Lovibond® Water Testing

Tintometer® Group

Lovibond

since 1885



General Catalogue

General Catalogue

Lovibond

Instruments and Reagents
for Today's Water Analysis

www.lovibond.com

02/21

new!



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What we care about

Every drop counts.

In the swimming pool; the sewage plant; an industrial process; or a well in an African village: for over 130 years, our Lovibond® products have been utilized where the quality of water forms the basis of existence.

With Lovibond®, you can protect your industrial plants and ensure clean, waste water. Healthy drinking water flows into your drinking bottle and you dive into clear water in your pool.

Your needs are our inspiration.

There is more to the Lovibond® logo than just instruments, chemicals and accessories for water and colour analysis. At our locations in Germany, Great Britain, in the USA and India, in Brasil, China, Spain and Malaysia, every staff member invests their passion for water and colour analysis in every instrument, every box of reagents, every pack of powder reagents, every liquid and glass standard.

Your trust is our incentive.

We are where you are.
You can obtain Lovibond® products in over 160 countries. Our analysis systems and our expertise are in demand wherever there is a need for precise and efficient analytics for challenging applications: from disinfection control; to food and beverage; or the marine industry, they are essential.

We therefore know your requirements for modern and precise water tests, your operation methods and needs for your analysis and control routines. Our instruments and reagents are constantly being further developed for you, so that you can achieve reliable results with tailor-made solutions.

With us, you get everything from one source – from the instrument to the reagents to our support.

Customer proximity and flexibility symbolise us.

Lovibond® is a family owned company which guarantees quality, control, effectiveness and reliability. We are also able to meet the constantly increasing demands because we have developed a distinctive profile with great commitment and passion. Our company is one of the the market leaders in water analysis and is therefore constantly on the move. The Lovibond® team is breaking new ground, for example in environmentally- friendly and safe chemicals or the use of state-of-the-art technologies. This is only possible because we are independent as a group of companies – and we will remain so.

Because our independence makes us unique.

Our heart also beats for colour:
Colour measurement was the foundation stone and is another pillar of our company.
Dive in to the Lovibond® world of water and colour at **www.lovibond.com**.
Here you will find everything about our history, our products, our motivation.
Because:

Water and colour are our life – and our vision!



„There are very few companies which can look back over a history of more than 130 years of success. The reason we can do so lies in the world-wide appreciation of our products and the determination of our work-force to maintain this" .

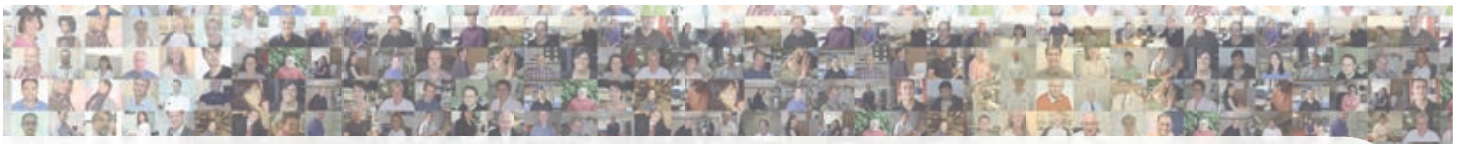
Cay-Peter Voss, CEO

Green Chemistry

Breaking new ground is worthwhile! This shows in our decision to refrain from using health-threatening substances in our chemicals and reagents wherever possible. Harmful boric acid and Ortho-Tolidine are a thing of the past for us. At the same time, our Green Chemistry label guarantees proven quality, sustainability and safety for your analysis results.

Environmental protection

Not only water is an important natural resource for us. We are also committed to protecting our environment and print this catalogue on FSC® certified paper. We are supporting the Forest Stewardship Council® (FSC®) in their worldwide work with environmental associations, social organisations, advanced forest enterprises and wood processing companies for an improvement of forest management. Only products whose raw material comes from carefully managed forests bear the seal of quality.



We produce for you...

... everything from a single source. With us, you get more than just the right instruments for your requirements and applications. You test drinking and waste water, surface water, ground and raw water, wastewater, cooling and boiler water or pool water every day: we supply you with the instruments, the suitable reagents and also the accessories to do this.

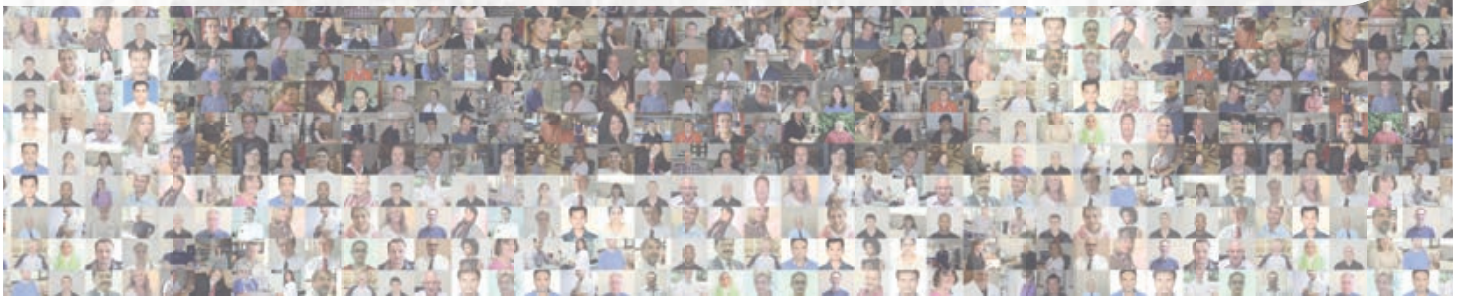
... controlled and safe. We check all our instruments, reagents and accessories in the production according to strict specifications. Our quality management guarantees additional safety pursuant to DIN EN ISO 9001 and has been certified for over 22 years.

... custom-fit and flexible. Our experts find solutions for your individual requirements and needs. You carry out routine analysis both in laboratory and in the field, you control the water in the public or private pool every day: With us you get the suitable instrument and everything you need for a fast and reliable water analysis.

... on a higher level, in each of our departments, our experts and staff members work constantly to further develop our products. The proven high quality standard of our instruments, reagents and chemicals has the highest priority when we break new grounds in instrument development with decades of experience. Our popular photometers, test kits and electrochemical instruments are always state of the art with the latest **Bluetooth®** technology and modern interfaces for data transmission. With our process turbidimeters or spectrophotometers, we targeted ourselves to develop solutions for potential problems in the control routine and new, user-friendly method applications.

... service-oriented - because proximity to the customer is particularly important to us.
We employ approximately 400 people to work closely together in all areas: from customer care; field service; sales; service and support to product management; product development and research, so that we can selectively develop exactly what you need. From software to calibration and repair to a new handbook of methods with detailed and easy-to-understand descriptions of all Lovibond® methods for photometry everything is included.

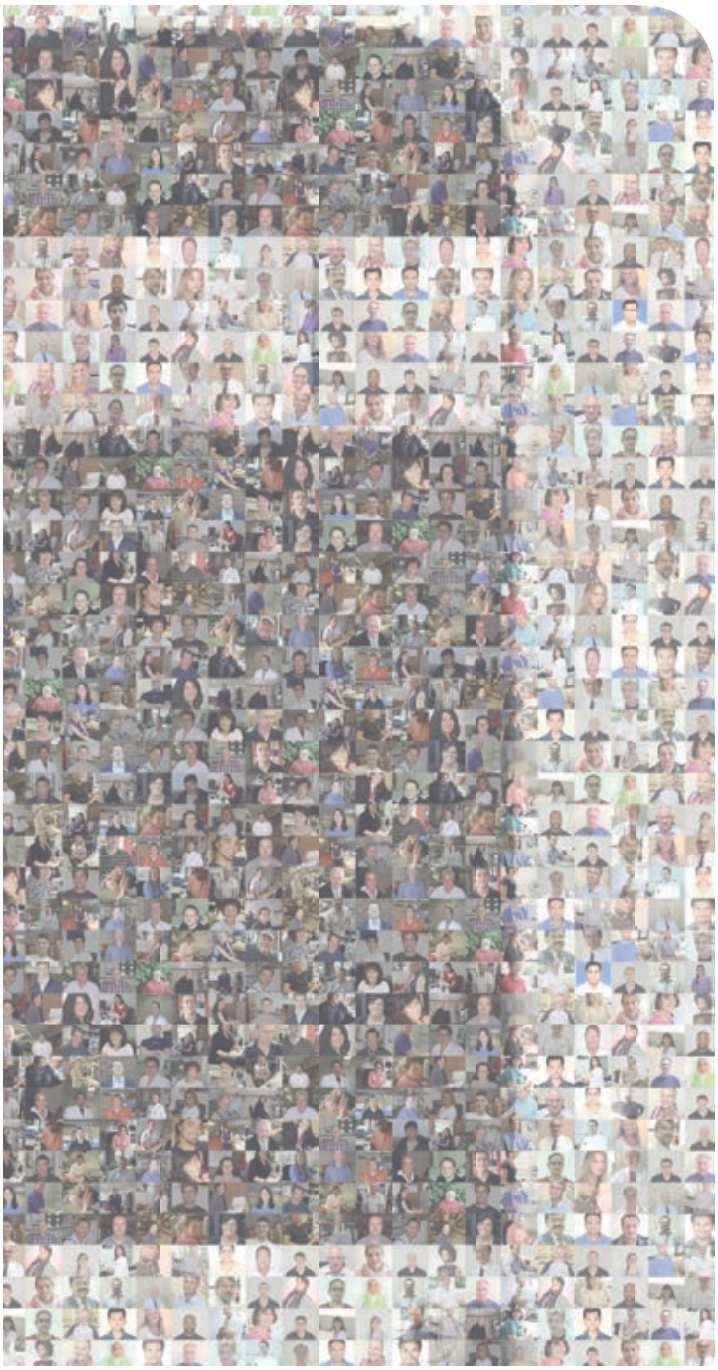
... informative. On our website, **lovibond.com**, you will find all the important information on every product, from anywhere, at any time – even when you are on the go via your smartphone or tablet. Here you can find details on all the new products and numerous downloads, for example our safety data sheets and certificates of analysis. In the Download Centre you can also access operating instructions, data sheets and catalogues. These are currently available in German, English, French, Spanish and Chinese, – our range of languages, however, is constantly being expanded.



Sign up now!

Dealer Portal on our Lovibond® Homepage

Are you a dealer
and not registered yet?
Then sign up now! Because in the Dealer Portal of our homepage you will have access to many valuable working aids and supplementary tools.
Simply register with your customer ID.
After a short check, your login data will be activated and you can download the current price lists at any time. We also have dealer packages, product pictures, presentations and posters ready for you here.











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new!

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Rapid Tests





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MINIKIT



Analysis	Type	Range	Methods Tablet Count	Speed Test	Yes/No Test
Alkalinity-m	AF 444	20 - 800 mg/l $CaCO_3$ ≅ 0.4 - 16 mmol/l		■	
Alkalinity-m	AF 413	10 - 500 mg/l $CaCO_3$ ≅ 0.2 - 10 mmol/l	■		
Alkalinity-p	AF 414	20 - 500 mg/l $CaCO_3$	■		
Calcium Hardness	AF 446	20- 800 mg/l $CaCO_3$ ≅ 0.4 - 16 mmol/l		■	
Calcium Hardness	AF 416	10- 500 mg/l $CaCO_3$ ≅ 0.1 - 5 mmol/l	■		
Chloride	AF 418	5 - 5000 mg/l Cl	■		
Cyanuric Acid	AF 422	20 - 200 mg/l Cyanuric Acid			
Hardness Total (very low range)	AF 426	1 - 10 mg/l $CaCO_3$ ≅ 0.01 - 0.1 mmol/l	■		
Hardness Total (low range)	AF 425	1 - 50 mg/l $CaCO_3$ ≅ 0.01 - 0.5 mmol/l	■		
Hardness Total (Yes/No)	AF 423	Limit 4 mg/l, 8 mg/l or 20 mg/l $CaCO_3$			■
Hardness Total	AF 445	20 - 800 mg/l $CaCO_3$ ≅ 0.4 - 16 mmol/l		■	
Hardness Total	AF 424	5 - 500 mg/l $CaCO_3$ ≅ 0.05 - 5 mmol/l	■		
Alkalinity Caustic/P	AF 415	20 - 500 mg/l $CaCO_3$	■		
Nitrite	AF 427	70 -1540 mg/l $NaNO_2$			
Organo-Phosphonate	AF 411	1 - 20 mg/l active O-P	Drop count method		
QAC (Quaternary Ammonium Comp.)	AF 417	0 - 500 mg/l active QAC Limit 200 mg/l (Yes/No)	■		■
Säurekonzentration	AF 410	0.75-10% Acid	■		
Sulphate (low range)	AF 432	20 - 200 mg/l Na_2SO_4	■		
Sulphate	AF 431	40 - 200 mg/l SO_4 (40 - 4000 mg/l by dilution)			
Sulphite (low range)	AF 434	2 - 50 mg/l Na_2SO_3	■		
Sulfit (high range)	AF 435	20 - 500 mg/l Na_2SO_3	■		
Tannin Index	AF 436	2 - 20 units	■		



The methods

The MINIKITs are designed for tablet based rapid water testing. Most MINIKITS are based on titrimetric methods.

Tablet count method

In the tablet count method, the liquid titration solution and indicator are replaced by Lovibond® tablet reagents. A specific number of tablets is added to a defined sample volume until a chemically induced colour change takes place. The concentration of the parameter being measured is calculated from the number of tablets required. The measuring range can be expanded by varying the sample volume.

Speed test

The speed test is based on reverse titration. After adding a reagent tablet to a calibrated test tube, the water sample is added slowly until the colour of the solution changes (e.g. from red to blue). The user can then obtain the result from the liquid level.

Yes/No test

A Yes/No test tells the user whether a specific ingredient is present in the water and/or if its concentration is higher or lower than a defined level.

Turbidity method

A two-section calibrated test tube is filled with the water sample and a reagent tablet added. The reagent creates a level of turbidity that is proportional to the concentration of the parameter being measured. The inner tube, which has a black dot on its base, is lowered until the dot is obscured by the turbidity. The result is read off from the water level in the inner tube.

Turbidity	Ordercode	Reagent	Ordercode	Quantity
	414440	ALK-TEST	515570BT	100
	414130	TOTAL ALKALINITY-tablets	515321BT	250
	414140	Alkalinity-p-tablets	515101	250
	414460	CAL-TEST	515580BT	100
	414160	CALCIUM HARDNESS	515191BT	250
	414180	CHLORIDE	515131	250
■	414220	CyA-TEST	511370BT	100
	414260	HARDNESS VLR	515351BT	250
	414250	HARDNESS LR (BW)*	515171BT	250
	414230	HARDNESS YES / NO	515361BT	250
	414450	T HARDNESS-TEST	515590BT	100
	414240	TOTAL HARDNESS	515161BT	250
	414150	Alkalinity-p-tablets Alkalinity-p ($BaCl_2$)-tablets	515101BT 515110BT	250 100
	414270	NITRITE No. 1 NITRITE No. 2	515200BT 515210BT	100 100
	414110	ORGANO-PHOSPHONATE No. 2 ORGANO-PHOSPHONATE No. 1	465351 512961BT	100 ml 250
	414170	QAC-Test	515410 515411	100 250
	414100	ACID CONCENTRATION	505420	100
	414320	SULFATE No. 1 SULFATE No. 2	515221 515231	250 250
■	414310	SULFATE	515451BT	250
	414340	SULFITE No. 1	515271BT	250
	414350	SULFITE No. 2 HR SULFITE No. 2 LR (BW*)	515281BT 515331BT	250 250
	414360	TANNIN No. 1 TANNIN No. 2	503500 503511	100 250

Delivery content

- Kit in a plastic box
- Tablet reagents for an average of 30 tests
- Sample container
- Required accessories
- Instruction manual

* also suitable for seawater

Green Chemistry (for detailed information see page 86)

MSDS (Material Safety Data Sheets): www.lovibond.com



Test Kits

Cooling and Industrial Process Water

Lovibond® test kits are specially developed for testing cooling and industrial process water. They make use of both colorimetric and titrimetric techniques. Each test kit contains all the necessary chemicals and reagents in liquid or powder form to conduct the tests.

The detailed instructions contain a step-by-step explanation of the test procedure. The kits are supplied in a sturdy, compact plastic case. Competitively priced refill reagent packs are available for all Lovibond® test kits.

Analysis	Range mg/l	Method	No. of Tests (approx.)	Order Code
Alkalinity PM-1 (p- + m-value)	1 drop = 1 or 0.5 mmol/l[1)]	titrimetric	75	2418501
Chloride LR CD-1	1 drop = 5 or 2,5 mg/l Cl^-[1)]	titrimetric	100	2418504
Chloride HR CD-2	1 drop = 50 or 25 mg/l Cl^-[1)]	titrimetric	100	2418506
DEHA	0,05 – 1 mg/l DEHA	colorimetric	50	24157580
Iron FE-2	0,1 – 2 mg/l Fe, 0,5 – 8 mg/l Fe	colorimetric	250	2418440
Hardness Carbonate (new version)	1 drop = 1 or 0,5 °dH*[1)]	titrimetric	25	2418413
Hardness Carbonate KH-1	1 drop = 1 or 0,5 °dH*[1)]	titrimetric	50	2418513
Hardness Residual RH-1	1 drop = 0,1 or 0,05 °dH*[1)]	titrimetric	50	2418514
Hardness Total (new version)	1 drop = 1 or 0,5 °dH*[1)]	titrimetric	25	2418411
Hardness Total GH-1	1 drop = 1 or 0,5 °dH*[1)]	titrimetric	50	2418511
Hardness Total (new version) + Carbonate GKH-1	1 drop = 1 or 0,5 °dH*[1)]	titrimetric	25	2418412
Carbonic Acid CO-2	1 drop = 5 or 2,5 mg/l CO_2[1)]	titrimetric	70	2418518
Phosphate (Total) PO-2 (ortho, poly, organic)	2,5 – 25 mg/l PO_4^{3-}	colorimetric	90	2418523
Phosphate (ortho) PO-3	2,5 – 25 mg/l PO_4^{3-}	colorimetric	70	2418544
Sulphite SUL-1	1 drop = 5 or 2,5 mg/l Na_2SO_3[1)]	titrimetric	80	2418532

* 1.0°dH = 0.18 mmol/l ; 5.6° dH = 1.0 mmol/l [1)] depending on sample volume

Hardness Test Kits

Water hardness can be problematic in various applications. Be it in the household, coffee or tea preparation or in technical applications.

Lovibond® always offers the right solution for rapid and cost-effective testing of total hardness, residual hardness or carbonate hardness.





Test Kit (Silt Density Index, SDI)

- SDI calculations in just 15 minutes
- Ideally suited for reverse osmosis plants
- Enables calculation of membrane fouling time, backwash frequency and membrane lifespan

The Silt Density Index (SDI) is a measure of the solids or particulate content of water and is of specific importance when commissioning reverse osmosis plant. The SDI of the feedwater is required to calculate membrane fouling time, backwash frequency and, ultimately, membrane lifespan. The Lovibond® test kit gives the RO engineer instant SDI values, increasing the speed and effectiveness of the installation.

The kit utilises a membrane/flow meter system to enable SDI calculations in just 15 minutes. Sufficient membranes included for 100 tests.

Article	Tests/Pack	Code
Silt Density Index (SDI) Test Kit	**-**	**56K001901**
0.45 µm Pore Filter Circles 47 mm diameter	100	56A007690
On/Off Valve	-	56A007201
Pressure Regulator	-	56A007301
Pressure Gauge	-	56A007401
High Pressure Hose 1 m	-	56A007501
Filter Holder 47 mm	-	56A007701

Non-Oxidising Biocide Kits

Article	Range mg/l	Tests (aprox.)	Code
Bronopol-Kit (2-Bromo-2-nitropropan-1,3-diol)	0 - 50 mg/l	50	56K001101
Bronopol-Reagent Pack	-	50	56R001150
DBNPA-Kit (2,2-Dibromo-3-nitrilopropionamid)	5 - 20 mg/l	50	56K001201
DBNPA-Reagent Pack	-	50	56R001250
Isothiazoline-Kit	0 - 7,5 mg/l	50	56K001401
Isothiazoline Reagent Pack	-	50	56R001450

Three-Chamber-Tester Chlorine / pH



If a fast and particularly cost-effective determination of chlorine or pH value is required, consider our three-chamber chlorine / pH tester. It comes with a pictogram-based manual and is supplied with the associated reagent tablets.
So even untrained laymen can use immediately.

0.1 -3.0 mg/l Chlorine, pH value 6.8 - 8.2

Three-Chamber-Tester Chlorine/pH **151610**

Green Chemistry

Arsenic Test Kit (5ppb)

The arsenic test is due to its high sensitivity suitable for the determination of arsenic in drinking water.

The advantages at one view

- Sensitivity is according to the requirements of the WHO for drinking water quality. This test detects 0.005 mg/l Arsenic.
- The removal of the interfering sulfide ions is integrated in the test procedure. To minimize the potential danger for the user of the test kit it doesn't use the highly toxic lead acetate for the sulfide removal.
- A solid acid substance is used in order to avoid any irritation by a corrosive acid on the user's hands.
- The unbreakable plastic reaction vessel is more convenient and safe for on-site testing.
- During the test procedure the reaction vessel is tightly closed. The developing arsine gas cannot escape and therefore does not harm the user.
- The test kit contains a water-proof colour chart which also includes the brief instruction for use in pictograms. Even if there is a lack of knowledge in foreign languages everybody can now handle the test kit.

Resolution:
0 - 0,005 - 0,01 - 0,025 - 0,05 - 0,1 - 0,25 - 0,5 mg $As^{3+/5+}$/l

Kit for 100 measurements in case.
Order code: 400700



Arsenic Test Kit, ready to use

Drop Test Titration

Derived from laboratory burette methods, the Lovibond® drop test range is an established methodology used across industry and which forms an integral part of the analytical program of many a speciality chemical supplier.
The reagents are quick to use and give results fast, making the drop test the method of choice for many customers.

A number of the methods have been recently adapted to comply with changes in legislation and hazard awareness. As the Lovibond® solutions have been adapted to address these changes, they have also improved in accuracy with their hazard implications reduced. The procedure has also been simplified as part of the Lovibond® commitment to product development.

Ordering information for the drop test range is as follows:

Test Kit – Ordered using the test kit code in the table below. The kit is supplied with all reagents and equipment to perform the test, housed in a plastic case.

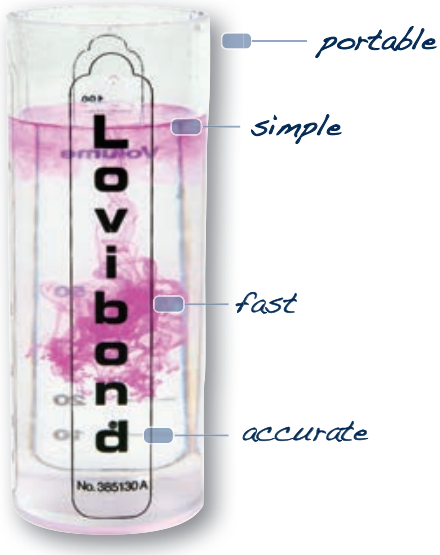
Or

Reagent Pack – Ordered using the reagent pack code in the table below. The pack is supplied in a carton containing test reagents and instruction sheet only.

Or combine reagent packs with a standard case to create your own multi-parameter test kit:

56A001801: A 1501 Compact Plus Case

Supplied with standard equipment and space to add up to 8 reagent packs – simply choose reagent packs from the list below to complete the kit.



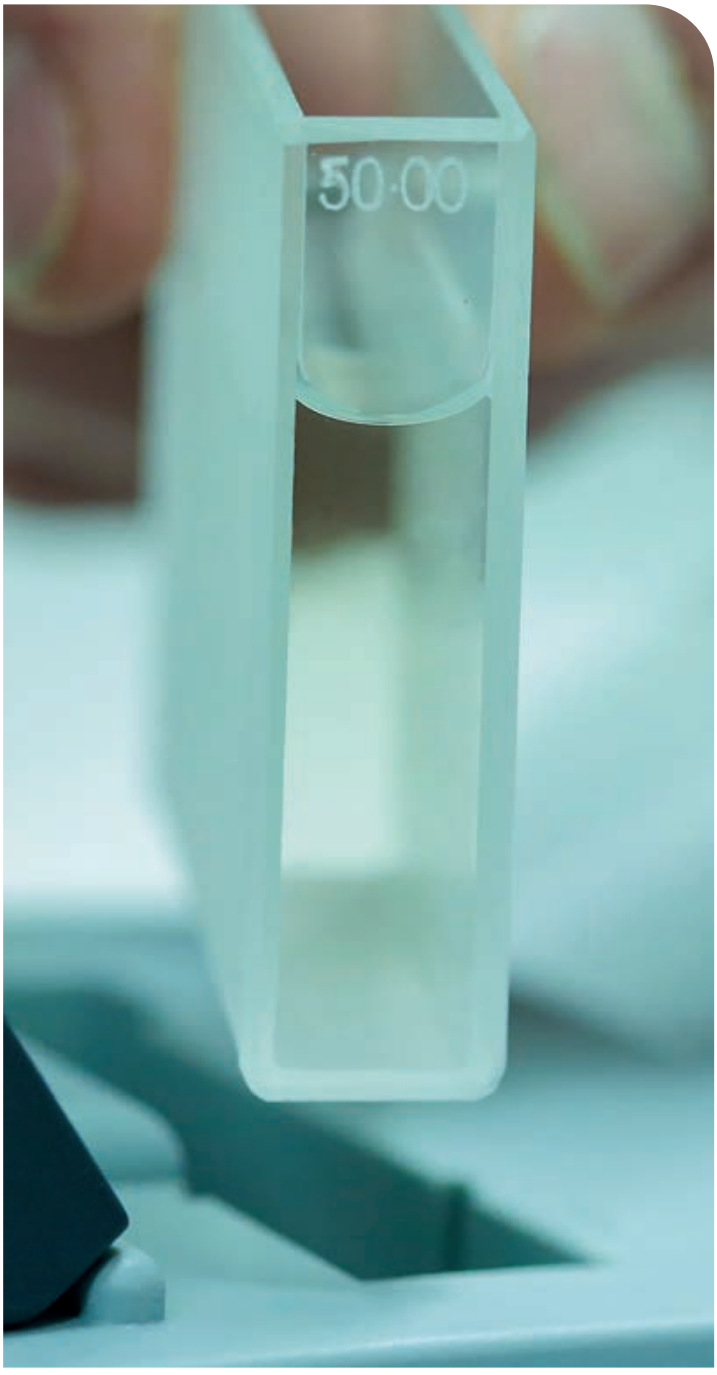
Test Kit Code	Reagent Pack	Description	Range	Tests/Pack
56K003501	56R003590	Acidity (P) Drop Test	0-7.5% H_2SO_4	100+
56K003601	56R003690	Alkalinity (M) HR Drop Test	200-2400mg/l $CaCO_3$	100+
56K003701	56R003790	Alkalinity (M) LR Drop Test	50-600mg/l $CaCO_3$	100+
56K003801	56R003890	Alkalinity (P + M) LR Drop Test	50-600mg/l $CaCO_3$	100+
56K003901	56R003990	Alkalinity (P + OH) HR Drop Test	200-2400mg/l $CaCO_3$	100+
56K004001	56R004090	Alkalinity (P) HR Drop Test	200-2400mg/l $CaCO_3$	100+
56K004101	56R004190	Alkalinity (P) HR Drop Test	0.25-6.0% NaOH	100+
56K004201	56R004290	Alkalinity (P) LR Drop Test	50-600mg/l $CaCO_3$	100+
56K004301	56R004390	Alkalinity (P) LR Drop Test	250-6000mg/l NaOH	100+
56K004401	56R004490	Alkalinity (P, M + OH) HR Drop Test	200-2400mg/l $CaCO_3$	100+
56K004501	56R004594	Alkalinity (P, M + OH) LR + HR Drop Test	50-2400mg/l $CaCO_3$	200+
56K004601	56R004690	Alkalinity (P, M + OH) LR Drop Test	50-600mg/l $CaCO_3$	100+
56K004701	--	Alkalinity Total (Disposable)	9-540mg/l $CaCO_3$	50+
56K025401	56R025490	Carbon Dioxide Drop Test	10-300mg/l CO_2	100+
56K004801	56R004890	Chloride HR Drop Test	200-12,000mg/l Cl^-	100+
56K004901	56R004990	Chloride LR + HR Drop Test	20-12,000mg/l Cl^-	100+
56K005001	56R005090	Chloride LR Drop Test	20-400mg/l Cl^-	100+
56K005101	56R005190	Chlorine (Free) HR Drop Test	15-300mg/l Cl_2	100+
56K005201	56R005290	Chlorine (Free) LR Drop Test	1-30mg/l Cl_2	100+
56K005301	--	Chlorine Spot Tester Kit (Disposable)	Trace Cl_2	500+
56K005401	56R005450	Chlorine (Semi-quantitative) Test	0.1-50mg/l Cl_2	50

Test Kit Code	Reagent Pack	Description	Range	Tests/Pack
56K005501	56R005590	Chlorine (Total Available) HR Drop Test	0.2-15% Cl_2	100+
56K005601	56R005690	Chlorine (Total Available) LR + HR Drop Test	0.01-15% Cl_2	100+
56K005701	56R005790	Chlorine (Total Available) LR Drop Test	100-2400mg/l Cl_2	100+
56K005801	56R005890	Chlorine Dioxide HR Drop Test	25-350mg/l ClO_2	100+
56K005901	56R005990	Chlorine Dioxide MR Drop Test	10-150mg/l ClO_2	100+
56K006001	56R006090	Chlorine Dioxide LR Drop Test	0.08-30 mg/l ClO_2	100+
56K006101	56R006190	EDTA (Free) Drop Test	0-2000mg/l EDTA	100+
56K006201	56R006290	Hardness (Calcium) HR Drop Test	50-600mg/l $CaCO_3$	100+
56K006301	56R006390	Hardness (Calcium) LR Drop Test	5-60mg/l $CaCO_3$	100+
56K006401	56R006490	Hardness (Total) LR + HR Drop Test	5-600mg/l $CaCO_3$	100+
56K006501	56R006590	Hardness (Total) HR Drop Test	50-600mg/l $CaCO_3$	100+
56K006601	56R006690	Hardness (Total) LR Drop Test	5-60mg/l $CaCO_3$	100+
56K006701	56R006790	Hardness (Total/Calcium) HR Drop Test	50-600mg/l $CaCO_3$	100+
56K006801	56R006890	Hardness Raw Water Drop Test	50-600mg/l $CaCO_3$	100+
56K006901	56R006990	Hardness Stop/Go Drop Test	4mg/l $CaCO_3$	100+
56K007001	--	Hardness (Temporary) Drop Test (Disposable)	9-540mg/l $CaCO_3$	50+
56K007101	56R007190	Hardness Total/Calcium LR+HR	5-600mg/l $CaCO_3$	100+
56K007201	56R007250	Hardness Yes/No Test Pack	8-20mg/l $CaCO_3$	250
56K007301	56R007390	Hydrogen Peroxide Drop Test	15-500mg/l H_2O_2	100+
56K007401	56R007490	Iron Spot Tester Drop Test Pack	Trace Fe	100+
56K007501	56R007590	Molybdate HR Drop Test (New)	25-400mg/l MoO_4	100+
56K007601	56R007690	Molybdate MR Drop Test (New)	10-200mg/l MoO_4	100+
56K007701	56R007790	Molybdate LR Drop Test (New)	5-40mg/l MoO_4	100+
56K007801	56R007890	Molybdate LR Drop Test	2.5-20mg/l MoO_4	100+
56K007901	56R007990	Nitrite Drop Test	10-2000mg/l $NaNO_2$	100+
56K008001	56R008090	Oxygen (Available) Drop Test	0-500mg/l O_2	100+
56K008101	56R008190	pH (Universal Indicator)	pH 4-10	100+
56K008201	56R008290	Peracetic Acid Drop Test	0-450mg/l CH_3CO_3H	100+
56K008301	56R008350	Phosphonate Drop Test	4-20mg/l HEDP	50+
56K008401	56R008490	Phosphonate Drop Test	4-20mg/l HEDP	100+
56K008501	56R008550	Polyacrylate Single Phase HR Drop Test	0-20mg/l PAA**	50+
56K008601	56R008650	Polyacrylate Single Phase LR Drop Test	0-20mg/l PAA**	50+
56K008701	56R008750	Polyacrylate Two Phase HR Drop Test	0-20mg/l PAA**	50+
56K008801	56R008850	Polyacrylate Two Phase LR Drop Test	0-20mg/l PAA**	50+
56K008901	56R008990	Quaternery Ammonium Compounds HR Drop Test	60-1800mg/l C.T.A.B.*	100+
56K009001	56R009090	Quaternery Ammonium Compounds LR Drop Test	40-300mg/l C.T.A.B.*	100+
56K009101	56R009190	Sulphite Drop Test	25-150mg/l Na_2SO_3	100+
56K009201	56R009290	Tannin Drop Test	50-300mg/l Tannin	100+
56K009301	56R009390	Total Chelant Drop Test	0-2000mg/l EDTA	100+
56K009401	56R009490	Total Oxidant Drop Test (Chlorine Dioxide)	0.2-6.0mg/l ClO_2	100+
56K009501	56R009550	Zinc (Free Soluble) Drop Test	1-10mg/l Zn^{2+}	50
56K009601	56R009650	Zinc (Total Complex) Drop Test	1-10mg/l Zn^{2+}	50

* Cetyl trimethyl ammonium bromide
** Polyacrylic Acid

Comparators







CHECKIT® Comparator
Page 18



Comparator 2000+
Page 32



Comparator EC Pt-Co
Page 50

CHECKIT® Comparator





CHECKIT® Comparator Test Kits are accurate, easy to use test kits for water analysis.
Simply add the reagent to the sample cell, rotate the disc until the colour matches the prepared water sample and read the concentration value.

CHECKIT® Comparator

The Lovibond® CHECKIT® Comparator is a compact and handy colorimetric unit which is suitable for both mobile and static analysis work. Supplied with a generous number of different colour scales, it provides the basis for a comprehensive, easy-to-use colorimetric analysis system.

CHECKIT® Disc

Each CHECKIT® Disc contains a continuous colour scale which makes it possible to achieve an exact colour match between the colour standard and the sample. These CHECKIT® Discs are specially manufactured in selected materials to retain colour stability over a long period and guarantee reliable, reproducible measurement results.

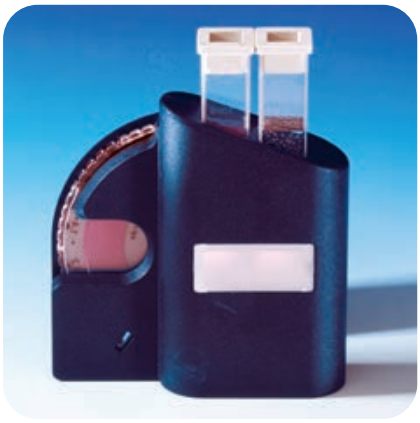
Applications

- Water Treatment (e.g. Drinking Water)
- Pool Water
- Laboratory and Field Testing
- Special Applications

Please see pages 22 onwards for tests, ranges and reagents



Front view of the CHECKIT® Comparator
with cells



Rear view of the CHECKIT® Comparator
with diffuser plate, cells and disc



Complete Test Kit with reagent in carrying case, ready to use



Plastic cells, frosted on two sides,
volume 10 ml, path length 13.5 mm, with lids



CHECKIT® Discs with continuous and stable scales



Tablet reagents in blister packaging



Plastic cells in pack, available:

5 cells - 145505
10 cells - 145500
100 cells - 145510

Delivery content

- CHECKIT® Comparator
- CHECKIT® Disc(s)
- Reagents for an average of 30 tests
- Cuvettes
- Accessories
- Instruction manual
- Warranty information
- in portable case

Single Parameter Test Kits

Test	Range* (± 5 % F.S.)	Best.-Nr.
Acid Capacity $K_{S4.3}$	0.5 - 5 mmol/l	147460
Aluminium	0 - 0.3 mg/l Al	147200
Ammonia	0 - 1 mg/l N	147210
Ammonium, Powder Pack	0 - 0.5 mg/l N	147211
Bromine	0 - 5 mg/l Br	147280
Chlorine (DPD) free, combined, total**	0.02 - 0.3 mg/l Cl_2	147000
Chlorine (DPD) free, combined, total	0 - 1 mg/l Cl_2	147010
Chlorine (DPD) free, combined, total	0 - 2 mg/l Cl_2	147040
Chlorine, free (DPD), Powder Pack	0 - 3.5 mg/l Cl_2	147050
Chlorine, total (DPD), Powder Pack	0 - 3.5 mg/l Cl_2	147051
Chlorine free + total (DPD), Powder Packs	0 - 3.5 mg/l Cl_2	147052
Chlorine (DPD) free, combined, total	0 - 4 mg/l Cl_2	147020
Chlorine KI	10 - 300 mg/l Cl_2 (total)	147030
Chlorine dioxide**	0.01 - 0.2 mg/l ClO_2	147330
Copper, free (Cu^{2+})	0 - 1 mg/l Cu	147230
Copper HR, free + total	0 - 5 mg/l Cu	147430
Copper HR, free, Powder Pack	0 - 5 mg/l Cu	147431
Copper LR, free + total**	0 - 1 mg/l Cu	147440
Copper LR, free, Powder Pack**	0 - 1 mg/l Cu	147441
DEHA	0 - 0.5 mg/l DEHA	147370
Fluoride, Testpak available only	0.2 - 2 mg/l F^-	
Iron HR	0- 10 mg/l Fe	147320
Iron LR	0.05 - 1 mg/l Fe	147220
Iron (TPTZ), Powder Pack	0 - 1.8 mg/l Fe	147470
Manganese LR, Testpak available only	0.1 - 0.7 mg/l Mn	
Manganese VLR,** Testpak available only	0.02 - 0.2 mg/l Mn	
Molybdate LR**	0 - 10 mg/l MoO_4	147291
Molybdate HR	0 - 100 mg/l MoO_4	147290
Molybdate HR	50 - 500 mg/l MoO_4	147295
Nitrate LR, Testpak available only	0 - 1 mg/l NO_3	
Nitrite LR	0 - 0.5 mg/l N	147300
Nitrite, Powder Pack	0 - 0.3 mg/l N	147301
Ozon (DPD), in the presence of chlorine	0 - 1.0 mg/l O_3	147270
Ozon (DPD)	0 - 1.0 mg/l O_3	147275
pH value (Phenol red)	6.5 - 8.4 pH	147100
pH value (Bromocresol purple)	5.2 - 6.8 pH	147110
pH value (Bromocresol purple)	6.0 - 7.6 pH	147120
pH value (Universal)	4 - 10 pH	147130
Phosphate, Powder Pack	0 - 2.5 mg/l PO_4	147480
Phosphate HR	0 - 80 mg/l PO_4	147250
Phosphate LR	0 - 4 mg/l PO_4	147240
Silica LR	0.25 - 4 mg/l SiO_2	147350
Silica HR, Powder Pack	0 - 100 mg/l SiO_2	147351
Silica VLR**	0 - 1 mg/l SiO_2	147360
Sodium hypochlorit	2 - 18 %	147490
Sulfite LR	0.5 - 10 mg/l SO_3	147380
Total Alkalinity	20 - 240 mg/l $CaCO_3$	147450
Zinc LR	0 - 1 mg/l Zn	147340

* Disc readings see following pages
** Only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)

Green Chemistry
also suitable for seawater

Test Kits 2in1

Test Kit	Code
Chlorine 0 - 1,0 mg/l Cl_2* **pH value** 6,5 - 8,4 pH	147016
Chlorine 0,1 - 2,0 mg/l Cl_2* **pH value** 6,5 - 8,4 pH	147046
Chlorine 0 - 4,0 mg/l Cl_2* **pH value** 6,5 - 8,4 pH	147026
Bromine 0 - 5,0 mg/l Br **pH value** 6,5 - 8,4 pH	147285
Copper 0 - 1,0 mg/l Cu **pH value** 6,5 - 8,4 pH	147235

Test Kit 5in1

Water Balance	Code
Chlorine 0 - 4,0 mg/l Cl_2* **pH value** 6,5 - 8,4 pH **Cyanuric acid** (Turbidity method)** 20 - 200 mg/l Cys **Calcium hardness** (Speed-Test)** 20 - 800 mg/l $CaCO_3$ **Total Alkalinity (m)** (Speed-Test)** 20 - 800 mg/l $CaCO_3$	147028

Disc readings see following pages.
*All test kits for chlorine are for "free, combined and total chlorine".
**Reagents for turbidity method and speed test (Test-Kit 5 in 1) see MINIKIT.

Testpak

The Testpak concept makes it easy to add new parameters to the CHECKIT® Comparator.

The only requirement is the CHECKIT® Comparator as the basic unit, Code: 145000.

For test paks, see the following pages.

CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	TestKit	Testpak
Aluminium	0 - 0.3 mg/l Al	0 / 0.01 / 0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3	147200	147700
Ammonia	0 - 1 mg/l N	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.9 / 0.95 / 1.0	147210	147710
Ammonia VARIO	0 - 0.5 mg/l N	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5	147211	147711
Bromine	0 - 5 mg/l Br	0 / 0.2 / 0.4 / 0.6 / 0.8 / 1.0 / 1.2 / 1.4 / 1.6 / 1.8 / 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5	147280	147780
Chlorine free, combined**, total	0 - 1 mg/l Cl_2	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.85 / 0.9 / 0.95 / 1.0	147010	147510
Chlorine free, combined**, total	0 - 2 mg/l Cl_2	0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0 / 1.1 / 1.2 / 1.3 / 1.4 / 1.6 / 1.8 / 2.0	147040	147540
Chlorine free, combined**, total	0 - 4 mg/l Cl_2	0 / 0.2 / 0.4 / 0.6 / 0.8 / 1.0 / 1.2 / 1.4 / 1.6 / 1.8 / 2.0 / 2.5 / 3.0 / 3.5 / 4.0	147020	147520
Chlorine free, combined**, total	0 - 3.5 mg/l Cl_2	0 / 0.2 / 0.4 / 0.6 / 0.8 / 1 / 1.2 / 1.4 / 1.6 / 1.8 / 2 / 2.2 / 2.4 / 2.6 / 2.8 / 3 / 3.2 / 3.4 / 3.5	147052	147550,free 147551,total
Chlorine free, combined**, total **may be calculated by deducting free from = total chlorine	0.02 - 0.3 mg/l Cl_2	0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.1 / 0.11 / 0.12 / 0.13 / 0.14 / 0.15 / 0.16 / 0.17 / 0.18 / 0.19 / 0.2 / 0.22 / 0.24 / 0.26 / 0.28 / 0.3 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm) Code: 14 50 10	147000	147500

* RAPID: fast dissolving tablet
\# including stirring rod

Disc	Reagent	Quantity	Code
146200	ALUMINIUM No.1	100	515460BT
		250	515461BT
	ALUMINIUM No.2	100	515470BT
		250	515471BT
	Combi pack#	each 100	517601BT
	ALUMINIUM No.1 / No.2	each 250	517602BT
146210	AMMONIA No.1	100	512580BT
		250	512581BT
	AMMONIA No.2	100	512590BT
		250	512591BT
	Combi pack#	each 100	517611BT
	AMMONIA No.1 / No.2	each 250	517612BT
146211	VARIO Ammonia Salicylate F10	Powder Pack / 200	
	VARIO Ammonia Cyanurate F10	Powder Pack / 200	
		Set	535500
146280	DPD No.1-RAPID*	100	511310BT
		250	511311BT
		500	511312BT
146010	DPD No.1-RAPID*	100	511310BT
		250	511311BT
		500	511312BT
	DPD No.3-RAPID*	100	511290BT
		250	511291BT
		500	511292BT
	DPD No.4-RAPID*	100	511570BT
		250	511571BT
		500	511572BT
146040	DPD No.1/3/4-RAPID*		
146020	DPD No.1/3/4-RAPID*		
146050	VARIO Chlorine Free DPD F5	100	530090
	VARIO Chlorine Total DPD F5	100	530080
146000	DPD No.1	100	511050BT
		250	511051BT
		500	511052BT
	DPD No.3	100	511080BT
		250	511081BT
		500	511082BT
	Combi pack#	each 100	517711BT
	DPD No.1 / No.3	each 250	517712BT



CHECKIT® Discs

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine

Green Chemistry

CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	TestKit	Testpak
Chlorine KI total only	10 - 300 mg/l Cl_2	10 / 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100 / 110 / 120 / 130 / 140 / 150 / 160 / 170 / 180 / 190 / 200 / 250 / 300	147030	147530
Chlorine dioxide	0.01 - 0.2 mg/l ClO_2	0.01 / 0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.1 / 0.11 / 0.12 / 0.13 / 0.14 / 0.15 / 0.16 / 0.17 / 0.18 / 0.19 / 0.2 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm) Code: 14 50 10	147330	147830
DEHA	0 - 0.5 mg/l DEHA	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5	147370	147870
Iron LR	0 - 1 mg/l Fe	0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.9 / 1.0	147220	147720
Iron HR	1 - 10 mg/l Fe	1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7 / 7.5 / 8 / 8.5 / 9 / 10	147320	147820
Iron (TPTZ)	0 - 1.8 mg/l Fe	0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1 / 1.1 / 1.2 / 1.3 / 1.4 / 1.5 / 1.6 / 1.7 / 1.8	147470	147970
Fluoride Testpak available only	0.2 - 2 mg/l F	0.2 / 0.4 / 0.6 / 0.8 / 1.0 / 1.2 / 1.4 / 1.6 / 1.8 / 2.0	-	147890
Copper, free **(Cu^{2+})**	0 - 1 mg/l Cu	0 / 0.1 / .2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0	147230	147730
Copper LR free and total	0 - 1 mg/l Cu	0 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)	147440	147940
Copper LR, only free	0 - 1 mg/l Cu	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)	147441	147941

* RAPID: fast dissolving tablet
\# including stirring rod

Disc	Reagent	Quantity	Code
146030	CHLORINE HR (KI)	100	513000BT
		250	513001BT
	ACIDIFYING GP	100	515480BT
		250	515481BT
	Combi pack#	each 100	517721BT
	CHLORINE HR (KI)/ACIDIFYING GP	each 250	517722BT
146330	DPD No. 1	100	511050BT
		250	511051BT
	DPD Glycine f)	100	512170BT
		250	512171BT
	Combi pack#	each 100	517731BT
	DPD No.1 / GLYCINE	each 250	517732BT
146370	DEHA	100	513220BT
		250	513221BT
	DEHA Solution	15 ml	461185
		100 ml	461181
146220	IRON LR (Fe^{2+} und Fe^{3+})	100	515370BT
		250	515371BT
	IRON (II) LR (Fe^{2+})	100	515420BT
146320	IRON HR	100	515380BT
		250	515381BT
146470	Vario Iron TPTZ F10	100	530550
146390	SPADNS reagent solution	250 ml	467481
		500 ml	467482
	Help for pipette	1	365055
	Pipette 2 ml	1	365050
146230	COPPER/ZINC LR	100	512620BT
		250	512621BT
146440	COPPER No. 1	100	513550BT
		250	513551BT
	COPPER No. 2	100	513560BT
		250	513561BT
	Combi pack#	each 100	517691BT
	COPPER No.1 / No.2	each 250	517692BT
146441	Vario Cu1 F10	100	530300



Test Kit complete in case

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine

Green Chemistry

CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	TestKit	Testpak
Copper HR free and total	0 - 5 mg/l Cu	0 / 0.5 / 1.0 / 1.5 / 2.0 / 2.5 / 3.0 / 3.5 / 4.0 / 4.5 / 5.0	147430	147930
Copper HR, free only	0 - 5 mg/l Cu	0 / 0.5 / 1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 5	147431	147931
Manganese LR Testpak available only	0.1 - 0.7 mg/l Mn	01. / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7	-	147910
Manganese VLR Testpak available only	0.02 - 0.2 mg/l Mn	0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.1 / 0.11 / 0.12 / 0.13 / 0.14 / 0.15 / 0.16 / 0.18 / 0.2 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)	-	147920
Molybdate HR	0 - 100 mg/l MoO_4	0 / 5 / 10 / 15 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 55 / 60 / 65 / 70 / 75 / 80 / 85 / 90 / 95 / 100	147290	147790
Molybdate HR	50 - 500 mg/l MoO_4	50 / 100 / 150 / 200 / 250 / 300 / 500	147295	147795
Molybdate LR	0 - 10 mg/l MoO_4	0 / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 only with CHECKIT® Comparator D55 with mirror optics (path length 55 mm)	147291	147791

* RAPID: fast dissolving tablet
\# including stirring rod

Disc	Reagent	Quantity	Code
146430	COPPER No. 1	100	513550BT
		250	513551BT
	COPPER No. 2	100	513560BT
		250	513561BT
	Combi pack#	each 100	517691BT
	COPPER No.1 / No.2	each 250	517692BT
146431	Vario Cu1 F10	100	530300
146410	VARIO Manganese Reagent, LR F10	1 **Set**	
	consists of:		535090
	VARIO Alkaline-Cyanide Solution	60 ml	
	Vario Ascorbic Acid	100	
	Vario PAN Indicator Solution	60 ml	
	Accessories:		
	VARIO Rochelle Salt Solution needed for samples with hardness values above 300 mg/l $CaCO_3$	30 ml	530640
146420	VARIO Manganese Reagent, LR F10	1 **Set**	
	consists of:		
	VARIO Alkaline-Cyanide Solution	60 ml	535090
	Vario Ascorbic Acid	100	
	Vario PAN Indicator Solution	60 ml	
	Accessories:		
	VARIO Rochelle Salt Solution needed for samples with hardness values above 300 mg/l $CaCO_3$	30 ml	530640
146290	MOLYBDATE No. 1 HR	100	513060BT
		250	513061BT
	MOLYBDATE No. 2 HR	100	513070BT
		250	513071BT
	Combi pack#	each 100	517631BT
	MOLYBDATE No.1 HR / No.2 HR	each 250	517632BT
146295	MOLYBDATE No. 1 HR	100	513060BT
		250	513061BT
	MOLYBDATE No. 2 HR	100	513070BT
		250	513071BT
	Combi pack#	each 100	517631BT
	MOLYBDATE No.1 HR / No.2 HR	each 250	517632BT
146291	MOLYBDATE No. 1 HR	100	513060BT
		250	513061BT
	MOLYBDATE No. 2 HR	100	513070BT
		250	513071BT
	Combi pack#	each 100	517631BT
	MOLYBDATE No.1 HR / No.2 HR	each 250	517632BT

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine

Green Chemistry



Plastic cells, volume 10 ml

CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	TestKit	Testpak
Sodiumhypochlorite	2 - 18 %	2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16 / 18	147490	147990
Nitrate LR to order as a testpak only	0 - 1 mg/l N	0 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0	-	147810
Nitrite LR	0 - 0.5 mg/l N	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5	147300	147800
Nitrite VARIO	0 - 0.3 mg/l N	0 / 0.01 / 0.02 / 0.03 / 0.04 / 0.05 / 0.06 / 0.07 / 0.08 / 0.09 / 0.10 0.11 / 0.12 / 0.13 / 0.14 / 0.15 / 0.16 / 0.17 / 0.18 / 0.19 / 0.20 0.21 / 0.22 / 0.23 / 0.24 / 0.25 / 0.26 / 0.27 / 0.28 / 0.29 / 0.30	147301	147801
Ozone (DPD) in the presence of chlorine	0 - 1.0 mg/l O_3	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.9 / 1.0	147270	147770
Ozone (DPD)	0 - 1.0 mg/l O_3	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.55 / 0.6 / 0.65 / 0.7 / 0.75 / 0.8 / 0.9 / 1.0	147275	147775
pH	5.2 - 6.8 pH	5.2 / 5.3 / 5.4 / 5.5 / 5.6 / 5.7 / 5.8 / 5.9 / 6.0 / 6.1 / 6.2 / 6.3 / 6.4 / 6.5 / 6.6 / 6.7 / 6.8	147110	147610
	6.0 - 7.6 pH	6.0 / 6.1 / 6.2 / 6.3 / 6.4 / 6.5 / 6.6 / 6.7 / 6.8 / 6.9 / 7.0 / 7.1 / 7.2 / 7.3 / 7.4 / 7.5 / 7.6	147120	147620
	6.5 - 8.4 pH	6.5 / 6.6 / 6.7 / 6.8 / 6.9 / 7.0 / 7.1 / 7.2 / 7.3 / 7.4 / 7.5 / 7.6 / 7.7 / 7.8 / 7.9 / 8.0 / 8.1 / 8.2 / 8.3 / 8.4	147100	147600
pH-Universal	4 - 10 pH	4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7 / 7.5 / 8 / 8.5 / 9 / 9.5 / 10	147130	147630
Phosphate LR	0 - 4 mg/l PO_4	0 / 0.25 / 0.5 / 0.75 / 1.0 / 1.25 / 1.5 / 1.75 / 2.0 / 2.25 / 2.5 / 2.75 / 3.0 / 3.25 / 3.5 / 3.75 / 4.0	147240	147740

* RAPID: fast dissolving tablet
\# including stirring rod

Disc	Reagent	Quantity	Code
146490	CHLORINE HR (KI)	100	513000BT
		250	513001BT
	ACIDIFYING GP	100	515480BT
		250	515481BT
	Combi pack#	each 100	517721BT
	CHLORINE HR (Ki)/ACIDIFYING GP	each 250	517722BT
	Dilution set for sample preparation	1	414470
146310	NITRITE LR	100	512310BT
		250	512311BT
	NITRATE-Test tablets	100 (bottle)	502810
	NITRATE Test powder	15 g	465230
	NITRATE Test tubes	1	366220
146300	NITRITE LR	100	512310BT
		250	512311BT
146301	VARIO Nitri 3 F10	Powder Pack / 100	530980
146270	DPD No. 4	100	511220BT
		250	511221BT
	DPD Glycine f)	100	512170BT
		250	512171BT
146275	DPD No. 4	100	511220BT
		250	511221BT
146110	BROMOCRESOL PURPLE	100	511730
		250	511731
146120	BROMOTHYMOL BLUE	100	511640BT
		250	511641BT
146100	PHENOL RED-RAPID*	100	511790BT
		250	511791BT
146130	UNIVERSAL PH	100	515440
		250	515441
146240	PHOSPHATE No. 1 LR	100	513040BT
	PHOSPHATE No. 2 LR	100	513050BT
	Combi pack#	each 100	517651BT
	PHOSPHATE No.1 LR / No.2 LR		



CHECKIT® Comparator with powder reagent / tablets

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine

Green Chemistry

CHECKIT® Comparator

Tests, Test Kits, Testpaks, Discs, Reagents

Test	Range	Readings (Accuracy ± 5 % Full Scale)	TestKit	Testpak
Phosphate HR	0 - 80 mg/l PO_4	0 / 5 / 10 / 15 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 55 / 60 / 65 / 70 / 75 / 80	147250	147750
Phosphate	0 - 2.5 mg/l PO_4	0 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1 / 1.1 / 1.2 1.3 / 1.4 / 15 / 1.6 / 1.7 / 1.8 / 1.9 / 2 / 2.1 / 2.2 / 2.3 / 2.4 / 2.5	147480	147980
Acid capacity $K_{S4.3}$	0.5 - 5 mmol/l	0.5 / 1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 5	147460	147960
Silica LR	0.25 - 4 mg/l SiO_2	0.25 / 0.5 / 0.75 / 1.0 / 1.25 / 1.5 / 1.75 / 2.0 / 2.5 / 3.0 / 3.5 / 4	147350	147850
Silica HR VARIO	0 - 100 mg/l SiO_2	0 / 10 / 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100	147351	147851
Silica VLR	0 - 1 mg/l SiO_2	0 / 0.05 / 0.1 / 0.15 / 0.2 / 0.25 / 0.3 / 0.35 / 0.4 / 0.45 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0	147360	147860
Sulfite LR	0.5 - 10 mg/l SO_3^{2-}	0.5 / 1 / 1.5 / 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 6 / 7 / 8 / 9 / 10	147380	147880
Total Alkalinity	20 - 240 mg/l $CaCO_3$	20 /30 / 40 / 50 / 60 / 70 / 80 / 90 / 100 / 110 / 120 / 130 140 / 150 / 160 / 170 / 180 / 190 / 200 / 220 / 240	147450	147950
Zinc LR	0 - 1 mg/l Zn	0 / 0.1 / 0.2 / 0.3 / 0.4 / 0.5 / 0.6 / 0.7 / 0.8 / 0.9 / 1.0	147340	147840

* RAPID: fast dissolving tablet
\# including stirring rod

Disc	Reagent	Quantity	Code
146250	PHOSPHATE HR	100	511980BT
146480	Vario PHOS 3 F10	100	531550
146460	ALKACHECK	100 250	513200BT 513201BT
146350	SILICA No. 1 SILICA No. 2 Combi pack# SILICA No.1 / No.2 SILICA PR	100 250 100 250 each 100 each 200 100 250	513130BT 513131BT 513140BT 513141BT 517671BT 517672BT 513150BT 513151BT
146351	Vario Silica HR Molybdate F10 Vario Silica HR Acid Rgt F10 Vario Silica HR Citric Acid F10	Powder Pack / 100 Powder Pack / 100 Powder Pack / 100 **Set**	535700
146360	SILICA No. 1 SILICA No. 2 Combi pack# SILICA No.1 / No.2 SILICA PR	100 250 100 250 each 100 each 200 100 250	513130BT 513131BT 513140BT 513141BT 517671BT 517672BT 513150BT 513151BT
146380	SULFITE LR	100	518020BT
146450	ALKACHECK	100 250	513200BT 513201BT
146340	COPPER/ZINC LR EDTA DECHLOR	100 250 100 250 100	512620BT 512621BT 512390BT 512391BT 512350BT



CHECKIT® Discs

Material Safety Data Sheets: www.lovibond.com

f) additionally required for determination of chlorine dioxide / ozone in the presence of chlorine

Green Chemistry

Comparator 2000+







Colorimeter for regular testing with colour-stable glass standards

Comparator 2000+

With its accessories, the Lovibond® Comparator system 2000+ is an extremely versatile, modular system for testing water. It is simple to use yet is uncompromising in terms of precision and reproducibility of results. It is compact and portable. The integrated prism brings the glass standards of the test discs and the coloured sample into the same field of view.

Test discs

The required accuracy of results is only ensured if stable, fade-free colour standards are used.

Glass colour standards are fade-free, resistant to chemicals and scratchproof. Lovibond® standards are made from coloured glass filters. They comply with international standards, e.g. ISO 7393/2.

Please see the table on page 36 for information on the various test discs or refer to our **disc catalogue Lovibond Comparator 2000+**.

Lighting unit

We recommend the use of the battery-operated Lovibond® lighting unit in variable lighting conditions. This guarantees uniform lighting conditions, and ensures greater test accuracy.

Cells

We manufacture precision plastic and optical glass cells in line with the highest quality standards. The cells ensure high accuracy and reproducibility of results.



Comparator 2000+



Lighting unit TK 102



Plastic cells



Test disc with colour-stable glass standards

Order codes see page 36

Applications

- Water Treatment (e.g. Drinking Water)
- Pool Water
- Research Centres
- Universities
- Special Applications
- Laboratory and Field Testing

Comparator 2000+ Test Kits

Complete kits for water analysis

Scope of delivery for standard kits

Comparator test kits are supplied as a complete system in a sturdy plastic case. Together with the Comparator 2000+ and test discs, each kit includes all the necessary cells, accessories and Lovibond® tablet reagents (for 100 measurements) to achieve reliable results.

The table to the right shows a selection of the most popular standard test kits. The entire product range can be found in the special catalog for Comparator 2000+.

Customised equipment

In addition to supplying standard test kits, we can construct customised kits to suit individual requirements.

Based on the desired test parameters and measuring ranges we will draw up a detailed offer to suit your application.

Optional accessory

All test kit versions allow integration of the battery-operated portable lighting unit TK 102.

Operating instructions

The operating instructions provide a step-by-step explanation of how to conduct the water test, ensuring that even "non-chemists" can achieve reliable and accurate measurements in the minimum of time.



Example of a comparator test kit, together with daylight unit

Type	Designation/ Combi	Test	Range	Type C.d.*	Code
AF 270	**Mini Lab Pool Water**	Aluminium Ammonia Chlorine Chloride** Cyanuric Acid (Cys)** Iron Alkalinity-m pH-value Sulphate**	0 - 0,5 mg/l Al 0 - 0,4 mg/l N 0,1 - 1,0 mg/l Cl_2 1,0 - 4,0 mg/l Cl_2 5 - 5000 mg/l Cl^- 0 - 80 mg/l 0,1 - 1,0 mg/l Fe 20 - 800 mg/l $CaCO_3$ 5,2 - 6,8 pH 6,8 - 8,4 pH 40 - 4000 mg/l SO_4	3/127 A 3/112 3/40 A 3/40 S - - 3/116 - 2/1 G 2/1 J -	412700
AF 357	**Drinking Water**	Chloride (salinity)** Chlorine Fluoride Hardness Total** Hazen pH-value	0 - 5000 mg/l Cl^- 0,02 - 0,3 mg/l Cl_2 0,2 - 4 mg/l Cl_2 0 - 1,6 mg/l F^- 0 - 500 mg/l $CaCO_3$ 10 - 90 mg/l Pt 6 - 8,4 pH	- 3/40 C 3/40 B NO 11 - NSH 2/1 J	413570
AF 358	**Sewage and Domestic Effluents**	Ammonia Chlorine Nitrite Permanganate (BOD) pH-value Sulphide	0 - 1 mg/l N 0,1 - 1 mg/l Cl_2 1 - 10 mg/l Cl_2 0,05 - 0,5 mg/l N 0 - 60 mg/l 4 - 8 pH 8 - 9,6 pH 0 - 0,5 mg/l S	3/113 3/40 A 3/40 HN 3/103 3/3 A 2/1 CC 2/1 C 3/128	413580
AF 368	**Mini Lab Heavy Metals** (supplied without reagents)	Chromium Copper Cyanide Nickel Zinc	0,4 - 4 mg/l Cr 0,05 - 1 mg/l Cn 1 - 10 mg/l Cu 1 - 10 mg/l Ni 0 - 2 mg/l Zn	3/59 3/86 3/39 3/36 3/69	413680

Type	Designation/ Combi	Test	Range	Type C.d.*	Code
AF 274	**Amine**	Amine	1 - 10 mg/l	3/58	412740
AF 112A	**Chlorine** free, comb. tot.	Chlorine	0,1 - 1 mg/l Cl_2	3/40 A	411120
AF 112B	**Chlorine** free, comb. tot.	Chlorine	0,2 - 4 mg/l Cl_2	3/40 B	411130
AF 112E	**Chlorine** free, comb. tot.	Chlorine	0,02 - 0,3 mg/l Cl_2	3/40 E	411250
AF 112E/F	**Chlorine** free, comb. tot.	Chlorine Chlorine	0,02 - 0,3 mg/l Cl_2 0,2 - 0,8 mg/l Cl_2	3/40 E 3/40 F	411126
AF 112J/J	**Chlorine** free, comb. tot.	Chlorine pH-value	0,1 - 2,0 mg/l Cl_2 6,8 - 8,4 pH	3/40 J 2/1 J	417246
AF 112N/T	**Chlorine** free, comb. tot.	Chlorine Chlorine	0,1 - 1,0 mg/l Cl_2 1,1 - 2,0 mg/l Cl_2	3/40 A 3/40 N	410120
AF 112ED	**Chlorine dioxide**	Chlorine dioxide	0,04 - 0,57 mg/l ClO_2	3/40 CD	410001
AF 112 EF/ED	**Chlorine dioxide**	Chlorine dioxide	0,04 - 0,57 mg/l ClO_2 0,38 - 1,52 mg/l ClO_2	3/40 CD 3/40 FD	410007
AF 116A	**Chlorine, pH**	Chlorine pH-value	0,1 - 1 mg/l Cl_2 6,8 - 8,4 pH	3/40 A 2/1 J	411140
AF 116B	**Chlorine, pH**	Chlorine pH-value	0,2 - 4 mg/l Cl_2 6,8 - 8,4 pH	3/40 B 2/1 J	411160
AF 118S	**Chlorine, pH**	Chlorine) Chlorine pH-value pH-value	0,1 - 1,0 mg/l Cl_2 1,0 - 4,0 mg/l Cl_2 5,2 - 6,8 pH 6,8 - 8,4 pH	3/40 A 3/40 S 2/1 G 2/1 J	411181
AF 139	**Sodium hypochlorite**	Sodium hypochlorite	2 - 18 % NaOCl	3/2 Hypo	411390
AF 129	**Water Balance**	Chlorine pH-value Alkalinity-m** Calcium hardness**	0,2 - 4,0 mg/l 6,8 - 8,4 pH 20 - 500 mg/l $CaCO_3$ 20 - 500 mg/l $CaCO_3$	3/40 B 2/1 J - -	411290

* C.d. Colour disc, disc readings see following pages

** MINIKIT

Green Chemistry



Comparator 2000+ and Accessories

Type	Item	Code
TK 100	Comparator 2000+	142000
TK 102	Portable lighting unit, battery operated	142050
	Daylight Unit for Comparator 2000+, mains operated	171010
AF 631	Water sampler with two 500 ml bottles and one lid	170500
	Measuring beaker, 100 ml	384801
	Vial stand for 10 vials (ø 16 mm or □ 13.5 mm), acrylic glass	418957
	Glass stirring rod, 12 cm length	364110
	Plastic stirring rod,13 cm length	364100
	Brush, 11 cm length	380230
Type	**Item**	**Code**
Glass Cells		
DB424/S	5 glass cells, 13.5 mm path length 13.5 mm path length, volume 10 ml, with lid	354243
W680/40	Glass cell 40 mm path length, calibrated at 20 ml	606890
Plastic Cells		
	5 plastic cells, frosted on two sides,13.5 mm path length, volume 10 ml, with lid	145505
	10 plastic cells, as 14 55 05	145500
	100 plastic cells, as 14 55 05	145510



Glass cell with lid, volume 10 ml, calibrated 2 - 12 ml, path length 13.5 mm, Pack of 5, code: 354243

Nessleriser System and Accessories

Type	Item	Code
2150	Nessleriser 2150 with stand, daylight unit and AF 306/P	172030
2150	Nessleriser 2150 with stand	172150
2150	Nessleriser 2150 upgrade kit	172160
2250	Nessleriser 2250 with stand, daylight unit and DB 420	172040
2250	Nessleriser 2250 with stand	172250
2250	Nessleriser 2250 upgrade kit with Nessler tubes DB 420	172170
	Daylight Unit for Nessleriser, mains operated	171020
	Stand for Nessleriser upgrade kit	172180
AF 306/S	Stand for 12 Nessler tubes	170290
AF 306	Pair Nessler tubes, 113 mm	353060
AF 306/P	Pair Nessler tubes, 113 mm with plungers	353080
	Plunger for Nessler tube AF 306 and AF 306/P	353070
DB 420	Pair Nessler tubes, 250 mm with plungers	354200
	Plunger for Nessler tube DB 420	354229
AF 315	Special Nessler tube (determination of oxygen with disc NOE)	353150



Nessleriser with daylight

Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	CodeColourdisc
Aluminium	3/127 A	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,4; 0,5 mg/l	0 - 0.5 mg/l	230205
Amine	3/58	1; 2; 3; 4; 5; 6; 7; 8; 10 mg/l	1.0 - 10 mg/l	235800
Amine	3/64	0; 0,25; 0,5; 1; 2 mg/l	0 - 2 mg/l	236400
Ammonia	3/112	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4 mg/l	0 - 0.4 mg/l NH4	230060
Ammonia	3/113	0; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 mg/l	0 - 1.0 mg/l N	230070
Ammonia	3/125	0; 1; 2; 3; 4; 5; 6; 8; 10 mg/l	0 - 10 mg/l N	230180
Ammonia	NAA	1; 2; 3; 4; 5; 6; 8; 10 µg (50 ml probe)	0.02- 0.2 mg/l NH_3	283110
Ammonia	NAB	10; 12; 14; 16; 18; 20; 22; 24; 26 µg (50 ml probe)	0.2- 0.52 mg/l NH_3	283120
Ammonia	NAC	28; 32; 36; 40; 44; 48; 52; 56; 60 µg (50 ml probe)	0.56- 1.2 mg/l NH_3	283130
Ammonia	NAD	60; 65; 70; 75; 80; 85; 90; 95; 100 µg (50 ml probe)	1.2 - 2 mg/l NH_3	283140
Bromine	3/53A	0,2; 0,4 ; 0,6; 0,8; 1; 1,2; 1,4; 1,6; 2 mg/l	0.2 - 2.0 mg/l	235310
Bromine	3/53B	1; 2; 3; 4; 5; 6; 7; 8; 10 mg/l	1.0 - 10 mg/l	235320
Bromine	3/53C	0,5; 1; 1,5; 2; 2,5; 3; 4; 5; 6 mg/l	0.5 - 6 mg/l	235330
Chlorine free, combined, total	3/40E	0,02; 0,04 ; 0,06; 0,08; 0,1; 0,15; 0,2; 0,25; 0,3 mg/l	0.02 - 0.3 mg/l	234060

including stirring rod

Reagent	Quantity	Code	Accessories	Code
ALUMINIUM No.1	100	515460BT	13.5 mm cell, 10 ml	354243
ALUMINIUM No.2	250	515461BT		
Combi pack#	100	515470BT		
ALUMINIUM No.1 / No.2	250	515471BT		
	each 100	517601BT		
	each 250	517602BT		
AMINE	100	511010	Extraction tube AF260	352600
	250	511011		
Details on request			13.5 mm cell, 10 ml	354243
AMMONIA No.1	100	512580BT	40 mm cell W680/40	606890
	250	512581BT		
AMMONIA No.2	100	512590BT		
	250	512591BT		
Combi pack#				
AMMONIA No.1 / No.2	each 100	517611BT		
	each 250	517612BT		
AMMONIA No.1/2			13.5 mm cell, 10 ml	354243
AMMONIA No.1/2			2.5 mm cell W680/2.5	606780
NESSLER reagent	30 ml	465200	Nessler-tubes 113 mm	353060
SEIGNETTE salt solution	100 ml	465201	Nessleriser 2150	172150
	100 ml	466101		
NESSLER reagent			Nessler-tubes 113 mm	353060
SEIGNETTE salt solution			Nessleriser 2150	172150
NESSLER reagent			Nessler-tubes 113 mm	353060
SEIGNETTE salt solution			Nessleriser 2150	172150
NESSLER reagent			Nessler-tubes 113 mm	353060
SEIGNETTE salt solution			Nessleriser 2150	172150
DPD No.1	100	511050BT	13.5 mm cell, 10 ml	354243
	250	511051BT		
	500	511052BT		
DPD No.1			13.5 mm cell, 10 ml	354243
DPD No.1			13.5 mm cell, 10 ml	354243
DPD No.1	100	511050BT	40 mm cell W680/40	606890
	250	511051BT		
	500	511052BT		
DPD No.2	100	511530BT		
	250	511531BT		
DPD No.3	100	511080BT		
	250	511081BT		
	500	511082BT		
Combi pack#	each 100	517711BT		
DPD No.1 / No.3	each 250	517712BT		
DPD No.4	100	511220BT		
	250	511221BT		
	500	511222BT		

Material Safety Data Sheets: www.lovibond.com

Green Chemistry



Test disc with colour stable glass standards

Certification for Comparator 2000+ Discs

To allow users to demonstrate that test equipment has been assessed for conformance with accepted quality standards, Lovibond® colour discs can be certified by the Tintometer® Group to conform to ISO 9001. If requested at the time of order, new discs are issued with a serial number and a certificate of conformance stating that the disc has satisfied the relevant inspection criteria and conforms to the requirements of the appropriate test. Depending on the requirements of the user's quality control system, used discs can be returned at regular intervals to the Tintometer® Group for checking and recertification.

Type of certificate	Code
Certificate for a new test disc	999800
Certificate for a used test disc	999810
Calibration certificate for a new test disc	999820
Calibration certificate for a used test disc	999830

Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	CodeColourdisc
Chlorine free, combined, total		0,02; 0,04 ; 0,06; 0,08; 0,1; 0,2; 0,3; 0,4; 0,5 mg/l	0.02 - 0.5 mg/l	295920
Chlorine free, combined, total	3/40F	0,2; 0,25 ; 0,3; 0,35; 0,4; 0,5; 0,6; 0,7; 0,8 mg/l	0.2 - 0.8 mg/l	234070
Chlorine free, combined, total	3/40G	1,5; 1,8; 2,0; 2,3; 2,5; 2,7; 3,0; 3,2; 3,5 mg/l	1.5 - 3.5 mg/l	234030
Chlorine free, combined, total	3/40A	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	234010
Chlorine free, combined, total	3/40T	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	234110
Chlorine free, combined, total	3/40N	1,1; 1,2; 1,3; 1,4; 1,5; 1,6; 1,7; 1,8; 2 mg/l	1.1 - 2.0 mg/l	233960
Chlorine free, combined, total	3/40J	0,1; 0,2; 0,3; 0,4; 0,6; 0,8; 1; 1,5; 2 mg/l	0.1 - 2.0 mg/l	234140
Chlorine free, combined, total	3/40B	0,2; 0,4; 0,6; 1; 1,5; 2; 2,5; 3; 4 mg/l	0.2 - 4.0 mg/l	234020
Chlorine free, combined, total	3/40K	0,5; 1; 1,5; 2; 2,5; 3; 4; 5; 6 mg/l	0.5 - 6.0 mg/l	233930
Chlorine free, combined, total	3/40S	1; 1,2; 1,4; 1,6; 1,8; 2; 2,5; 3; 4 mg/l	1.0 - 4.0 mg/l	234090
Chlorine free, combined, total	3/40P	2; 2,3; 2,5; 2,7; 3; 3,2; 3,6; 4; 5 mg/l	2.0 - 5.0 mg/l	233920
Chlorine free, combined, total	3/40HN	2; 3; 4; 5; 6; 7; 8; 9; 10 mg/l	2.0 - 10 mg/l	234081
Chlorine free, combined, total	3/40CZ	0,5; 1; 1,5; 2; 4 mg/l Cl_2 7; 7,4; 7,6; 8 pH	0.5 - 4 mg/l Cl_2 7 - 8 pH	233990
Chlorine free, combined, total	3/2A	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	232010
Chlorine free, combined, total	3/2AB	0,15; 0,25; 0,5; 0,75; 1; 1,25; 1,5; 1,75; 2 mg/l	0.15 - 2.0 mg/l	232020
Chlorine free, combined, total	3/2APC	1; 1,5; 2; 2,5; 3; 3,5; 4; 4,5; 5 mg/l	1.0 - 5.0 mg/l	232050
Chlorine HR total chlorine only	3/2APH	2; 3; 4; 5; 6; 7; 8; 9; 10 mg/l total Cl_2	2 - 10 mg/l	232060

including stirring rod

Reagent	Quantity	Code	Accessories	Code
DPD No.1/2/3/4			40 mm cell W680/40	606890
DPD No.1/2/3/4			40 mm cell W680/40	606890
DPD No.1/2/3/4			13.5 mm cell, 10 ml	354243
DPD No.1/2/3/4			13.5 mm cell, 10 ml	354243
DPD No.1/2/3/4			25 mm cell W680/25 13.5 mm cell, 10 ml	606860 354243
DPD No.1/2/3/4			25 mm cell W680/25 13.5 mm cell, 10 ml	606860 354243
DPD No.1/2/3/4			13.5 mm cell, 10 ml	354243
DPD No.1/2/3/4			13.5 mm cell, 10 ml	354243
DPD No.1/2/3/4			13.5 mm cell, 10 ml	354243
DPD No.1/2/3/4			13.5 mm cell, 10 ml	354243
DPD No.1/2/3/4			13.5 mm cell, 10 ml	354243
DPD No.1/2/3/4			5 mm cell W680/5	606790
DPD No.1/2/3/4 Phenol red tablets, see pH determination			13.5 mm cell, 10 ml 13.5 mm cell, 10 ml	354243 354243
Reagents at specialized chemistry dealer			13.5 mm cell, 10 ml	354243
Reagents at specialized chemistry dealer			13.5 mm cell, 10 ml	354243
Reagents at specialized chemistry dealer			5 mm cell W680/5	606790
CHLORINE HR (KI) ACIDIFYING GP Combi pack# CHLORINE HR (KI)/ ACIDIFYING GP	100 250 100 250 each 100 each 250	513000BT 513001BT 515480BT 515481BT 517721BT 517722BT	40 mm cell W680/40	606890



Lighting unit, mains operated

Material Safety Data Sheets: www.lovibond.com

Green Chemistry

Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	CodeColourdisc
Chlorine HR total chlorine only	3/2ARP	5; 10; 15; 20; 25; 30; 35; 40; 50 mg/l total Cl_2	5.0 - 50 mg/l	232070
Chlorine HR total chlorine only	3/2IOD	5; 10; 25; 50; 75; 100; 150; 200; 250 mg/l total Cl_2	5.0 - 250 mg/l	232090
Chlorine free, combined, total	NDPB	0,01; 0,02; 0,03; 0,04; 0,05; 0,06; 0,07; 0,08; 0,1 mg/l	0.01 - 0.1 mg/l	283450
Chlorine free, combined, total	NDPC	0,02; 0,04; 0,06; 0,08; 0,1; 0,12; 0,14; 0,16; 0,2 mg/l	0.02 - 0.2 mg/l	283460
Chlorine free, combined, total	NDP	0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4; 0,5 mg/l	0.05 - 0.5 mg/l	283440
Chlorine free, combined, total	NDPD	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	283470
Chlorine dioxide	3/40AD	0,19; 0,38; 0,57; 0,76; 0,95; 1,14; 1,33; 1,52; 1,9 mg/l	0.19 - 1.9 mg/l	292260
Chlorine dioxide	3/40ED	0,04; 0,08; 0,11; 0,15; 0,19; 0,28; 0,38; 0,48; 0,57 mg/l	0.04 - 0.57 mg/l	297970
Chlorine dioxide	3/40FD	0,38; 0,48; 0,57; 0,66; 0,76; 0,95; 1,14; 1,33; 1,52 mg/l	0.38 - 1.52 mg/l	298750
Chlorine dioxide	3/157	0,25; 0,5; 0,75; 1; 1,25; 1,5; 2; 3; 5 mg/l	0.25 - 5.0 mg/l	230570
Chromium	3/59	10; 20; 30; 40; 50; 60; 70; 80; 100 µg (25 ml probe)	0.4 - 4 mg/l	235900
Copper	3/106	0; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 mg/l	0 - 1.0 mg/l	230050
Copper	3/110	0; 0,5; 1; 1,5; 2; 2,5; 3; 3,5; 4 mg/l	0 - 4.0 mg/l	230040
DEHA	3/150	8; 16; 24; 32; 40; 48; 56; 64; 80 µg/l Disc reading should be multiplied by 2 for true DEHA concentration	16 - 160 µg/l	230460
Fluoride	NOM	0; 0,2; 0,4; 0,6; 0,8; 1; 1,2; 1,4; 1,6 mg/l	0 - 1.6 mg/l	283730

including stirring rod

Reagent	Quantity	Code	Accessories	Code
CHLORINE HR (KI) ACIDIFYING GP			13.5 mm cell, 10 ml	354243
CHLORINE HR (KI) ACIDIFYING GP			13.5 mm cell, 10 ml	354243
DPD No.1 NESSLERISER	100	511230BT	Nessleriser 2150	172150
	250	511231BT	Nessler-tubes 113 mm	353060
DPD No.2 NESSLERISER	100	511240		
	250	511241		
DPD No.3 NESSLERISER	100	511250BT		
	250	511251BT		
DPD No.4 NESSLERISER	100	511260BT		
	250	511261BT		
DPD No.1/2/3/4 NESSLERISER			Nessleriser 2150 Nessler-tubes 113 mm	172150 353060
DPD No.1/2/3/4 NESSLERISER			Nessleriser 2150 Nessler-tubes 113 mm	172150 353060
DPD No.1/2/3/4 NESSLERISER			Nessleriser 2150 Nessler-tubes 113 mm	172150 353060
DPD No.1	100	511050BT	13.5 mm cell, 10 ml	354243
	250	511051BT		
DPD No.1			40 mm cell W680/40	606890
DPD No.1			40 mm cell W680/40	606890
CHLORINE HR (KI)	100	513000BT	40 mm cell W680/40	606890
	250	513001BT		
ACIDIFYING GP	100	515480BT		
	250	515481BT		
Combi pack#	each 100	517721BT		
CHLORINE HR (KI)/ ACIDIFYING GP	each 250	517722BT		
Details on request			13.5 mm cell, 10 ml	354243
COPPER/ZINC LR	100	512620BT	13.5 mm cell, 10 ml	354243
	250	512621BT		
COPPER/ZINC HR	100	512340BT	13.5 mm cell, 10 ml	354243
	250	512341BT		
DEHA	100	513220BT	40 mm cell W680/40	606890
	250	513221BT		
DEHA solution	100 ml	461181		
FLUORIDE A-Z	100	511400BT	Nessleriser 2150	172150
FLUORIDE EXCESS AL	100	511410	Nessler-tubes 113 mm	353060
	250	511411		

Material Safety Data Sheets: www.lovibond.com

Green Chemistry



Nessleriser with lighting unit

Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	CodeColourdisc
Iron, total	3/144	0,02; 0,04; 0,06; 0,08; 0,1; 0,15; 0,2; 0,25; 0,3 mg/l	0.02 - 0.3 mg/l	230380
Iron, total	3/116	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	230100
Iron, total	3/117	1; 2; 3; 4; 5; 6; 7; 8; 10 mg/l	1.0 - 10 mg/l	230110
Iron, total	NOL	0,01; 0,02; 0,03; 0,04; 0,05; 0,06; 0,07; 0,08; 0,10 mg/l	0.01 - 0.1 mg/l	283720
Hardness, total	4/38	0; 5; 10; 15; 20; 25; 30; 40; 60 mg/l	0 - 60 mg/l $CaCO_3$	231070
Hazen/APHA	4/28	50; 75; 100; 150; 200; 250; 300; 400; 500 mg Pt/l	50 - 500 mg/l Pt	242801
Hazen/APHA	NSH	10; 20; 30; 40; 50; 60; 70; 80; 90 mg Pt/l	10 - 90 mg/l Pt	284170
Hazen/APHA	NSB	70; 85; 100; 125; 150; 175; 200; 225; 250 mg Pt/l	70 - 250 mg/l Pt	284120
Hazen/APHA	CAA	0; 2,5; 5; 7,5; 10; 15; 20; 25; 30 mg Pt/l	0 - 30 mg/l Pt	284150
Hazen/APHA	CAB	30; 35; 40; 45; 50; 55; 60; 65; 70 mg Pt/l	30 - 70 mg/l Pt	284160
Hydrazine	3/126	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,4; 0,5 mg/l	0 - 0.5 mg/l	230190
Hydrazine	3/135	0,02; 0,04; 0,06; 0,08; 0,1; 0,12; 0,14; 0,16; 0,2 mg/l	0.02 - 0.2 mg/l	230290
Hydrazine	3/85	0; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 mg/l	0 - 1.0 mg/l	238500
Hydrazine	NOH	0; 0,5; 1; 2; 3; 4; 6; 8; 10 µg (25 ml Probe)	0 - 0.4 mg/l	283700
Hydrogen peroxide	3/50 A	0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4; 0,5 mg/l	0.05 - 0.5 mg/l	235000
Hydrogen peroxide	3/50 B	0,1; 0,2; 0,3; 0,4; 0,6; 1; 1,5; 2; 3 mg/l	0.1 - 3 mg/l	235010
Hydrogen peroxide	3/50 E	0,01; 0,02; 0,03; 0,04; 0,05; 0,07; 0,09; 0,12; 0,15 mg/l	0.01 - 0.15 mg/l	235020
Iodine	3/77A	0,4; 0,7; 1,1; 1,4; 1,8; 2,2; 2,5; 2,9; 3,6 mg/l	0.4 - 3.6 mg/l	237710
Iodine	3/77B	0,7; 1,4; 2,2; 3,6; 5,4; 7,2; 9,0; 11; 14 mg/l	0.7 - 14 mg/l	237720

including stirring rod

Reagent	Quantity	Code	Accessories	Code
IRON LR (Fe^{2+} und Fe^{3+})	100 250	515370BT 515371BT	40 mm cell W680/40	606890
IRON LR (Fe^{2+} und Fe^{3+}) IRON (II) LR (Fe^{2+})	100 250 100	515370BT 515371BT 515420BT	13.5 mm cell, 10 ml	354243
IRON HR	100 250	515380BT 515381BT	13.5 mm cell, 10 ml	354243
IRON LR + IRON (II) LR			Nessleriser 2150 Nessler-tubes 113 mm	172150 353060
ERIOCHROME HARDNESS powder	100 Tests	462950	13.5 mm cell, 10 ml	354243
Straight colour match to sample			40 mm cell W680/40	606890
Straight colour match to sample			Nessleriser 2150 Nessler-tubes 113 mm	172150 353060
Straight colour match to sample			Nessleriser 2150 Nessler-tubes 113 mm	172150 353060 without lid 353080 with lid
Straight colour match to sample			Nessleriser 2250 Nessler-tubes 250 mm	172250 354200
Straight colour match to sample			Nessleriser 2250 Nessler-tubes 250 mm	172250 354200
HYDRAZINE TEST-powder	30 g	462910	13.5 mm cell, 10 ml	354243
HYDRAZINE TEST-powder	30 g	462910	40 mm cell W680/40	606890
p-DMAB reagent	100 ml	461261	13.5 mm cell, 10 ml	354243
p-DMAB reagent	100 ml	461261	Nessler-tubes 113 mm	353060 without lid 353080 with lid
HYDR. PEROXIDE LR	100 250	512380BT 512381BT	13.5 mm cell, 10 ml	354243
HYDR. PEROXIDE LR			13.5 mm cell, 10 ml	354243
HYDR. PEROXIDE LR			40 mm cell W680/40	606890
DPD No.1	100 250	511050BT 511051BT	13.5 mm cell, 10 ml	354243
DPD No.1			13.5 mm cell, 10 ml	354243



