45 DeltaRange combined meter

DeltaRange™ Measuring Cells

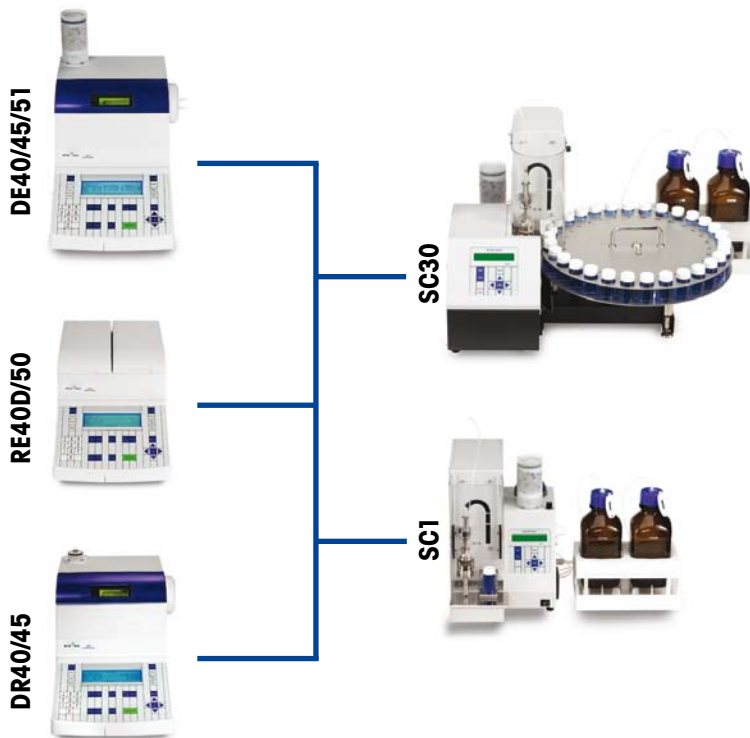
For density determinations five decimal place measuring accuracy is not usually needed over the entire measuring range, as most samples which must be measured with such high accuracy (organic solvents and alcohol/water mixtures) have a density lower than 1 g/cm^3 . With the new DeltaRange™ measuring cells, METTLER TOLEDO now offers a tailor-made solution for such applications – at best value prices!



Automation

Highly Reliable with Minimal Effort

High resolution instruments alone do not guarantee accurate measurements because the results can still be influenced by the operator or by sample-related effects. Automation is thus not only the best guarantee for a high sample throughput and fast payback, it also helps to prevent measurement errors.



SC1 and SC30 Less Work, Greater Certainty

The SC1 and SC30 sample delivery and cleaning units reduce the work involved in the determination of density and refractive index and enable the measuring instrument to automatically detect the most frequent sources of error in density and refractive index measurements.

Benefits:

- More reliable results.
- Completely automatic measuring cycle.
- Only small sample volume required (3 mL for DE/RE, 6 mL for DR).
- Automatic sample recovery.
- Suitable for highly viscous or sticky samples.

Heating Options Even for Samples Which Are Solid at Ambient Temperature

In cases where the samples are solid at ambient temperature, the SC1 and SC30 can be equipped with a heating unit to allow density testing to be performed.

For maximum performance, the SC1 and SC30 can be fitted with a Power Purge Unit (PPU). This external pump ensures shortest cycle times, as it considerably reduces the time required for rinsing and purging.



LiQC Systems Smooth Automation in Multi-Parameter Analyses



LabX direct density and refractometry

PC software designed to provide users with easy data transfer to a personal computer: LabX direct supports the download of the entire results data memory of the Refracto and Densito portable meters, and captures results of measurements, adjustments and instrument performance checks obtained with DE, RE and DR bench top instruments. The data can directly be dumped into any Windows® application such as Microsoft Excel® and also be stored as ASCII text files.