Lighting unit with comparator and discs, mains operated

Material Safety Data Sheets: www.lovibond.com

Green Chemistry

Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	CodeColourdisc
Manganese	3/169	0; 0,5; 1; 1,5; 2; 2,5; 3; 3,5; 4 mg/l	0 - 4.0 mg/l	230690
Molybdate	3/162	0; 1; 2; 3; 4; 5; 6; 8; 10 mg/l	0 -10 mg/l MoO_4	230620
Molybdate	3/137	5; 10; 15; 20; 25; 30; 35; 40; 50 mg/l	5.0 -50 mg/l MoO_4	230320
Molybdate	3/138	10; 20; 30; 40; 60; 80; 100; 120; 150 mg/l	10 -150 mg/l MoO_4	230330
Sodiumhypochlorite	3/2 Hypo	2; 4; 6; 8; 10; 12; 14; 16 %	2 - 16 %	232110
Nitrate	3/124	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 -1.0 mg/l N	230170
Nitrate	3/142	10; 20; 30; 40; 50; 60; 70; 80; 100 mg/l	10 -100 mg/l NO_3	230360
Nitrite	3/103	0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4; 0,5 mg/l	0.05 - 0.5 mg/l N	230030
Nitrite	NJP	0,002; 0,004; 0,006; 0,01; 0,015; 0,02; 0,03; 0,04; 0,05 mg/l	0.002 - 0.05 mg/l N	283960
Nitrite	NJ	0,05; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 µg/l (50 ml probe)	0.001 - 0.02 mg/l N	283580
Oxygen	3/165	2; 3; 4; 5; 6; 7; 8; 10; 12 mg/l	2.0 - 12 mg/l	230650
Ozone	3/67	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1 mg/l	0.1 - 1.0 mg/l	236700
Ozone	3/67A	0,01; 0,02; 0,03; 0,04; 0,05; 0,06; 0,07; 0,08; 0,1 mg/l	0.01 - 0.1 mg/l	236710

including stirring rod

Reagent	Quantity	Code	Accessories	Code
MANGANESE LR 1	100	516080BT	13.5 mm cell, 10 ml	354243
	250	516081BT		
MANGANESE LR 2	100	516090BT		
	250	516091BT		
Combi pack#	each 100	517621BT		
MANGANESE LR 1/ MANGANESE LR 2	each 250	517622BT		
Details on request			40 mm cell W680/40	606890
MOLYBDATE No.1 HR	100	513060BT	40 mm cell W680/40	606890
	250	513061BT		
MOLYBDATE No.2 HR	100	513070BT		
	250	513071BT		
Combi pack#	each 100	517631BT		
MOLYBDATE No.1 HR / MOLYBDATE No.2 HR	each 250	517632BT		
MOLYBDATE No.1 HR MOLYBDATE No.2 HR			13.5 mm cell, 10 ml	354243
CHLORINE HR (KI)	100	513000BT	13.5 mm cell, 10 ml	354243
	250	513001BT		
ACIDIFYING GP	100	515480BT		
	250	515481BT		
Combi pack#	each 100	517721BT		
CHLORINE HR (KI) ACIDIFYING GP	each 250	517722BT		
Dilution set for sample preparation	1	414470		
NITRATE-TEST tablets	100 (bottle)	502810	13.5 mm cell, 10 ml Nitrate-Test-tubes	354243 366220
NITRATE Test powder	15 g	465230		
NITRITE LR	100	512310BT		
	250	512311BT		
NITRATE No.1	100	513110	13.5 mm cell, 10 ml	354243
NITRITE LR	100	512310BT	13.5 mm cell, 10 ml	354243
	250	512311BT		
NITRITE LR	100	512310BT	Nessler-tubes 113 mm	353060
	250	512311BT		
NITRITE ACIDIFYING	250 (bottle)	502371		
Details on request			Nessler-tubes 113 mm	353060
DO-reagent No.1	100 Tests	461150	13.5 mm cell, 10 ml	354243
DO-reagent No.2	100 Tests	461160		
DO-reagent No.3	90 Tests	461170		
DPD No.4	100	511220BT	13.5 mm cell, 10 ml	354243
	250	511221BT		
DPD No.4	100	511220BT	40 mm cell W680/40	606890
	250	511221BT		



Lighting unit TK 102

Material Safety Data Sheets: www.lovibond.com

Green Chemistry

Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	CodeColourdisc
Ozone	3/67S	0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,35; 0,4; 0,45 mg/l	0.05 - 0.45 mg/l	236770
Ozone	3/148	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,4; 0,5 mg/l	0 - 0.5 mg/l	230440
pH	2/1A	1,2; 1,4; 1,6; 1,8; 2,0; 2,2; 2,4; 2,6; 2,8	1.2 - 2.8 pH	221010
pH	2/1B	2,8; 3; 3,2; 3,4; 3,6; 3,8; 4; 4,2; 4,4	2.8 - 4.4 pH	221030
pH	2/1C	3,6; 3,8; 4; 4,2; 4,4; 4,6; 4,8; 5; 5,2	3.6 - 5.2 pH	221050
pH	2/1E	4,4; 4,6; 4,8; 5; 5,2; 5,4; 5,6; 5,8; 6	4.4 - 6.0 pH	221080
pH	2/1G	5,2; 5,4; 5,6; 5,8; 6; 6,2; 6,4; 6,6; 6,8	5.2 - 6.8 pH	221100
pH	2/1H	6; 6,2; 6,4; 6,6; 6,8; 7; 7,2; 7,4; 7,6	6.0 - 7.6 pH	221110
pH	2/1J	6,8; 7; 7,2; 7,4; 7,6; 7,8; 8; 8,2; 8,4	6.8 - 8.4 pH	221130
pH	2/1K	7,2; 7,4; 7,6; 7,8; 8; 8,2; 8,4; 8,6; 8,8	7.2 - 8.8 pH	221140
pH	2/1L	8; 8,2; 8,4; 8,6; 8,8; 9; 9,2; 9,4; 9,6	8.0 - 9.6 pH	221190
pH	2/1P	4; 5; 6; 7; 8; 9; 9,4; 10; 11	4.0 - 11 pH	221220
pH	2/1W	1,0; 1,2; 1,4; 1,6; 1,8; 2,0; 2,2; 2,4; 2,6	1.0 - 2.6 pH	221250
pH	2/1Z	7,6; 7,8; 8; 8,2; 8,4; 8,6; 8,8; 9,0; 9,2	7.6 - 9.2 pH	221270
pH	NLC	6; 6,2; 6,4; 6,6; 6,8; 7; 7,2; 7,4; 7,6	6.0 - 7.6 pH	281030
pH	NLF	8; 8,2; 8,4; 8,6; 8,8; 9; 9,2; 9,4; 9,6	8.0 - 9.6 pH	281060
Phosphate	3/133	0; 0,25; 0,5; 1; 1,5; 2; 2,5; 3; 4 mg/l	0 - 4.0 mg/l PO_4	230270

including stirring rod

Reagent	Quantity	Code	Accessories	Code
DPD No.4	100 250	511220BT 511221BT	13.5 mm cell, 10 ml	354243
OZONE-INDIGO	100 250	513170BT 513171BT	40 mm cell W680/40	606890
THYMOL BLUE	100 250	511650 511651	13.5 mm cell, 10 ml	354243
BROMOPHENOL BLUE	100 250	511620 511621	13.5 mm cell, 10 ml	354243
BROMOCRESOL GREEN	100 250	511760 511761	13.5 mm cell, 10 ml	354243
METHYL RED	100 ml	451631	13.5 mm cell, 10 ml	354243
BROMOCRESOL PURPLE	100 250	511730 511731	13.5 mm cell, 10 ml	354243
BROMOTHYMOL BLUE	100 250	511640BT 511641BT	13.5 mm cell, 10 ml	354243
PHENOL RED	100 250	511750BT 511751BT	13.5 mm cell, 10 ml	354243
CRESOL RED	100 250	511600 511601	13.5 mm cell, 10 ml	354243
THYMOL BLUE	100 250	511650 511651	13.5 mm cell, 10 ml	354243
UNIVERSAL PH Indicator	25 ml 100 ml 250 ml 500 ml	451770 451771 451772 451773	13.5 mm cell, 10 ml	354243
M-CRESOL PURPLE	100 250	511710BT 511711BT	13.5 mm cell, 10 ml	354243
M-CRESOL PURPLE	100 250	511710BT 511711BT	13.5 mm cell, 10 ml	354243
BROMOTHYMOL BLUE PH Indicator	25 ml 100 ml 250 ml 500 ml	451620 451621 451622 451623	Nessler-tubes 113 mm	353060
THYMOL BLUE PH Indicator	25 ml 100 ml 250 ml 500 ml	451650 451651 451652 451653	Nessler-tubes 113 mm	353060
PHOSPHATE No.1 LR PHOSPHATE No.2 LR Combi pack# PHOSPHATE No.1 LR / No.2 LR	100 100 each 100	513040BT 513050BT 517651BT	13.5 mm cell, 10 ml	354243



Tablet reagents in foil blister strip (BT)

Material Safety Data Sheets: www.lovibond.com

Green Chemistry

Comparator 2000+

Tests, Discs, Reagents, Cells

Test	Disc	Disc Readings	Range	CodeColourdisc
Phosphate	3/136	0; 5; 10; 15; 20; 25; 30; 35; 40 mg/l	0 - 40 mg/l PO_4	230310
Phosphate	3/12	0; 10; 20; 30; 40; 50; 60; 70; 80 mg/l	0 - 80 mg/l PO_4	231200
Phosphate	3/70	0; 10; 20; 30; 40; 50; 60; 70; 80; 100 mg/l	0 - 100 mg/l PO_4	237000
Phosphate	3/60	10; 20; 30; 40; 50; 60; 70; 80; 100 mg/l	10 - 100 mg/l PO_4	236000
Phosphate	NMD	10; 20; 30; 40; 50; 60; 70; 80; 100 µg/l (50 ml probe)	0.2 - 2 mg/l PO_4	283950
QAC (Quaternary Ammonia Compounds)	3/118	0; 2; 4; 6; 8; 10; 12; 15; 20 mg/l	0 - 20 mg/l	230120
QAC (Quaternary Ammonia Compounds)	3/119	0; 20; 40; 60; 80; 100; 120; 150; 200 mg/l	0 - 200 mg/l	230130
Silica	3/139	0,4; 0,6; 1; 1,5; 2; 2,5; 3; 3,5; 4 mg/l	0.4 - 4.0 mg/l SiO_2	230340
Silica	3/147	1; 2; 3; 4; 5; 6; 7; 8; 10 mg/l	1.0 - 10 mg/l SiO_2	230420
Silica	3/140	0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 1,0 mg/l	0.1 - 1.0 mg/l SiO_2	230250
Silica	3/13	2,5; 5; 7,5; 10; 12,5; 15; 17,5; 20; 25 mg/l	2.5 - 25 mg/l SiO_2	231300
Silica	NN	1; 2; 4; 6; 8; 10; 12; 16; 20 mg/l	1.0 - 20 mg/l SiO_2	283630
Silica	NV	0,2; 0,3; 0,4; 0,5; 0,6; 0,7; 0,8; 0,9; 1,0 mg/l	0.2 - 1.0 mg/l SiO_2	283880
Sugar	3/29A	0; 5; 10; 15; 30; 45; 60; 75; 100 mg/l	0 - 100 mg/l	232910
Sulphide	3/128	0; 0,05; 0,1; 0,15; 0,2; 0,25; 0,3; 0,4; 0,5 mg/l	0 - 0.5 mg/l S	230210
Zinc	3/151	0; 0,1; 0,2; 0,3; 0,4; 0,5; 0,6; 0,8; 1 mg/l	0 - 1.0 mg/l	230470
Zinc	3/102	0; 0,5; 1; 1,5; 2; 2,5; 3; 3,5; 4 mg/l	0 - 4.0 mg/l	230020

including stirring rod

Reagent	Quantity	Code	Accessories	Code
PHOSPHATE HR	100 250	511980BT 511981BT	13.5 mm cell, 10 ml	354243
Details on request			13.5 mm cell, 10 ml	354243
PHOSPHATE HR	100	511980BT	13.5 mm cell, 10 ml	354243
Vanadomolybdat-Reagent	1 litre	468404	13.5 mm cell, 10 ml	354243
Details on request			Nessler-tubes 113 mm	353060
QAC LR ACIDIFYING GP	100 250 100 250	515390BT 515391BT 515480BT 515481BT	40 mm cell W680/40	606890
QAC HR ACIDIFYING GP	100 250 100 250	515400 515401 515480BT 515481BT	13.5 mm cell, 10 ml	354243
SILICA No.1 SILICA No.2 Combi pack# SILICA No.1 / No.2	100 250 100 250 each 100 each 200	513130BT 513131BT 513140BT 513141BT 517671BT 517672BT	13.5 mm cell, 10 ml	354243
SILICA No.1/No.2			13.5 mm cell, 10 ml	354243
Details on request			40 mm cell W680/40	606890
Ammonia-molybdate	100 ml	460241	40 mm cell W680/40	606890
Ammonia-molybdate	100 ml	460241	Nessleriser 215 Nessler-tubes 113 mm	172150 353060
Details on request			Nessler-tubes 113 mm	353060
Details on request			5 mm cell W680/5	606790
SULPHIDE No.1 SULPHIDE No.2	100 (bottle) 100 (bottle)	502930 502940	13.5 mm cell, 10 ml	354243
COPPER/ZINC LR COPPER/ZINC LR	100 250	512620BT 512621BT	13.5 mm cell, 10 ml	354243
COPPER/ZINC HR COPPER/ZINC HR	100 250	512340BT 512341BT	13.5 mm cell, 10 ml	354243



Test disc with colour-stable glass standards

Material Safety Data Sheets: www.lovibond.com

Green Chemistry

Colour measurement of water
E-Comparator EC 2000 Pt-Co



The evolution of the visual (subjective) for electronic (objective) colour measurement of water

The Lovibond® EComparator Pt-Co provides an easy way to replace the subjective visual colour comparison with an objective and accurate electronic measurement, without sacrificing the visual assessment of the colour view.

The user friendly ergonomics and intuitive interface guarantee new users can be quickly trained and easily supported. Large data storage (> 20,000 readings) and USB connectivity ensures readings can be stored and shared easily and quickly. Flexibility is further enhanced with software packages for **Windows® with multiple language* support on-screen.

Touch screen technology makes the EComparator Series easily programmable with instinctive menus on screen. Users can set language*, date and time, view preferences and create projects with individual tolerance settings.

An on-screen warning system of:

Green = Within Tolerance;

Red = Outside Tolerance;

Amber = On Border of Tolerance

provides the user with immediate information on the sample.

* Supported Languages: English, French, German, Spanish, Italian, Chinese, Japanese, Russian

**Applicable for the following operating systems: Windows XP, Windows Vista and Windows 7/10

✓ Colour measurement of water

✓ according to international standards such as:
Platinum-Cobalt / Hazen / APHA / ASTM D 1209 / TCU

Platinum-Cobalt / Hazen / APHA Colour (ASTM D 1209)

Often referred to as Pt-Co, Platinum-Cobalt, Hazen or APHA Colour – all terms are inter-changeable and equally valid.

Used to measure clear to dark amber liquids.

Originally defined by specified dilutions: range from 0 at the light end of the scale to 500 at the darkest.

Used extensively in the water industry but also for clear oils, chemicals and petrochemicals such as glycerine, plasticisers, solvents, carbon tetra-chloride and petroleum spirits.

Accuracy and Efficiency

The EComparator Pt-Co are supplied with a Certified and Liquid Reference Standard enabling quick and simple validation.

The instrument is equipped with an integrated light shield to protect the sample from ambient light and a flexible path length and cell choice (plastic or glass) for flexibility of application.

With robust casing and a small laboratory footprint, the EComparator Series is the ideal solution for users wishing to experience the benefits of immediate, accurate, electronic readings: the best of both worlds.

Technical Data

Light Source	White LED (25 year lifetime)
Sensors	Tristimulus Detectors, Reference and Sample
Colour	Pt-Co
Range	2 - 500
Resolution	1 Pt-Co Unit
Repeatability	± 3% +1 Pt-Co Unit
Detection limit	2 Pt-Co TCU Units
Path Length	50 mm

Standards	ASTM D1209
Comparator View	2 Field
Display	Size: 3,5 cm Resolution: 320 x 240 Colour: 24 Bit (True Colour)
Touchscreen	Resistiv
Keypad	3 key tactile membrane
Sample Chamber Cell Type Filters	W100 Spectrophotometer EC Range Holders

Filter	Glass standard for E-Comparator
Casing	Flame Retardant ABS
Material Size	L 106 x B 210 x H 57 (mm)
Power Sources	USB or Battery (4 x AA)
Data Storage	> 20.000 readings
Interface	USB 2.0 A- Micro B
Software	Data Transmission Software (**Windows®)
Temperature	Max Sampl. Temperature = 80 °C

Accessories

			Code
Liquid Standard Zero	EC 2000	500 ml	133991
Liquid Reference Standard ASTM Value 1	LIQUID REF STD		134000
Liquid Reference Standard ASTM Value 3	LIQUID REF STD		134010
Liquid Reference Standard ASTM Value 5	LIQUID REF STD		134020
Liquid Reference Standard Pt-Co 5	EC 2000	500 ml	134140
Liquid Reference Standard Pt-Co 10	EC 2000	500 ml	134150
Liquid Reference Standard Pt-Co 15	EC 2000	500 ml	134160
Liquid Reference Standard Pt-Co 30	EC 2000	500 ml	134170
Liquid Reference Standard Pt-Co 50	EC 2000	500 ml	134180
Liquid Reference Standard Pt-Co 100	EC 2000	500 ml	134190
Liquid Reference Standard ASTM 0.4 (<0.5)	LIQUID REF STD		134290
Liquid Standard (15 ± 2.0)	EC 2000	for EC 2000 PT-CO - 60 ml	135049
Liquid Standard Zero	EC 2000	for EC 2000 PT-CO - 60 ml	135059
Glass Standard conformity filter			135119
W 100 50 mm tube (plastic), tube Set 50			352101
W 100. OG. 50 mm, 1 tube (optical glass)			601070
USB adapter			190620
USB cable, 2.0 A- Micro B plug for data transfer			190630

**Applicable for the following operating systems: Windows XP, Windows Vista and Windows 7/10



Due to aesthetic considerations, the colouring of drinking water should not be strong or even visible. In many countries the colouring of drinking water is therefore determined by "True Colour Units", TCU for short, which correspond in numerical value to Hazen units. For this reason, the EC2000 Comparator is also available in a version for displaying the values in TCU units.

Code EC-TCU Kit: 162011

Code EC-TCU Instrument:162007

Delivery Content

- EC 2000-Pt-Co in carrying case
- Power Supply (UK, EU, US Plug)
- USB Cable
- Screwdriver
- 4x AA Batteries
- Liquid Reference Standard 1
- 3 x 50mm W100 (Plastic cell)
  1 x 50mm W100 (Optical Glass cell)
- Glass Standard
- CD with Software (Windows) and Manual

Code 162010

Photometry


Home
12.02.18 11:48
Konzentration
Spektrum
Extinktion
% Transmission
Kinetik
Spezial
Multi-Wellenlängen
Einstellungen
DeviceCheck
Info
F1
F2
F3
F4
Esc
Zero
START
ENTER





MD 100 / 110 / 200
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COD Setups
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MD 600 / 610
Page 66



MD 640
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SpectroDirect
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XD 7000 / 7500
Page 78

Photometry

History

More than three decades have passed since the appearance of the first photometer system.

Since that time, Tintometer has become a world-famous name as the manufacturer of photometer systems sold under the brand name of Lovibond®.

Our range of photometer systems extends from the **MD 100*** and **MD 110*** as hand-held models, the multi parameter **MD 200*** as desktop model to the **SpectroDirect** spectrophotometer for laboratories to the spectrophotometer **UV / VIS XD 7500.**

The new **XD 7000** (VIS) and **XD 7500** (UV/VIS) spectrophotometers include all available Lovibond® methods and give the professional user a wide range of options in all areas of water analysis. These instruments also apply to special implementations and demanding applications in research and development, as well as everyday routine lab work.

The multi-functional **PM 6x0** photometer provides the answer to all requirements relating to the analysis of water used in modern swimming pools. They offer a wide variety of pre-programmed methods and are therefore suitable for the demands of modern water analysis.

The **MultiDirect** offers a wide variety of preprogrammed methods and is therefore suitable for the demands of modern water and drinking water analysis.

Representing particularly robust, portable photometers for fast, flexible on-site analysis are thetwo **MD 600** and **MD 610** instruments. Additionally, the enhanced MD 640 is optimally suited for tracer measurements in closed water treatment water systems with the added parameters for fluorescein and PTSA.

The **MD 110**, **PM 630**, the **MD 610** and the **MD 640** are equipped with state-of-the-art data transmission and feature a **Bluetooth®**interface. Together with the free app AquaLX® or the separately offered Bluetooth® dongle (for PC), data exchange is fast and wireless.

Parameter	MD 100* & MD 110*	MD 200*	MD 600 & MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Reagents also compatible to Hach® instruments*
Acid Capacity $K_{S4.3}$		■	■	■	■		■	■	■	
Alkalinity-m	■	■	■	■	■	■	■	■	■	
Alkalinity-p			■	■			■	■	■	
Aluminium	■		■	■	■		■	■	■	s. page 114
Ammonia	■		■	■	■		■	■	■	s. page 114
Arsenic							■	■	■	
Boron			■	■			■	■	■	
Bromine	■	■	■	■	■	■	■	■	■	s. page 114
Cadmium							■	■	■	
Calcium Hardness	■	■	■	■	■	■		■	■	
Chloride	■		■	■			■	■	■	
Chlorine	■	■	■	■	■	■	■	■	■	s. page 114
Chlorine Dioxid	■	■	■	■	■		■	■	■	s. page 114
Chromium			■	■			■	■	■	
COD	■	■	■	■			■	■	■	s. page 114
Copper	■	■	■	■	■	■	■	■	■	s. page 114
Cyanide			■	■			■	■	■	
Cyanuric Acid	■	■	■	■	■	■	■	■	■	
DEHA	■		■	■			■	■	■	s. page 116
Fluoresceine (only MD 640)			■							
Fluoride	■		■	■			■	■	■	
Formaldehyde							■	■	■	
Hazen (Pt-Co-Units ; APHA)	■		■	■			■	■	■	
Hydrazine	■		■	■			■	■	■	s. page 116
Hydrogen Peroxide		■	■	■	■		■	■	■	
Iodine			■	■	■		■	■	■	
Iron (Fe^{2+}, Fe^{3+}), soluble	■	■	■	■	■	■	■	■	■	s. page 116
Langelier Water Balance System		■	■	■	■					
Lead							■	■	■	
Manganese	■		■	■			■	■	■	s. page 116
Molybdate / Molybdenum	■		■	■			■	■	■	s. page 116
Nickel			■	■			■	■	■	
Nitrate			■	■			■	■	■	s. page 116
Nitrite			■	■			■	■	■	s. page 116

* The photometer series MD 100, MD 110 and MD 200 does not contain all the mentioned parameters in one instrument. Number and type of parameters are version dependent (see corresponding chapter).







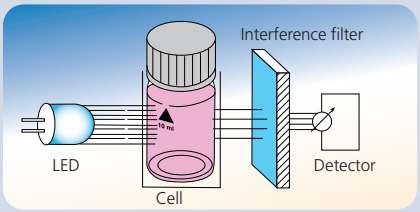
* HACH® is a registered trademark of Hach Company, Loveland, Colorado. The use of the HACH® trademark does not imply any affiliation with or approval by Hach Company regarding the formulation, testing or compatibility of these products for use in HACH® brand spectrophotometers or other instruments or systems.

Parameter	MD 100* & MD 110*	MD 200*	MD 600 & MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Reagents also compatible to Hach® instruments*
Oxygen, active			■	■	■			■	■	
Oxygen, dissolved	■		■	■				■	■	
Ozone	■	■	■	■	■	■	■	■	■	
pH-Value	■	■	■	■	■	■	■	■	■	
Phenole							■	■	■	
PHMB (Biguanide)			■	■	■			■	■	
Phosphate	■		■	■	■	■	■	■	■	s. page 118
Phosphonate		■	■			■		■	■	s. page 118
Polyacrylates	■							■	■	
Potassium			■	■			■	■	■	
PTSA (only MD 640)			■							
Silicia	■		■	■			■	■	■	s. page 118
Sodiumhypochlorite		■	■	■	■			■	■	
Spectral Absorption Coefficient (436 nm/525 nm/620 nm)						■		■	■	
Spectral Absorption-Coefficient (254 nm)									■	
Sulphate	■		■	■	■		■	■	■	s. page 118
Sulphide			■	■			■	■	■	
Sulphite			■	■			■	■	■	
Surfactants (anionic, cationic, non ionic)			■	■			■	■	■	
Suspended Solids	■		■	■			■	■	■	
TOC			■	■			■	■	■	
Total Hardness	■		■	■	■		■	■	■	
Total Nitrogen			■	■			■	■	■	s. page 118
Triazoles	■		■					■	■	
Turbidity (attenuated radiation method)			■	■			■	■	■	
Urea	■	■	■	■	■		■	■	■	
Zinc	■		■	■			■	■	■	

The principle of photometry

When specific reagents are added, the water sample takes on a degree of coloration that is proportional to the concentration of the parameter being measured. The photometer measures this coloration.

When a light beam passes through the coloured sample, energy with a specific wavelength is absorbed by the test substance. The photometer determines the coloration of the sample by measuring the transmission or absorption of light of this wavelength (in other words, monochromatic light). High-quality interference filters precisely limit the wavelength and are a prerequisite for obtaining high precision measurement results.
The use of such interference filters is one Lovibond® filter photometers to the quality standard. The photometer digitally calculates the required concentration and displays the result.





MD 600 / 610 / 640


MultiDirect


XD 7000 / 7500

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Photometer MD 100, MD 110 & MD 200



Measurements using high quality interference filters with long-life LEDs as a light source in a transparent sample chamber.

The units provide accurate, reproducible results very quickly. Other major advantages include ease of operation, ergonomic design, compact dimensions and safe handling.

Using an internal ring memory, the last 16 data sets (MD 100, MD 200) and 125 data sets (MD 110) are stored automatically with date, time, parameter and measurement value.

The tests are conducted using either Lovibond® tablet reagents with long-term stability, VARIO powder reagents or liquid reagents.

Bluetooth® is a wireless technology subject to regional approval. The use of the MD 110 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada. The use of the MD 110 will also be possible in other regions in the future. For current regions and further information, visit: **bluetooth.lovibond.com** Regions in which the MD 110 with **Bluetooth®** can currently be used (status: 01/2019): within Europe (according R&TTE Directive 1999/5/EC) ; USA (according to FCC part 15, comprised in FCC ID QOQBT113) ; Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-AB0103)

** analog IP 68 1 hour at 0,1 m*

Scroll Memory (SM)

To avoid unnecessary scrolling for the required test method, the instrument memorizes the last method used before switching off the instrument. When the instrument is switched on again, the scroll list comes up with the last used test method first.

Zero Setting (OTZ)

For certain versions of the instrument it is not necessary to zero the instrument each time.
The zero setting is held in memory until the instrument is turned off. (**O**ne **T**ime **Z**ero - OTZ).
The zero setting can be confirmed whenever it is required.

Manufacturers Test Certificate M

Besides the "Certificate of Compliance" the manufacturers test certificates M is available at cost on request. Manufacturers test certificates M are individually supplied per instrument and per method.

The manufacturers test certificate M has to be ordered together with the new instrument and cannot be delivered at a later stage.

NIST Traceability

The instrument is factory pre-adjusted to international standards. The user can set the instrument in "user calibration mode" with standards traceable to NIST adjust.
(NIST = National Institute of Standards and Technology)

Data Transfer

The optional available IRiM (infrared interface module) uses modern infrared technology to transmit measurement data from the **MD 100** and **MD 200** photometer to one of 3 optional interfaces.
These interfaces can be used to connect to a PC, a USB printer[1)] or alternatively a serial printer[2)].

The unit is supplied complete with data logging software providing easy and rapid transfer of data to the PC. As an option, the data can be saved as an Excel sheet or a .txt file.

Measurement data can quickly be printed out, using a specified[1)] USB or alternatively a printer with a serial plug-in connected to the IRiM.

The **MD 110** photometers have a **Bluetooth®** feature.

Via the **Bluetooth®** interface, the measurement results are transmitted to external instruments for prompt assessment and processing, so that all data can be evaluated and collated directly on site. In order to get the best use out of this, Tintometer offers an app for mobile instruments and PC software with a dongle.

The free app **AquaLX®** is ideally designed for use in on-site measurements. Compatible with iOS®- and Android® TM-based smartphones and Tablets, it enables fuss-free data transfer. It maps all measured values as descriptive graphs with minimum and maximum limits and supports export of the data as an Excel®-compatible CSV file.

With the aid of the complimentary **Bluetooth®** dongle, the PC software makes it possible to import data directly from the photometer to the Windows-based PC. As a stationary solution, it facilitates the transfer of data through a fast established, permanent wireless connection. Further processing of the results can be processed both in the software itself and by exporting the data to Excel or as a CSV file.

The set of software and **Bluetooth®** dongle is offered as separate accessories under item no.:

Code 2444480

For more information please see:
www. bluetooth.lovibond.com

GET IT ON Google Play

Download on the App Store



Verification Standard Kit

The verification standards serve to verify the photometric accuracy and reproducibility of the results at the different wavelengths. The absorbance value is stated.
The kit contains one zero standard, six different vials for checking six different wave lengths and allows checking the complete range of MD 100 photometers.
The shelf life of the verification standard kit is two years from the date of production, provided that storage and use are in accordance with the instructions provided.
Measurements are taken in mAbs.

Verification Standard Kit 215670
(MD 100, MD 110 & MD 200)



Reference Standard Kit for MD 100, MD 110 and MD 200

The reference standards are designed to check the accuracy and the reliability of the results.

It is not possible to calibrate the photometer with the reference standards.

The shelf life of reference standards is two years from the date of production, provided that storage and use are in accordance with the instructions provided.

Kit Chlorine for instruments with tablet / liquid reagent 0.2* and 1.0* mg/l 275650

Kit Chlorine for instruments with tablet / liquid reagent 0.5* and 2.0* mg/l 275655

Kit Chlorine for instruments with tablet / liquid reagent 1.0* and 4.0* mg/l 275656

Kit Chlorine for instruments with powder reagent 0.2* and 1.0* mg/l 275660

Kit pH for instruments with tablet / liquid reagent 7.45* pH 275670

* Approximate figure, actual figure specified in Certificate of Analysis

Primary standard chlorine

Ideal for validating the chlorine method.
This standard is easy to handle and will meet the requirements of US EPA 334.0.



ValidCheck Chlorine 1,5 mg/l
Code.: 48105510

new!

Please see pages 88 onwards for reagents (order codes)

The **Bluetooth®** word mark is a registered trademark owned by Bluetooth SIG, Inc. and any use by Lovibond® Tintometer GmbH is under license. IOS® is a registered trademark of Cisco, Inc. and licensed to Apple, Inc. Android™ is a trademark of Google, Inc.

Single-Parameter MD 100 / MD 110 / MD 200

Single-Parameter

Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents		MD 100	MD 110	MD 200
Aluminium		0,01 - 0,3 mg/l Al	M40 /AL Tablet	Tablet	✓	276200	-	-	
		0,01 - 0,25 mg/l Al	M50 /AL Powder	Powder	✓	276205	-	-	
Ammonia		0,02 - 1,0 mg/l N	M60 /A Tablet	Tablet	✓	276060	-	-	
		0,01 - 0,8 mg/l N	M62 /A Powder	Powder	✓	276065	-	-	
Chlorine Tablet	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	✓	276000	-	-	
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid	✓	276005	-	-	
		0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet		-	-	-	
Chlorine DUO		0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	✓	276020	-	-	
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid					
		0,1 - 10 mg/l Cl_2**	M 103 / CL10	Tablet					
		0,02 - 2,0 mg/l Cl_2	M 110 / CL2	Powder	✓	276025	-	-	
		0,1 - 8,0 mg/l Cl_2 (10 mm multi vial-2)	M 111 / CL8	Powder	✓				
Chlorine Powder		0,02 - 2,0 mg/l Cl_2	M 110 / Cl2	Powder	✓	276010	-	-	
		0,1 - 8,0 mg/l Cl_2 (10 mm multi vial-2)	M 111 / CL8	Powder	✓				
Chlorine HR (KI)		5 - 200 mg/l Cl_2	M105 / CLHr	Tablet	✓	276170	-	-	
Chlorine dioxide		0,02 - 11 mg/l ClO_2	M120 / CLO2	Tablet	✓	276030	-	-	
		0,04 - 3,8 mg/l ClO_2	M122 / CLO2	Powder	✓	276035			
Chloride		0,5 - 25 mg/l Cl^-	M90 / CL-1	Tablet	✓	276180	-	-	
		5 - 250 mg/l Cl^- (by dilution)	M93 / CL-2						
COD		3 - 150 mg/l O_2	M130 / Lr	Tubes	without reagents	276120	2961202	2892502	
		15 - 300 mg/l O_2	M133 / MLr						
		20 - 1500 mg/l O_2	M131 / Mr						
		200 - 15000 mg/l O_2	M132 / Hr						
Iron		0,02 - 1,0 mg/l Fe	M220 / FE	Tablet	✓	276050	-	-	
		0,02 - 1,8 mg/l Fe TPTZ	M223 / FE2	Powder	✓	276055	-	-	
		0,02 - 3,0 mg/l Fe	M222 / FE1	Powder	✓	276056	-	-	
Fluoride		0,05 - 2,0 mg/l F-	M170 / F	Liquid	without reagents	276090	-	-	
Hardness total		2 - 50 mg/l $CaCO_3$	M200 / tH1	Tablet	✓	276190	-	-	
		20 - 500 mg/l $CaCO_3$ (by dilution)	M201 / tH2						
Urea		0,1 - 2,5 mg/l Urea	M390 / Ur1	Tablet and Liquid	✓	276210	-	-	
		0,2 - 5 mg/l Urea (by dilution)	M391 / Ur2						
Hazen		10 - 500 mg/l Pt-Co	M 204 / PtCo	without	without reagents	276160	-	-	
Copper		0,05 - 5,0 mg/l Cu	M150 / Cu	Tablet	✓	276080	-	-	
		0,05 - 5,0 mg/l Cu	M153 / Cu	Powder	✓	276085	-	-	
Manganese		0,2 - 4,0 mg/l Mn	M240 / Mn	Tablet	✓	276100	-	-	
		0,01 - 0,7 mg/l Mn	M242 / Mn1	Powder	✓	276105	-	-	
		0,1 - 18 mg/l Mn	M243 / Mn2	Powder	✓	276106	-	-	
Molybdenum		0,03 - 3,0 mg/l Mo	M251 / Mo1	Powder	✓ mixing cylinder (not included)	276140 19802650	-	-	
		0,3 - 40 mg/l Mo	M252 / MO2	Tablet	✓	276141	-	-	
		0,6 - 30 mg/l Mo	M250 / Mo3	Tablet	✓	276142	-	-	
Ozone (DPD)		0,02 - 2,0 mg/l O_3	M300 / O3	Tablet	✓	-	-	2899802	

Green Chemistry

* OTZ (zero adjustment applies to all methods of the measuring instrument)

** Delivery without reagents

Please see pages 88 onwards for reagents (order codes)

Single-Parameter MD 100 / MD 110 / MD 200

Single-Parameter

Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents	MD 100	MD 110	MD 200
Phosphate		0,05 - 4,0 mg/l PO_4	M320 / PO4	Tablet	✓	276040	-	-
		0,06 - 2,5 mg/l PO_4	M323 / PO4	Powder	✓	276045	-	-
Silica		0,05 - 4.0 mg/l SiO_2	M350 / Si	Tablet	Tablets	276110	-	-
		0,1 - 1,6 mg/l SiO_2	M351 / SiLr	Powder	✓	276115	-	-
		1 - 90 mg/l SiO_2	M352 / SiHr	Powder	✓	276116	-	-
Suspended solids		10 - 750 mg/l TSS	M384 / SuS	without	without reagents	276150	-	-

2in1

Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents	MD 100	MD 110	MD 200
Chlorine Tablet	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or Liquid	Tablets for Chlorine, pH	278020	-	2889402
		0,02 - 4 mg/l Cl_2	M101 / CL6					
		0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet	Liquid reagents for Chlorine, pH	278025	-	2889412
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Chlorine Powder		0,02 - 2,0 mg/l Cl_2	M110 / CL2	Powder	Powder reagents for Chlorine, Tablets for pH	278030	-	-
		0,1 - 8,0 mg/l Cl_2 (10 mm multi vial-2)	M111 / CL8	Powder				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Copper	✓	0,05 - 5,0 mg/l Cu	M150 / Cu	Tablet	Tablets for Cu und pH	-	-	2872102
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Hydrogen-peroxide		1 - 50 mg/l H_2O_2 40 - 500 mg/l H_2O_2	M213 / HP1 M214 / HP2	Liquid	Liquid reagents for H_2O_2 and pH	-	-	2888102
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				

3in1

Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents	MD 100	MD 110	MD 200
Chlorine	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, pH, CyA	278010	2980102	2860102
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid	Tablets CyA Liquid reagents for Chlorine, pH	278015	2980152	2882002
		0,1 - 10 mg/l Cl_2**	M 103 / CL10	Tablet				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Cyanuric acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
Chlorine	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, pH, Alka-M	278060	-	2889002
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid	Tablets Alka-M Liquid reagents for Chlorine, pH	278065	-	2889302
		0,1 - 10 mg/l Cl2**	M 103 / CL10	Tablet				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Alkalinity-m		5 - 200 mg/l $CaCO_3$	M30 / tA	Tablet				
Chlorine		0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, Chlorine dioxide	278000	-	-
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid				
Chlorine HR (KI)		5 - 200 mg/l Cl_2	M105 / CLHr	Tablet				
Chlorine dioxide		0,02 - 11 mg/l ClO_2	M120 / CLO2	Tablet				
Chlorine	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, pH, Bromine	-	-	2861802
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Brome		0,05 - 13 mg/l Br_2	M80 / Br	Tablet				
Chlorine	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, pH, Acid capacity	-	-	2889012
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid	Tablets Acid capacity Liquid reagents for Chlorine, pH	-	-	2889202
		0,1 - 10 mg/l Cl_2**	M 103 / CL10	Tablet				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Acid capacity		0,1 - 4,0 mmol/l $K_{S4.3}$	M20 / S:4.3	Tablet				

* OTZ (zero adjustment applies to all methods of the measuring instrument)
** Delivery without reagents
Green Chemistry

4in1

Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents	MD 100	MD 110	MD 200
Chlorine	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, pH, CyA, Alka-M	278070	2980702	2860502
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid	Tablets for CyA, Alka-M Liquid reagents for Chlorine and pH	278075	2980752	2860542
		0,1 - 10 mg/l Cl_2**	M 103 / CL10	Tablet				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
Alkalinity-m		5 - 200 mg/l $CaCO_3$	M30 / tA	Tablet				
Chlorine DUO		0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet	Powder reagents for Chlorine, Tablets for Chlorine, pH, CyA, Alka-M	278160	-	-
		0,02 - 3,5 mg/l Cl_2	M113 / CL2	Powder				
		5 - 200 mg/l Cl_2**	M105 / CLHr	Tablet				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Alkalinity-m		5 - 200 mg/l $CaCO_3$	M30 / tA	Tablet				
Hardness, Calcium		0 - 500 mg/l $CaCO_3$	M191 / CAH	Tablet				
Chlorine	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, pH, CyA and Acid Capacity	-	-	2860512
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid	Tablets for CyA and Acid Capacity Liquid reagents for Chlorine and pH	-	-	2860522
		0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet				
pH		6,5 - 8,4 pH	M330/331 / pH	Tablet/Liquid				
Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
Acid Capacity		0,1 - 4,0 mmol/l $K_{S4.3}$	M20 / S:4.3	Tablet				
Chlorine	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, pH, Acid Capacity, Urea (add. Liquid)	-	-	2862912
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid				
		0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Acid Capacity		0,1 - 4,0 mmol/l $K_{S4.3}$	M20 / S:4.3	Tablet				
Urea		0,1 - 2,5 mg/l Urea	M390 / Ur1	Tablet/Liquid				
		0,2 - 5 mg/l Urea (by dilution)	M391 / Ur2					
Chlorine	✓	0,01 - 6,0 mg/l Cl_2	M100 / CL6	Tablet or	Tablets for Chlorine, Chlorine dioxide, pH, Acid Capacity	-	-	2863802
		0,02 - 4 mg/l Cl_2	M101 / CL6	Liquid				
		0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet				
Chlorine dioxide		0,02 - 11 mg/l ClO_2	M120 / CLO2	Tablet				
pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
Acid Capacity		0,1 - 4,0 mmol/l $K_{S4.3}$	M20 / S:4.3	Tablet				

* OTZ (zero adjustment applies to all methods of the measuring instrument)
** Delivery without reagents

Green Chemistry

Please see pages 88 onwards for reagents (order codes)



	Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents	MD 100	MD 110	MD 200
5in1	**Chlorine**	✓	0,01 - 6,0 mg/l Cl_2 0,02 - 4 mg/l Cl_2	M100 / CL6 M101 / CL6	Tablet or Liquid	Tablets for Chlorine, pH, CyA, Alka-M, CaH	278080	-	2861202
			0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Alkalinity-m		5 - 200 mg/l $CaCO_3$	M30 / tA	Tablet				
	Hardness, Calcium		0 - 500 mg/l $CaCO_3$	M191 / CAH	Tablet				
	Chlorine		0,01 - 6,0 mg/l Cl_2 0,02 - 4 mg/l Cl_2	M100 / CL6 M101 / CL6	Tablet or Liquid	Tablets for Chlorine, pH, CyA, Acid Capacity, CaH	-	-	2861212
			0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Acid Capacity		0,1 - 4,0 mmol/l $K_{S4.3}$	M20 / S:4.3	Tablet				
	Hardness, Calcium		0 - 500 mg/l $CaCO_3$	M191 / CAH	Tablet				
6in1	**Chlorine**	✓	0,01 - 6,0 mg/l Cl_2 0,02 - 4 mg/l Cl_2	M100 / CL6 M101 / CL6	Tablet or Liquid	Tablets for Chlorine, Bromine, pH, CyA, Alka-M, CaH	278090	2980902	2861902
			0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet				
	Bromine		0,05 - 13 mg/l Br_2	M80 / Br	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Alkalinity-m		5 - 200 mg/l $CaCO_3$	M30 / tA	Tablet				
	Hardness, Calcium		0 - 500 mg/l $CaCO_3$	M191 / CAH	Tablet				
	Chlorine	✓	0,01 - 6,0 mg/l Cl_2 0,02 - 4 mg/l Cl_2	M100 / CL6 M101 / CL6	Tablet or Liquid	Tablets for Chlorine, Bromine, pH, CyA, Acid Capacity, CaH	-	-	2861912
			0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet				
	Bromine		0,05 - 13 mg/l Br_2	M80 / Br	Tablet				
	pH		6,5 - 8,4 pH	M330 / M331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Acid Capacity		0,1 - 4,0 mmol/l $K_{S4.3}$	M20 / S:4.3	Tablet				
	Hardness, Calcium		0 - 500 mg/l $CaCO_3$	M191 / CAH	Tablet				
	Chlorine	✓	0,01 - 6,0 mg/l Cl_2 0,02 - 4 mg/l Cl_2	M100 / CL6 M101 / CL6	Tablet or Liquid	Tablets for Chlorine, Bromine, pH, CyA, Alka-M, Copper, Iron	-	-	2862102
			0,1 - 10 mg/l Cl_2**	M103 / CL10	Tablet				
	pH		6,5 - 8,4 pH	M330/331 / pH	Tablet/Liquid				
	Cyanuric Acid		0 - 160 mg/l Cya	M160 / CyA	Tablet				
	Alkalinity-m		5 - 200 mg/l $CaCO_3$	M30 / tA	Tablet				
	Copper		0,05 - 5,0 mg/l Cu	M150 / Cu	Tablet				
	Iron		0,02 - 1,0 mg/l Fe	M220 / FE	Tablet				

* OTZ (zero adjustment applies to all methods of the measuring instrument)

** Delivery without reagents

Green Chemistry

Delivery Content

- Instrument in carrying case
- **MD 100 & MD 110**
  4 micro batteries (AAA)
  MD 200
  4 micro batteries (AA),
- 3 round vials (glass) with lids
- 1 stirring rod & 1 brush & syringe
- Reagents (see tables)
- Warranty information
- Certificate (Certificate of Compliance)
- Instruction Manual



	Instrument with Parameter	OTZ*	Range	Method name Handbook / Display	usable reagent form	delivery content incl. reagents	MD 100	MD 110	MD 200
Boiler Water	**Aluminium**		0,01 - 0,25 mg/l Al	M50 /AL (PP)	Powder	without reagents	276230	2962302	-
	Iron		0,03 - 2 mg/l Fe $^{2+/3+}$	M225 / FE (L)	Liquid				
	Copper		0,3 - 5,0 mg/l Cu	M150 / Cu (T)	Tablet				
	Silica		1 - 90 mg/l SiO_2	M352 / SiHr (PP)	Powder				
	Chloride		0,5 - 20 mg/l Cl^-	M92 / CL- (L)	Liquid				
	Phosphate		5 - 80 mg/l PO_4	M335 / PO4 (L)	Liquid				
	Oxygen (dissolved)		10 - 800 µg/l O_2	M292 / O2	Vacu-vials				
	DEHA		20 - 500 µg/l DEHA	M167 / DEHA (PP)	Powder				
	Hydrazine		50 - 500 µg/l N_2H_4	M205 / Hydr (P)	Powder				
	Polyacrylates		1 - 30 mg/l Polyacrylates	M338 / POLY (L)	Liquid				
Cooling Water	**Bromine**		0,05 - 13 mg/l Br_2	M80 / Br (T)	Tablet	without reagents	276240	2962402	-
	Chlorine		0,01 - 6,0 mg/l Cl_2	M100 / CL6 (T)	Tablet				
	Chlorine HR (KI)		5 - 200 mg/l Cl_2	M105 / CLHr (T)	Tablet				
	Chlorine dioxide		0,02 - 11 mg/l ClO_2	M100 / CL6 (T) (Factor 1,9)	Tablet				
	Ozone		0,02 - 2 mg/l O_3	M300 / O3 (T)	Tablet				
	Aluminium		0,01 - 0,25 mg/l Al	M50 /AL (PP)	Powder				
	Iron		0,03 - 2 mg/l Fe $^{2+/3+}$	M225 / FE (L)	Liquid				
	Iron in Mo		0,01 - 1,8 mg/l Fe	M224 / FEM(PP)	Powder				
	Copper		0,3 - 5,0 mg/l Cu	M150 / Cu (T)	Tablet				
	Zinc		0,1 - 2,5 mg/l Zn	M405 / Zn (L)	Liquid				
	Sulfate		5 - 100 mg/l SO_4	M360 / SO4 (PP)	Powder				
	Molybdenum		0,03 - 3 mg/l Mo	M251 / Mo1 (PP)	Powder				
			0,6 - 60 mg/l Mo	M254 / Mo2 (L)	Liquid				
	Triazoles		1 - 16 mg/l Benzotriazoles	M388 / tri (PP)	Powder				
	Polyacrylates		1 - 30 mg/l Polyacrylates	M338 / POLY (L)	Liquid				

Please see pages 88 onwards for reagents (order codes)

Accessories

Item	Code
Set of 12 round vials with lid height 48 mm, Ø 24 mm	197620
Set of 5 round vials with lid height 48 mm, Ø 24 mm	197629
Satz à 10 round vials with lid, height 90 mm, Ø 16 mm	197665
Adapter for round vials ø 16 mm	19802190
Set of 12 plastic vials (PC), with lid **"Multi"-Type 2**, □ 10 mm	197600
Vial stand for 6 round vials Ø 24 mm, acrylic glass	418951
Vial stand for 10 vials (Ø 16 mm), acrylic glass	418957
Mixing cylinder, 25 ml, with stopper required accessory for molybdenum LR test with MD 100 (276140)	19802650
Membrane filter set for use when preparing samples, 25 membrane filters, 0.45 µm, 2 syringes 20 ml	366150
Cleaning cloth for vials	197635
Set of 12 sealing rings for round vial ø 24 mm	197626
4 micro batteries (AAA) MD 100, MD 110	1950026
4 batteries (AA) MD 200	1950025
Battery lid MD 100, MD 110	19802617
Battery lid MD 200	19802241
Measuring beaker, volume 100 ml	384801
Plastic funnel with handle	471007
Plastic stirring rod, 13 cm length	364100
Plastic stirring rod, 13 cm length, (10 pcs.)	364120
Plastic stirring rod, 10 cm length	364109
Plastic stirring rod, 10 cm length, (10 pcs.)	364130
Infrared data transfer module IRiM (MD 100, MD 200 only)	214050
Bluetooth-Dongle and Software (MD110 only)	2444480

Technical Data	MD 100	MD 110	MD 200
Interface for data transfer	Infrared interface (IRiM needed)	**Bluetooth®**-interface	Infrared interface (IRiM needed)
Storage	internal ring memory for **16** data sets	internal ring memory for **125** data sets	internal ring memory for **16** data sets
Power Supply	4 micro batteries (AAA), capacity approx. 17 hours or approx. 5000 tests in continuous operation with the display lighting switched off	4 micro batteries (AAA), capacity approx. 17 hours or approx. 5000 tests in continuous operation with the display lighting and **Bluetooth®** Function switched off	4 batteries (AA), capacity approx. 53 hours or 15000 tests (continuous operation without display lighting)
Dimensions	155 x 75 x 35 mm (L x W x H)		190 x 110 x 55 mm (L x W x H)
Weight	basic unit ca. 260 g		basic unit ca. 455 g (batteries incl.)
Optics	LEDs, interference filters (IF) and photo sensor in transparent sample chamber. Depending on the version, up to 3 different interference filters are used. Wavelength specifications of interference filters: 430 nm Δ λ = 5 nm 530 nm Δ λ = 5 nm 560 nm Δ λ = 5 nm 580 nm Δ λ = 5 nm 610 nm Δ λ = 6 nm 660 nm Δ λ = 5 nm		
Wavelength Accuracy	± 1 nm		
Photometric Accuracy[4]	3 % FS (T = 20 °C - 25 °C)		
Photometric Resolution	0,01 A		
Absorption range	-2500 to 2500 m Abs		
Auto - OFF	automatic switch-off		
Display	backlit LCD (on keypress)		
Time	real time clock and date		
Calibration	factory calibration and user calibration. Reset to factory calibration possible		
Environmental conditions	temperature: 5 - 40 °C rel. humidity: 30 - 90 % (non condensing)		
Conformity	CE		

[4] tested with standard solutions

Thermoreactor RD 125

For the tube test digestion of

COD (150 °C)
TOC (120 °C)
Total Chromium (100 °C)
Total Nitrogen (100 °C)
Total Phosphate (100 °C)



Chemical digestion of samples is required for the photometric determination of COD, TOC, total phosphate and total nitrogen.

The required temperatures and reaction time can be selected by using the membrane keypad of the reactor RD 125. The unit works at three different temperatures (100 / 120 / 150 °C) and three pre-set reaction times 30 / 60 / 120 minutes). When digestion is complete, the reactor automatically switches off and gives a corresponding LED indication with short beep alarm.

The RD 125 reactor is fitted with 24 slots for 16 mm diameter vials.

The voltage can be selected between 230 V and 115 V at the rear on the instrument.

COD Reactor RD 125 Order code: 2418940

Technical data

Power supply	230 V / 50-60 Hz or 115 V / 50-60 Hz (switchable)
Power	550 W
Dimensions	248 x 219 x 171 mm
Weight	3,9 kg
Materials, housing **Block insert** **Protection grid** **Lid** **Heating block**	ABS PBT PPS PPS Aluminium
Cuvette recording	24 slots, aluminium block ø 16.2 mm ± 0.2 mm
Selectable temp.	100 / 120 / 150 °C
temperature supervision	Pt100 A class
Temperature stability	± 1 °C at the Pt100
Selected time	30 / 60 / 120 / min. and continuous operation (∞)
Heating up	from 20 °C to 150 °C in 12 min.
Protection against overheating	at the alu block at 190 °C
Beeper	max. 88 dB (Piezo Summer)
Environmental conditions	10 - 40 °C max. 85 % rel. humidity
CE-Conformity	

Waste Water Setups

Waste Water Setup MD 600 Photometer MD 600 with standard accessory, Infrared data transmission module IRiM	214100
Waste Water Setup MD 610 Photometer MD 600 with standard accessory **Bluetooth®** data transmission	214110
Waste Water Setup SpectroDirect Spectrophotometer SpectroDirect with standard accessory, 5 round vials ø 24 mm	712100

Delivery Content

- Photometer
- Thermoreactor RD 125
- Tube stand
- Membrane filter set
- Instruction manual
- Warranty information
- Reagents for the following ranges

  COD 3 - 150 mg/l and 20 - 1500 mg/l
  Ammonia 1 - 50 mg/l N,
  Nitrate 1 - 30 mg/l N,
  Nitrite LR 0,01 - 0,3 mg/l N
  Nitrogen 5 - 150 mg/l N
  Phosphate 0,02 - 1 mg/l P /
  0,06 - 3,5 mg/l PO_4

Reagents & Accessories

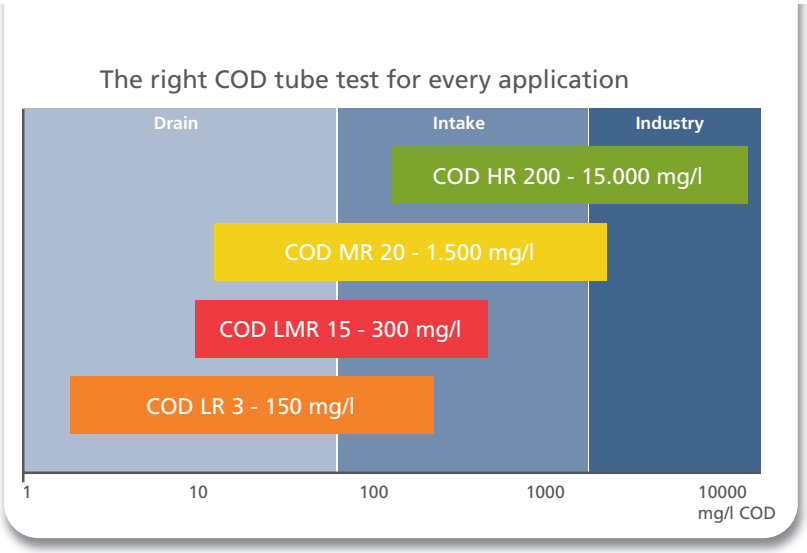
VARIO COD 0-150 mg/l O_2 (25 pc.), mercury free [1] (25 pc.) (150 pc.)	 2420710 2420720 2420725
COD 15-300 mg/l O_2 new! (25 pc.)	242312
VARIO COD 0-1500 mg/l O_2 (VARIO) (25 pc.), mercury free [1] (150 pc.), mercury free [1] (25 pc.) (150 pc.)	 2420711 2420716 2420721 2420726
VARIO COD 0-15000 mg/l O_2 (25 pc.), mercury free [1] (25 pc.) (150 pc.)	 2420712 2420722 2420727
Ammonia VARIO HR tube test	535650
Nitrate VARIO tube test	535580
Nitrite LR VARIO powder pack	530980
Nitrogen VARIO Total HR tube test	535560
Phosphate VARIO Total HR tube test	535210
ValidCheck WW Influent Multi-Standard new! 102 ml Standard solution + 21 ml Standard solution **COD** 500 mg/l **NO^{3-} -N** 2 mg/ **PO_4^{3-} -P** 10 mg/l	48399712

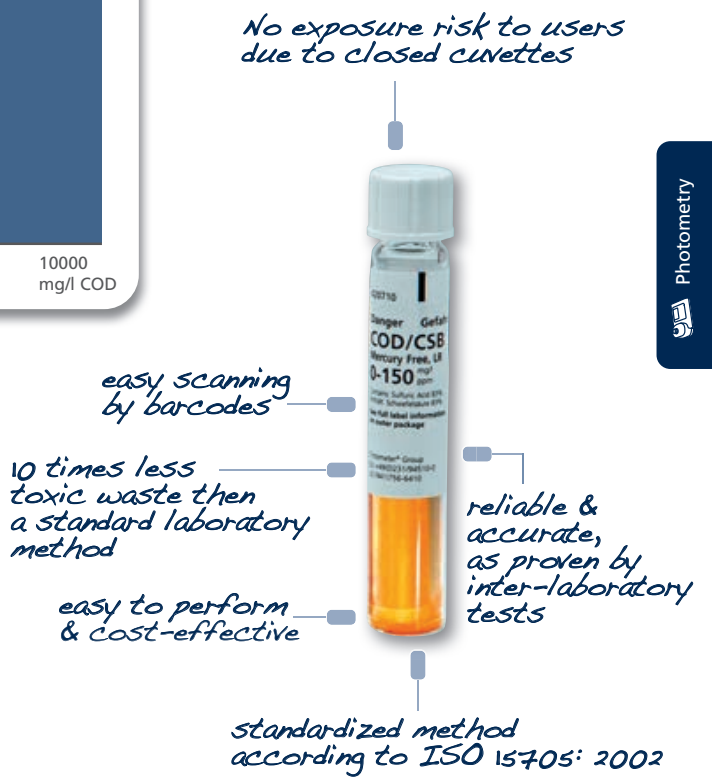
further Information on page 83

ValidCheck WW Effluent Multi-Standard new! 102 ml Standard solution + 21 ml Standard solution **CSB** 40 mg/l **NO^{3-} -N** 10 mg/l **P (total)** 1 mg/l	48399612
Set of round vials with lids Height 48 mm, Ø 24 mm	197629
Membrane filter set for use when preparing samples, 25 membrane filters 0.45 µm, 2 syringes 20 ml	366150
Vial stand for 6 round vials Ø 24 mm, acrylic glass	418951
Vial stand for 10 vials (Ø 16 mm), acrylic glass	418957
Automatic pipette [2], 1 - 5 ml	419076
Pipette tips [2], 1 - 5 ml (weiß), 100 Stück	419066
Automatische Pipette [3], 0,1 - 1 ml	419077
Pipettenspitzen [3], 0,1 - 1 ml (white), 1000 Stück	419073

[1] without chloride removal
[2] LR, LMR, HR
[3] HR

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COD determination

Cost-effective, easy & safe

Now with additional middle LMR range!

COD Photometers

With a measuring range from 0 to 15,000 mg/l O_2, the Lovibond® COD photometers are suitable for waste water testing.

Two LEDs light sources with long-term stability (λ_1 = 610 nm; λ_2 = 430 nm, according to ISO 15705:2002), a waterproof sample chamber, a large digital display, and the user-friendly keypad ensure maximum operating reliability and convenience.

MD 100 COD (in case)	Code: 276120
MD 110 COD (in case)	Code: 2961202
MD 200 COD (in case)	Code: 2892502

Setups COD

The Lovibond® COD Setups allow highly sensitive and precise water testing with minimum effort.

COD Setup MD 100 Instrument in carrying case	Code: 276130
COD Setup MD 110 Instrument in carrying case	Code: 2961302
COD Setup MD 200 Instrument in carrying case	Code: 2892602
COD Setup MD 600 Instrument in carrying case	Code: 214040
COD Setup MD 610 Instrument in carrying case	Code: 214041

COD VARIO Tube tests

The Lovibond® COD VARIO tube tests are available for the measuring ranges 3-150 mg/l O_2 (LR), 15-300 mg/l O_2 (LMR), 20-1500 mg/l O_2 (MR) and 200-15000 mg/l O_2 (HR).
Their chemical properties and a 16 mm tube diameter make them compatible to Hach® instruments.*

Tube tests	Order code
VARIO COD 0-150 mg/l O_2	
(25 pc.), mercury free [1]	2420710
(25 pc.)	2420720
(150 pc.)	2420725
COD 15-300 mg/l O_2 new!	
(25 pc.)	2423120
VARIO COD 0-1500 mg/l O_2	
(25 pc.), mercury free [1]	2420711
(150 pc.), mercury free [1]	2420716
(25 pc.),	2420721
(150 pc.)	2420726
VARIO COD 0-15000 mg/l O_2	
(25 pc.), mercury free [1]	2420712
(25 pc.)	2420722
(150 pc.)	2420727

[1] without chloride removal

*HACH® is a registered trademark of Hach Company, Loveland, Colorado. The use of the HACH® trademark does not imply any affiliation with or approval by Hach Company regarding the formulation, testing or compatibility of these products for use in HACH® brand spectrophotometers or other instruments or systems.

Please see pages 88 onwards for reagents (order codes)

Standard solutions

Standard solutions are solutions with a defined concentration and are provided to check the operation methods and instruments of the cuvette tests as well as the condition of optical filters and the instrument.

Standard solution	Quantity	Code
100 mg/l COD	30 ml	2420803
500 mg/l COD	30 ml	2420804
5000 mg/l COD	10 ml	2420805

Valid Check

available in Q 4!

Valid Check COD 250 ml (120 mg/l)	48371425
Valid Check COD 250 ml (500 mg/l)	48371625
Valid Check COD 250 ml (5000 mg/l)	48371825

Delivery Content

- Photometer
- Adapter for round vials ø 16 mm
- 2 sets of tube tests 3-150 mg/l 20-1500 mg/l
- Thermoreactor RD 125
- Tube stand
- 2 syringes 1 ml, 2 ml
- Batteries
- Warranty information
- Certificate (COC)
- Instruction manual

Photometers
MD 600 & MD 610





Highest reproducible precision with interference filter

Infrared-Interface (MD 600)

Bluetooth® 4.0 Interface (MD 610)

Display with background lighting

More than 120 pre-programmed methods

Automatic selection of wavelength

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The MD 610 and MD 600 give you mobile instruments in a modern design with the analytical features of laboratory photometers.

All important water analysis parameters from A(luminium) to Z(inc) are covered by these instruments. Combined with the high precision of Lovibond® reagents, a reliable and quick analysis of water samples is guaranteed. Reagent tablets, powder reagents, liquid reagents, or cuvette tests are used depending on the method.

The highest accuracy is guaranteed by the combination of six long-term stable LEDs as the light source together with interference filters, even when being used in absorption mode. The instruments are designed without moving parts and thus maintenance are free measuring units.
While the MD 600 has an infrared interface for data exchange, the MD 610 is equipped with a modern **Bluetooth®** 4.0 interface.
Measurement data can thus easily be transferred from the MD 610 to smartphones or tablets.
To support this, the free app AquaLX® is available.
For stationary use, the set of PC software and **Bluetooth®** dongle availability as an accessory can alternatively be used for data transfer to a Windows-based PC.

The proven MD 600 photometer uses the classic infrared interface with which data can be transferred by means of the IRiM module to the PC or laptop.

NIST Traceability

The instrument is factory pre-adjusted to international standards. The user can set the instrument in "user calibration mode" with standards traceable to NIST adjust.
(NIST = National Institute of Standards and Technology)

New methods

Test methods are regularly updated to suit market requirements. You can find software updates for new methods and additional languages on our website at **www.lovibond.com**.
You can program your own methods. This could be done via calibration functions in form of polynomials or by concentration measurements.

Polynomials

Up to 25 fifth order calibration polynomials ($y = A + Bx + Cx2 + Dx3 + Ex4 + Fx5$) can be stored for custom methods.

Concentration

With this function 2 to 14 standards can be measured. The photometer saves the value pairs obtained as calibration points of a user method (up to 10 methods).

Delivery Content

- Instrument in carrying case
- 4 batteries
- 3 round vials each 24 and 16 mm ø
- 1 adapter each for 16 mm and 13 mm vials
- Plastic stirring rod 13 cm, Brush 11 cm, screw driver
- Warranty information
- Certificate of Compliance
- Instruction Manual

Order codes (without reagents)
MD 600: 214020
MD 610: 214025

Please specify the reagents or parameters required at time of order.

Up-to-date information about methods, parameters and measuring ranges can always be found on our website: **www.lovibond.com**

Applications

- Waste Water
- Drinking Water
- Industrial Process Water
- Science & Research
- Governmental and private Laboratories
- Mobile Applications





Please see pages 88 onwards for reagents (order codes)

Bluetooth® is a wireless technology subject to regional approval. The use of the MD 610 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada.
The use of the MD 610 will also be possible in other regions in the future. For current regions and further information, visit: **bluetooth.lovibond.com**
Regions in which the MD 610 with **Bluetooth®** can currently be used (status: 01/2019): within Europe (according R&TTE Directive 1999/5/EC) ; USA (according to FCC part 15, comprised in FCC ID QOQBT113) ; Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-AB0103)

Photometers MD 600 & MD 610



Technical Data

Display	Backlit graphic-display
Interfaces	Infrared[1] (MD 600), **Bluetooth®** 4.0 (MD 610) RJ45 socket for updates[2]
Optics	LEDs, interference filters and photo sensor in transparent sample chamber Wavelength range: 430 nm IF Δ λ = 5 nm 530 nm IF Δ λ = 5 nm 560 nm IF Δ λ = 5 nm 580 nm IF Δ λ = 5 nm 610 nm IF Δ λ = 6 nm 660 nm IF Δ λ = 5 nm IF = interference filter
Wavelength Accuracy	± 1 nm
Photometric Accuracy*	2 % FS (T = 20 °C – 25 °C)
Photometric Resolution	0.005 A
Operation	Acid and solvent resistant, touch-sensitive keypad with audible feedback via integrated beeper
Language Selection	German, English, French, Spanish, Italian,Portuguese, Polish, Indonesian ; additional languages via update
Memory Capacity	approx. 1000 data sets (MD 600) approx. 500 data sets (MD 610)
Auto-Off	approx. 20 minutes after last keypress with audible signal
Power Supply	4 batteries (Mignon AA/LR6); Operation time: approx. 26 h continuous operation or 3500 tests
Dimensions	approx. 210 x 95 x 45 mm (unit) approx. 395 x 295 x 106 mm (case)
Weight (unit)	approx. 450 g
Ambient Conditions	5-40 °C at max. 30-90 % rel. humidity (non condensing)
CE-Conformity	

[1] optional available: IRiM (Infrared Interface Modul)
[2] optional available: connection cable with integrated electronics (RS 232 / RJ-45 plug)
* tested with standard solutions

Please see pages 88 onwards for reagents (order codes)

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IOS® is a registered trademark of Cisco, Inc. and licensed to Apple, Inc. Android™ is a trademark of Google, Inc.

Accessories

Item	Code
Set of 12 round vials with lid Height 48 mm, Ø 24 mm	197620
Set of 10 round vials with lid height 90 mm, Ø 16 mm	197665
Adapter for round vials ø 16 mm	19802190
Adapter for round vials ø 13 mm	19802192
Set of **multi vials-3** with lids path length 10 mm, 10 ml volume Height 48 mm, Ø 24 mm (12 pc.)	197605
Vial stand for 6 round vials Ø 24 mm, acrylic glass	418951
Küvettenständer für 10 Küvetten (Ø 16 mm), Acrylglas	418957
Sealing ring for vial ø 24 mm (12 pc.	197626
Sealing ring for vial ø 24 mm (black	197636
Battery, 1.5 V, AA-Alkali-Mangan (4 pc.)	1950025
Cleaning cloth for vial	197635
Plastic funnel with handle	471007
Plastic stirring rod, 13 cm length	364100
Plastic stirring rod, 13 cm length, (10 pc.)	364120
Plastic stirring rod, 10 cm length	364109
Plastic stirring rod, 10 cm length, (10 pc.)	364130
Cleaning brush, 10 cm	380230
Verification Standard Kit	215640
Reference Standard-Kit Chlorine 0,2 and 1mg/l	215630
Reference Standard-Kit Chlorine 0,5 and 2mg/l	215635
Reference Standard-Kit Chlorine 1 and 4mg/l	215636
Cable for update for connection to a PC	214030
Data transmission modul IRiM	214050
Bluetooth Dongle Set incl. PC Software	2444480

Verification Standard Kit

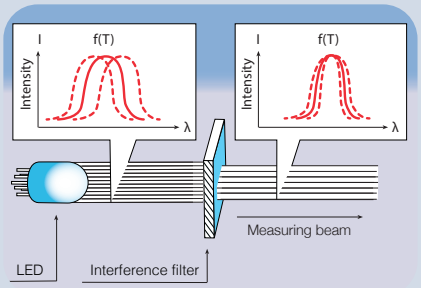
The verification standards serve to verify the photometric accuracy and reproducibility of the results at the different wavelengths.
The absorption value is stated.
The kit contains one zero standard, six different vials for checking six different wave lengths and allows checking the complete range of MD 600 and MD 610 photometers.
The shelf life of the verification standard kit is two years from the date of production, provided that storage and use are in accordance with the instructions provided.
Measurements are taken in mAbs.

Verifications Standard Kit **215640**
(MD 600, MD 610, MD 640)





Interference filter increases reducibility



LEDs have very positive qualities as a light source for photometers:

They achieve a very high intensity in a limited spectral range, which enables low-cost optical set-ups. They are very energy-efficient, which ensures a long operating life when battery operated. They have a long service life and usually last the life of the photometer.

However, the semiconductors inside the LEDs react to temperature fluctuations and are subject to changes during their lifetime. These lead to fluctuations in both the emitted wavelength, the spectral bandwidth and the intensity. While intensity fluctuations are still occur by zeroing the instrument can can compensate before a measurement, a constant measuring wavelength cannot be achieved without the use of high-quality interference filters.

Only when interference filters are used is it possible to ensure that their analytical methods are reproducible.

All Lovibond LED photometers use high-quality interference filters with a half-width of approx. 5 nm.

Bluetooth® is a wireless technology subject to regional approval. The use of the MD 610 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada.
The use of the MD 610 will also be possible in other regions in the future. For current regions and further information, visit:
bluetooth.lovibond.com
Regions in which the MD 610 with **Bluetooth®** can currently be used (status: 01/2019):
within Europe (according R&TTE Directive 1999/5/EC) ; USA (according to FCC part 15, comprised in FCC ID QOQBT113) ; Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-AB0103)
Windows® is a registered trademark of Microsoft Corporation in the United States and other countries.

Please see pages 88 onwards for reagents (order codes)

Photometer & Fluorometer for PTSA in one instrument MD 640





Photometry, trace analysis and tracer detection in one instrument

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The Lovibond® Photometer MD 640 is an enhanced version of the MD 610 photometer, offering additional fluorescence capability for the determination of PTSA and fluoresceine in water systems.

PTSA (1,3,6,8 pyrenetetrasulfonic acid, sodium salt) and fluoresceine are fluorescent materials that are increasingly being added to speciality water treatment products to enable real time product dose analysis. Both materials are detectable at ppb levels, are non-toxic and chemically stable, all of which make them ideal tracer additives throughout complex water systems. Accurately measuring product dose levels helps the water treatment specialist to control water chemistry; prevent corrosion, scale and biological fouling; increase system efficiency and, ultimately, save energy and costs.

Delivery Content

- Instrument in carrying case
- 4 batteries
- 3 round vials each 24 and 16 mm ø (black lid)
- 1 adapter each for 16 mm and 13 mm vials
- Plastic stirring rod 13 cm, Brush 11 cm, syringe 5 ml, screw driver
- Warranty information
- Certificate of Compliance
- Instruction Manual

Order codes (without reagents)

MD 640: 214140

Please specify the reagents or parameters required at time of order.

You can find updated information on parameters and measuring ranges at **www.lovibond.com**

Applications

- Industrial Process Water & Waste Water
- Drinking Water
- Science & Research
- Governmental and Private Laboratories
- Mobile Applications

Technical Data

Display	Backlit graphic-display
Interfaces	**Bluetooth®** 4.0 RJ45 socket for Internet updates[1]
Optics	LEDs, interference filters (IF) and photo sensor in transparent sample chamber Wavelength range: 430 nm IF Δ λ = 5 nm 530 nm IF Δ λ = 5 nm 560 nm IF Δ λ = 5 nm 580 nm IF Δ λ = 5 nm 610 nm IF Δ λ = 6 nm 660 nm IF Δ λ = 5 nm IF = interference filter
UV excitation	375 nm
Measurement Ranges	PTSA 10 - 1000 ppb Fluorescein 10 - 400 ppb
Calibration Check	Monthly (user) (using calibration sets)
Calibration	Factory set & user adjustable (using calibration Standard Set)
Wavelength Accuracy	± 1 nm
Photometric Accuracy*	2 % FS (T = 20 °C – 25 °C)
Photometric Resolution	0.005 A
Operation	Acid and solvent resistant, touch-sensitive keypad with audible feedback via integrated beeper
Power Supply	4 batteries (Mignon AA/LR6); Operation time: approx. 26 h continuous operation or 3500 tests
Auto-Off	Approx. 20 minutes after last keypress with audible signal
Dimensions	Approx. 210 x 95 x 45 mm (unit) approx. 395 x 295 x 106 mm (case)
Weight (unit)	Approx. 450 g
Ambient Conditions	5–40 °C at max. 30–90 % rel. humidity (non condensing)
Language Selection	German, English, French, Spanish, Italian,Portuguese, Polish, Indonesian ; additional languages via Internet update
Memory Capacity	Approx. 500 data sets
CE-Conformity	

Accessories

Item	Code
Set of 12 round vials with lid Height 48 mm, Ø 24 mm	197620
Set of 12 round vials with **black** lid for PTSA / Fluorescein Height 48 mm, Ø 24 mm	197657
Set of 10 round vials with lid Height 90 mm, Ø 16 mm	197665
Adapter for round vials ø 16 mm	19802190
Adapter for round vials ø 13 mm	19802192
Set of **multi vials-3** with lids path length 10 mm, 10 ml volume Height 48 mm, Ø 24 mm (12 pc.)	197605
Vial stand for 6 round vials Ø 24 mm, acrylic glass	418951
Vial stand for 10 vials (Ø 16 mm), acrylic glass	418957
Sealing ring for vial ø 24 mm (12 pc.)	197626
Sealing ring for vial ø 24 mm (black)	197636
Battery, 1.5 V, AA-Alkali-Mangan (4 pc.	1950025
Cleaning cloth for vials	197635
Plastic funnel with handle	471007
Plastic stirring rod, 13 cm length	364100
Plastic stirring rod, 13 cm length, (10 pc.)	364120
Plastic stirring rod, 10 cm length	364109
Plastic stirring rod, 10 cm length, (10 pc.)	364130
Cleaning brush, 10 cm	380230
Verification Standard Kit	215640
Cable for update for connection to a PC	214030
PTSA standard addition solution, 1000 ppb, 50ml	461210
PTSA calibration set (0, 200, 1000 ppb)	461245
Fluorescein standard addition solution, 400 ppb, 50ml	461230
Fluorescein calibration set (0, 75, 400 ppb)	461240
Bluetooth Dongle Set incl. PC Software	2444480

[1] optional available: connection cable with integrated electronics (RS 232 / RJ-45 plug)
* tested with standard solutions

Bluetooth® is a wireless technology subject to regional approval. The use of the MD 640 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada. The use of the MD 640 will also be possible in other regions in the future. For current regions and further information, visit: **bluetooth.lovibond.com**
Regions in which the MD 640 with **Bluetooth®** can currently be used (status: 01/2019):
within Europe (according R&TTE Directive 1999/5/EC) ; USA (according to FCC part 15, comprised in FCC ID QOQBLE113) ;
Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-AB0103)

Photometer MultiDirect



The MultiDirect is a contemporary, microprocessor-controlled photometer with ergonomically designed keypad and large-format graphic display. It is equipped with a wide range of pre-programmed methods based on the proven range of Lovibond® tablet reagents, liquid reagents, tube tests and powder reagents (VARIO Powder Packs). Users can also store their own methods.

The MultiDirect has 6 precision interference filters using different wavelengths.

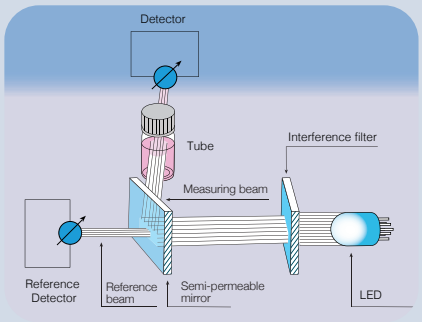
The unique design of the optics allows the automatic selection of the required wavelength without any moving parts. This and the dual beam technology utilizing an internal reference channel, guarantees the highest accuracy.

For portable use, the instrument operates with seven standard rechargeable batteries (supplied). These batteries are available all over the world and are easily changed.

The integrated intelligent charge controller allows simultaneous operation of the unit and battery charging (using the supplied power pack). The MultiDirect also operates without a power pack by using alkaline manganese batteries.

The entire instrument, including sample chamber (the most critical component of any photometer) and battery compartment, is waterproof, ensuring that no water comes in contact with the electronic components.

Dual Beam Technology



The two-beam technology with one internal reference channel guarantees highest accuracy.

Dual Beam technology and Interference filters for highest accuracy

Long-term stable LEDs as light sources

Update of new methods & languages via Internet (free of charge)

A wide range of pre-programmed methods



NIST Traceability

The instrument is factory pre-adjusted to international standards. The user can set the programmed instrument in "user calibration mode" with standards traceable to NIST adjust.
(NIST = National Institute of Standards and Technology)

New methods

Test methods are regularly updated to suit market requirements. You can find software updates for new methods and additional languages on our website at **www.lovibond.com**.

Polynomials

From measured data pairs (concentration Absorption), the user can create a polynomial an obedient polynomial as a calibration function for own methods serves.
A known polynomial may also be used. 25 order polynomials (y = A+Bx+Cx2 +Dx3 +EX4 + FX5) can be stored together with user-specific parameters such as wavelength, measuring range, unit and number of decimals.

Concentration

Alternatively, calibration functions for your own methods can be created by measuring two to fourteen standards. On the basis of the concentrations/absorption pairs obtained, the photometer will calculate a linear interpolation between the measured points. Up to 10 methods can be stored for further sample measurements.

Applications

- Waste Water
- Drinking Water
- Industrial Process Water
- Science & Research
- Governmental and Private Laboratories
- Mobile Applications

Please see pages 88 onwards for reagents (order codes)

Photometer MultiDirect



Technical Data

Display	Graphic-display
Optics	6 temperature compensating LED, internal reference channel, photodiode in protected sample chamber
Wavelengths	6 interference filters in one unit, λ_1 = 430 nm IF Δ λ (nm) = 5, λ_2 = 530 nm IF Δ λ (nm) = 5, λ_3 = 560 nm IF Δ λ (nm) = 5, λ_4 = 580 nm IF Δ λ (nm) = 5, λ_5 = 610 nm IF Δ λ (nm) = 6, λ_6 = 660 nm IF Δ λ (nm) = 5 IF = interference filter
Interface	RS232 for printer and PC-connection
Download	Software and methods up-date by means of the internet
Operation	Acid and solvent resistant, touch-sensitive keypad with audible feedback

Power Supply	7 Ni-MH-battery pack (AA/Mignon), charged whilst in the unit with external mains charger, integrated overload cut-out
Dimensions (L x W x H)	265 x 195 x 70 mm
Weight (unit)	approx. 1000 g with rechargeable batteries
Ambient Conditions	up to max. 90 % humidity (non condensing) approx. 5–40 °C
Auto-Off	approx. 20 minutes after last keypress with no loss of data
Auto-Check	By pressing ON/OFF-key
Memory Capacity	approx. 1000 data sets with date, time and registration number
Approval	CE

Delivery Content

- Instrument in carrying case
- 7 rechargeable batteries
- 1 lithium battery
- Mains charger, 100-240 V
- PC connection cable
- 3 round vials each 24 and 16 mm ø
- 1 adapter for 16 mm ø vials
- 3 syringes
- 1 plastic beaker 100 ml
- Warranty information
- Certificate of Compliance
- Instruction Manual

Order code: 210000-B
Order code: 210000
(without lithium battery and reagents)

Please specify the reagents or parameters required at time of order.

You can find updated information on parameters and measuring ranges on our website at **www.lovibond.com**

Please see pages 88 onwards for reagents (order codes)



Accessories

Item	Code
Set of 12 round vials with lid Height 48 mm, Ø 24 mm	197620
Set of 10 round vials with lid Height 90 mm, Ø 16 mm	197665
Adapter for round vials Ø 16 mm	19801094
Lid for adapter	19801100
Sealing ring for vial ø 24 mm (12 pc.)	197626
Vial stand for 6 round vials Ø 24 mm, acrylic glass	418951
Vial stand for 10 vials (Ø 16 mm), acrylic glass	418957
Cleaning cloth for vials	197635
Adapter for Vacu-vial®	192075
Plastic beaker, 100 ml	384801
Plastic funnel with handl	471007
Plastic stirring rod, 13 cm lengt	364100
Plastic stirring rod, 13 cm length, (10 pc.)	364120
Plastic stirring rod, 10 cm length	364109
Plastic stirring rod, 10 cm length, (10 pc.)	364130

Item	Code
Cleaning brush, 10 cm	380230
Syringe, plastic, 2 ml	369080
Syringe, plastic, 5 ml	366120
Syringe, plastic, 10 ml	369090
Rubber seal cap	19801501
Mains charger, 100-240 V, 50-60 Hz, with international adapters	193010
Cable for connection to PC, serial 9-pins	198198
AA Ni-MH, 1100 mAh (7 pc.)	1950020
Lithium battery	1950017
Verification Standard Kit	215650
Plain paper printer Incl. mains adapter and RS 232 cable	198077

Verification Standard Kit

The verification standards serve to verify the photometric accuracy and reproducibility of the results at the different wavelengths. The absorption value is stated.
The kit contains one zero standard, six different vials for checking six different wave lengths and allows checking the complete range of the MultiDirect photometer.
The shelf life of the verification standard kit is two years from the date of production, provided that storage and use are in accordance with the instructions provided.
Measurements are taken in mAbs.

Verification Standard Kit **215650**
(MultiDirect)



Spectrophotometer SpectroDirect



The SpectroDirect is a solid single-beam spectrophotometer with an excellent price/performance ratio that is specifically designed for water testing.

Optics

The light source is a tungsten halogen lamp.
The lamp is switched on only momentarily during the measurement process[1)], so there is no need for a warm-up period.
The SpectroDirect is ready to perform a self-test as soon as it is switched on.

The light passes through an entry slot to the monochromator, where it is split into spectral ranges. The monochromator is a holographically produced, transparent grating. The movable mirror ensures that light of the desired wavelength is focused automatically so that it passes through the exit slot, into the sample chamber and therefore through the water sample. The light that is not absorbed by the sample travels to the silicon photodiode detector. This signal is then evaluated by a microprocessor and shown as a result in the display.

Multifunctional sample chamber

Round vials measuring 16 mm and 24 mm in diameter and rectangular cells with pathlengths from 10 to 50 mm may be used without an adapter. Only the 10 mm cell will be fixed by a little holder that must inserted into the sample chamber.

Operator guidance and functions

The choice of language is prompted in the display and can be switched to German, English, French, Italian, Spanish or Portugese. When further languages become available, they will be updated via internet.

In addition to the pre-programmed Lovibond® methods, the user can also program 35 own methods (10 user concentration methods and 25 user polynomials). Other functions include the automatic count-down function in various methods, differentiated determination for some methods, absorption / transmission, spectral uptake, kinetics and up to 7 concentrations (linear).

Data transfer

The RS232 interface at the rear allows direct connection and data transfer to a PC or printer with serial interface. Up to 1000 records can be saved with a date, time, running test and code number as well as the measuring range and the method number.

Updates for new methods and additional languages can be found on our website: www.lovibond.com.

Power supply

The required input voltage is 12 V.
The SpectroDirect is connected to an external power pack as standard. Battery operation is also possible by using an external energy station (see accessories).

Traceability

The instrument can be checked by the user with a secondary standard filter set (order no .: 711160) with DAkkS calibration certificate. The user can set the instrument in "user calibration mode" with standards traceable to NIST adjust.
(NIST = National Institute of Standards and Technology)

Please see pages 88 onwards for reagents (order codes)

Technical data

Wavelength range:	330 to 900 nm
Photometric range:	-0.3 to 2.5 Abs
Spectral bandwidth:	10 nm
Wavelength accuracy:	± 2 nm
Wavelength reproducibility:	± 1 nm
Light source:	Pre-adjusted tungsten halogen lamp
Monochromator:	Holographic grating
Detector:	Silicon photodiode
Multifunctional sample chamber for:	Round vials 24 and 16 mm Ø, Rectangular cells 10 - 50 mm
Display:	Backlit LCD graphic display
Language options:	German, English, French, Italian, Spanish, Portuguese
Storage capacity:	1000 test data sets
Serial interface:	RS232
Dimensions: (L x W x H)	270 x 275 x 150 mm
Weight:	approx. 3.2 kg
Power supply unit:	Input: 100 - 240 V ~ 1.0 A 50 - 60 Hz Output: 12 V .... 30 W
CE-Conformity	

Accessories

Item	Code
Replacement halogen lamp	711000
Magnetic pin (for updates)	19801687-2
Connection cable to a PC	198197
Connection to a 12 V plug	711040
Case for transport	712050
Secondary standard filter set with certificate	711160
Plastic funnel with handle	471007
Cleaning cloth for vials	197635
Power supply unit 100-240 V / 50-60 Hz	711090
Energy station for SpectroDirect and XD for mobile power supply	711051
12 round vials with lid Height 48 mm, 24 mm Ø	197620
5 round vials with lid Height 48 mm, 24 mm Ø	197629
10 round vials with lid Height 90 mm, 16 mm Ø	197665
Vial stand for 6 round vials Ø 24 mm, acrylic glass	418951
Vial stand for 10 vials (Ø 16 mm), acrylic glass	418957
W 100, rectangular cell optical glass OG, 10 mm path length	601040
W 100, rectangular cell optical glass OG, 50 mm path length	601070
W 110, rectangular cell Quartz-UV-glass, 10 mm path length	661130
Plain paper printer Incl. mains adapter and RS 232 cable	198077





We would be pleased to quote a ready to use spectrophotometer unit for the parameters and required accessories.