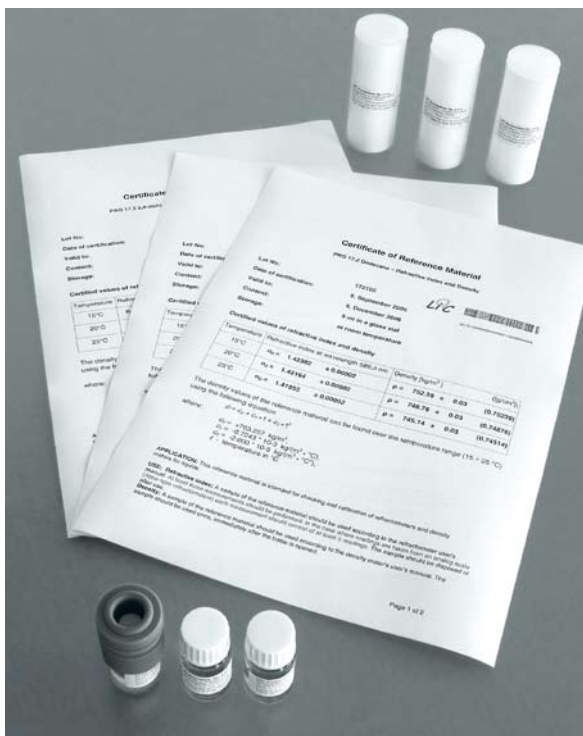
LiQC revolutionizes quality control checks of liquid samples by its smooth and seamless approach to automation: It increases productivity and data security, as it automatically eliminates non trustworthy measuring results, automatically checks whether results are within tolerances and allows simple integration into any laboratory Information and Management System. LiQC is available in two versions:

LiQC Standard enables your personal computer to act as a powerful remote control and data logging system for automated measuring systems based on a DE Density Meter, an RE Refractometer or a DR Combined Meter. LiQC Standard comes with a fingerprint reader for biometric user identification. This patented technology eliminates cumbersome user name and password systems and increases data and system security.

LiQC Multi Device allows the additional connection of a METTLER TOLEDO SevenEasy™ pH or conductivity meter and/or a color measuring instrument. LiQC Multi-Device makes it even possible to combine a DE Density Meter and an RE Refractometer in one automated measuring system. Furthermore, complete barcode functionality facilitates automatic sample data entry and product based method selection. The SC30 sample changer can even be fitted with an SC30BC barcode scanner which scans sample information directly from barcode labels on the sample vials – fully automatic!

Traceable Standards For Improved Data Security

The new combined liquid standard reference materials from METTLER TOLEDO reduce uncertainty, eliminate time-consuming and error-prone sample transfer and facilitate fully automatic performance verification.



No manual handling – No errors due to contamination

The combined standard reference material comes in vials suitable to be used directly on the SC1 and SC30 automation units – no syringe required. This not only reduces effort but also eliminates errors due to contamination.

Two parameters in one – Fewer standard reference materials required

The four new combined standard reference substances are certified for density value and refractive index at three different temperatures. They can therefore be used to certify or verify both, density and refractive index instruments. Users of DR Combined Meters benefit greatly as they can verify the two measuring cells in one simple step.

Barcode certificates – Simple and effective verification procedure

All the information contained in the certificates of the combined standard reference material is coded in one single barcode. Users of LiQC systems simply scan this barcode and let the system perform the subsequent processes – no need to input data manually!

Standard Reference Material	Density [g/cm ³] at 20°C	Uncertainty ¹⁾ [g/cm ³]	Refractive Index nD at 20°C	Uncertainty ¹⁾ nD	Certified at [°C]	Quantity	Part No.
Water	0.998..	0.00003	1.333..	0.00002	15, 20, 25	9 mL	51338010
Dodecane	0.749..	0.00003	1.422..	0.00002	15, 20, 25	9 mL	51338012
2,4-dichlorotoluene	1.250..	0.00003	1.546..	0.00002	15, 20, 25	9 mL	51338013
1-bromonaphthalene	1.481..	0.00003	1.658..	0.00002	15, 20, 25	9 ml	51338014
Water	0.998..	0.00003	-	-	20	2 x 10 mL	51338011
Water	0.998..	0.001	-	-	20	10 x 3 mL	51325005

¹⁾ Typical values. May change from lot to lot without prior notice.