Please see pages 88 onwards for reagents (order codes)



Delivery Content

SpectroDirect (standard equipment)

- SpectroDirect (basic unit)
- Power supply unit 100 - 240 V
- Serial cable for connection to a PC
- Magnetic pin (for Update)
- 2 batteries (AA)
- Manufacturers test certificate M
- Warranty information
- Instruction manual

  Order code: 712000

SpectroDirect (advanced features)

- SpectroDirect in aluminium case
- Power supply unit 100 - 240 V
- Serial cable for connection to a PC
- Magnetic pin (for Update)
- 2 batteries (AA)
- Energy station
- Replacement lamp
- 12 round vials with lids, 24 mm Ø
- 10 round vials with lids, 16 mm Ø
- 2 rectangular cells, 10 mm path length
- 2 rectangular cells, 50 mm path length
- Plastic stirring rod, 13 cm
- Manufacturers test certificate M
- Warranty information
- Instruction manual

  Order code: 712005

Applications

- Waste Water
- Drinking Water
- Industrial Process Water
- Science & Research
- Governmental and private Laboratories

VIS / UV-VIS Spectrophotometer XD 7000 / XD 7500



Please see pages 88 onwards for reagents (order codes)



The Tintometer® Group has a decade-long heritage of standing for in-house produced high quality reagents and instruments. With the XD series, the portfolio is supplemented by an equally first-class spectrophotometer that fulfils even the highest demands in water analysis.

The Lovibond® UV-VIS and VIS spectrophotometers XD 7500 and XD 7000 combine the latest reference beam technology with high user-friendliness and flexibility.

All from one provider

The XD instruments. offer over 150 preprogrammed methods, which are based on the proven Lovibond® reagents. The combination of Photometer and Lovibond® reagents gives the user a complete system for immediate work input. There are no issues concerning with the implementation of reagent and instrument.
This means that the user not only gets uncomplicated equipment for the working area at all times but also competence in after-sales service.

Quality at an affordable price

The outstanding price/performance ratio of the total systems XD 7000 and XD 7500 is maintained with the diverse range of Lovibond® reagents. So the user can be sure when purchasing the instrument to also have a low-priced solution for consumables in future.

Method selection made simple

The barcoded cuvette tests allow the user an immediate access to the respective method: the insertion of the 16 mm cuvettes into the light-shielded duct is sufficient.

Likewise for any other of the more than 150 parameters, the external barcode reader provides direct method selection. By adopting these barcodes into customer documents, such as work instructions, the correct operation is significantly streamlined.

Global deployment desirable

With its 24-language instrument software, a 27-language user manual and a methodology handbook written in 8 languages, the XD 7000/7500 series qualifies for global applicability.

Through the self-explanatory pictograms the methodology handbook gives the user a quick and reliable overview of the path to the measurement result.

Straightforward user guidance

The bright colour display and the easy-to-use menu navigation allow every user fast access to the instrument and its functions.

Diversity assured

In addition to the pre-installed Lovibond® methods the user also benefits from the various cuvette sizes of 16 and 24 mm round cuvettes, as well as 10, 20 and 50 mm rectangular cuvettes.
These are all automatically recognised, without exception, and the user acquires a wide variety of methods.

The possibility of using a 13 mm cuvette by use of an adapter further enhances the method portfolio.

Always up to date

The latest software updates are always available for registration-free download on our website www.lovibond.com.

This allows users to keep their own XD instrument at the cutting edge with new methods, functions or languages.

Extensive features inclusive

The XD 7000/7500 series offers a comprehensive set of features for versatile use in the analysis of water-based solutions:

- Preprogrammed Lovibond® methods
- The creation of user-defined methods using multiple wavelengths.
- Measurement of transmission and absorption
- Spectral scan
- kinetic analysis

Well secured

Backup of own data is becoming increasingly important, not just for the maintenance of Good Laboratory Practice (**GLP**). For this purpose, the user can set up to 3 user levels: Administrator, user and guest (sometimes with password protection).

Guidelines and quality standards that call for such security will be handled in accordance with respective requirements.





Analytical quality assurance

In many application areas, beyond the GLP guidelines, reliable assurance of correct and precise measurement results is both a requirement and a challenge.

The XD 7000 and XD 7500 instruments meet this requirement with 3 selectable functions:

PCheck

The complete photometer is checked by means of the Verification Standard Kit, which can be ordered separately.

MCheck

The photometer is checked in conjunction with the method.

The required standards are called application-related ValidCheck® multistandards and ValidCheck® single parameter standard solutions offered.

SCheck

The SCheck checks whether the photometric determination of other ingredients in the sample have been disturbed.

Each of the mentioned check options includes the capability to define inspection time intervals, indicating verified results and issuing a test report.

Spectrophotometer XD 7000
Order Code: 71307000

Spectrophotometer XD 7500
Order Code: 71307500

Delivery Content

- Spectrophotometer
- Set of 4 round vials with lid + zero vial XD7x00 (24mm)
- zero via 16 mm for XD 7000 / XD 7500
- 4 batteries AA
- Power supply unit 100 - 240 V / 50-60 Hz / 12 V DC Output
- Power cable
- Quickstart-Guide in 27 languages
- Full User-Manual in 8 languages (digital)
- Handbook of Methods (digital)
- Calibration record in shipping box

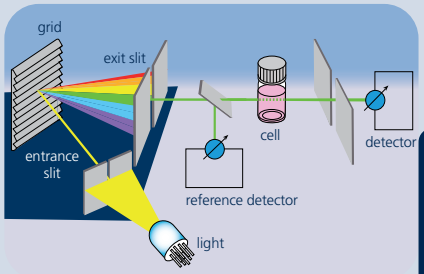
Technical data	XD 7000	XD 7500
Wavelength range	320 – 1100 nm (scan range)	190 – 1100 nm (scan range)
Light source	Tungsten-halogen-lamp	Xenon flash lamp (500 millionen flashes possible)
Optical system	grid monochromator with reference beam and beam splitter after exit slit	
Measurement	grid monochromator with reference beam and beam splitter after exit slit	
Suitable Vials	round: 13, 16 and 24 mm, rectangle: 10, 20 and 50 mm	
Automatic Tube Recognition	automatic recognition of 16 and 24 mm round tubes, 10,20,50 mm rectangular tubes	
Test recognition	via internal or external barcode reader (depending on the method)	
Dimensions (W x H x D)	422 x 195 x 323 mm	
Weight	approx. 4,5 kg	
Power supply	100 – 240 V, 50 / 60 Hz	
Display	7“ high contrast colour graphic-dislay	
Protection class	IP30	
Keyboard	membrane keyboard	
Interfaces	1 x ethernet RJ45, 1 x USB A for external memory, keyboard, mouse, barcode-scanner and 1x USB B for PC and PCL compatible printer	
Spectral scope	4 nm	
Wavelength accuracy	± 1 nm on all Holmium peaks	
Wavelength reproducibility	better than 0,5 nm	
Photometric range	-3,3 - +3,3 Abs	
Photometric resolution	Abs.: 0,001 Transmission: 0,1%	
Photometric accuracy	0,003 Abs below 0,6 Abs / 0,5 % from 0.6 bis 2,0 Abs	
Photometric reproducibility	0,003 Abs below 0,6 Abs / 0,5 % from 0,6 bis 2,0 Abs	
Photometric linearity	<1% up to 2.0 Abs between 340 to 900 nm	
Scattered light at 340 and 408 nm	< 0,1% transmission	< 0,05% transmission
Drift	< 0.005 Abs per hour after 15 minutes heat up time	
Internal storage	approx. 5000 data sets (method, user ID, date, result), autostorage function / manual storage function	
Programmability	up to 100 user programs, 20 user profiles	



The Handbook of Methods

The 900 pages contain more than 160 Lovibond® test methods. Each method can also be selected directly by the XD instrument via barcode with the scanner. With basic chapters on water analysis, source and literature references, references to standards and explanations for possible errors, it is also a compact reference book for photometry - printed or digital.

The methods manual is currently available in eight languages.



The optical system

Using reference beam technology, the spectrophotometers achieve maximum accuracy in the visual and non-visual wavelength range.

The light source according to the model and consists of a tungsten-halogen lamp in the XD 7000, while the XD 7500 is equipped with a xenon flash lamp.
With an output of up to 500 million flashes, the UV light source is designed to last the life of the instrument and is a cost-effective replaceable part as opposed to the usual deuterium lamps.

By means of a grating monochromator and beam splitter behind the exit slit, the respective required wavelength is precisely demarcated and allows a wave length accuracy of +/- 1 nm.

The principle in detail

The light emitted by the light source falls through the entrance slit on the monochromator and is deflected by the grating situated towards the exit slit. This mechanism, along with the limitation after the exit slip, enables the selected wavelength to be accurately reproduced.
The semi-transparent mirror deflects the reference beam while allowing the light beam to pass through to the sample in the cuvette.
The photodiodes act as detectors and transmit these signals to the microprocessor. The result is calculated and issued as a value in the display.

Accessories

Item	Code
Replacement lamp for XD 7000	71310000
Transport case for XD Spectrophotometer	71310010
12 Volt Connection cable for XD Spectrophotometer	71310020
Barcode Scanner USB	71310030
Cleaning cloth for tubes	197635
USB-cable for PC-Connection, 3 m length	2444482
Batteries (AA), 4er pack	1950025
Round tube with lid, 12er-pack height 48 mm; diameter 24 mm	197620
Round tube with lid, 5er-pack height 48 mm; diameter 24 mm	197629
Round tube with lid, 10er-pack, 12er-pack height 90 mm; diameter 16 mm	197665
Tube stand for 6 vials 24 mm acrylic glass with laser engraving Lovibond	418951
Tube stand for 10 vials 16 mm acrylic glass with laser engraving Lovibond	418957
W100/OG/10 mm rectangle tube opt. glass	601040
W100/OG/20 mm rectangle tube opt. glass	601050
W100/OG/50 mm rectangle tube opt. glass	601070
W110/UV/10 mm rectangle tube quartz UV	661130
W110/UV/20 mm rectangle tube quartz UV	661140
W110/UV/50 mm rectangle tube quartz UV	661160
Secondary standard set VIS with DAkkS calibration	711160
Secondary standard set VIS with UV mit DAkkS calibration	711161
Automatic pipette 1-5 ml with stepless volume adjustment (digital)	419076
Pipette tips 1-5 ml, white (Pckg with 100 pc)	419066
Automatic pipette 0,1-1 ml with stepless volume adjustment (digital)	419077
Pipette tips 0,1-1 ml , blue (Pckg with 100 pc)	419073
Zero vial 16 mm for XD 7000/XD 7500	215661
Zero vial 24 mm for XD 7000/XD 7500	215662
Handbook of Methods, german	003864401
Handbook of Methods, english	003864402
Manuel des Méthodes, french	003864403
Manuale di Metodi, italian	003864404
Handbook de Métodos, spanish	003864405
Manual de Métodos, portuguese	003864406
Metotlar el Kitabi, turkish	003864407
Handbook of Methods, chinese (simplified)	003864408


XD Spectrophotometer in carrying case

ValidCheck Standard Solutions

Single standards

Item	Analyte	Analyte concentration
ValidCheck Chlorine	Cl_2	1,5 mg/l Cl_2
ValidCheck Fluoride	F-	0,3 mg/l
ValidCheck Fluoride	F-	1 mg/l
ValidCheck Sulfate	SO_4^{2-}	75 mg/l
ValidCheck Sulfate	SO_4^{2-}	500 mg/l
ValidCheck Copper	Cu	0,5 mg/l
ValidCheck Copper	Cu	2 mg/l
ValidCheck Manganese	Mn	0,3 mg/l
ValidCheck Potassium	K	10 mg/l
ValidCheck Nitrate	NO^{3-}	10 mg/l NO^{3-}
ValidCheck Nitrate	NO^{3-}	50 mg/l NO^{3-}
ValidCheck Nitrite	NO^{2-} -N	0,1 mg/l
ValidCheck Nitrite	NO^{2-} -N	0,4 mg/l
ValidCheck Total Nitrogen	N	50 mg/l
ValidCheck Phosphate	PO_4^{3-} - P	0,3 mg/l
ValidCheck Phosphate	PO_4^{3-} - P	1 mg/l
ValidCheck COD	COD / TOC	40 mg/l COD
ValidCheck COD	COD / TOC	120 mg/l COD
ValidCheck COD	COD / TOC	500 mg/l COD
ValidCheck COD	COD / TOC	5000 mg/l COD

Multistandards inclusive Stocking Solution

Item	Analyte	Analyte concentration of the standards
ValidCheck DW Anions	Cl^- NO^{3-} PO_4^{3-} SO_4^{2-}	250 mg/l 50 mg/l 2 mg/l 500 mg/l
ValidCheck WW Influent Multi-Standard COD/TOC/NO_3-N/PO_4-P/TP	CSB/COD/ TOC NO^{3-} -N PO_4^{3-} -P	500 mg/l O_2 2 mg/l 10 mg/l
ValidCheck WW Effluent Multi-Standard COD/TOC/NO_3-N/PO_4-P/TP	CSB/COD/ TOC NO^{3-} -N P (total)	40 mg/l O_2 10 mg/l 1 mg/l



ValidCheck Standard solutions

Quality management of analytical methods is a fundamental prerequisite for reliable water analysis. With the new ValidCheck standard solutions, ready-to-use solutions are available to the user. The precisely adjusted concentrations are modified to each particular application case. The dilution is omitted.

With the ValidCheck Multistandards, the user can immediately check all important analysis methods of an application with one product: Anions and metals in the drinking water analysis or in the analysis of the wastewater treatment plant inflow and outflow. In addition, the Multistandards contain a stocking solution, which enables the reliable determination of the influences of the sample matrix on the results.

	Container sizes	Code
	98,5 +1,5 ml	**48105510**
	250 ml	**48321225**
	250 ml	**48321325**
	250 ml	**48311325**
	250 ml	**48311825**
	250 ml	**48141325**
	250 ml	**48141525**
	250 ml	**48161425**
	250 ml	**48191325**
	250 ml	**48211325**
	250 ml	**48211625**
	250 ml	**48221225**
	250 ml	**48221425**
	250 ml	**48231725**
	250 ml	**48241225**
	250 ml	**48241425**
	250 ml	**48371225**
	250 ml	**48371425**
	250 ml	**48371625**
	250 ml	**48371825**

new!

available in Q 4 !



Analyte concentration Stocking Solution	Container sizes	Code
1500 mg/l 250 mg/l NO^{3-} 10 mg/l 3000 mg/l	102 ml Stocking solution + 21 ml Stocking solution	48399312
2500 mg/l O_2 10 mg/l 50 mg/l	102 ml Stocking solution + 21 ml Stocking solution	48399712
200 mg/l O_2 50 mg/l 5 mg/l	102 ml Stocking solution + 21 ml Stocking solution	48399612


Reagents
DPD No.1





Indicator Systems
Page 86



Reagents
Page 88-109

Indicator-Systems

Green chemistry

For decades, the Tintometer® Group has been known as a producer of reagents for water analysis, which are supplied under the brand name Lovibond®.

The wide range of applications requires different types of reagents.

Also, users tend to have personal preferences as to which dosage system to use.

Our broad product range covers blistered tablet reagents, powder reagents packed in aluminium foil and precise dosing liquid reagents in dropper bottles.

With all our reagents, we strive to keep the formulations as environmentally friendly as possible. Hazardous substances are – whenever possible – replaced by harmless and functionally identical substitutes.

Where the required chemistry of the detection method makes the use of these substances absolutely necessary, the concentration levels are lowered to the minimum rate, without compromising the accuracy of the analysis results.

For example, our reagents for Pool & Spa water testing are free from boric acid, which is still frequently being used as an additive in the industry. The European Union (EU) has classified boric acid as a dangerous substance.

The Lovibond® DPD No. 1 tablets are not only 100% free from boric acid, they also guarantee compliance with the buffering effect required by the standard.
This characteristic makes the tablet a leader in its field.



Tablet reagents

The reagent tablet is the most popular indicator system because it has several advantages. Its precise dosability, easy handling and very long shelf life make it a popular choice. Tablets can withstand almost all climatic conditions.

In part only thanks to the aluminium their blister packaging, from which they can be released at the press of a finger. Their compact form leaves almost no room for changes in the mixture due to external influences. Individually packaged, some tablets can be stored for up to 10 years.
The weight of the tablet is fixed within very narrow limits. This allows a high dosing accuracy to be achieved. These solid tablets are designed for ease of use and to dissolve easily in the sample being tested.

Achieving a tablet substance which has both the solidity and the ease of dissolution needed for ease of use whilst having no undesired effects upon the analytical results requires many years of experience and a deep knowledge of the underlying chemistry.

You can therefore rely on over 130 years of expertise in the production of reagent tablets by Lovibond®.

Liquid reagents

The use of liquid reagents has one decisive advantage: their speed, because there is no need to dissolve reagents in solid form. However, liquid reagents must be dosed exactly, for example, with a pipette. Warning: Incorrect handling can result in significant dosage errors. In addition, pipettes must be checked continuously to ensure that they remain accurate.

Because of these issues, the counting of droplets for simple dosing has therefore become established.

Here, too, there are external factors that can influence the result. This is because the drop size can change due to temperature, material, diameter of the dosing tip and composition of the reagent.

Liquid reagents have a significantly shorter shelf life than comparable products in solid form.
The shelf life also deteriorates after opening.
If the storage conditions are observed, Lovibond® DPD and Phenolred solutions have a shelf life of up to two years from the date of manufacture.

Powder reagents

Simply tear open the aluminium foil pack and add the contents to the water sample: Powder reagents can be used easily and quickly. This makes the Powder Packs a popular means of detection in water analysis in many countries.
Lovibond® Powder Packs are manufactured to the same high quality standards that have been tried and tested in tablet production for decades.



* HACH® is a registered trademark of Hach Company, Loveland, Colorado. The use of the HACH® trademark does not imply any affiliation with or approval by Hach Company regarding the formulation, testing or compatibility of these products for use in HACH® brand spectrophotometers or other instruments or systems.

Tintometer is appreciated worldwide for this.

The Lovibond® Powder Pack range is a valuable addition to the range of reagent systems. In addition, the range covers all known parameters - from aluminum to chlorine and to the sulfate.

Due to their chemical properties, Lovibond® Powder Packs can also be used in Hach® equipment.

Tube tests

It couldn't be easier:
The cuvettes already contain the essential indicators and reagents in the exact dosage required. Simply add the sample substance, insert it into the photometric measuring instrument and the result is available.

Anyone can carry out these simple tube tests. This makes highly sensitive and precise water tests exceptionally easy. The sample liquid discolours as soon as the reagent chemicals are added.

The photometer measures this discoloration and allows conclusions to be drawn about the concentration of the parameter being investigated.
The process is standardized, saves time and everyone is able to perform it, with significant reductions in workload.
The pre-dosed reagents eliminate the need to handle hazardous chemicals. This also increases work safety.

Up to six different measuring ranges are available for individual sample verifications. The round cuvettes are Ø 16 mm made of special optical glass as well as digestion or auxiliary reagents are supplied in a storage and shipping box.
It contains 24 or 25 reaction cuvettes and up to 2 zero cuvettes for adjusting the photometer systems.

Environmental Protection

In many countries used cuvette tests are taken back. This is followed by professional disposal or recycling on the basis of the applicable environmental protection aspects.

Specifications and Certificate of Analysis

To underline the high quality standard of Lovibond® reagents, a specification is available for each reagent and a certificate of analysis for each lot (**www.lovibond.com**).

Detailed information see pages 114 - 119

Preparing samples for photometric measurements



Membrane filter set

Advantages

- removes turbid materials from samples
- differentiates between dissolved and total substances
- 0.45 µm mesh meets the requirements of the official German unitary procedure for water testing

To prevent the effects of light scatter, it must be ensured that all turbid materials are removed from the sample before photometric measurements are carried out. This can be achieved with the Lovibond® membrane filter set.

Where certain methods are employed (e.g., iron, manganese, CSB, etc.) a membrane filter set must be used to differentiate samples in terms of dissolved and total substances. The filter mesh size of 0.45 µm is in accordance with the official German unitary procedure for water testing.

Order code 366150
(covers 25 x 0.45 µm membrane filters and two 20 ml syringes)



Reagents

Test	No. Methods	Range	Wave lengths λ / nm									Method
			MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	
Acid capacity $K_{S4.3}$	M20	0,1 - 4 mmol/l	-	610	610	610	610	-	615	615	615	Acid/Indicator [1, 2]
ADMI	M2530 M2531	2 - 100 mg/l 10 - 500 mg/l								400 bis 700	400 bis 700	Tristimulus Colorometry
Alkalinity-m	M30	5 - 200 mg/l	610	610	610	610	610	610	615	615	615	Acid/Indicator [1, 2, 5]
Alkalinity-m HR	M31	5 - 500 mg/l	-	-	610	610	610	610	615	615	615	Acid/Indicator [1, 2, 5]
Alkalinity-p	M35	5 - 300 mg/l	-	-	560	560	-	-	551	551	551	Acid/Indicator [1, 2, 5]
Aluminium VARIO	M50	0,01 - 0,25 mg/l	530	-	530	530	530	-	535	535	535	Eriochromcyanin R [2]
Aluminium	M40	0,01 - 0,3 mg/l	530	-	530	530	530	-	535	535	535	Eriochrome cyanine R [2]
Ammonia	M60	0,02 - 1 mg/l	610	-	610	610	610	-	676	676	676	Indophenole blue [2, 3]
Ammonia VARIO	M62	0,01 - 0,8 mg/l	660	-	660	660	-	-	655	655	655	Salicylate [2]
Ammonia VARIO LR	M65	0,02 - 2,5 mg/l	-	-	660	660	-	-	655	655	655	Salicylate [2]
Ammonia VARIO HR	M66	1 - 50 mg/l	-	-	660	660	-	-	655	655	655	Salicylate [2]
Arsenic (III, V)	M68	0,02 - 0,6 mg/l	-	-	-	-	-	-	507	507	507	Silver diethyldithiocarbamate[1]
Biguanide (see PHMB)												

MSDS (Material Safety Data Sheets): **www.lovibond.com**

For other reagent quantities please see our current price list.

[1] Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlamm- Untersuchung
[2] Standard Methods for the Examination of Water and Wastewater, 18th Edition; 1992
[3] Photometrische Analysenverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989
[4] Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980
[5] Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
24 mm ø		ALKA-M-PHOTOMETER	Tablet / 100	513210BT
50 mm ☐ 10 mm ☐		Pt-Co Units	no reagents required	
24 mm ø	$CaCO_3$	ALKA-M-PHOTOMETER	Tablet / 100	513210BT
24 mm ø	$CaCO_3$	ALKA-M-HR-PHOTOMETER	Tablet / 100	513240BT
24 mm ø	$CaCO_3$	ALKA-P-PHOTOMETER	Tablet / 100	513230BT
24 mm ø	Al	 VARIO Aluminum ECR/F20 VARIO Aluminum Hexamine/F20 VARIO Aluminum ECR Masking Reagent	**Set** Powder Pack / 100 Powder Pack / 100 Liquid reagent / 25 ml	535000
24 mm ø	Al	ALUMINIUMNo. 1 ALUMINIUMNo. 2 Combi pack# ALUMINIUM No.1 / No.2 Combi pack# ALUMINIUM No.1 / No.2	Tablet / 100 Tablet / 100 each 100 each 250	515460BT 515470BT 517601BT 517602BT
24 mm ø	NH_4 - N	AMMONIA No. 1 AMMONIA No. 2 Combi pack# AMMONIA No.1 / No.2 Combi pack# AMMONIA No.1 / No.2 Ammonia conditioning powder (for seawater)	Tablet / 100 Tablet / 100 each 100 each 250 Powder / 15 g / 50 Tests	512580BT 512590BT 517611BT 517612BT 460170
24 mm ø	NH_4 - N	 VARIO Ammonia Salicylate F10 VARIO Ammonia Cyanurate F10	**Set** Powder Pack / 200 Powder Pack / 200	535500
16 mm ø	NH_4 - N	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO AmDiluent Reagent LR VARIO Deionised Water (for Zero)	**Set** (Tube test) Powder Pack / 50 Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml	535600
16 mm ø	NH_4 - N	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO AMDiluent Reagent HR VARIO Deionised Water (for Zero)	**Set** (Tube test) Powder Pack / 50 Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml	535650
20 mm ☐	As	for chemicals see manual, reagents at specialized chemistry dealer **Arsenic Reaction apparatus Set** Erlenmeyer flask glass stopper absorption tube **W 100** (tube, Optical Glass-OG, 20 mm layer depth)		 **370500** 370501 370502 370503 601050

a) determination of free, combined and total
b) Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)
c) MultiDirect: Adapter is necessary for Vacu-vials® (Order code 192075)
d) Spectroquant® is a Merck KGaA Trademark
e) alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity
f) additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine
g) Reagent recovers most insoluble iron oxides without digestion
h) additionally required for samples with hardness values above 300 mg/l $CaCO_3$
i) high range by dilution
j) Vacu-vials® is a Chemetrics Trademark
including stirring rod

Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Boron	M85	0,1 - 2 mg/l	-	-	430	430	-	-	450	450	450	Azomethine [3]
Bromine	M80	0,05 - 13 mg/l	530	530	530	530	530	530	-	510	510	DPD [5]
		0,05 - 6,5 mg/l	-	-	-	-	-	-	510	-	-	
	M79	0,05 - 1 mg/l	-	-	-	-	-	-	510	510	510	
	M78	0,1 - 3 mg/l	-	-	-	-	-	-	510	510	510	
Bromine Powder	M81	0,05 - 4,5 mg/l	-	-	530	530	-	-	-	510	510	DPD [1, 2]
Cadmium (Cd^{2+})	M87	0,025 - 0,75 mg/l	-	-	-	-	-	-	525	525	525	Cadion
Chlorine [a)]	M100	0,01 - 6 mg/l	530	530	530	530	530	530	-	510	510	DPD [1, 2]
		0,02 - 3 mg/l	-	-	-	-	-	-	510	-	-	
	M99	0,02 - 0,5 mg/l	-	-	-	-	-	-	510	510	510	
	M98	0,1 - 6 mg/l	-	-	-	-	-	-	510	510	510	
Chlorine HR (DPD) [a)]	M103	0,1 - 10 mg/l	530	530	530	530	530	530	-	-	-	DPD [1, 2]
	M104	0,1 - 10 mg/l	-	-	-	-	-	-	510	510	510	
Chlorine [a)]	M101	0,02 - 4 mg/l	530	530	530	530	530	-	-	-	-	DPD [1, 2]
		0,02 - 3 mg/l	-	-	-	-	-	-	510	510	510	
Chlorine Powder MR	M113	0,02 - 3,5 mg/l	530	-	530	530	-	-	510	510	510	DPD [1, 2]
Chlorine Powder [a)]	M110	0,02 - 2 mg/l	530	-	530	530	530	-	510	510	510	DPD [1, 2]
	M111	0,1 - 8 mg/l	530	-	530	-	530	-	-	-	-	

MSDS (Material Safety Data Sheets): **www.lovibond.com**

For other reagent quantities please see our current price list.

[1] Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlamm- Untersuchung
[2] Standard Methods for the Examination of Water and Wastewater, 18th Edition; 1992
[3] Photometrische Analysenverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989
[4] Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980
[5] Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
24 mm ø	B	BORON No. 1	Tablet / 100	515790BT
		BORON No. 2	Tablet / 100	515800BT
		Combi pack# BORON No.1 / No.2	each 100	517681BT
		Combi pack# BORON No.1 / No.2	each 200	517682BT
24 mm ø 24 mm ø 50 mm ☐ 10 mm ☐	Br	in absence of Chlorine: DPD No.1 Bromine beside Chlorine: DPD No.1, Glycine differentiated bromine determination: DPD No.1, DPD No.3, DPD Nitrite		
		DPD No. 1	Tablet / 100	511050BT
		GLYCINE [f]	Tablet / 100	512170BT
		DPD No. 3	Tablet / 100	511080BT
		DPD Nitrite	Tablet / 250	502691
		Combi pack# DPD No.1 / GLYCINE	each 100	517731BT
		Combi pack# DPD No.1 / GLYCINE	each 250	517732BT
		Combi pack# DPD No.1 / No.3	each 100	517711BT
		Combi pack# DPD No.1 / No.3	each 250	517712BT
		DPD No. 1 HIGH CALCIUM[e]	Tablet / 100	515740BT
		DPD No. 3 HIGH CALCIUM[e]	Tablet / 100	515730BT
		Combi pack# DPD No.1 / No.3 HIGH CALCIUM[e]	each 100	517781BT
		Combi pack# DPD No.1 / No.3 HIGH CALCIUM[e]	each 250	517782BT
24 mm ø	Br	Chlorine TOTAL-DPD/F10	Powder Pack / 100	530120
16 mm ø	Cd	Spectroquant® 1.14834.0001[d]	Tube test / 25	420750
24 mm ø 24 mm ø 50 mm ☐ 10 mm ☐	Cl_2	DPD No. 1 DPD No. 3 Combi pack# DPD No.1 / No.3 Combi pack# DPD No.1 / No.3 DPD No. 1 HIGH CALCIUM[e] DPD No. 3 HIGH CALCIUM[e] Combi pack# DPD No.1 / No.3 HIGH CALCIUM[e] Combi pack# DPD No.1 / No.3 HIGH CALCIUM[e]	Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100 Tablet / 100 each 100 each 250	511050BT 511080BT 517711BT 517712BT 515740BT 515730BT 517781BT 517782BT
24 mm ø 10 mm ☐	Cl_2	DPD No. 1 HR DPD No. 3 HR	Tablet / 100 Tablet / 100	511500BT 511590BT
24 mm ø 24 mm ø	Cl_2	DPD 1 Buffer solution DPD 1 Reagent solution DPD 3 Solution	Liquid reagent / 15 ml Liquid reagent / 15 ml Liquid reagent / 15 ml **Set**	471010 471020 471030 471056
24 mm ø	Cl_2	VARIO Chlorine FREE-DPD/F10 VARIO Chlorine TOTAL-DPD/F10	Powder Pack / 100 Powder Pack / 100	530180 530190
24 mm ø 10 mm ☐ Multivial	Cl_2	Chlorine FREE-DPD/F10 Chlorine TOTAL-DPD/F10	Powder Pack / 100 Powder Pack / 100	530100 530120

[a] determination of free, combined and total
[b] Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)
[c] MultiDirect: Adapter is necessary for Vacu-vials® (Order code 192075)
[d] Spectroquant® is a Merck KGaA Trademark
[e] alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity
[f] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine
[g] Reagent recovers most insoluble iron oxides without digestion
[h] additionally required for samples with hardness values above 300 mg/l $CaCO_3$
[i] high range by dilution
[j] Vacu-vials® is a Chemetrics Trademark
including stirring rod

Reagents

Test	No. Methods	Range	Wave lengths λ / nm									Method
			MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	
Chlorine HR (KI)	M105	5 - 200 mg/l	530	-	530	530	-	-	470	470	470	KI / Acid [5]
Chlorine dioxide	M120	0,02 - 11 mg/l	530	530	530	530	530	-	-	510	510	DPD/Glycine [1,2]
		0,05 - 2,5 mg/l	-	-	-	-	-	-	510	-	-	
	M119	0,05 - 1 mg/l	-	-	-	-	-	-	510	510	510	
Chlorine dioxide Powder	M122	0,04 - 3,8 mg/l	530	-	530	530	-	-	-	510	510	DPD [1, 2]
Chloride	M90	0,5 - 25 mg/l	530	-	530	530	-	-	450	450	450	Silver nitrate/turbidity
	M93	5 - 250 mg/l [i)]	530	-	-	-	-	-	-	-	-	
Chloride	M91	5 - 60 mg/l	-	-	-	-	-	-	455	455	455	Iron (III)-thiocyanate [4]
Chloride	M92	0,5 - 20 mg/l	430	-	430	-	-	-	-	430	430	Mercury thiocyanate / Iron nitrate
Chrome (III, VI) [b)]	M124	0,005 - 0,5 mg/l	-	-	-	-	-	-	542	542	542	1,5-Diphenylcarbozide[1, 2]
	M125	0,02 - 2 mg/l	-	-	530	530	-	-	542	542	542	
COD LR (ISO 15705:2002)[b)]	M130	3 - 150 mg/l	430	430	430	430	-	-	443	443	443	Dichromate / H_2SO_4 [1, 2]
COD LMR (ISO 15705:2002)[b)] new!	M133	15 - 300 mg/l	430	430	430	430	-	-	445	445	445	Dichromate / H_2SO_4 [1, 2]
COD MR (ISO 15705:2002)[b)]	M131	20 - 1500 mg/l	610	610	610	610	-	-	596	596	596	Dichromate / H_2SO_4 [1, 2]
COD HR [b)]	M132	200 - 15000 mg/l	610	610	610	610	-	-	602	602	602	Dichromate / H_2SO_4 [1, 2]

MSDS (Material Safety Data Sheets): **www.lovibond.com**

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[1] Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlamm- Untersuchung
[2] Standard Methods for the Examination of Water and Wastewater, 18th Edition; 1992
[3] Photometrische Analysenverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989
[4] Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980
[5] Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
16 mm ø	Cl_2	ACIDIFYING GP	Tablet / 100	515480BT
		CHLORINE HR (KI)	Tablet / 100	513000BT
		Combi pack# CHLORINE HR (KI)/ACIDIFYING GP	each 100	517721BT
		Combi pack# CHLORINE HR (KI)/ACIDIFYING GP	each 250	517722BT
24 mm ø 24 mm ø 50 mm □	ClO_2	in absence of chlorine: DPD No.1 Chlorine dioxide beside Chlorine: DPD No.1, Glycine, DPD No.3		
		DPD No. 1	Tablet / 100	511050BT
		GLYCINE [f]	Tablet / 100	512170BT
		DPD No. 3	Tablet / 100	511080BT
		Combi pack# DPD No.1 / GLYCINE	each 100	517731BT
		Combi pack# DPD No.1 / GLYCINE	each 250	517732BT
		Combi pack# DPD No.1 / No.3	each 100	517711BT
		Combi pack# DPD No.1 / No.3	each 250	517712BT
		DPD No. 1 HIGH CALCIUM[e]	Tablet / 100	515740BT
		DPD No. 3 HIGH CALCIUM[e]	Tablet / 100	515730BT
		Combi pack# DPD No.1 / No.3 HIGH CALCIUM[e]	each 100	517781BT
		Combi pack# DPD No.1 / No.3 HIGH CALCIUM[e]	each 250	517782BT
24 mm ø	ClO_2	Chlorine FREE-DPD/F10	Powder Pack / 100	530100
		GLYCINE [f]	Tablet / 100	512170BT
24 mm ø	Cl^-	CHLORIDE T1	Tablet / 100	515910BT
		CHLORIDE T2	Tablet / 100	515920BT
		Combi pack# CHLORIDE T1 / T2	each 100	517741BT
		Combi pack# CHLORIDE T1 / T2	each 250	517742BT
24 mm ø	Cl^-	Chloride-51 / Chloride-52	Reagent test (Liquid reagent) approx. 50-75 Tests	2419031
24 mm ø	Cl^-	KS251 (Chloride Reagent A)	Liquid reagent / 65 ml	56L025165
		KS253 (Chloride Reagent B)	Liquid reagent / 65 ml	56L025365
			Set	56R018490
50 mm □	Cr	PERSULF. RTG FOR CR	Powder Pack / 100	537300
16 mm ø		ChromiuMHexavalent	Powder Pack /100	537310
16 mm ø	O_2	VARIO COD 0-150 mg/l	Tube test / 25	2420720 with Barcode
		VARIO COD 0-150 mg/l, mercury free* *without chloride removal	Tube test / 25	2420710 with Barcode
16 mm ø	O_2	COD 15-300 mg/l	Tube test / 25	2423120 with Barcode
16 mm ø	O_2	VARIO COD 0-1500 mg/l	Tube test / 25	2420721with Barcode
		VARIO COD 0-1500 mg/l, mercury free* *without chloride removal	Tube test / 25	2420711with Barcode
16 mm ø	O_2	VARIO COD 0-15000 mg/l	Tube test / 25	2420722 with Barcode
		VARIO COD 0-15000 mg/l, mercury free* *without chloride removal	Tube test / 25	2420712 with Barcode

a) determination of free, combined and total
b) Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)
c) MultiDirect: Adapter is necessary for Vacu-vials® (Order code 192075)
d) Spectroquant® is a Merck KGaA Trademark
e) alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity
f) additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine
g) Reagent recovers most insoluble iron oxides without digestion
h) additionally required for samples with hardness values above 300 mg/l $CaCO_3$
i) high range by dilution
j) Vacu-vials® is a Chemetrics Trademark
including stirring rod

Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Copper [a]	M150 M149	0,05 - 5 mg/l 0,5 - 5 mg/l 0,05 - 1 mg/l	560 530 -	560 - -	560 - -	560 - -	560 - -	560 - -	559 - 559	559 - 559	559 - 559	Biquinoline [4]
Copper [a]	M151	0,05 - 4 mg/l	-	-	560	-	-	-	-	560	560	Bicinchoninate
Copper, free VARIO	M153	0,05 - 5 mg/l	560	-	560	560	560	-	560	560	560	Bicinchoninate
Cyanide	M157 M156	0,01 - 0,5 mg/l 0,005 - 0,2 mg/l	- -	- -	580 -	580 -	- -	- -	585 585	585 585	585 585	Pyridine-barbituric acid [1]
Cyanuric acid	M160	10 - 160 mg/l	530	530	530	530	530	530	530	530	530	Melamine
Cyanuric acid HR available in Q2!	M161	20 - 200 mg/l	-	-	530	530	530	530	530	530	530	Melamine
DEHA	M165	20 - 500 µg/l	-	-	560	560	-	-	562	562	562	PPST [3]
DEHA VARIO	M167	20 - 500 µg/l	560	-	560	560	-	-	562	562	562	PPST [3]
Fluoresceine (only MD 640)	M510	10 - 400 ppb	-	-	> 395	-	-	-	-	-	-	Fluorescence
Fluoride	M170	0,05 - 2 mg/l	580	-	580	580	-	-	580	580	580	SPADNS [2]
Formaldehyde	M175 M176	1 - 5 mg/l 0,02 - 1 mg/l	- -	- -	- -	- -	- -	- -	585 585	585 585	585 585	H_2SO_4/ Chromotropic acid
Formaldehyde	M177	0,1 - 5 mg/l	-	-	-	-	-	-	575	575	575	H_2SO_4/ Chromotropic acid
Hardness, calcium	M191	20 - 500 mg/l	560	560	560	560	560	560	-	560	560	Murexide [4]
Hardness, total	M200 M201	2 - 50 mg/l 20 - 500 mg/l [i]	560 560	- -	560 560	560 560	560 560	- -	571 571	571 571	571 571	Metallphthalein [3]
Hazen (Pt-Co-Units ; APHA)	M204 M203	10 - 500 mg/l 10 - 500 mg/l	430 -	- -	430 -	430 -	- -	- -	- 455	455 455	455 455	Direct reading [1, 2]
Hydrazine	M205	0,05 - 0,5 mg/l	430	-	430	430	-	-	455	455	455	Dimethylamino-benzaldehyd [3]

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Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
24 mm ø 24 mm ø 50 mm ø	Cu	COPPER No. 1 COPPER No. 2 Combi pack# COPPER No.1 / No.2 Combi pack# COPPER No.1 / No.2	Tablet / 100 Tablet / 100 each 100 each 250	513550BT 513560BT 517691BT 517692BT
24 mm ø	Cu	KS240 (Coppercol Reagent 1) KS241 (Coppercol Reagent 2) KS242 (Coppercol Reagent 3) COPPER No.2 (Cu total)	Liquid reagent / 30 ml Liquid reagent / 30 ml Powder / 10 g Tablet / 100 **Set**	56L024030 56L024130 56L024210 513560BT 56R023355
24 mm ø	Cu	Vario Cu 1 F10	Powder Pack / 100	530300
24 mm ø 50 mm □	CN	Cyanide-11 / Cyanide-12 / Cyanide-13	Reagent test (Powder, Liquid reagent) / 200 Tests	2418875
24 mm ø	Cys	CyA-TEST	Tablet / 100	511370BT
24 mm ø	Cys	CyA HR-TEST	Tablet / 100	511430BT
24 mm ø	DEHA	DEHA-Liquid DEHA	Liquid reagent / 100 ml Tablet / 100	461181 513220BT
24 mm ø	DEHA	 VARIO OXYSCAV 1 RGT VARIO DEHA 2 RGT	**Set** Powder Pack / 200 Solution / 100 ml	536000
24 mm ø	Fluoresceine	no reagents required		
24 mm ø	F	SPADNS-Reagent Fluoride Standard Reagent solution and standard required	Liquid reagent / 250 ml Liquid reagent / 500 ml Solution / 30 ml	467481 467482 205630
10 mm □ 50 mm □	HCHO	Spectroquant® 1.14678.0001[d]	Reagent test / ca. 50-75 Tests	420751
16 mm ø	HCHO	Spectroquant® 1.14500.0001[d]	Tube test / 25	420752
24 mm ø	$CaCO_3$	Combi pack# CALCIO H No.1 / No.2 Combi pack# CALCIO H No.1 / No.2	each 100 each 250	517761BT 517762BT
24 mm ø	$CaCO_3$	HARDCHECK P	Tablet / 100 Tablet / 250	515660BT 515661BT
24 mm ø 50 mm □	Pt-Co-Units	no reagents required	-	-
24 mm ø	N_2H_4	Hydrazine Test Powder measuring spoon	Powder / 30 g	462910 384930

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i) high range by dilution
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including stirring rod

Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Hydrazine	M206	0,01 - 0,6 mg/l 5 - 600 µg/l	- -	- -	430 -	430 -	- -	- -	- 455	- 455	- 455	Dimethylamino-benzaldehyd [3]
Hydrazine [c]	M207	0,01 - 0,7 mg/l	-	-	430	430	-	-	-	430	430	PDMAB
Hydrogen peroxide	M210 M209	0,03 - 3 mg/l 0,03 - 1,5 mg/l 0,01 - 0,5 mg/l	- - -	- - -	530 - -	530 - -	530 - -	- - -	- 510 510	510 - 510	510 - 510	DPD/Catalysator [5]
Hydrogen peroxide	M213 M214	1 - 50 mg/l 40 - 500 mg/l [i]	- -	430 530	430 530	430 530	- 530	- -	- -	430 530	430 530	Peroxotitanium acid
Iodine	M215	0,05 - 3,6 mg/l	-	-	530	530	530	-	510	510	510	DPD [5]
Iron (II, III) soluble	M220 M219 M218	0,02 - 1 mg/l 0,01 - 0,5 mg/l 0,05 - 1 mg/l	560 - -	560 - -	560 - -	560 - -	560 - -	560 - -	- 562 562	562 562 562	562 562 562	PPST [3]
Iron VARIO (II, III) soluble	M222	0,02 - 3 mg/l 0,01 - 1,5 mg/l	530 -	- -	530 -	530 -	- -	- -	- 510	510 510	510 510	1,10-Phenanthrolin [2]
Iron VARIO, gesamt [g]	M223	0,02 - 1,8 mg/l 0,1 - 1,8 mg/l	580 -	- -	580 -	580 -	- -	- -	- 590	590 -	590 -	TPTZ [g]
Iron LR ($Fe^{2+/3+}$)	M225	0,03 - 2,0 mg/l	560	-	560	-	-	-	-	560	560	Ferrozine / Thioglycolate
Iron LR 2 (Fe^{2+} und Fe^{3+})	M226	0,03 - 2,0 mg/l	-	-	560	-	-	-	-	560	560	Ferrozine / Thioglycolate
Iron HR	M227	0,1 - 10 mg/l	-	-	530	-	-	-	-	530	530	Thioglycolate
Iron, total, Fe in Mo	M224	0,01 - 1,8 mg/l	580	-	580	-	-	-	-	580	580	Fe in Mo