Accessories



Printer, barcode reader and software for DE/RE/DR

	Part No.
RS-P42 dot matrix printer	00229265
Cable for RS-P42 dot matrix printer and connection to PC (DE/RE/DR)	51190362
Heron-G D130 Barcode Reader (also suitable for LiQC Multi Device)	21901297
Cable for Heron-G D130 Barcode Reader	21901340
LabX direct density and refractometry software	51324103

LiQC System for DE / RE and DR

LiQC Standard (Software, fingerprint reader)	51327317
LiQC MultiDevice (Software, Fingerprint reader, LiQC Device Controller, connecting cables)	51327315
SB30BC Barcode Reader for automatic operation with SC30	51327316
SevenEasy™ S20 pH Meter	51302803
pH Flowthrough cell (complete, inc. pH electrode, cables and tubing)	51327305
pH Electrode (replacement)	59902917
SevenEasy™ Conductivity Meter	51302805
Conductivity connection kit (complete, incl. probe, cables and tubing)	51327404
Connection kit for Lovibond colorimeter (complete, incl. flow cuvette, cables and tubing)	51327406

Accessories for DA-100M density meter

Automatic sampling unit ASU-100	51321400
RS-P42 dot matrix printer	00229265
Cable for RS-P42 printer (DA-100M)	51328094

Accessories for DE40/45/51 density meters

Protective cover (3 pcs)	51107667
Purge pump (required if used without PSU-DE, SC1 or SC30)	51321502
PSU-DE sampling pump (to be installed in the instrument) suitable for low viscous samples only	51321700

Accessories for RE40D/RE50 refractometers

Protective cover (3 pcs)	51107667
Vapor proof lid (for volatile samples)	51322114

Accessories for SC1/SC30 sample delivery and cleaning units

PPU Power Purge Unit (for faster cleaning and drying of measuring cells)	51327365
SC-RE connection kit (required for connection of RE refractometers)	51322068
Sampling needle made of Hastelloy C22 (for highly aggressive samples)	51327323
Electrical heating for SC1 (suitable for DE only)	51326301
Electrical heating for SC30 (suitable for DE only)	51327300
Sample vials 20 mL (148 pcs, vials only)	51322310
Screw caps with seal (148 pcs)	51322319
Sample vials 9 mL (1860 pcs)	51322312
Sample vials 6 mL (1860 pcs)	51322313
Adapters for small sample vials (30 pcs) ¹⁾	51322304
Seals for small sample vials (2000 pcs) ¹⁾	51322305
Screw caps for small sample vials (3500 pcs)	51322306

¹⁾ required for 6 mL and 9 mL sample vials

Mobile – Multi-Parameter

	Quick-Brix™ 60	Quick-Brix™ 90	Refracto 30PX	Refracto 30GS	RE40D	RE50
Description	Portable Brixmeter	Portable Brixmeter	Portable Refractometer	Portable Refractometer	Refractometer	Refractometer
Technical Data						
Measuring range Density [g/cm ³]	-	-	-	-	-	-
Limit of error density [g/cm ³]	-	-	-	-	-	-
Viscosity correction (Density)	-	-	-	-	-	-
Measuring range refractive index nD	-	-	1.3200 ... 1.5000	1.3200 ... 1.6500	1.3200 ... 1.7000	1.3200 ... 1.5800
Limit of error refractive index nD	-	-	0.0005	0.0005	0.0001	0.00005 (1.32 ... 1.40) 0.00010 (1.40 ... 1.58)
Measuring range Brix [%] (based on nD)	0.0 ... 60.0	0.0 ... 90.0	0.0 ... 85.0	0.0 ... 100.0	0.00 ... 100.00	0.00 ... 100.00
Limit of error Brix [%] (based on nD)	0.2	0.1	0.2	0.2	0.10	0.03
Built-in thermostat	-	-	-	-	Peltier	Peltier
Temperature range [°C] (Measuring temperature)	10 ... 70	10 ... 70	10.0 ... 40.0	10.0 ... 40.0	15.0 ... 70.0	15.00 ... 50.00
Limit of error temperature [°C]	0.5	0.5	0.5	0.5	0.1	0.03
Temperature compensation	yes	yes	yes	yes	yes	yes
Typical measuring time [s]	5	5	5	5	15	15
Measuring methods	1	1	1	1	9 + 1 (for adjustment)	
Official methods (based on official tables)	Brix	Brix	Brix, HFCS42, HFCS55 Wine: Oechsle, TA, KMW (babo), °Baumé		Brix	Brix, HFCS42, HFCS55
Built-in applications	-	-	Concentration and freezing point: Alcohol, NaCl, eth. glycol, prop. glycol Concentration: IPA, user defined unit (formula)		Can be input as concentration tables	
User-defined concentration tables	-	-	-	-	9	9
Password protection	-	-	-	-	yes	yes
Automatic error detection	-	-	-	-	yes (SC1 or SC30 required)	
Memory card	-	-	-	-	-	yes
Connections						
Printer	-	-	yes (IrDA/RS232 adapter required)		yes	yes
Barcode reader	-	-	-	-	yes	yes
Computer	-	-	yes (IrDA/RS232 adapter required)		yes	yes
Automation units	-	-	-	-	SC1, SC30	SC1, SC30
PC Software						
	-	-	LabX direct PortableCapt (EXCEL macro)		LabX direct LiQC Standard, LiQC MultiDevice (SC1 or SC30 required)	

DR40	DR45 DeltaRange™	Densito 30PX	DA-100M	DE40	DE45 DeltaRange™	DE51
Combined Meter	Combined Meter	Portable Density Meter	Density Meter	Density Meter	Density Meter	Density Meter

0.00000 ... 3.00000	0.00000 ... 3.00000	0.0000 ... 2.0000	0.000 ... 3.000	0.0000 ... 3.0000	0.00000 ... 3.00000	0.00000 ... 3.00000
0.00005	0.00002 (0 ... 1 g/cm ³) 0.00005 (1 ... 3 g/cm ³)	0.001	0.001	0.0001	0.00002 (0 ... 1 g/cm ³) 0.00005 (1 ... 3 g/cm ³)	0.00002
yes	yes	no (not required)	no (not required)	yes	yes	yes
1.3200 ... 1.7000	1.32000 ... 1.58000	-	-	-	-	-
0.0001	0.00005 (1.32 ... 1.40) 0.00010 (1.40 ... 1.58)	-	-	-	-	-
0.00 ... 100.00	0.00 ... 100.00	-	-	-	-	-
0.10	0.03	-	-	-	-	-
Peltier	Peltier	-	Peltier	Peltier	Peltier	Peltier
15.00 ... 50.00	15.00 ... 50.00	5.0 ... 35.0	15.0 ... 40.0	4.00 ... 90.00	4.00 ... 90.00	4.00 ... 70.00
0.1 Refractive index 0.05 Density	0.03 Refractive index 0.02 Density (15 ... 20°C) 0.05 Density (4 ... 90°C)	0.5	0.1	0.05 (10 ... 30°C) 0.10 (4 ... 90°C)	0.02 (15 ... 20°C) 0.05 (4 ... 90°C)	0.02 (10 ... 30°C) 0.05 (4 ... 70°C)
yes	yes	yes	no	yes	yes	yes
60	60	60	20	50	60	60
9 + 1 (for adjustment)		1	1	9 + 1 (for adjustment)		
Brix, HFCS42, HFCS55, Alcohol, API		Brix, Alcohol, Proof (US), Proof (IP), API	-	Brix, Alcohol, API		
Can be input as concentration tables		Sulphuric acid, °Baumé, Plato, user defined unit (formula)	User defined unit (formula)	Can be input as concentration tables		
18	18	-	-	9	9	9
yes	yes	-	-	yes	yes	yes
yes	yes	-	-	yes (PSU-DE, SC1 or SC30 required)		
yes	yes	-	-	yes	yes	yes

yes	yes	yes (IrDA/RS232 adapter required)	yes	yes	yes	yes
yes	yes	-	-	yes	yes	yes
yes	yes	yes (IrDA/RS232 adapter required)	-	yes	yes	yes
SC1, SC30 (required)	SC1, SC30 (required)	-	ASU-100	PSU-DE, SC1, SC30	PSU-DE, SC1, SC30	PSU-DE, SC1, SC30

LabX direct LiQC Standard, LiQC MultiDevice	LabX direct PortableCapt (EXCEL macro)	-	LabX direct LiQC Standard, LiQC MultiDevice (SC1 or SC30 required)
--	--	---	---

Efficient Solutions for Density and Refractive Index



Quality control of liquid samples without the measurement of density and refractive index is difficult to imagine today. Be it in production, goods receiving or in the laboratory: digital instruments from METLER TOLEDO simplify the determination of both parameters wherever they need to be measured.



www.mt.com/density

For more information

Mettler-Toledo AG, Analytical

CH-8603 Schwerzenbach, Switzerland

Tel. +41-44-806 77 11

Fax +41-44-806 73 50

Internet: www.mt.com

Subject to technical changes

© 08/2008 Mettler-Toledo AG

Printed in Switzerland, 51725113

MarCom Analytical



Quality certificate

Development, production and testing according to ISO 9001.



Environment management system

according to ISO 14001.



"Communauté Européenne"

This mark gives you the assurance that our products conform with the latest directives.