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Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
24 mm ø	N_2H_4	VARIO Hydra 2 Reagent	Solution / 100 ml	531200
24 mm ø	N_2H_4	Vacu-vial® [j]	Test Kit / 30 Adapter for Vacu-vials® [j]	380470 192075
24 mm ø 24 mm ø 50 mm □	H_2O_2	HYDROGENPEROXIDE LR	Tablet / 100	512380BT
16 mm ø	H_2O_2	H_2O_2 Reagent solution	Liquid reagent / 15 ml	424991
24 mm ø	I	DPD No. 1	Tablet / 100	511050BT
24 mm ø 50 mm □ 10 mm □	Fe	IRON LR (Fe^{2+} und Fe^{3+}) IRON (II) LR (Fe^{2+})	Tablet / 100 Tablet / 100	515370BT 515420BT
24 mm ø	Fe	VARIO Ferro F10	Powder Pack / 100	530560
24 mm ø	Fe	VARIO IRON TPTZ F10	Powder Pack / 100	530550
24 mm ø	Fe	KS61 (Ferrozine / Thioglycolate, FE5) KS63 (Thioglycolate Reagenz, FE6) digestion: KP962 (Ammonium Persulphate Powder) KS135 (Phenolphthalein / Indicator) KS144 (Calcium Hardness Buffer)	Liquid reagent / 65 ml Liquid reagent / 65 ml Powder Liquid reagent / 65 ml Liquid reagent / 65 ml	56L006165 56L006365 56P096240 56L013565 56L014465
24 mm ø	Fe	KS60 FE1 (Acetate Buffer) KS63 FE6 (Thioglycolate Reagent) KS65 FE7 (Ferrozine Reagent) digestion: KP962 (Ammonium Persulphate Powder) KS135 (Phenolphthalein / Indicator) KS144 (Calcium Hardness Buffer)	Liquid reagent / 65 ml Liquid reagent / 65 ml Liquid reagent / 65 ml **Set** Powder Liquid reagent / 65 ml Liquid reagent / 65 ml	56L006065 56L006365 56L006565 56R023490 56P096240 56L013565 56L014465
24 mm ø	Fe	KS160 TH2 FE8 (Total Hardness Buffer) KS63 FE6 (Thioglycolate Reagent) digestion: KP962 (Ammonium Persulphate Powder) KS135 (Phenolphthalein / Indicator) KS144 (Calcium Hardness Buffer)	Liquid reagent / 65 ml Liquid reagent / 65 ml **Set** Powder Liquid reagent / 65 ml Liquid reagent / 65 ml	56L016065 56L006365 56R023590 56P096240 56L013565 56L014465
24 mm ø	Fe	VARIO (Fe in Mo) Rgt 1 VARIO (Fe in Mo) Rgt 2	Powder Pack / 100 Powder Pack / 100 **Set**	530310 530320 536010

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i) high range by dilution
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Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Lead (Pb^{2+})	M232	0,1 - 5 mg/l	-	-	-	-	-	-	520	520	520	4-(2-Pyridylazo)-resorcine
Lead (Pb^{2+})	M234/ M235	0,1 - 5 mg/l	-	-	-	-	-	-	515	515	515	4-(2-Pyridylazo)-resorcine
Manganese	M240	0,2 - 4 mg/l	530	-	530	530	-	-	450	450	450	Formaldoxime
Manganese VARIO LR	M242	0,01 - 0,7 mg/l	560	-	560	560	-	-	558	558	558	PAN
Manganese VARIO HR	M243	0,1 - 18 mg/l	530	-	530	530	-	-	525	525	525	Periodate oxidation [2]
Manganese	M245	0,05 - 5 mg/l	-	-	430	-	-	-	-	450	450	Formaldoxime
Molybdate / Molybdenum	M250	1 - 50 mg/l 1 - 30 mg/l 0,6 - 30 mg/l	- - 430	- - -	430 - -	430 - -	- - -	- - -	- 366 -	366 - -	366 - -	Thioglycolate [4]
Molybdate / Molybdenum VARIO LR	M251	0,05 - 5 mg/l 0,03 - 3 mg/l	- 610	- -	610 610	610 610	- -	- -	610 610	610 610	610 610	Mercaptoacetic acid
Molybdate / Molybdenum VARIO HR	M252	0,5 - 66 mg/l 0,3 - 40 mg/l	- 430	- -	430 430	430 430	- -	- -	420 420	420 420	420 420	Mercaptoacetic acid
Molybdate / Molybdenum HR	M254	1 - 100 mg/l 0,6 - 60 mg/l	- 430	- -	430 430	- -	- -	- -	- -	430 430	430 430	Thioglycolate [4]
Nickel	M255 M256	0,02 - 1 mg/l 0,2 - 7 mg/l	- -	- -	- 430	- 430	- -	- -	443 443	443 443	443 443	Dimethylglyoxime[2, 3]
Nitrate	M260	0,08 - 1 mg/l 0,35 - 4,4 mg/l	- -	- -	530 530	- -	- -	- -	- -	530 530	530 530	Zinc reduction / NED

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Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
10 mm□	Pb	Spectroquant® 1.09717.0001[d]	Reagent test / 50 Tests	420753
16 mm ø	Pb	Spectroquant® 1.14833.0001[d]	Tube test / 25	420754
24 mm ø	Mn	MANGANESE LR 1 MANGANESE LR 2 Combi pack# MANGANESE LR 1 / LR 2 Combi pack# MANGANESE LR 1 / LR 2	Tablet / 100 Tablet / 100 each 100 each 250	516080BT 516090BT 517621BT 517622BT
24 mm ø	Mn	 VARIO Ascorbic Acid VARIO Alkaline-Cyanide VARIO PAN Indicator VARIO Rochelle Salt Solution [h]	**Set** Powder Pack / 100 Liquid reagent / 60 ml Liquid reagent / 60 ml 30 ml	535090 530640
24 mm ø	Mn	 VARIO Manganese Citrate Buffer F10 VARIO Sodiumperiodate F10	**Set** Powder Pack / 100 Powder Pack / 100	535100
24 mm ø	Mn	KS265 Manganese Reagent A KS266 Manganese Reagent B KS267 Manganese Reagent C	Liquid reagent / 30 ml Liquid reagent / 30 ml Liquid reagent / 30 ml **Set**	56L026530 56L026630 56L030430 56R024055
24 mm ø	MoO_4 MoO_4 Mo	MOLYBDATE No.1 HR MOLYBDATE No.2 HR Combi pack# MOLYBDATE No.1 HR / No.2 HR Combi pack# MOLYBDATE No.1 HR / No.2 HR	Tablet / 100 Tablet / 100 each 100 each 250	513060BT 513070BT 517631BT 517632BT
24 mm ø	MoO_4 Mo	 VARIO MolybdenuM1 LR F20 VARIO MolybdenuM2 LR required accessory: mixing cylinder (not included)	**Set** Powder Pack / 100 Liquid reagent/ 50 ml	535450
24 mm ø	MoO_4 Mo	 VARIO MolybdenuMHR1 F10 VARIO MolybdenuMHR2 F10 VARIO MolybdenuMHR3 F10	**Set** Powder Pack / 100 Powder Pack / 100 Powder Pack / 100	535300
24 mm ø	MoO_4 Mo	KS63 (Thioglycolate Reagent)	Liquid reagent / 65 ml	56L006365
50 mm □ 24 mm ø	Ni	Nickel-51, Nickel-52	Reagent test (Powder, Liquid reagent) / 50 Tests	2419033
24 mm ø	NO_3 - N NO_3	NITRATE TEST Powder NITRATE TEST Tablet NITRITE LR Nitrate test tube	Powder / 15 g Tablet / 100 Tablet / 100	465230 502810 512310BT 366220

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[e] alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

[f] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

[g] Reagent recovers most insoluble iron oxides without digestion

[h] additionally required for samples with hardness values above 300 mg/l $CaCO_3$

[i] high range by dilution

[j] Vacu-vials® is a Chemetrics Trademark

including stirring rod

Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Nitrate VARIO	M265	1 - 30 mg/l 4,4 - 132 mg/l	- -	- -	430 430	430 430	- -	- -	410 410	410 410	410 410	Chromotropic acid
Nitrate DMP LR	M267	0,5 - 14 mg/l 2,2 - 62 mg/l	- -	- -	- -	- -	- -	- -	340 340	340 340	340 340	2,6-Dimethylphenole [3]
Nitrate DMP HR available in Q2!	M268	1,2 - 35 mg/l 5,3 - 154 mg/l	- -	- -	- -	- -	- -	- -	340 340	340 340	340 340	2,6-Dimethylphenole [3]
Nitrite	M270	0,01 - 0,5 mg/l 0,03 - 0,16 mg/l	- -	- -	560 560	560 560	- -	- -	545 545	540 540	540 540	N-(1-Naphthyl)-ethylenediamine [2,3]
Nitrite LR	M275	0,03 - 0,6 mg/l 0,1 - 2 mg/l	- -	- -	- -	- -	- -	- -	545 545	545 545	545 545	Sulfanil/Naphthylamine [1]
Nitrite HR	M276	0,3 - 3 mg/l 1 - 10 mg/l	- -	- -	- -	- -	- -	- -	545 545	545 545	545 545	Sulfanil/Naphthylamine [1]
Nitrite LR VARIO	M272	0,01 - 0,3 mg/l 0,03 - 1 mg/l	- -	- -	530 530	530 530	- -	- -	507 507	507 507	507 507	Diazotation
Nitrogen-total [b] **LR** **DMP HR**	M283 M284	0,5 - 14 mg/l 5 - 140 mg/l [i]	- -	- -	- -	- -	- -	- -	340 340	340 340	340 340	2,6-Dimethylphenole [2,3]
Nitrogen-total [b] **DMP LR**	M283	0,5 - 14 mg/l	-	-	-	-	-	-	340	340	340	2,6-Dimethylphenole [2,3]
Nitrogen-total [b] **DMP HR**	M284	5 - 140 mg/l	-	-	-	-	-	-	340	340	340	2,6-Dimethylphenole [2,3]
Nitrogen VARIO total LR [b]	M280	0,5 - 25 mg/l	-	-	430	430	-	-	410	410	410	Persulphate-digestion method
Nitrogen VARIO, total HR [b]	M281	5 - 150 mg/l	-	-	430	430	-	-	410	410	410	Persulphate-digestion method
Oxygen, active	M290	0,1 - 10 mg/l	-	-	530	530	530	-	-	510	510	DPD
Oxygen, dissolved	M292	10 - 800 µg/l 10 - 1100 µg/l	530 -	- -	530 -	530 -	- -	- -	- -	- 547	- 547	Rodazin D ™

MSDS (Material Safety Data Sheets): **www.lovibond.com**

For other reagent quantities please see our current price list.

[1] Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlamm- Untersuchung
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[3] Photometrische Analysenverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989
[4] Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980
[5] Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
16 mm ø	NO_3 - N NO_3	VARIO Nitrate Chromotropic VARIO Nitra X Reagent tube VARIO Deionised Water (for Zero)	**Set** (Tube test) Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml	535580
16 mm ø	NO_3 - N NO_3	Reaction tube, Nitrate-111	Tube test / 25	2420702 without Barcode 2423340 with Barcode
16 mm ø	NO_3 - N NO_3	Reaction tube, Nitrate-111	Tube test / 25	2423370 with Barcode
24 mm ø	NO_2 - N NO_2	NITRITE LR	Tablet / 100	512310BT
16 mm ø	NO_2 - N NO_2	Reaction tube, Nitrite-101	Tube test / 25	2419018 without Barcode 2423420 with Barcode
16 mm ø	NO_2 - N NO_2	Reaction tube, Nitrite HR	Tube test / 25	2423470 with Barcode
24 mm ø	NO_2 - N NO_2	VARIO Nitri 3	Powder Pack / 100	530980
16 mm ø	N	Digestion reagent, Compensation reagent, Nitrate-111	Tube test / 24	2420703 without Barcode
16 mm ø	N	Digestion reagent, Compensation reagent, Nitrate-111	Tube test / 25	2423540 with Barcode
16 mm ø	N	Digestion reagent, Compensation reagent, Nitrate-111	Tube test / 25	2423570 with Barcode
16 mm ø	N	VARIO TN HYDROX. LR Tubes VARIO PERSULFATE Reagent VARIO TN Reagent A VARIO TN Reagent B VARIO TN ACID LR/HR Tubes VARIO Deionised Water (for Zero)	**Set** (Tube test) Digestion tubes / 50 Powder Pack / 50 Powder Pack / 50 Powder Pack / 50 Reaction tuben / 50 Bottle, 100 ml	535550
16 mm ø	N	VARIO TN HYDROX. HR Tubes VARIO PERSULFATE Reagent VARIO TN Reagent A VARIO TN Reagent B VARIO TN ACID LR/HR Tubes VARIO Deionised Water (for Zero)	**Set** (Tube test) Digestion tubes / 50 Powder Pack / 50 Powder Pack / 50 Powder Pack / 50 Reaction tubes / 50 Bottle, 100 ml	535560
	O_2	DPD No. 4	Tablet / 100	511220BT
13 mm ø	O_2	Vacu-vial® [j]	Liquid reagent / 30 Adapter for Vacu-vials® [j]	380450 192075

[a] determination of free, combined and total
[b] Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)
[c] MultiDirect: Adapter is necessary for Vacu-vials® (Order code 192075)
[d] Spectroquant® is a Merck KGaA Trademark
[e] alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity
[f] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine
[g] Reagent recovers most insoluble iron oxides without digestion
[h] additionally required for samples with hardness values above 300 mg/l $CaCO_3$
[i] high range by dilution
[j] Vacu-vials® is a Chemetrics Trademark
including stirring rod

Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Ozone	M300	0,02 - 1 mg/l	-	-	-	-	-	-	510	-	-	DPD/Glycine [5]
		0,02 - 2 mg/l	530	530	530	530	530	530	-	510	510	
	M299	0,02 - 0,5 mg/l	-	-	-	-	-	-	510	510	510	
Ozone Powder	M301	0,015 - 2 mg/l	-	-	530	530	-	-	510	510	510	DPD/Glycine [5]
Phenoles	M315	0,1 - 5 mg/l	-	-	-	-	-	-	507	507	507	4-Aminoantipyrine [1]
PHMB (Biguanides)	M70	2 - 60 mg/l	-	-	560	560	560	-	-	560	560	Buffer/Indicator
Phosphate-total LR [b)]	M317	0,07 - 3 mg/l	-	-	-	-	-	-	690	690	690	Phosphomolybdenum blue
		0,2 - 10 mg/l	-	-	-	-	-	-	690	690	690	/ Ascorbic acid [2]
Phosphate-total HR [b)]	M318	1,5 - 20 mg/l	-	-	-	-	-	-	690	690	690	Phosphomolybdenum blue
		5 - 60 mg/l	-	-	-	-	-	-	690	690	690	/ Ascorbic acid [2]
Phosphate LR, ortho	M320	0,016 - 1,3 mg/l	660	-	660	660	610	610	710	710	710	Phosphomolybdenum blue
		0,05 - 4 mg/l	660	-	660	660	610	610	710	710	710	/ Ascorbic acid [2]
Phosphate HR, ortho	M321	0,33 - 26 mg/l	-	-	430	430	-	-	470	470	470	Vanadomolybdate [2]
		1 - 80 mg/l	-	-	430	430	-	-	470	470	470	
Phosphate VARIO ortho	M323	0,02 - 0,82 mg/l	660	-	660	660	-	-	890	890	890	Phosphomolybdenum blue
		0,06 - 2,5 mg/l	660	-	660	660	-	-	890	890	890	/ Ascorbic acid [2]
Phosphate VARIO ortho	M324	0,02 - 1,6 mg/l	-	-	660	660	-	-	890	890	890	Phosphomolybdenum blue
		0,06 - 5 mg/l	-	-	660	660	-	-	890	890	890	/ Ascorbic acid [2]
Phosphate-ortho	M322	1 - 20 mg/l	-	-	-	-	-	-	438	438	438	Vanadomolybdate [2]
		3 - 60 mg/l	-	-	-	-	-	-	438	438	438	
Phosphate VARIO [b)]		acid hydrolyzable:										
acid hydrolyzable	M325	0,02 - 1,6 mg/l	-	-	660	660	-	-	890	890	890	Acid digestion
and total		0,06 - 5 mg/l	-	-	660	660	-	-	890	890	890	Phosphomolybdenum blue/ Ascorbic acid [2]
		total:										
	M326	0,02 - 1,1 mg/l										Acid-/ Persulphate digestion
		0,06 - 3,5 mg/l										Phosphomolybdenum blue/ Ascorbic acid [2]

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[3] Photometrische Analysenverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989
[4] Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980
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Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
24 mm ø	O_3	O_3 in absence of Cl_2:		
24 mm ø		DPD No. 1	Tablet / 100	511050BT
50 mm □		DPD No. 3	Tablet / 100	511080BT
		O_3 beside Cl_2:		
		Combi pack# DPD No.1 / No.3	each 100	517711BT
		Combi pack# DPD No.1 / No.3	each 250	517712BT
		GLYCINE [f]	Tablet / 100	512170BT
24 mm ø	O_3	Chlorine total - DPD /F10	Powder Pack / 100	530120
		GLYCINE	Tablet / 100	512170BT
24 mm ø	$C_6H_5O_H$	PHENOLE No. 1	Tablet / 100	515950BT
		PHENOLE No. 2	Tablet / 100	515960BT
24 mm ø	PHMB	PHMB PHOTOMETER	Tablet / 100	516100BT
16 mm ø	PO_4 - P	Reaction tube, Phosphate-101,	Tube test / 24	2419019 with Barcode
	PO_4	Phosphate- 102, Phosphate-103	Tube test / 24	
16 mm ø	PO_4 - P	Reaction tube, Phosphate-101,	Tube test / 24	2420700 with Barcode
	PO_4	Phosphate-102, Phosphate-103		
24 mm ø	PO_4 - P	PHOSPHATE No. 1 LR	Tablet / 100	513040BT
	PO_4	PHOSPHATE No. 2 LR	Tablet / 100	513050BT
		Combi pack# PHOSPHATE No.1 LR / No.2 LR	each 100	517651BT
24 mm ø	PO_4 - P	PHOSPHATE No. 1 HR	Tablet / 100	515810BT
	PO_4	PHOSPHATE No. 2 HR	Tablet / 100	515820BT
		Combi pack# PHOSPHATE No.1 HR / No.2 HR	each 100	517661BT
24 mm ø	PO_4 - P	VARIO Phosphate Rgt., F10	Powder Pack / 100	531550
	PO_4			
16 mm ø	PO_4 - P		**Set** (Tube test)	535200 with Barcode
	PO_4	VARIO Dilution Vial	50 Tubes	
		VARIO PHOSPHATE RGT, F10	Powder Pack / 50	
		VARIO Deionised Water (for Zero)	Bottle, 100 ml	
16 mm ø	PO_4 - P	Reaction tube	Tube test / 24	2420701 with Barcode
	PO_4			
			Set (Tube test)	535250 with Barcode
16 mm ø	PO_4 - P	VARIO Acid Reagent Vial	50 Tubes	
16 mm ø	PO_4	VARIO PHOSPHATE RGT, F10	Powder Pack / 50	
		VARIO Deionised Water (for Zero)	Bottle, 100 ml	
	PO_4 - P	1N NaOH	Bottle / 100 ml	
	PO_4	1,54 N NaOH	Bottle / 100 ml	
		VARIO Potassium Persulfate F10	Powder Pack / 50	

[a] determination of free, combined and total

[b] Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)

[c] MultiDirect: Adapter is necessary for Vacu-vials® (Order code 192075)

[d] Spectroquant® is a Merck KGaA Trademark

[e] alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

[f] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine

[g] Reagent recovers most insoluble iron oxides without digestion

[h] additionally required for samples with hardness values above 300 mg/l $CaCO_3$

[i] high range by dilution

[j] Vacu-vials® is a Chemetrics Trademark

including stirring rod

Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Phosphate VARIO [b] **total**	M326	0,02 - 1,1 mg/l 0,06 - 3,5 mg/l	- -	- -	660 660	660 660	- -	- -	890 890	890 890	890 890	Acid-/Persulphate digestion Phosphomolybdenum blue Ascorbic acid [2]
Phosphate, ortho [c]	M328	0,016 - 1,6 mg/l 0,05 - 5 mg/l	- -	- -	660 660	660 660	- -	- -	- -	660 660	660 660	Stannous chloride [2]
Phosphate, ortho [c]	M327	1,6 - 13 mg/l 5 - 40 mg/l	- -	- -	430 430	430 430	- -	- -	- -	430 430	430 430	Vanadomolybdate [2]
Phosphate LR	M334	0,033 - 3,3 mg/l 0,1 - 10 mg/l	- -	- -	660 660	- -	- -	- -	- -	660 660	660 660	Phosphomolybdic acid// Ascorbic acid [2]
Phosphate HR, ortho	M335	1,63 - 26 mg/l 5 - 80 mg/l	430 430	- -	430 430	- -	- -	- -	- -	430 430	430 430	Vanadomolybdate [2]
Phosphonate VARIO	M316	0,02 - 125 mg/l	-	-	660	660	-	-	890	890	890	Persulfate UV-Oxidation
pH value	M329	5,2 - 6,8	-	-	560	560	560	-	-	560	560	Bromcresol purple [5]
pH value	M330	6,5 - 8,4	560	560	560	560	560	560	558	558	558	Phenol red [5]
pH value	M331	6,5 - 8,4	560	560	560	560	560	-	558	558	558	Phenol red [5]
pH value	M332	8,0 - 9,6	-	-	560	560	560	-	-	560	560	Thymol blue [5]
Polyacrylates	M338	1 - 30 mg/l	530	-	660	-	-	-	-	660	660	Turbidity

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Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
16 mm ø	PO_4 - P		**Set** (Tube test)	535210 with Barcode
16 mm ø	PO_4	VARIO Acid Reagent Vial	50 Tubes	
		VARIO PHOSPHATE RGT, F10	Powder Pack / 50	
		VARIO Deionised Water (for Zero)	Bottle, 100 ml	
		1,54 N NaOH	Bottle / 100 ml	
		VARIO Potassium Persulfate F10	Powder Pack / 50	
	PO_4 - P	Vacu-vial® [j]	Test Kit / 30	380480
	PO_4		Adapter for Vacu-vials® [j]	192075
	PO_4 - P	Vacu-vial® [j]	Test Kit / 30	380460
	PO_4		Adapter for Vacu-vials® [j]	192075
24 mm ø	PO_4 - P	KS80 (CRP Reagent)	Liquid reagent / 2 x 65 ml	56L008065
	PO_4	KP119 (Ascorbic acid)	Powder / 20 g	56P011920
			Set	56R023765
		Digestion reagents:		
		KS278 (50 % Sulfuric Acid)	Liquid reagent / 65 ml	56L027865
		KS135 (Phenolphthalein Indicator)	Liquid reagent / 65 ml	56L013565
		KS144 (Calcium Hardness Buffer)	Liquid reagent / 65 ml	56L014465
		KP962 (Ammonium Persulfate Powder)	Powder / 40 g	56P096240
24 mm ø	PO_4 - P	KS228 (Ammonium Molybdate)	Liquid reagent / 65 ml	56L022865
	PO_4	KS229 (Ammonium Metavanadate)	Liquid reagent / 65 ml	56L022965
			Set	56R019090
		Option Polyphosphate		
		KS278 (50 % Sulfuric Acid)	Liquid reagent / 65 ml	56L027865
		KS135 (Phenolphthalein Indicator)	Liquid reagent / 65 ml	56L013565
		KS144 (Calcium Hardness Buffer)	Liquid reagent / 65 ml	56L014465
		KP962 (Ammonium Persulfate Powder)	Powder / 40 g	56P096240
24 mm ø	PO_4		**Set**	535220
		VARIO Potassium Persulfate F10	Powder Pack / 100	
		VARIO PHOSPHATE RGT, F10	Powder Pack / 200	
24 mm ø	pH	BROMOCRESOLPURPLE/PHOTOMETER	Tablet / 100	515700BT
24 mm ø	pH	PHENOLRED / PHOTOMETER	Tablet / 100	511770BT
24 mm ø	pH	PHENOLRED Solution	Liquid reagent / 15 ml	471040
24 mm ø	pH	THYMOLBLUE / PHOTOMETER	Tablet / 100	515710BT
24 mm ø	Polyacryl	KS255 (Polyacrylate Reagent 1)	Liquid reagent / 65 ml	56L025565
		KS256 (Polyacrylate Reagent 2)	Liquid reagent / 65 ml	56L025665
				56R019165
		KS336 (Propan-2-ol)	**Set**	56L033665
		C18 (Cartouche)	Liquid reagent / 65 ml	56A020101
		KS173 (2,4 Dinitrophenol)	Liquid reagent / 65 ml	56L017365
		KT183 (Nitric Acid)	Liquid reagent / 65 ml	56L018365



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[e] alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity
[f] additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine
[g] Reagent recovers most insoluble iron oxides without digestion
[h] additionally required for samples with hardness values above 300 mg/l $CaCO_3$
[i] high range by dilution
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including stirring rod

Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Potassium	M340	0,7 - 16 mg/l	-	-	660	430	-	-	730	730	730	Tetraphenylborate-Turbidity [4]
PTSA (only MD 640)	M500	10 - 1000 ppb	-	-	> 395	-	-	-	-	-	-	Fluorescence
Silica VLR new!	M349	5 - 500 µg/l	-	-	-	-	-	-	820	820	820	Heteropolyblue [2]
Silica	M350	0,05 - 4 mg/l 0,05 - 3 mg/l 0,05 - 4 mg/l	660 - -	- - -	660 - -	660 - -	- - -	- - -	- 820 -	820 - 820	820 - 820	Silicomolybdate [2,3]
Silica VARIO LR	M351	0,1 - 1,6 mg/l 0,05 - 1,6 mg/l	660 -	- -	660 -	660 -	- -	- -	815 -	- 815	- 815	Heteropolyblue [2]
Silica VARIO HR	M352	1 - 90 mg/l 1 - 100 mg/l	430 -	- -	430 -	430 -	- -	- -	- 452	- 452	- 452	Silicomolybdate [2,3]
Silica	M353	0,1 - 8 mg/l	-	-	430	-	-	-	-	660	660	Heteropolyblue [2]
Sodiumhypochlorite	M212	0,2 - 16 % 0,2 - 17 %	- -	- -	530 -	530 -	530 -	530 -	- -	- 470	- 470	Potassium iodide [5]
Spectral Absorption-coefficient (S.A.K.)	M344 M345 M346 M347	0,5 - 50 m^{-1}	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- 436 525 620	- 436 436 620	254 436 436 620	Direct reading [1] ISO 7887:1994
Spectral Absorption-coefficient (S.A.K.)	M344 M345 M346 M347	3 - 250 m^{-1}	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	- 436 525 620	254 436 525 620	Direct reading[1] ISO 7887:1994
Sulphate VARIO	M360 M361	5 - 100 mg/l 50 - 1000 mg/l	530 -	- -	530 530	530 530	530 -	- -	450 530	530 530	530 530	Bariumsulphate Turbidity [2]
Sulphate	M355	5 - 100 mg/l	-	-	610	610	610	-	-	610	610	Bariumsulphate Turbidity [2]

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[4] Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980
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Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
24 mm ø	K	POTASSIUM T	Tablet / 100	515670BT
24 mm ø	PTSA	no reagents required		
50 mm □	SiO_2	Heptamolybdate Reagent Tartaric Acid Reagent Silica Amino Acid F10	Liquid reagent / 20 ml Liquid reagent / 20 ml Powder Pack / 100 Set	471070 471080 531600 5443002
24 mm ø 10 mm □ 10 mm □	SiO_2	SILICA No. 1 SILICA No.2 Combi pack# SILICA No.1 / No.2 Combi pack# SILICA No.1 / No.2 SILICA PR	Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100	513130BT 513140BT 517671BT 517672BT 513150BT
24 mm ø 24 mm ø	SiO_2	 VARIO Amino Acid F10 VARIO Citric Acid F10 VARIO Molybdate 3 Reagent solution	**Set** Powder Pack / 100 Powder Pack / 200 Liquid reagent / 2 x 50 ml	535690
24 mm ø 24 mm ø	SiO_2	 VARIO Silica HR Molybdate F10 VARIO Silica HR Acid Rgt F10 VARIO Silica HR Citric Acid F10	**Set** Powder Pack / 100 Powder Pack / 100 Powder Pack / 100	535700
24 mm ø	SiO_2	KS104 (Silica Reagent 1) KS105 (Silica Reagent 2) KP106 (Silica Reagent 3)	Liquid reagent / 65 ml Liquid reagent / 65 ml Powder / 10 g **Set**	56L010465 56L010565 56P010610 56R023856
24 mm ø	NaOCl	ACIDIFYING GP CHLORINE HR (KI) Combi pack# CHLORINE HR (KI)/ACIDIFYING GP Combi pack# CHLORINE HR (KI)/ACIDIFYING GP Dilution set for sample preparation	Tablet / 100 Tablet / 100 each 100 each 250 1 Set	515480BT 513000BT 517721BT 517722BT 414470
50 mm □	-	no reagents required	-	-
10 mm □	-	no reagents required		
24 mm ø	SO_4	VARIO Sulpha 4 / F10	Powder Pack / 100	532160
24 mm ø	SO_4	SULPHATE T	Tablet / 100	515450BT

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including stirring rod

Reagents

Test	No. Methods	Range	MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect	XD 7000	XD 7500	Method
			Wave lengths λ / nm									
Sulphide	M365	0,04 - 0,5 mg/l	-	-	660	660	-	-	668	668	668	DPD/Catalysator [3, 4]
Sulphite	M370	0,1 - 5 mg/l	-	-	430	430	-	-	-	405	405	DTNB
		0,05 - 4 mg/l	-	-	-	-	-	-	405	-	-	
	M368	0,1 - 10 mg/l	-	-	-	-	-	-	405	405	405	
Surfactants (anionic)	M376	0,05 - 2 mg/l	-	-	660	660	-	-	660	660	660	Methylene blue[1]
Surfactants (cationic)	M378	0,05 - 1,5 mg/l	-	-	610	610	-	-	610	610	610	Disulphine blue
Surfactants (non ionic)	M377	0,1 - 7,5 mg/l	-	-	610	610	-	-	610	610	610	TBPE
Suspended solids	M384	10 - 750 mg/l	660	-	660	660	-	-	660	810	810	Turbidity/Attenuated
									660	810	810	Radiation
TOC [b)]	M380	5 - 80 mg/l	-	-	610	610	-	-	596	610	610	H_2SO_4/ Indicator
TOC [b)]	M381	50 - 800 mg/l	-	-	610	610	-	-	596	610	610	H_2SO_4/ Indicator
Triazoles (UV-lamp required)	M388	1 - 16 mg/l	430	-	430	-	-	-	-	430	430	Catalyzed UV Digestion
Turbidity	M385	5 - 500	-	-	-	-	-	-	860	860	860	Attenuated Radiation Meth.
	M386	10 - 1000	-	-	530	530	-	-	-	860	860	Attenuated Radiation Meth.
Urea	M390	0,1 - 2,5 mg/l	610	610	610	610	610	-	-	676	676	Urease / Indophenol
		0,1 - 2 mg/l	-	-	-	-	-	-	676	-	-	
	M391	0,2 - 5 mg/l [i)]	610	610	-	-	-	-	-	-	-	
Zinc	M400	0,02 - 1 mg/l	-	-	610	610	-	-	-	616	616	Zincon[3]/EDTA
		0,02 - 0,5 mg/l	-	-	-	-	-	-	616	-	-	
Zinc	M405	0,1 - 2,5 mg/l	610	-	610	-	-	-	-	610	610	Zincon[3]/EDTA

MSDS (Material Safety Data Sheets): **www.lovibond.com**

For other reagent quantities please see our current price list.

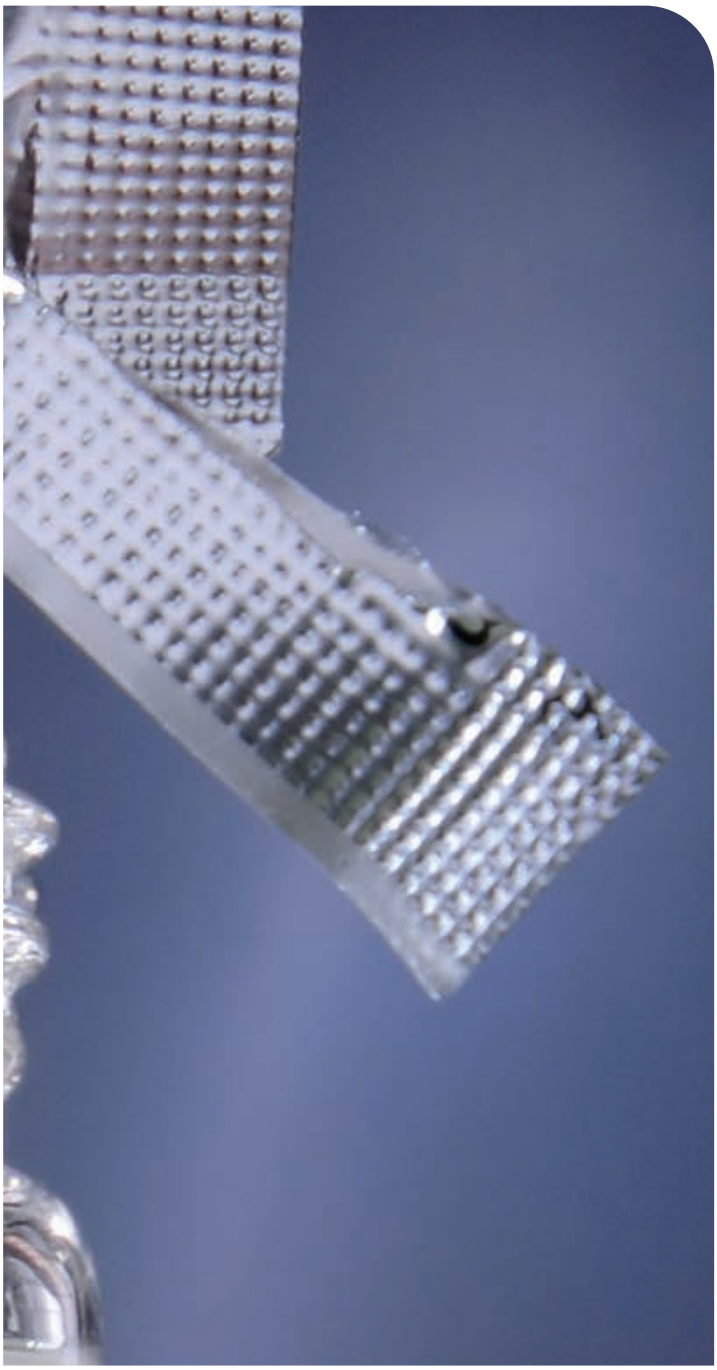
[1] Deutsche Einheitsverfahren zur Wasser-, Abwasser- und Schlamm- Untersuchung
[2] Standard Methods for the Examination of Water and Wastewater, 18th Edition; 1992
[3] Photometrische Analysenverfahren, Schwedt, Wissenschaftliche Verlagsgesellschaft mbH, Stuttgart; 1989
[4] Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980
[5] Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Green Chemistry

Tube	Display	Reagent	Form of reagent/Quantity	Ordercode
24 mm ø	S	Sulphide No. 1 Sulphide No. 2	Tablet / 100 Tablet / 100	502930 502940
24 mm ø 24 mm ø 10 mm □	SO_3	SULPHITE LR	Tablet / 100	518020BT
16 mm ø	MBAS	Spectroquant® 1.02552.0001	Tube test / 25	420763
16 mm ø	CTAB	Spectroquant® 1.01764.0001	Tube test / 25	420765
16 mm ø	Triton® X-100	Spectroquant® 1.01787.0001	Tube test / 25	420764
24 mm ø 50 mm □	TSS	no reagents required	-	-
16 mm ø	TOC	Spectroquant® 1.14878.0001[d)]	Tube test / 25 Aluminium screwcaps / 6 pc.	420761 420757
16 mm ø	TOC	Spectroquant® 1.14879.0001[d)]	Tube test / 25 Aluminium screwcaps / 6 pc.	420756 420757
24 mm ø	Benzo-triazole	VARIO Triazole Rgt F25	Powder Pack / 100	532200
50 mm □ 24 mm ø	FAU FAU	no reagents required	-	-
24 mm ø	CH_4N_2O	UREA-Reagent 1 UREA-Reagent 2 AMMONIA No. 1 AMMONIA No. 2 Combi pack# AMMONIA No.1 / No.2 Combi pack# AMMONIA No.1 / No.2 (without Urea-Reagent 1 and 2, please order seperatly) UREA PRETREAT (compensates for the interference of free Chlorine up to 2 mg/l) UREA Reagent Set, contains: UREA-Reagent 1/2, AMMONIA No.1/2, UREA PRETREAT	Liquid reagent / 15 ml Liquid reagent / 10 ml Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100 **Set**	459300 459400 512580BT 512590BT 517611BT 517612BT 516110BT 517800BT
24 mm ø	Zn	COPPER/ZINC LR EDTA DECHLOR (in case of high levels of residual chlorine)	Tablet / 100 Tablet / 100 Tablet / 100	512620BT 512390BT 512350BT
24 mm ø	Zn	KS243 (Zinc Reagent 1) KP244 (Zinc Reagent 2)	Liquid reagent / 65 ml Powder / 20 g **Set**	56L024365 56L024420 56R023965

a) determination of free, combined and total
b) Thermoreactor is necessary for COD (150 °C), TOC (120 °C) and total -chromium, - phosphate, -nitrogen, (100 °C)
c) MultiDirect: Adapter is necessary for Vacu-vials® (Order code 192075)
d) Spectroquant® is a Merck KGaA Trademark
e) alternative reagent, used instead of DPD No.1 / DPD No.3 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity
f) additionally required for determination of bromine, chlorine dioxide and ozone in the presence of chlorine
g) Reagent recovers most insoluble iron oxides without digestion
h) additionally required for samples with hardness values above 300 mg/l $CaCO_3$
i) high range by dilution
j) Vacu-vials® is a Chemetrics Trademark
including stirring rod


Vario Reagents





Reagents
Page 112



Powder dispenser PD 250
Page 113

Process Chlorine Analyser Reagents

Suitable for Hach® CL17™* Chlorine analysers



Chlorine Analyser Reagents are available with the quality and longevity expected of the Lovibond® brand.
That means **highest accuracy** at **low cost**.

These reagents can be used on the online system without additions or updates as they are supplied in compatible bottle size.

Delivery Content

Reagent set for process chlorine analyser in bag

Free Chlorine

- 1 bottle, 473 ml
  DPD Indicator Solution "Free Chlorine"
- 1 bottle, 473 ml
  DPD Buffer Solution " Free Chlorine"
- 1 bottle, DPD Indicator Powder
  Order code: 530210

Total Chlorine

- 1 bottle, 473 ml DPD Indicator Solution "Total Chlorine"
- 1 bottle, 473 ml
  DPD Buffer Solution "Total Chlorine"
- 1 bottle, DPD Indicator Powder
  Order code: 540210

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Chlorine DPD Powder Dispenser PD 250





Determination of chlorine according to ISO 7393-2:2000 (free + total)

250 Tests

Easy handling

5 years reagent shelf life (before opening)

Precise dosage

Delivery Content

PD 250 in carton including 1 reagent vial and instruction manual

PD 250 Set 1 - Free Chlorine

- 1 powder dispenser "Free Chlorine"
- 1 reagent vial "Free Chlorine"
- 1 instruction manual
- 1 protective sleeve (rubber)

Order code: 194900

PD 250 Set 2 - Total Chlorine

- 1 powder dispenser "Total Chlorine"
- 1 reagent vial "Total Chlorine"
- 1 instruction manual
- 1 protective sleeve (rubber)

Order code: 194910

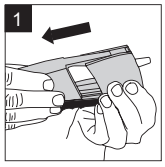
Refill Packs

Article	Order code	
Chlorine **Free** 10 ml 2 reagent vials	530140	
Chlorine **Total** 10 ml 2 reagent vials	530150	
Chlorine **Free + Total** 10 ml one reagent vial each	530160	
VARIO Chlorine **Free** 10 ml 2 reagent vials	530145	
VARIO Chlorine **Total** 10 ml 2 reagent vials	530155	
VARIO Chlorine **Free + Total** 10 ml one reagent vial each	530165	

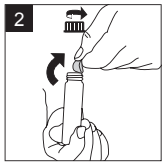
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Green Chemistry

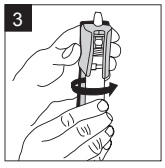
Easy Handling



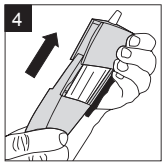
Remove the dispenser cover.



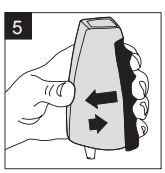
Uncap the reagent vial and remove the seal. Use material within 6 months of removing the seal.



Hold the dispenser with the tip upright and screw the vial on to the dispenser.



Slide the cover into the grooves until the lower end snaps into place.



To use:
Hold with the tip down and press the blue handle towards the dispenser body.

Reagents VARIO Powder Packs (PP) and Reagents

(also compatible in Hach® instruments*)

Test	Range	Reagent	Liquid Reagent	Tube Tests	Powder Pack
Aluminium	0 – 0,22 mg/l Al	VARIO Aluminium Reagent, Set F20 consists of: VARIO Aluminium ECR VARIO Aluminium Hexamine VARIO Aluminium Masking Rgt	■		■ ■
Ammonia	0 – 0,5 mg/l N	VARIO Ammonia Nitrogen, Set F10 consists of: VARIO Ammonia Salicylate, F10 VARIO Ammonia Cyanurate, F10			■ ■
Ammonia LR	0 - 2,5 mg/l N	VARIO Am tube test Reagent, Set LR, F5 consists of: VARIO Ammonia Salicylate, F5 VARIO Ammonia Cyanurate, F5 VARIO Am Diluent Reagent Low Range		■	■ ■
Ammonia HR	0 - 50 mg/l N	VARIO Am tube test Reagent, Set HR, F5 consists of: VARIO Ammonia Salicylate, F5 VARIO Ammonia Cyanurate, F5 VARIO Am Diluent Reagent High Range		■	■ ■
Bromine	0,05 - 4,5 mg/l Br	VARIO Chlorine TOTAL-DPD, F10 VARIO Chlorine TOTAL-DPD, F10			■ ■
Chlorine free, combined and total **Chlorine dioxide**	Visual Test Kit up to 3,5mg/l Cl_2 0,01 - 2 mg/l Cl_2 0 - 5 mg/l Cl_2	VARIO Chlorine FREE-DPD, F5 VARIO Chlorine FREE-DPD, F5 VARIO Chlorine TOTAL-DPD, F5 VARIO Chlorine TOTAL-DPD, F5 VARIO Chlorine FREE-DPD, F10 VARIO Chlorine FREE-DPD, F10 VARIO Chlorine TOTAL-DPD, F10 VARIO Chlorine TOTAL-DPD, F10 VARIO Chlorine FREE-DPD, F25 VARIO Chlorine FREE-DPD, F25 VARIO Chlorine TOTAL-DPD, F25 VARIO Chlorine TOTAL-DPD, F25			■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Chlorine, online free and total	0,035 - 5 mg/l Cl_2	Chlorine FREE Set consists of: Chlorine, DPD Compound (free & total) Chlorine FREE, Indicator Solution Chlorine FREE, Buffer Solution Chlorine TOTAL Set consists of: Chlorine, DPD Compound (free & total) Chlorine TOTAL, Indicator Solution Chlorine TOTAL, Buffer Solution	■ ■ ■ ■		■ ■
COD LR	3 - 150 mg/l O_2	COD VARIO 0 - 150 mg/l		■ ■ ■	
COD MR	20 - 1500 mg/l O_2	COD VARIO 0 - 1500 mg/l		■ ■ ■ ■	
COD HR	200 - 15000 mg/l O_2	COD VARIO 0 - 15000 mg/l		■ ■ ■	
Copper	0 - 5 mg/l Cu	VARIO CU1, F10 VARIO CU1, F10			■ ■

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Pouches

Our Powder Packs have the right kink:
The powder reagent can be used easily with two fingers in one grip and the right trick

The packaging automatically forms itself into a funnel so nothing is lost.



Method	Applications	Quantity	Code
Eriochrome cyanine R	Water	**1 Set** 100 100 25 ml	535000
Salicylate	Water, waste water, seawater	**1 Set** 2 x 100 2 x 100	535500
Salicylate	Water, waste water, seawater	**1 Set** 50 50 50 tubes	535600
Salicylate	Water, waste water, seawater	**1 Set** 50 50 50 tubes	535650
DPD method: **USEPA** accepted for drinking water analysis	Water, waste water, seawater	100 1000	530190 530193
DPD method: **USEPA** accepted for drinking water analysis DPD method: **USEPA** accepted for drinking water analysis DPD method: **USEPA** accepted for drinking water analysis	Water, waste water, seawater Water, waste water, seawater Water, waste water, seawater	100 1000 100 1000 100 1000 100 1000 100 1000 100 1000	530090 530093 530080 530083 530180 530183 530190 530193 530110 530113 530130 530133
DPD method: **USEPA** accepted for drinking water analysis DPD method: **USEPA** accepted for drinking water analysis	for use in Hach® CL17 Process Analysers for use in Hach® CL17 Process Analysers	**1 Set** 473 ml 473 ml **1 Set** 473 ml 473 ml	530210 530200 530222 530223 540210 530200 540222 540223
Dichromate Reactor, Digestion	Water, waste water, seawater	25 tubes 150 tubes 25 tubes, mercury free	2420720 2420725 2420710
Dichromate Reactor, Digestion	Water, waste water, seawater	25 tubes 150 tubes 25 tubes, mercury free 150 tubes, mercury free	2420721 2420726 2420711 2420716
Dichromate Reactor, Digestion	Water, waste water, seawater	25 tubes 150 tubes 25 tubes, mercury free	2420722 2420727 2420712
Biquinolin	Water, waste water, seawater	100 1000	530300 530303



Green Chemistry

Reagents VARIO Powder Packs (PP) and Reagents

(also compatible in Hach® instruments*)

Test	Range	Reagent	Liquid Reagent	Tube Tests	Powder Pack
DEHA	20 - 500 µg/l DEHA	VARIO DEHA REAGENT SET consists of: VARIO OXYSCAV 1 RGT VARIO DEHA 2 RGT	 ■		 ■
Hydrazine	0,005 - 0,6 mg/l N_2H_4	VARIO Hydra2 Reagent	■		
Iron (Fe^{2+}, Fe^{3+}), dissolved	0 - 3 mg/l Fe 0 - 1,8 mg/l Fe	VARIO Ferro, F10 VARIO IRON TPTZ			■ ■
Iron, total, Fe in Mo	0,01 - 1,8 mg/l	VARIO (Fe in Mo) Reagent Set consists of: VARIO (Fe in Mo) Rgt 1 VARIO (Fe in Mo) Rgt 2			 ■ ■
Manganese LR	0 - 0,7 mg/l Mn	VARIO Manganese Reagent, Set LR, F10 consists of: VARIO Alkaline-Cyanide Reagent Solution VARIO Ascorbic Acid VARIO PAN Indicator Solution	 ■ ■		 ■
Manganese HR	0 - 20 mg/l Mn	VARIO Manganese Reagent, Set HR, F10 consists of: VARIO MANGANESE CITRATE BUFFER, F10 VARIO SODIUMPERIODATE, F10			 ■ ■
Molybdate LR	0,03 - 3 mg/l Mo	VARIO MOLYBDENUM LR, Set consists of: VARIO Molybdenum 1 LR, F20 VARIO Molybdenum 2 LR	 ■		 ■
Molybdate HR	0,3 - 40 mg/l Mo	VARIO MOLYBDENUM HR, Set F10 consists of: VARIO MOLYBDENUM HR1, F10 VARIO MOLYBDENUM HR2, F10 VARIO MOLYBDENUM HR3, F10			 ■ ■ ■
Molybdate HR	0 - 35 mg/l Mo	VARIO MOLYBDENUM HR, Set F25 consists of: VARIO MOLYBDENUM HR1, F25 VARIO MOLYBDENUM HR2, F25 VARIO MOLYBDENUM HR3, F25			 ■ ■ ■
Nitrate	0 - 30 mg/l N	VARIO NITRA X Reagent, Set consists of: VARIO NITRA X Test vials VARIO NITRA NITROGEN NITRATE Reag. B Deionised water	 ■	 ■	 ■
Nitrite LR	0 - 0,3 mg/l N	VARIO NITRI3, F10 VARIO NITRI3, F25			■ ■
Nitrogen, total LR	0 - 25 mg/l N	VARIO TOTAL NITROGEN LR, Set consists of: VARIO TOTAL NITROGEN HYDROX. LR, Set VARIO TOTAL NITROGEN HYDROX. LR, tubes VARIO TOTAL N PERSULFATE Reagent, VARIO TOTAL NITROGEN ACID LR, tubes VARIO TOTAL NITROGEN Reag. A VARIO TOTAL NITROGEN Reag. B VARIO TOTAL NITROGEN ACID LR/HR tubes Deionised water	 ■	 ■ ■ 	 ■ ■ ■

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Method	Applications	Quantity	Code
PPST		**1 Set** 100 100 ml	536000
4-(Dimethylamino)-benzaldehyde	Water, waste water, seawater	100 ml	531200
Iron, total: 1, 10-phenantroline Iron, total: TPTZ	Water, waste water, seawater Water, waste water, seawater	100 100	530560 530550
Fe in Mo	Water, waste water	**1 Set** 100 100	536010 530310 530320
PAN	Water, waste water	**1 Set** 60 ml 100 60 ml	535090
Periodate oxidation	Water, waste water	**1 Set** 100 100	535100
Ternary Complex	Water, waste water	**1 Set** 100 50 ml	535450
Mercaptoacetic acid	Water, waste water	**1 Set** 100 100 100	535300
Mercaptoacetic acid	Water, waste water	**1 Set** 100 100 100	535400
Chromotropic acid	Water, waste water	**1 Set** 50 50 100 ml	535580
Diazotiation	Water, waste water	100 100	530980 530970
Persulfate digestion	Water, waste water	**1 Set** 50 50 50 50 50 100 ml	535550



Reagents VARIO Powder Packs (PP) and Reagents

(also compatible in Hach® instruments*)

Test	Range	Reagent	Liquid Reagent	Tube Tests	Powder Pack
Nitrogen, total HR	5 - 150 mg/l N	VARIO TOTAL NITROGEN HR, Set			
		consists of:			
		VARIO TOTAL NITROGEN HYDROX. HR, Set			
		VARIO TOTAL NITROGEN HYDROX. HR, tubes		■	
		VARIO TOTAL N PERSULFATE Reagent,			■
		VARIO TOTAL NITROGEN ACID LR, tubes		■	
		VARIO TOTAL NITROGEN Reag. A			■
		VARIO TOTAL NITROGEN Reag. B			■
		VARIO TOTAL NITROGEN ACID LR/HR tubes			
		Deionised water	■		
Phosphate	0 - 2,5 mg/l PO_4	VARIO PHOSPHATE RGT, F10			■
Phosphate, ortho	0,06 - 5 mg/l PO_4	VARIO REACTIVE PHOSPHATE REAGENT SET			
		consists of:			
		VARIO PHOSPHATE DILUTION TUBE TEST			
		VARIO PHOSPHATE RGT, F10		■	
		Deionised water	■		■
Phosphate, Acid hydrolyzable and total	acid hydrolyzable:	VARIO TOTAL & ACID HYDROLYZABLE			
	0,02 - 1,6 mg/l P ≙	PHOSPHATE REAGENT SET			
	0,06 - 5 mg/l PO_4	consists of:			
	total:	VARIO PHOSPHATE ACID REAG. TUBE TEST		■	
	0,02 - 1,1 mg/l P ≙	Deionised water			
	0,06 - 3,5 mg/l PO_4	VARIO PHOSPHATE RGT, F10	■		■
		VARIO SODIUM HYDROXID 1N			
		VARIO SODIUM HYDROXID 1,54N	■		
		VARIO POTASSIUM PERSULFATE	■		■
Phosphate, total	0,02 - 1,1 mg/l P ≙	VARIO TOTAL PHOSPHATE REAGENT SET			
	0,06 - 3,5 mg/l PO_4	consists of:			
		VARIO PHOSPHATE ACID REAG. TUBE TEST		■	
		VARIO PHOSPHATE RGT, F10			■
		Deionised water	■		
		VARIO SODIUM HYDROXID 1,54N	■		
		VARIO POTASSIUM PERSULFATE			■
Phosponate	0,02 - 125 mg/l PO_4	VARIO PHOSPHONATE REAGENT SET			
		consists of:			
		VARIO Potassium Persulfate F10			■
		VARIO PHOSPHATE RGT, F10			■
Silica, LR	0 - 1,6 mg/l SiO_2	VARIO SILICA Reagent LR, Set F10			
		consists of:			
		VARIO LR SILICA AMINO ACID F			■
		VARIO SILICA CITRIC ACID			■
		VARIO MOLYBDATE 3 Reagent solution	■		
Silica, HR	0 - 100 mg/l SiO_2	VARIO SILICA Reagent HR, Set F10			
		consists of:			
		VARIO SILICA HR MOLYBDATE, F10			■
		VARIO SILICA HR ACID RGT, F10			■
		VARIO SILICA CITRIC ACID, F10			■
Silica, UHR	0 - 200 mg/l SiO_2	VARIO SILICA Reagent HR, Set F25			
		consists of:			
		VARIO SILICA HR MOLYBDATE, F25			■
		VARIO SILICA HR ACID RGT, F25			■
		VARIO SILICA HR CITRIC ACID, F25			■
Sulphate	0 - 70 mg/l SO_4	VARIO Sulpha 4, F10			■
		VARIO Sulpha 4, F25			■
Triazoles	1 - 16 mg/l	VARIO Triazole Rgt F25			■

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Method	Applications	Quantity	Code
Persulfate digestion	Water, waste water	**1 Set** 50 50 50 50 50 100 ml	535560
Phosphomolybdic acid/ Ascorbic acid	Water, waste water, seawater	100	531550
Phosphomolybdic acid/ Ascorbic acid	Water, seawater	**1 Set** 50 50 100 ml	535200
Phosphomolybdic acid/ Ascorbic acid	Water, seawater	**1 Set** 50 50 100 ml 100 ml 100 ml 50	535250
Phosphomolybdic acid/ Ascorbic acid	Water, seawater	**1 Set** 50 50 100 ml 100 ml 50	535210
Persulfate UV-Oxidation	Water	**1 Set** 100 200	535220
Heteropoly blue	Water, seawater	**1 Set** 100 200 2 x 50 ml	535690
Silicomolybdate	Water, seawater	**1 Set** 100 100 100	535700
Silicomolybdate	Water, seawater	**1 Set** 100 100 100	535900
USEPA accepted for drinking water analysis	Water, waste water, seawater	100 100	532160 532150
Catalyzed UV Digestion	Water	100	532200




Turbidity





TB 300 IR
Page 122



TB 211 IR
Page 124



TB 250 WL
Page 125

Laboratory Turbidity Measurement TB 300 IR

with infrared light source



Turbidity is measured according to EN ISO 7027 by nephelometric means (90° scattered light). The infrared light-source permits measurement of coloured and colour-free samples.

The automatic measurement range detection facility (Autorange) enables direct turbidity measurement from 0.01 to 1100 NTU with an accuracy of ± 2 % up to 500 NTU and ± 5 % thereafter.

A large graphic display, a choice of several different languages and user-friendly operating instructions make the instrument extremely easy to use.

Software updates (for example: languages) can be downloaded free of charge.

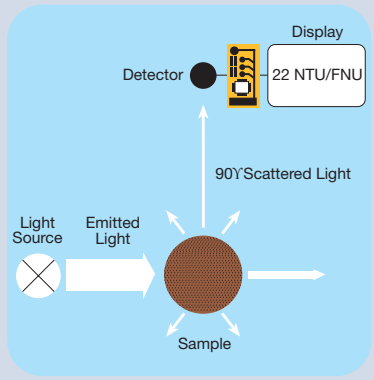


Technical data

Principle	nephelometric (90° scattered light)
Light source	IR-LED (860 nm)
Keypad	acid and solvent resistant; membrane keypad
Auto – Off	automatic switch off
Display	Graphic-Display
Update	Software update via Internet
Clock	real time clock
Memory	1000 data sets
Sample vol.	approx. 12 ml
Range	0.01 – 1100 NTU (Auto range)
Resolution (NTU)	0.01 from 0.01 - 9.99 0.1 NTU from 10.0 - 99.9 1 NTU from 100 - 1100
Accuracy (NTU)	± 2 % of reading or 0.01 (0 - 500) ± 5 % of reading (500 - 1100), whichever is greater
Ambient conditions	temperature: 5-40 °C at 30-90 % relative humidity (non condensing)
Interface	RS232 for printer and PC connection
Power supply	7 NiCd rechargeable batteries (Type AA) ; mains adapter (Input: 100-230V) ; and lithium battery for data storage
Weight (instrument)	approx. 1000 g including batteries and power pack
Dimensions	265 x 195 x 70 mm (L x W x H)
CE-Conformity	

Accessories

Set of 12 sample vials with black lid, height 55 mm, ø 24 mm	197655
Cleaning cloth for vials	197635
Rubber seal cap, black for interface and power plug-in	19801716
Sample chamber lid, black	19801119
Mains charger, 100-240 V, 50-60 Hz, with international adapte	193010
Connection cable connection to PC, serial 9-pin	198198
AA Battery Mignon, 1100 mAh (7 pc.)	1950020
Lithium battery	1950017
Formazin Stock Solution (4000 NTU), 125 ml	194141
Formazin Stock Solution (4000 NTU), 250 ml	194142
Set Turbidity Standards T-CAL (<0.1, 20, 200, 800 NTU)	194150
Paper Printer (Adapter and RS 232-Cable inlcuded)	198077



Turbidity measurement

In pool water, turbidity is an indication for the effectiveness of the filter system and cleaning agents. In drinking water it indicates the possible bacterial growth. In sewage treatment plants the turbidity is an indicator of quality in the cleaning procedures. In industries, turbidity is a quality criterion for products.

The cause of turbidity is usually tiny small particles or droplets that do not dissolve in the surrounding liquids.

The light is distracted by these substances and is partly absorbed and scattered. This scattered light is measured for turbidity levels.

The measurement is made at a 90° angle with infrared or white light.

Formazine solutions are used for calibration.

Delivery Content

- Instrument in plastic case
- 1 set of turbidity standards T-CAL
- 7 rechargeable batteries (AA)
- 1 lithium battery
- Mains charger, 100-240 V
- PC connection cable
- 4 cells (ø 24 mm) with lids
- Warranty information
- Certificate of Compliance
- Instruction Manual

Order code: 194000-B
Order code: 194000
(without lithium battery)

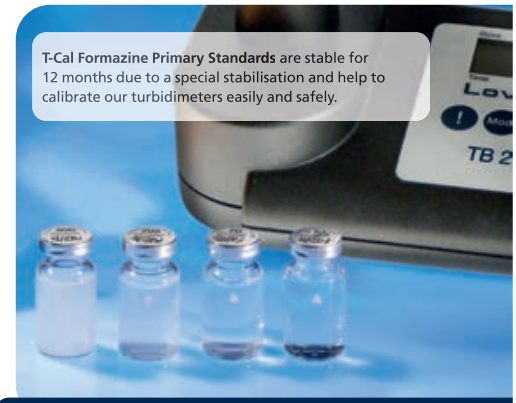




Mobile turbidity measurement

TB 211 IR with infrared light source (EN ISO 7027) & USB-Interface





The compact Lovibond® infrared turbidity measuring instrument TB 211 IR for fast and accurate on-site analysis. It is measured as provided in EN ISO 7027, the scattered light at an angle of 90 °.

The wide measuring range from 0.01 to 1100 TE / F = NTU = FNU with a detection limit of 0.01 NTU allows the use of the instrument in different areas, from drinking water to wastewater.

Since the measurements are made by means of infrared light, both coloured and colourless water samples can be measured. A direct transfer of the measurement results to a PC is easy to set up via the USB interface. The required USB cable is a standard part of the sope of the delivery.

Accessories

Item	Code
Turbidity standard set T-CAL (< 0.1, 20, 200, 800 NTU)	194150
Set empty vials, 24 mm ø (12 pc.)	197655
Cleaning cloth for vials	197635
Sample chamber lid	19801100
Battery, 9 V	1950012
Formazin Stock Solution (4000 NTU), 125 ml	194141
Formazin Stock Solution (4000 NTU), 250 ml	194142
USB-Cable 1.5 m	19802509

Technical data

Measurement cycle	approx. 8 seconds
Display	backlit LCD (on keypress)
Optics	temperature-compensated LED (λ = 860 nm) and photosensor amplifier in water proof sample chamber, infrared light
Keypad	polycarbonate membrane, splash proof
Power supply	9 V power pack battery
Auto - OFF	automatic switch-off
Interface	Micro-USB
Storage	internal ring memory for 125 data sets
Additional feature	real time clock and date
Range (Auto-range)	0,01 - 1100 NTU
Resolution	0.01 - 9.99 NTU = 0.01 NTU 10.0 - 99.9 NTU = 0.1 NTU 100 - 1100 NTU = 1 NTU
Accuracy	± 2.5 % of reading or ± 0.01 NTU whichever is bigger 500 - 1100 NTU: ± 5 % of reading
Housing	ABS
Dimensions (L x W x H)	190 x 110 x 55 mm
Weight	approx. 0.4 kg (basic unit)
Ambient conditions	Temperature: 5 – 40 °C rel. humidity: 30 – 90 %
CE-Conformity	

Delivery Content

- Instrument in plastic case
- 4 turbidity standards (< 0.1, 20, 200 and 800 NTU)
- 9 V battery
- 2 cells (ø 24 mm) with lids
- USB cable 1.5 m
- Warranty information
- Certificate of Compliance
- Instruction Manual

  Code: 266030

Mobile turbidity measurement
TB 250 WL with white light source (EPA 180.1)



The TB 250 WL allows easy turbidity measurement either in the field or in the laboratory.
Using a „white light" source and 90° detection, the TB 250 WL meets the specifications for EPA turbidity measurement (EPA Standard 180.1).
A power efficient micro-circuit design allows the instrument to yield 5000 tests on 4-AA alkaline batteries with an estimated 7-10 year bulb life.
Integrated diagnostics confirm proper operation and accuracy. The instrument features an Auto-Ranging feature that automatically selects the correct turbidity range for your sample.
Calibration is simple with the included calibration standards. The instrument comes with all the required items for testing including the TB 250 WL Turbidimeter, sample, cuvettes, batteries, calibration set, operators manual and carrying case.

Technical data

Display	large LCD display
Keypad	5 key polycarbonate membrane, splash proof
Power supply	4 AA Alkaline batteries for approx. 20 h continuous operation or 3500 tests
Range	0.01 to 1100 NTU
Accuracy	± 2 % of reading or ± 0.01 NTU whichever is greater 500 - 1100 NTU: ± 3 % of reading
Resolution	0.01 NTU to 99.99 NTU 0.1 NTU from 100.0 to 999.9 NTU 1.0 NTU from 1000 to 1100 NTU
Housing	ABS
Dimensions	210 x 95 x 45 mm
Weight	approx. 0.45 kg (base unit)
Ambient conditions	Temperature: 0 – 50 °C rel. humidity: 0 – 90 %
CE-Conformity	

Accessories

Set of secondary standards
0.02, 10, 1000 NTU
Order code: 194280

Set of 3 vials with black lids
Order code: 194290

Delivery content

- Instrument in a sturdy handy case
- 2 sample cells
- 3 turbidity standards
- 4 batteries
- Instruction manual
- Warranty information

Order code: 194200

Floc-Tester





Floc testers with variable stirring speed for laboratory and field use

Applications

- Flocculant Manufacturer
- Waste Water Treatment Plants
- Laboratories
- Research Centres
- Universities

ET 740 (laboratory)

Stirring places	four
Stirring speed control	10 - 300 revolutions per minute
Resolution	1 revolution
Timer	1 - 999 minutes or 0 - 99 hours (continuous)
Power supply	100 – 240 V, 50 - 60 Hz
Weight	approx. 13 kg
Dimensions (mm)	645 L x 347 W x 260 H
EC-conformity	CE
Order code	2419155

ET 750 (laboratory)

Stirring places	six
Stirring speed control	10 - 300 revolutions per minute
Resolution	1 revolution
Timer	1 - 999 minutes or 0 - 99 hours (continuous)
Power supply	100 – 240 V, 50 - 60 Hz
Weight	approx. 17 kg
Dimensions (mm)	935 L x 347 W x 260 H
EC-conformity	CE
Order code	2419160

ET 730 (portable/field)

Stirring places	four
Stirring speed control	20 - 40 - 50 - 100 - 200 revolutions per minute
Timer	1 - 30 minutes (continuous)
Power supply	100 – 240 V, 50 - 60 Hz (including adapter for connection in the car)
Weight	approx. 4.8 kg
Dimensions (mm)	250 L x 320 W x 250 H
EC-conformity	CE
Order code	2 41 91 50

Accessories

Measuring beaker, glass, low form, 1000 ml	419165
Measuring beaker, PP, low form, 1000 ml	419166
Bag for transport of ET 730	419151

Floc testers are designed for a range of applications – such as testing the efficiency of flocculation or precipitation agents.

The ET 740 model with 4 stirring places and the ET 750 model with 6 stirring places are fitted with an illuminated back panel for glare-free observation of the samples and are suitable for laboratory use.

The floc tester ET 730 with 4 stirring places is primarily designed for field use. The 4 stirring points are arranged in a circle around a lamp making it easier to observe the flocculation process.

State-of-the-art technology ensures maximum operating convenience and makes the unit maintenance-free. The main features of the laboratory floc testers are the continuously variable stirring speed, the digital display of stirring rpm, the timer function, the illuminated back panel, and the height adjustment option for the stirring blades during operation.

For model ET 730 beakers with 1000 ml volume, low form can be used.

For models ET 740 and ET 750 beakers with 1000 ml - 1500 ml volume, low or high form can be used.

The beakers are **not** included, they have to be ordered seperatly.



BOD Measurement System
BD 600 & BD 600 GLP



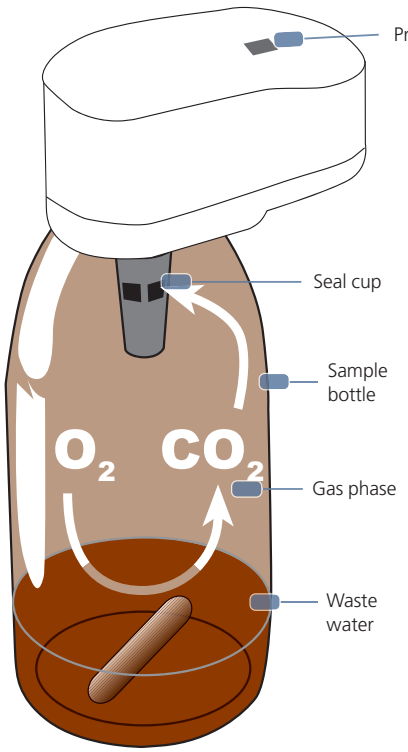
Accurate, automatic and direct control of your waste water samples

References

- APHA, AWWA, WEF Standard Methods 5210 D, OECD 301 F, 301 C, 302 C

Applications

- Waste Water
- Determination of Biological Activity
- Waste Water Treatment Plants
- Analytical Laboratories
- Science & Research



Biochemical Oxygen Demand (BOD)

BOD – biochemical oxygen demand – is an expression for the quantity of oxygen required for biological degradation of organic matter in a waste water sample. BOD measurement is therefore used as a basis for the detection of biologically degradable organic matter in water.
The difference between BOD and chemical oxygen demand (COD) is that COD additionally registers biologically non-degradable organic matter.

BOD measurement is therefore an important measurement of the effects of domestic and industrial waste water on sewage plants and outflow points.

Manometric, respirometric BOD measurement using the Lovibond® BD 600

The Lovibond® sensor system BD 600 is a 6 sample system that allows precise measurements of BOD based on the manometric principle. Manometric respirometers relate oxygen uptake to the change in pressure caused by oxygen consumption while maintaining a constant volume.
Thanks to the modern integral pressure sensors, it is no longer necessary to use mercury for pressure measurements.

Respirometric principle

Respirometric methods provide direct measurements of the oxygen consumed by microorganisms from an air or the oxygen-enriched environment in a closed vessel under conditions of constant temperature and agitation. Carbon dioxide produced metabolically by the bacteria is chemically bound by the potassium hydroxide solution contained in the sealed cup in the bottle.

The result is a pressure drop in the system, which is directly proportional to the BOD value and is measured by the BOD sensor. The BOD level is then displayed directly in mg/l.

The BOD values are stored automatically in the sensor memory in regular intervals and can be called up on the large-format display at any time without the need for time-consuming conversion using factors. This means that test series that end on a Sunday can be evaluated during the following week without any problem.
Measurement series can be stored on USB stick/ SD card or transfered via the USB cable to evaluate the data on a computer.

The measurement period is user-selectable between 1 and 28 days to suit the application. While short measurement periods are useful for scientific applications, standard BOD measurements typically extend over a period of 5 days – and manometric determination of OECD, for example, generally takes place over a period of 28 days.

Evaluation of measurements

The BD 600 measuring system records a measurement once every hour, independent of the length of the measuring period. This way the quality of the series of measurement can be evaluated at an early stage. Current values and stored values may be called up at any time. Stored values can be displayed numerically or graphically. The table/ graph on the left illustrates an example of BOD_5 evaluation. The development of BOD over a period of five days is easily seen.

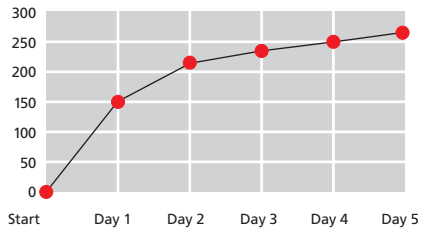
Automatic start function

Variations in sample temperature prior to testing result in pressure variations within the measuring system during the temperature equalisation period in the thermostatically controlled cabinet (if BOD measurement is to take place at 20°C, for example). Such variations would normally cause errors during manometric measurement. In order to prevent such errors, the Lovibond® BD 600 BOD meter is equipped with an automatic start feature:
measurement does not commence until the temperature in the samples is the same as that in the thermostatically controlled cabinet.
This rules out the possibility of temperature (and hence pressure) fluctuations that are not related to the manometric measurement.

Complete measuring system

In addition to the BOD unit for the measurement and storage of BOD levels, the Lovibond® BD 600 BOD measuring system includes the sample bottles, measuring sensors, non-wearing inductive stirring system, overflow measuring flasks for metering of sample volumes, nitrification inhibitor and potassium hydroxide as an absorbent.

Day	Display
1. Day	150 mg/l
2. Day	220 mg/l
3. Day	240 mg/l
4. Day	250 mg/l
5. Day	260 mg/l



BOD_5 Diagram



- Supports the requirements for GLP
- Suitable for BOD measurements and tests according to OECD 301F
- Protected, more permanent memory for all data over the lifetime of the instrument (1 GB)
- Long term tests of up to 90 days measurement duration possible
- Simplified data transfer to the PC via USB
- Graphical user interface

Technical data	BD 600	BD 600 GLP
Meas. principle	Manometric; mercury-free; electronic pressure sensor	
Ranges [mg/l O_2]	0 - 40, 0 - 80, 0 - 200, 0 - 400, 0 - 800, 0 - 2000, 0 - 4000 mg/l	
Applications	BSB_5, BSB_7,	OECD 301 F, 301 C, 302 C
Display	128 x 240 Pixel, 45 x 84 mm backlit	Large graphic display
Measurement period	User-selectable, between 1 and 28 days	5, 28, 60 and 90 days
Auto result storage	Up to 744 results, depending on measurement period and amount of sample bottles	up to 50.000 measurements (1GB)
Storage interval	- hourly (1. day) - every 2 hours (2. day) - 1x daily (3.-28. day)	- every 2 hours (5 days) - every 12 hours (28 days) - every 24 hours (60 days) - every 24-48 hours (90 days)
Autostart function	equalisation of samples with a temperature of 15 to 21 °C, can be switched off	-
Power supply	3 alkaline-manganese batteries ("Baby" cells/size "C") or via power supply unit using y-cable with stirring unit	100 - 240 V / 50-60 Hz
Interface	USB-host port (USB-storage medium) USB-Instrument-Port (Computer) SD-card (for BD 600 GLP occupied)	
Clock	Real-time clock with date	
Dimensions (L x W x H)	375 x 181 x 230 mm including stirring unit	
Weight	ca. 4100 g, unit with bottles & batteries approx 5775 g, complete with stirring unit	
Approval	CE	

BD 600 GLP

(OECD 301 F, 301 C, 302 C)

Optimized for biodegradability tests under GLP requirements

The REACH provisions stipulate that every chemical with a production volume of more than one tonne / year must be registered and tested.
These tests follow precise guidelines and procedures, which, among other things, examine the residence time of chemicals in the environment. Therefore, the demand for tests for the measurement of biodegradability according to OECD standard 301F is correspondingly high. While performing these tests laboratories need to comply with GLP (Good Laboratory Practice) standards.

With the BD 600 GLP, we have developed a new system that combines modern design and up-to-date data exchange via USB with GLP-compliant data management and a lifetime of the instrument's protected resident memory (1 GB).
All settings and changes are registered and logged. Any manipulation is thus prevented, erasure of data is impossible. The sensor heads are validated and delivered with a test certificate.

Delivery Content

- **BD 600 (Order code: 2444460)** or **BD 600 GLP (Order code: 2444461),** complete unit with 6 sensors and control unit with batteries (BD 600 GLP with certificate)
- Power supply unit incl. Y-cable for common power supply of BD 600 and stirring unit
- 1 x remote control (without batteries)
- Inductive stirring unit
- 6 sample bottles
- 6 rubber gaskets
- 6 magnetic stirring rods
- 1 overflow flask, 157 ml
- 1 overflow flask, 428 ml
- 1 bottle, 50 ml potassium hydroxide solution
- 1 bottle, 50 ml Nitrifikationshemmstoff
- 1 instruction manual
- 1 x USB cable (BD 600 only)
- Warranty

BD 606 **Order code: 2444465**

- 2 x BD 600 complete unit with 12 sensor heads and control units with batteries
- 2 x Power supply unit incl. Y-cable for common power supply of BD 606 and stirring unit
- 2 x USB cable
- 2 x Inductive stirring unit
- 12 sample bottles
- 12 rubber gaskets
- 12 magnetic stirring rods
- 1 overflow flask, 157 ml
- 1 overflow flask, 428 ml
- 1 bottle, 50 ml potassium hydroxide solution
- 1 bottle, 50 ml nitrification inhibitor solution
- 1 instruction manual
- 1 x remote control (without batteries)
- Warranty

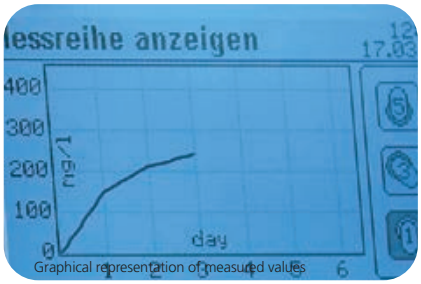
Accessories

Item	BD 600	BD 600 GLP	Ordercode
BSB-Sensor	•		2444470
Sensor BOD GLP validated with certificate		•	2444470-GLP
Sensor validation with certificate		•	999610-GLP
BOD sample bottle, Brown glass, 500 ml	•	•	418644
BOD sample bottle, Brown glass, 500 ml, set of 6 bottles	•	•	418645
Inductive stirring system for 6 samples, 100-240 V / 50-60 Hz, incl. power supply	•	•	2444456
Power supply unit for inductive stirring system, 100 - 240 V / 50 - 60 Hz	•	•	444454
Magnetic stir bar	•	•	418633
Magnetic stir bar, 100 pc.		•	418633-100
Stir bar remover	•	•	418638
Rubber gasket 4,5 cm	•		418636
Rubber gasket GLP 6,5 cm	•	•	418676
Potassium hydroxide solution 45 %, 50 ml	•	•	2418634
Nitrification inhibitor (N-ATH) 50 ml	•	•	2418642
Overflow flask, 21,7 ml	•	•	418664
Overflow flask, 56 ml	•	•	418655
Overflow flask, 94 ml	•	•	418656
Overflow flask, 157 ml	•	•	418657
Overflow flask, 244 ml	•	•	418658
Overflow flask, 360 ml	•	•	418659
Overflow flask, 428 ml	•	•	418660
Complete set overflow flasks	•	•	418654
Test set, BOD CM test tablets, box with 10 tablets	•	•	2418328
USB cable 3 m	•	•	2444482
Y cable	•	•	2444475
Remote control	•	•	2444481


BOD Accessoires


BOD CM test tablets, order code: 2418328


Inductive stirring system



Graphical representation of measured values


Remote control

Test set for BD 600

We also supply a test set to check for the correct operation of the Lovibond® BD 600 BOD meter. The set contains 10 BOD CM1 test tablets that cause a defined oxygen consumption.

The tablets are easy to use. Simply place a tablet in the BOD bottle, start the measurement process, read off the BOD value after 5 days, and then compare with the defined value. If this value is within the quoted tolerance, this means that the BOD measuring system is functioning correctly.

Temperature equalisation during BOD measurement

Temperature equalisation is essential prior to biological testing, as temperature has a major effect on biological activity. BOD measurements, for example, are always performed in a thermostatically controlled cabinet at a temperature of 20°C.

For temperature equalisation, we recommend Lovibond® thermostatically controlled cabinets with a user-selectable temperature from 2°C to 40°C.

environmentally friendly coolant!

Thermostatically controlled incubators TC-Series





Temperature control unit

The temperature controll unit fulfils the EMC requirements according to IEC 61326 : Electrical equipment for measurement, control and laboratory use.

The TC series of thermostatically controlled cabinets is used for continuous temperature control over a range of 2 °C to 40 °C. This makes them ideal for a wide range of different applications in industrial and research laboratories.

In particular they are ideal for the temperature-controlled storage of samples or BOD determination in effluent analysis work.

The temperature can be set in steps of 0.1 °C and an LED display shows both the set temperature and the current temperature in the cabinets. Instruments such as magnetic agitators, which require a power supply, can be connected to sockets incorporated in the interior of the cabinet.
The integral temperature control unit meets the requirements of the EMC directive issued as IEC 61326: "Electrical instruments for measurement, monitoring and for use in laboratories".

Improved, robust, insulated housing and highly efficient components provide maximum energy efficiency.

There are 3 models available with standard doors from 135 to 445 litres net capacity, and 2 models with glass doors with 140 and 255 litres net capacity, the doors are lockable.

Space for **BD 600-systems**		
Model	**6er-systems, standard**[1)]	**6er-systems, comfort**[2)]
TC 135 S / TC 140 G	3	2
TC 255 S / TC 256 G	7	3
TC 445 S	12	9

1) Change of bottles by removing racks.
2) Change of bottles without removing racks.

Applications

- BOD Measurement
- Microbiological Research
- Food Industry
- Dairies
- Laboratories
- Research Centres
- Universities

Technical Data	Models with standard door			Models with glass door	
Cooling/Heating	Integrated powerful cooling and heating				
Coolant	R600a				
Design	Fully insulated cabinet with universal temperature control unit				
Display	Backlit LED display				
Operation	Splash-proofed keypad, 2 buttons with tactile feedback				
Fan	Axial, output 320 m³/h				
Control range	+ 2 °C to + 40 °C, steps of 0.1 °C				
Power supply	220 - 240 V / 50 Hz				
Sockets	CEE 7/5, type E with hinged lid, 230 V / 16 A 2p + E, IP 4				
Door	lockable, door hinges changeable				
				Insulating glass door in an ABS frame	
Ceiling lighting				separately switchable	
Temperature tolerance	± 1 °C, specified for a stirred 500 ml water sample. For BOD (T=20 °C ±0.5 °C)				
Lighting				LED light bar	fluorescent tube
Climate class	+ 10 °C to + 32 °C (SN)		+10 to +43 °C (SN-T)	+ 10 °C to + 32 °C (SN)	
Shelf	3 retractable grids + 4 sockets	4 retractable grids + 1 bottom grid + 7 sockets	4 retractable grids + 1 bottom grid + 9 sockets	3 retractable grids + 1 bottom grid + 4 sockets	4 retractable grids + 1 bottom grid + 7 sockets
Energieverbrauch	ca. 1.41 kWh / 24h*	ca. 1.33 kWh / 24h*	ca. 1.24 kWh / 24h*	ca. 1.61 kWh / 24h**	ca. 1.91 kWh / 24h**
Inside dimensions (ca.)	513 W x 441 D x 702 H mm	470 W x 440 D x 1452 H mm	600 W x 560 D x 1452 H mm	513 W x 441 D x 702 H mm	470 W x 440 D x 1452 H mm
Overall dimensions (ca.)	600 W x 600 D x 850 H mm with worktop 600 W x 600 D x 819 H mm without worktop built-under	600 W x 610 D x 1640 H mm	750 W x 730 D x 1640 H mm	600 W x 600 D x 850 H mm with worktop 600 W x 600 D x 819 H mm without worktop built-under	600 W x 610 D x 1640 H mm
Net capacity (ca.):	135 l	255 l	445 l	140 l	255 l
Weight	39.0 kg	45 kg	78,5 kg	48,0 kg	77,0 kg
Shelf loading capacity	45 kg		60 kg	45 kg	
Approval	CE				
Code	2438200	2438230	2438240	2438210	2438235

* Ambient temperature 25 °C, Target temperature 20 °C, Variations possible
** Ambient temperature 25 °C, Target temperature 20 °C with interior lighting switched on (15 W), Variations possible



TC 135 S — TC 255 S — TC 445 S — TC 140 G — TC 256 G

Spark-free cabinets - EX series

Laboratory cabinets with a spark-free interior



Contents not supplied

The German guidelines „Working Safely in Laboratories BG-I 850-0“ stipulates that interior spaces must be explosion-protected where hazardous, explosive environments can develop (for example, due to the presence of flammable liquids).

The Lovibond® cabinets in the EX range meet the requirements of these guidelines and are fully equipped for daily laboratory use.

The cabinets consist of a sturdy sheet steel housing with impact-proof and jolt-resistant powder coating. Improved, robust, insulated housing and highly efficient components provide maximum energy efficiency.

The robust interior is made of high-quality, strong white plastic material (PS).

The door is lockable and supplied with a right-hand hinge as standard (but can easily be converted to a left-hand hinge). A tight door seal is ensured by an all-round magnetic gasket.

The temperature in the refrigerator can be continuously adjusted over the range +1°C to +15°C; a room thermostat ensures constant control. The digital temperature display enables the interior temperature to be easily read. The high performance fan provides for an even temperature distribution inside.

The models EX 220, EX 300 and EX 490 have a “fan stop” function, which switches the fan off when the door is opened.

Applications

- Laboratories
- Research Centres
- Universities

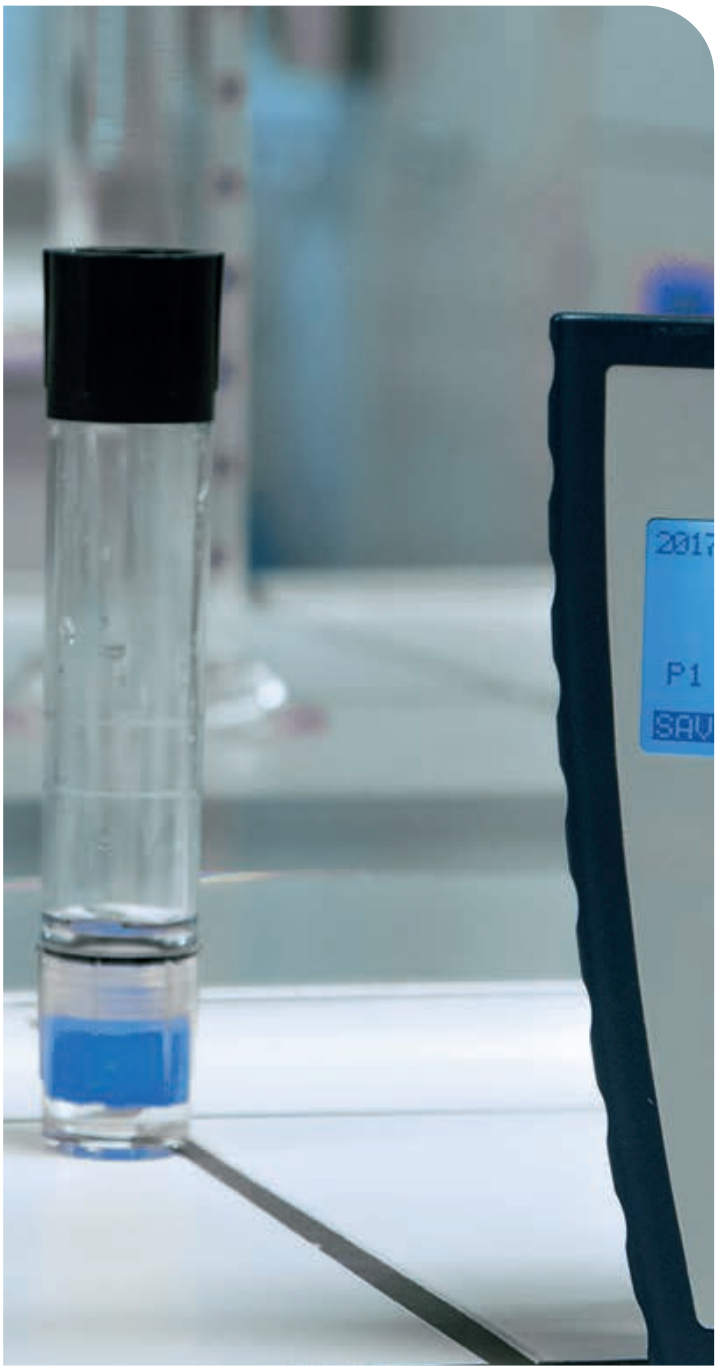
Technical data	EX 160	EX 220	EX 300	EX 490
Cooling	Powerful compressor unit, mounted on low noise, vibration-free bearings			
Coolant	R600a			
Defrost	Automatic defrost - condensation drains into a collection bowl within the refrigerator			
Temperature	1 °C to 15 °C			
Sound Power Level	47 dB			
Shelf loading capacity	40 kg			
EX-safety	Spark-free interior			
Height adjustment	Adjustable front feet			
Door	lockable, door hinges changeable			
Power supply	220 - 240 V / 50 Hz			
Shelf	4 (3 height-adjustable glass shelves)	5 (4 height-adjustable glass shelves)	6 (5 height-adjustable glass shelves)	
Connection value	1 A		1,5 A	
Power consumption	0,898 kWh / 24 h	0,786 kWh / 24 h	0,947 kWh / 24 h	0,983 kWh / 24 h
Climate class	SN, 10 °C bis 32 °C	SN-T, 10 °C bis 43 °C		
Temperature control	infinitely variable1 °C to 15 °C			
Inside dimensions (ca.)	513 W x 441 D x 702 H mm	470 W x 440 D x 1062 H mm	470 W x 440 D x 1452 H mm	600 W x 560 D x 1452 H mm
Overall dimensions (ca.)	600 W x 600 D x 860 H x mm	600 W x 610 D x 1250 H x mm	600 W x 610 D x 1640 H mm	750 W x 730 D x 1640 H mm
Net capacity	ca. 160 l	ca. 220 l	ca. 300 l	ca. 490 l
Weight	ca. 41,0 kg	ca. 53,0 kg	ca. 64,0 kg	ca. 84,0 kg
Approval	CE			
Code	2422105	2422115	2422125	2422135
Spares / Accessoires				
Safety- and collecting tub (PP)	422155	422156		422157
Glass shelve	422165	422166		422167

The product complies with the following
European directives and regulations: 2006/42/EC, 2006/95/EC, 94/9/EC, 2004/108/EC, 2011/65/EU.



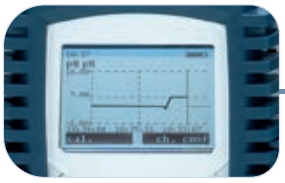
EX 160 — EX 220 — EX 300 — EX 490


Electrochemistry





SD 400 Oxi L
Page 138



SD 335
Page 140



SD Series 305, 315, 325
Page 142



SD 150
Page 146



SD 110
Page 148



SD Hand held meters
Page 150

Optical oxygen measurement SD 400 Oxi L





Applications

- Waste Water
- Water Treatment
- Marine Water
- Surface Water
- Drinking/ Potable Water

Users

- Sewage plants
- Research and development
- Institutes, Universities, Schools
- Water protection control
- Laboratories
- Aquaria

The SD 400 Oxi L allows the measurement of dissolved oxygen in a convenient and simple manner. The determination of dissolved oxygen in water is based on optical luminescence technology. This is characterized by fast response time and a particularly low maintenance requirement. Combined with high accuracy , this technology offers great benefits to the user.

Features of SD 400 Oxi L

For oxygen measurement by means of luminescence technology, the following advantages are obtained compared to galvanic sensors and Clark sensors:

- High accuracy
- No sample flow is needed
- Low maintenance
- No oxygen consumption in the measuring medium
- No pollution of ambient medium
- Long-life sensor membrane
- Robust measurement even in sulfide-containing samples

Additional features of SD 400 Oxi L

- Waterproof sensor IP 67
- Backlit LCD
- Internal data storage
- Software for monitoring and storage of data
- Micro USB port
- Comfortable fitting to BOD Karlsruhe NS 19 / 26 (16.4 mm ø and above)



Data Transmission Kit



SD 400 Oxi L in case

SD 400 Oxi L

Probe	Optical DO
Protection class	IP 67 (sensor)
Display	Large LCD display
Data Memory	Micro SD-card
Data Logger	Software for monitoring and storage of data
Software	Included in instrument
Interface	Micro USB
Power off	After 10 minutes or manual off
Power Supply	Micro USB or 4 x AA batteries
Salinity	0... 50 ppt, auto compensation (after manual input)
Response time	40 sec. to 90 % of final reading
Storage temperature	-5 °C to 50 °C
Working temperature	-5 °C to 50 °C
Dimensions	162 x 98 x 54 mm (L x W x H) instrument only
Weight	approx. 330 g (unit incl. batteries)
Languages	German, English, Italian, French, Spanish, Portuguese, Dutch, Chinese (simplified)
CE-Conformity	

Accessories

Code	Item
740060	Optical DO probe with 1.5 m cable and bottle for storage and calibration
740070	Optical DO probe with 3 m cable and bottle for storage and calibration
740080	Optical DO probe with 10 m cable and bottle for storage and calibration
740030	SD 400 Oxi L basic instrumen
740090	Data Transmission Kit (consists of USB cable and wall mount adapter)
740100	Maintenance Kit (consists of membrane cap and Micro SD card with software and calibration data)
740110	Metal guard (for protection and weight in field-testing)
740120	Bottle for storage and calibrati
1950025	1.5 V Batteries, AA, 4 pcs.
197635	Cleaning cloth

Technical Data

Measuring ranges

Oxygen	0 - 50 mg/l
- saturation	0 - 500 %
- temperature	-5 to 50 °C
- barometer	51 to 112 kPa

Resolution

Oxygen	0.01 mg/l
- saturation	0.1 %
- temperature	0.1 °C
- barometer	0.1 kPa

Accuracy

Oxygen

0 to 200 % or 0 - 20 mg/l:
± 1.0 % of the reading or
± 0.1 mg/l whichever is greater
> 200 % or > 20 mg/l:
± 10 % of reading
- temperature ± 0.2 °C
- barometer ± 0.2 %

Delivery Content

Order Code: 740000
SD 400 Oxi L, (Set 1)
instrument, 4 (AA) batteries,
optical DO probe with 1.5 m cable,
bottle for storage and calibration,
Micro SD Card with calibration data,
software and full user manual,
quick start guide and lanyard in case

Order Code: 740010
SD 400 Oxi L, (Set 2)
instrument, 4 (AA) batteries,
optical DO probe with 3 m cable,
bottle for storage and calibration,
Micro SD Card with calibration data,
software and full user manual,
quick start guide and lanyard in case

Order Code: 740020
SD 400 Oxi L, (Set 3)
instrument, 4 (AA) batteries,
optical DO probe with 10 m cable,
bottle for storage and calibration,
Micro SD Card with calibration data,
software and full user manual,
quick start guide and lanyard in case

new!

Multiparameter Instrument SD 335



Applications

- Drinking Water
- Cooling/Boiler Water
- Waste Water
- Surface Water
- Laboratory

Technical Data SD 335 Multi

Measurement range / Resolution	**Input 1: pH/ORP/Temp.**		Input 2: Optional oxygen- (a) or conductivity probe (b)			
			Input 2a: DO/Temp.		**Input 2b: Con/Temp.**	Max. Display range
	pH:	-2.00 … 16.00 pH	O_2-Concentration:	0.00 … 50.00 mg/l	Conductivity:	0.000 … 500 mS/cm
	Redox/ORP:	-2000 … + 2000 mV	O_2-Saturation:	0.0 … 500.0 %	TDS:	0.000 … 500 g/l
	Temperature:	-10.0 … +150 °C	O_2-Partial pressure:	0 … 1013 hPa	Salinity:	0.0 … 70.0 PSU (g/kg)
			Temperature:	-10.0 … 110.0 °C	Temperature:	-10.0 … 110.0 °C
					* **Measurement range depending on electrode** • **LC 12 (< 200 mS/cm; cell constant ca. 0.55 cm^{-1})** • **LC 16 (< 1000 mS/cm; cell constant ca. 0.42 cm^{-1}**	
Accuracy	pH:	± 0.25 % FS	O_2-Concentration	± 1.5 % FS	Conductivity:	± 0.5 % FS
	Redox/ORP:	± 0.25 % FS	O_2-Satiratopm:	± 1.5 % FS	TDS:	± 0.5 % FS
	Temperature:	± 0.25 % FS	O_2-Partial pressure:	± 1.5 % FS	Salinity:	± 0.5 % FS
			Temperature:	± 0.5 % FS	Temperature:	± 0.5 % FS
Connection	pH/ORP	BNC-socket	DO/Temperature:	7-pin bayonet socket	Con/Temperature:	7-pin bayonet socket
	Temperature:	banana socket				
Calibration	1 - 5 Point calibration (automatic or manual)		1 Point calibration (automatic)		1 Point calibration (automatic or manual)	
Temperature compensation	Automatic (with temperature probe) or manual		Automatic		Automatic	
Additional Features	Automatic buffer recognition	• Lovibond® standards (pH: 4.01 / 7.00 / 10.01) • DIN 19266 buffers	Salinity correction:	0 … 70 PSU (g/kg)	TDS-Factor:	0.4 ... 1.0
			Pressure compensation:	Automatic	Reference temperature:	25 °C / 20 °C
Operating conditions	Temperature: -25 … +50 °C Rel. Humidity: 0 … 95 % (non-condensing)					
Storage temperature	-25 … +70 °C					
Power supply	3 x AAA NiMH batteries (max. 750 mAh) or via USB-interface					
Dimensions	164 x 100 x 37 mm (L x W x H)					
Weights	310 g (incl. batteries and protective armouring)					
Display	LCD, 52 x 40 mm, 4 1/2 digit 7-segment					
Data storage	Internal mass storage: 8 GB					
Languages	German, English, French, Spanish, Portuguese, Italian, Dutch					
Protection Class	IP 67					
Conformity	CE					
Order info Sets:						
	724830	Unit in protective armouring, without electrode				
Set 1	724800	✓	-		✓	
Set 2	724810	✓	✓		-	
Set 3	724820	✓	✓		✓	

Delivery content

All Sets contain:

- Stable plastic case
- instrument in protective armouring
- electrode holders
- pH/Temp.-electrode type 231
- pH buffer: 4.01 / 7.00 / 10.01
- storage solution for pH/ORP-electrodes
- AAA NiMH batteries
- instruction manual

Set 1

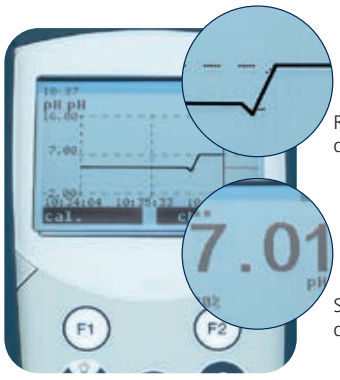
- pH / Con
- Conductivity probe LC 12
- Conductivity standard 1413 µS/cm (NIST)

Set 2

- pH / dissolved O2
- Oxygen probe type 300, 2 m cable
- Electrolyte & spare membranes
- Calibration bottle

Set 3

- pH / Con / dissolved O2 / Temp.
- Conductivity probe LC 12
- Conductivity standard 1413 µS/cm (NIST)
- Oxygen probe type 300, 2 m cable
- Electrolyte & spare membranes
- Calibration bottle



Accessories from page 152

new!

SD 305 pH
SD 315 Oxi
SD 325 Con



Applications

- Drinking Water
- Cooling/Boiler Water
- Waste Water
- Surface Water
- Laboratory





Functions SD 305 pH	SD 315 Oxi	SD 325 Con
Display of three different parameters • pH • Redox / ORP • Temperature **Optional 1-, 2- oder 3-point calibration** **Automatic buffer recognition** • Lovibond® standard buffer pH: 4.01 / 7.00 / 10.01 • pH buffer according to DIN 19266 **Status display of pH electrode** • Sensor evaluation after calibration **Redox measurement** • Display as "mV" vs. Ag/AgCl (3 M KCl) • Display as "mVH" vs. SHE according to DIN 38404-6	**Display of three different parameters** • O_2-Concentration • O_2-Saturation • Temperature **Simple calibration against watersaturated air** • recommended according to DIN EN ISO 5814 **Automatic pressure compensation** **Status display of oxygen probe** • Sensor evaluation in % after calibration **Salinity corretion (0.1 … 70 PSU)** **Galvanic oxygen probe** • Ready for immediate use, no polarization time	**Display of five different parameters** • Conductivity • TDS • Salinity • Resistivity • Temperature **Automatic recognition of conductivity standards to adjust the cell constant** • Lovibond® standards 1413 µS/cm, 12.88 mS/cm **Reference temperature 25 °C or 20 °C** **Conductivity probes for diverse application** • LC 12: < 200 mS/cm, universal use • LC 16: < 1000 mS/cm, high conductivities • LC 10: < 200 µS/cm, pure water

Min-/Max-Value memory

Automatic temperature compensation (ATC)

Automatic power off

Battery status indicator

Alarm functions (optical or with sound)

Auto-Hold function

Shock resistant rubber protective armouring

Robust electrode holder made of ABS

Data logger with real time clock

Data transmission and evaluation: Software GSOFT 350 (optional)

Accessories from page 152

Technical Data	SD 305 pH/ORP	SD 315 Oxi
Measurement range	pH: -2.000 … 16.000 pH Redox: -2000 … +2000 mV Temperature: -5.0 … +150.0 °C	O_2-Concentration: 0.0 … 70.0 mg/l O_2-Saturation: 0.0 … 600.0 % Temperature: -5.0 … +50.0 °C Operating pressure (sensor): max. 3 bar≈30 m water depth
Accuracy	pH: ± 0.005 pH Redox: ± 0.05 % FS Temperature: ± 0.2 °C	O_2-Konzentration: 0 … 25 mg/l ± 1.5 % v.MW ± 0.2 mg/l 25 …70 mg/l ± 2.5 % v.MW ± 0.3 mg/l Temperatur: ± 0.1 °C
Calibration	1 - 3 Point calibration (automatic or manual)	1 - 3 Point calibration (automatic)
Connection	pH, Redox: BNC-socket Temperature: Banana socket	O_2/Temperature: 7-pin bayonet socket
Operating conditions	Temperature: -25 ... +50 °C; rel. Humidity: 0 ... 95 % (non-condensing)	
Storage temperature	-25 ... +70 °C	
Power supply	2 x AAA batteries (delivery content) or via USB-interface	
Dimensions	164 x 100 x 37 mm (L x W x H)	
Weight	302 g (incl. batteries and protective armouring)	
Display	LCD, 52 x 40 mm, 4 1/2 digit 7-segment	
Data storage	Manual logger: 1000 data sets (value storage on key press) Automatic logger: 10000 data sets (cyclic, time interval: 1 … 3600 s)	
Protection class	IP 67	
Conformity	CE	

Order Info / Delivery content :					
SD 305 pH/ORP			**SD 315 Oxi**		
Instrument in protective armouring, electrode holder, pH buffer: 4.01 / 7.00 / 10.01 (Set-1 / Set-2), redox standard solution 470 mV (Set-3), storage solution for pH/ORP-electrodes, AAA batteries, instruction manual			Instrument in protective armouring, electrode holder, KOH electrolyte, spare membranes, calibration bottle, AAA batteries, instruction manual		
Electrode depending on Set					
Set 1-pH	724640	pH/Temp. electrode type 231	**Set 1-Oxi**	724680	Oxygen probe, Pt/Pb, galvanic, cable length: 2 m
Set 2-pH	724641	pH-electrode type 226, temperature probe Pt1000	**Set 2-Oxi**	724690	Oxygen probe, Pt/Pb, galvanic, cable length: 10 m
Set 3-ORP	724642	ORP-electrode type 240, temperature probe Pt1000	**Set 3-Oxi**	724695	Oxygen probe, Pt/Pb, galvanic, cable length: 30 m
Base unit	724630	without electrode			



SD 305 pH in case



SD 315 Oxi in case

SD 325 Con

Conductivity:	0.000 … 1000 mS/cm (Display range)
TDS:	0.000 … 5000 mg/l
Salinity:	0.0 … 70.0 PSU (Practical Salinity Unit)
Resistivity:	0.000 … 50.0 MΩ*cm
Temperature:	-5.0 ... 100.0 °C * Measurement range depending on electrode • LC 12 (< 200 mS/cm; cell constant ca. 0.55 cm^{-1}) • LC 16 (< 1000 mS/cm; cell constant ca. 0.42 cm^{-1} • LC 10 (< 200 µS/cm; cell constant ca. 0.1 cm^{-1}
Conductivity: Temperature:	± 0.5 % v. MW ± 0.1 % FS ± 0.2 °C
1 Point calibration (automatic or manual)	
Con/Temperature: 7-pin bayonet socket	
Temperature: -25 ... +50 °C; rel. Humidity: 0 ... 95 % (non-condensing)	
-25 ... +70 °C	
2 x AAA batteries (delivery content) or via USB-interface	
164 x 100 x 37 mm (L x W x H)	
302 g (incl. batteries and protective armouring)	
LCD, 52 x 40 mm, 4 1/2 digit 7-segment	
Manual logger: 1000 data sets (value storage on key press) Automatic logger: 10000 data sets (cyclic, time interval: 1 … 3600 s)	
IP 67	
CE	

SD 325 Con		
Instrument in protective armouring, electrode holder (Set-1 / Set-3), standard solution according to NIST 1413 µS/cm + 12.88 mS/cm (Set-1 / Set-2) flow-cell for low conductivities (Set-3) AAA batteries, instruction manual		
Set 1-Con	724740	Conductivity probe LC 12 (4 pole graphite, < 200 mS/cm)
Set 2-Con	724750	Conductivity probe LC 16 (4 pole graphite < 1000 mS/cm)
Set 3-Con	724760	Conductivity probe LC 10 (2-pole stainless steel < 200 µS/cm)



SD 325 Con in case

Accessories from page 152

SensoDirect 150



The SensoDirect 150 combines the features of several hand-held meters. It is designed for multi purpose operation and measures pH/Redox, dissolved oxygen and conductivity/TDS.

All measured values can be conveniently read on the large LCD display

Applications

- Drinking Water
- Cooling/Boiler Water
- Waste Water
- Pool Water
- Surface Water
- Water Treatment Companies
- Industrial and Governmental Laboratories

Technical Data SD 150

Parameter	pH	ORP	Oxygen	Conductivity	TDS	Temperature
Range / Resolution	0.00 … 14.00 pH	-1999 … 1999 mV	O_2 dissolved: 0.0 … 20.0 mg/L Air O_2: 0.0 … 100.0 %	0.0 … 200.0 µS/cm 0.200 … 2.000 mS/cm 2.00 … 20.00 mS/cm 20.0 … 200.0 mS/cm	0.0 ... 132.0 ppm 132 … 1320 ppm 1320 … 13200 ppm 13200 … 132000 ppm	0.0 … 60.0 °C 32.0 … 140.0 °F
Accuracy	± 0.02 pH	± 0.5% of measured value	O_2 dissolved: ± 0.4 mg/L Air O_2: ± 0.7 %	± 2 % of measured value		± 0.8 °C (± 1.5 °F)
Temperature compensation	automatically (with temperature electrode) and manually	-	automatically	adjustable: 0… 5.0 % / °C		-
Calibration	1-, 2- or 3-point calibration (automatically or custom)	1-point calibration (custom, standards only > +100 mV)	1-point calibration (automatically)	1- or 2-point calibration, manually		-
Standards for automatic detection	USA: 4.01 / 7.00 / 10.01 pH	-	oxygen content air	-		
Salinity correction	-		0 … 39 %, manually	-		
Air Pressure compensation	-		0 … 8900 m, manually	-		
Display	58 x 34 mm LCD					
Data-Hold-Function	Yes					
Automatic Power Off	after 10 min, optional					
Operating conditions	0 … 50 °C, 0 … 80 % relative humidity (non-condensing)					
Power Supply	4 x 1.5 V batteries AA or DC 9V adapter					
Weight	ca. 620 g (battery and protective armouring)					
Dimensions	203 x 76 x 38 mm (battery and protective armouring)					
Protection class	IP 51					
Conformity	CE					
Order Info Sets:						
Set 1 724200	✓	-	✓	✓	✓	✓
Set 2 724210	✓	-	-	✓	✓	✓
Set 3 724220	✓	-	✓	-	-	✓
Set 4 724230	✓	✓	-	-	-	✓

Delivery Content

All Sets include:

- Sturdy plastic case
- Measuring instrument with protective armouring
- 4 x 1.5 V batteries AA
- pH electrode type 226
- Temperature probe Pt1000
- pH 4.01 and 7.00 buffer set (90 ml each)
- Instruction manual

SensoDirect 150 Set 1

- pH / Con / TDS / O_2 dissolved / Temp.
- Conductivity probe type 110/150
- Oxygen sensor type 150
- Electrolyte and membrane heads (2 pc.)

SensoDirect 150 Set 2

- pH / Con / TDS / Temp.
- Conductivity probe type 110/150

SensoDirect 150 Set 3

- pH / O_2 dissolved / Temp.
- Oxygen sensor type 150
- Electrolyte and membrane heads (2 pc.)

SensoDirect 150 Set 4

- pH / Redox / Temp.
- Redox electrode type 242

Accessories from page 152

SensoDirect 110



Battery operated pH meter for the determination of pH, salinity and conductivity.
Variety of applications and user-friendly in operation.

The protective armouring offers not only a secure grip but also protection against fall damage.

A "Hold" function and an automatic battery check rounds off the range of functions.



Delivery Content

- Basic unit
- Battery
- Protective armouring
- Warranty information
- Instruction manual

Applications

- Drinking Water
- Cooling/Boiler Water
- Waste Water
- Pool Water
- Surface Water
- Water Treatment Companies
- Industrial and Governmental Laboratories

Technical Data	SensoDirect 110 pH	SensoDirect 110 Con	SensoDirect 110 Salt
Range / Resolution	0.00 … 14.00 pH	0.000 … 1.999 mS/cm 0.01 … 19.99 mS/cm	0.01 … 10.00 % salt
Accuracy	± 0.07 pH	± 3 % range	± 0.5 % range
Temperature compensation	-	automatically, 2 % / °C	
Calibration	custom (manually with adjusting screws)		
Display	52 x 37 mm LCD		
Data-Hold-Function	Yes		
Operating conditions	0 … 50 °C, 0 … 80 % rel. humidity (non condensing)		
Power Supply	9-V-Block Battery		
Weight	ca. 380 g (battery and protective armouring)		
Dimensions	208 x 110 x 34 mm (protective armouring)		
Protection class	IP 51		
Conformity	CE		
Order Info			
Instrument, electrode and accessories in stable case	721300	722300	723300
Instrument and electrode	721310	722310	-

Accessories from page 152



SD-Hand-held meters

Technical Data	SD 50 pH	SD 60 ORP
Range / Resolution	0.00 … 14.00 pH	-1000.0 … +1000.0 mV -1800 … +1800 mV
Accuracy	± 0.05 pH	± 2 mV
Calibration	1-, 2- or 3-point calibration (automatically)	1-point calibration (custom)
Standards for automatic recognition	USA: 4.01 / 7.00 / 10.01 pH NIST: 4.01 / 6.86 / 9.18 pH	-
Temperature: Range / Resolution	0,0 … 60,0 °C / 32,0 … 140 °F	
Temperature: Accuracy	± 1 °C / ± 1,8 °F	
Auto-off	8 minutes non-use	20 minutes non-use
Temperature compensation	automatically	-
Battery life	> 350 hours (backlight OFF)	
Display	22 x 22 mm LCD, with backlight	
Memory	25 data sets with time and date	
Data-Hold-Function	Yes	
Operating conditions	0 … 60 °C / 0 … 80 % rel. humidity (non condensing)	
Power supply	2 x 1.5 V batteries, AAA	
Dimensions, Weight	205 x 44 x 33 mm, approx. 155 g with batteries	
Conformity	CE	
Order Info		
Instrument and Accessories in plastic box	194800-16	194801-16
Instrument and Accessories in case	194800-30	-
Replacement electrode	194820	194821

The **SD series** comprises a range of compact, easy-to-use, hand-held instruments for the accurate measurement of pH, ORP, Con, TDS or Salt. With robust housing and fully waterproof (IP 67) casing, these testers are the ideal solution for in-situ testing in environmental, industrial or pool & spa applications.

The intuitive scroll-bar functionality and backlit display enable the easy measurement and simultaneous display of Result, Temperature, Date/Time and other Parameters.

With 25 sets of data storage, each with date and time stamp, the units also enable the easy recalling of data for record keeping requirements.

Designed and manufactured according to Lovibond® quality standards, the instruments are equipped with replaceable electrodes to ensure long-life functionality in the field.

Delivery Content

- Meter in a robust plastic case
- 2 x 1.5 V Batteries, AAA
- Lanyard
- Instruction manual
- pH 4.01; 7.00 and 10.01 Buffer tablets 3 x 10 St. (SD 50 pH only)
- pH 4.01 and 7.00 Calibration buffer and 2 x 100 ml measuring cup (SD 50 pH in case only)

Conversion table

1 mS/cm	=	1000 µS/cm
1 ppt	=	1000 ppm
1 ppt	=	0,1 %
1 ppt	≈	1 g/l
1 ppm	≈	1 mg/l
ppt	-	Parts per thousand
ppm	-	Parts per million



SD 50in case, Code: 194830-16



SD 70 Con	SD 80 TDS	SD 90 Salt/Salz
0 … 1999 µS/cm 2.00 … 20.00 mS/cm	0 … 1499 ppm 1.50 … 15.00 ppt	0 … 999 ppm 1.00 … 20.00 ppt 0.00 … 2.00 %
± 3 % range		
1- or 2-point calibration (automatically or custom)	1- or 2-point calibration (custom)	
1413 µS/cm and 12.88 mS/cm	-	-
0.0 … 60.0 °C / 32.0 … 140 °F		
± 1 °C / ± 1.8 °F		
8 minutes non-use		
automatically, 2 % / °C		
> 100 hours (backlight OFF)		
22 x 22 mm LCD, with backlight		
25 data sets with time and date		
Yes		
0 … 60 °C / 0 … 80 % rel. humidity (non condensing)		
2 x 1.5 V batteries, AAA		
205 x 44 x 33 mm, approx. 155 g with batteries		
CE		
194802-16	194803-16	194804-16
-	-	-
194822		

Accessories from page 152

Accessories SD Instruments

	Parameter	Article	Description
Electrodes	pH	SD pH electrode type 226	0 … 14 pH, gel/plastic, BNC, low conductivities
	pH	SD pH electrode type 330	0 … 14 pH, gel/plastic, BNC, universal use
	pH	SD pH electrode type 235	0 … 14 pH, gel/glass, BNC, double junction
	pH / T	SD pH electrode type 231	0 … 14 pH, gel/plastic, BNC, intergrated temperature probe
	pH / T	SD 50 pH Replacement electrode	0 … 14 pH, gel/plastic, pocket tester
	T	SD Temperature probe type 150	0 … 60 °C, Pt1000
	T	SD Temperature probe type 300	-70 … 250 °C, Pt1000
	ORP	SD ORP electrode type 240	± 2000 mV, platinum, gel/plastic, BNC
	ORP	SD ORP electrode type 242	± 2000 mV, platinum, gel/plastic, BNC
	ORP/T	SD 60 ORP Replacement electrode	± 1800 mV, platinum, gel/plastic, pocket tester
	Con / TDS / T	SD Conductivity probe type LC 8	< 200 mS/cm, 2-pole graphite, K ≈ 1.0 cm^{-1}
	Salt / T	SD Conductivity probe type LC 9	< 10 % salt 2-pole graphite, K ≈ 1.0 cm^{-1}
	Con / TDS / Salt / Res / T	SD Conductivity probe type LC 10	< 200 µS/cm, 2-pole stainless steel, K ≈ 0.1 cm^{-1}, pure water
	Con / TDS / Salt / Res / T	SD Conductivity probe type LC 12	< 200 mS/cm, 4-pole graphite , K ≈ 0.55 cm^{-1}, universal use
	Con / TDS / Salt / Res / T	SD Conductivity probe type LC 16	< 1000 mS/cm, 4-pole graphite,K ≈ 0.42 cm^{-1}, high conductivities
	Con / T	SD 70 Con Replacement electrode	< 20 mS/cm, 2-pole graphite, K ≈ 1.0 cm^{-1}, pocket tester
	TDS / T	SD 80 TDS Replacement electrode	< 15 ppt, 2-pole graphite, K ≈ 1.0 cm^{-1}, pocket tester
	Salt / T	SD 90 Salt Replacement electrode	< 2 %, 2-pole graphite, K ≈ 1.0 cm^{-1}, pocket tester
	DO / T	SD Oxygen probe type Oxi 150	< 20 mg/l, polearographic Au/Ag, 4 m cable
	DO / T	SD Oxygen probe type Oxi 300	< 70 mg/l, galvanic Pb/Pt, 2 m cable
	DO / T	SD Oxygen probe type Oxi 300	< 70 mg/l, galvanic Pb/Pt, 10 m cable
	DO / T	SD Oxygen probe type Oxi 300	< 70 mg/l, galvanic Pb/Pt, 30 m cable
	DO / T	SD Oxygen probe type Oxi L 400	< 50 mg/l, optical, 1.5 m cable
	DO / T	SD Oxygen probe type Oxi L 400	< 50 mg/l, optical, 3 m cable
	DO / T	SD Oxygen probe type Oxi L 400	< 50 mg/l, optical, 10 m cable
Solutions	pH	Buffer solution pH 4.01 ± 0.01	90 ml, traceable to NIST
	pH	Buffer solution pH 4.01 ± 0.01	1 l, traceable to NIST
	pH	Buffer solution pH 7.01 ± 0.015	90 ml, traceable to NIST
	pH	Buffer solution pH 7.01 ± 0.015	1 l, traceable to NIST
	pH	Buffer solution pH 10.01 ± 0.03	90 ml, traceable to NIST
	pH	Buffer solution pH 10.01 ± 0.03	1 l, traceable to NIST
	pH	Buffer solution Set pH 4 / 7 / 10	each 90 ml, traceable to NIST
	pH	Buffer tablets pH 4.00 ± 0.05	100 pcs.
	pH	Buffer tablets pH 4.00 ± 0.05	250 pcs.
	pH	Buffer tablets pH 7.00 ± 0.05	100 pcs.
	pH	Buffer tablets pH 7.00 ± 0.05	250 pcs.
	pH	Buffer tablets pH 10.00 ± 0.05	100 pcs.
	pH	Buffer tablets pH 10.00 ± 0.05	250 pcs.



SD 50 pH	SD 60 ORP	SD 70 Con	SD 80 TDS	SD 90 Salt	SD 110 pH	SD 110 Con	SD 110 Salt	SD 150	SD 305 pH/ORP	SD 315 Oxi	SD 325 Con	SD 335 Multi	SD 400 Oxi L	Order code
					•			•	•			•		721226
					•			•	•			•		721330
					•			•	•			•		721235BNC
									•			•		721231
•														194820
								•						724420
									•			•		721245
								•	•			•		721240BNC
								•	•			•		721242
	•													194821
						•		•						724400
							•							724430
											•			19805046
											•	•		19805040
											•	•		19805045
		•												194822
			•											194822
				•										194822
								•						724410
										•		•		19805050
										•		•		19805051
										•		•		19805052
													•	740060
													•	740070
													•	740080
•					•			•	•			•		721247
•					•			•	•			•		721252
•					•			•	•			•		721248
•					•			•	•			•		721254
•					•			•	•			•		721249
•					•			•	•			•		721256
•					•			•	•			•		721250
•					•			•	•			•		515620BT
•					•			•	•			•		515621BT
•					•			•	•			•		515610BT
•					•			•	•			•		515611BT
•					•			•	•			•		515600BT
•					•			•	•			•		515601BT

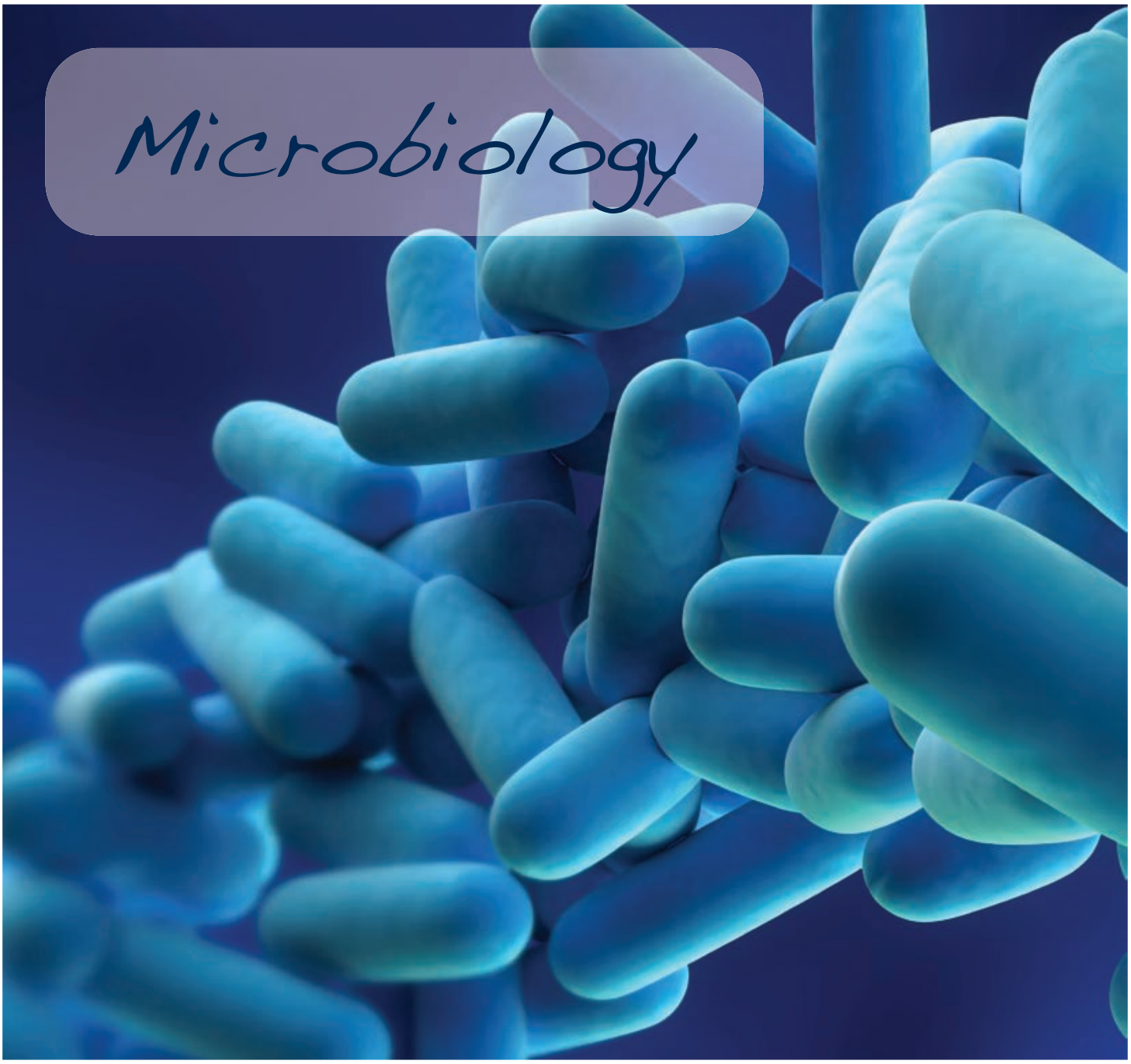
Accessories SD Instruments

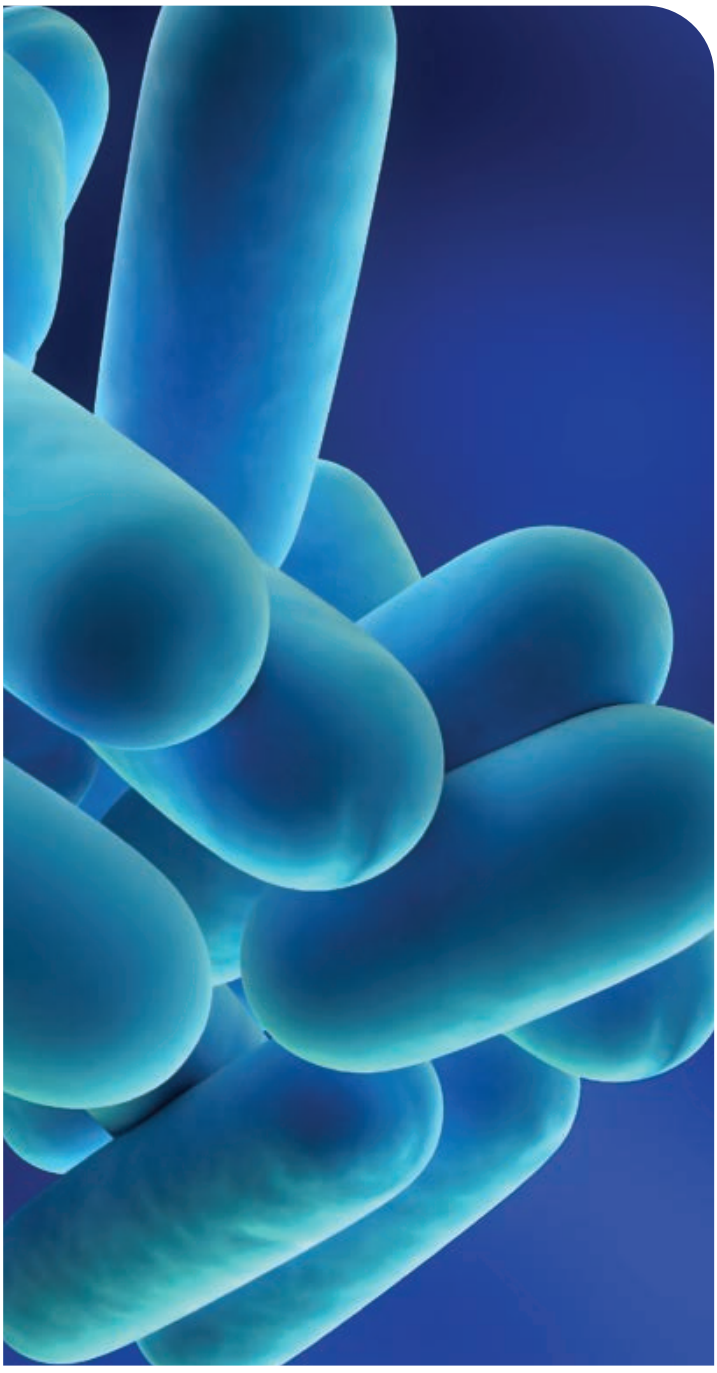
	Parameter	Article	Description
Solutions	pH / ORP	Storage solution for pH/ORP electrodes	25 ml
	pH / ORP	Storage solution for pH/ORP electrodes	100 ml
	ORP	Redox/ORP Standard solution 470 mV	100 ml
	Con	Conductivity solution 1413 µS/cm	500 ml, traceable to NIST
	Con	Conductivity solution 1413 µS/cm	90 ml, traceable to NIST
	Con	Conductivity solution 12.89 mS/cm	90 ml, traceable to NIST
	Con / TDS	Conductivity solution 1413 µS/cm TDS 988 ppm	100 ml
	Con / TDS	Conductivity solution 12.89 mS/cm TDS 9.02 ppth	100 ml
	Salt	0.5 % NaCl Solution (5 g/l)	100 ml
	Salt	0.1 % NaCl Solution (1 g/l)	100 ml
	DO	Electrolyte for oxygen probe SD 150	ca. 30 ml
	DO	Electrolyte for oxygen probe SD 300	100 ml
Miscellaneous	DO	Spare membrane oxygen probe type Oxi 150	1 pc.
	DO	Service-Set oxygen probe type Oxi 300	100 ml electrolyte and 3 spare membranes
	DO	Maintenance kit oxygen probe type Oxi L 400	membrane cap and micro SD-card incl. software + calibration data
	DO	Calibration bottle type Oxi 300	1 pc.
	DO	Storage/Calibration bottle type Oxi L 400	1 pc.
	DO	Data transfer Kit SD 400 Oxi L	USB-cable and universal power adapter
	DO	Protction cap oxygen probe type Oxi 310, PVC	1 pc.
	DO	Protction cap oxygen probe type Oxi 310, brass	1 pc.
	DO	Protction cap oxygen probe type Oxi L 400, steel	1 pc.
	Con	Flow-cell for conductivity probe LC 10	1 pc., Shaft diameter ø12 mm, hose connection ø 6 mm
		Power supply SD 150	1 pc.
		USB-cable SD 305 - 325	for data transfer and power supply
		GSOFT 3050 Data logger software SD 300 - 320	for Windows
		Electrode holder SD 305 series	1 pc.
		Block battery, 9 V	1 pc.
		AA batteries, 1.5 V	4 pcs.
		AAA batteries, 1.5 V	4 pcs.
		AAA-NiMH-batteries, 1.2 V	3 pc.
		Plastic beaker, 100 ml	1 pc.
		Cleaning cloth	1 pc.
		Deionised water (DI)	100 ml

pH = potentia Hydrogenii
ORP = Redox potential
T = Temperature
Con = Conductivity
Salt = Salinity
TDS = Ttotal dissolved solids
Res = Resistivity
DO = Dissolved Oxygen

SD 50 pH	SD 60 ORP	SD 70 Con	SD 80 TDS	SD 90 Salt	SD 110 pH	SD 110 Con	SD 110 Salt	SD 150	SD 305 pH/ORP	SD 315 Oxi	SD 325 Con	SD 335 Multi	SD 400 Oxi L	Order code
•	•				•			•	•			•		726402 new!
•	•				•			•	•			•		726404 new!
	•							•	•			•		195070
		•	•			•		•			•	•		722250
		•	•			•		•			•	•		726654 new!
		•	•			•		•			•	•		726684 new!
		•	•			•		•			•	•		467642
		•	•			•		•			•	•		467643
				•										467621
				•										467631
								•						724420
									•		•			19801130
								•						724460
									•					724670
													•	740100
									•		•			19805057 new!
													•	740120
													•	740090
									•		•			19805055
									•		•			19805056
													•	740110
										•	•			19805047 new!
								•						724540
									•	•	•			724620
									•	•	•			724625
									•	•	•	•		19805182 new!
					•	•	•							1950012
								•					•	1950025
•	•	•	•	•					•	•	•			1950026
												•		1950027
•	•	•	•	•	•	•	•	•	•	•	•	•	•	384801
•	•	•	•	•	•	•	•	•	•	•	•	•	•	197635
•	•	•	•	•	•	•	•	•	•	•	•	•	•	461275




Microbiology





Dipslides
Page 158



DI 10 Incubator
Page 158



Dipslide App
Coliform Test Kit
Page 159



Legionella Test Kits
Page 160

Dipslides



Determine aerobic and anaerobic bacteria levels.

- Early indication of bacteria
- Proliferation results in 48 hours
- Inexpensive
- Easy-to-Use
- Excellent for trend analysis

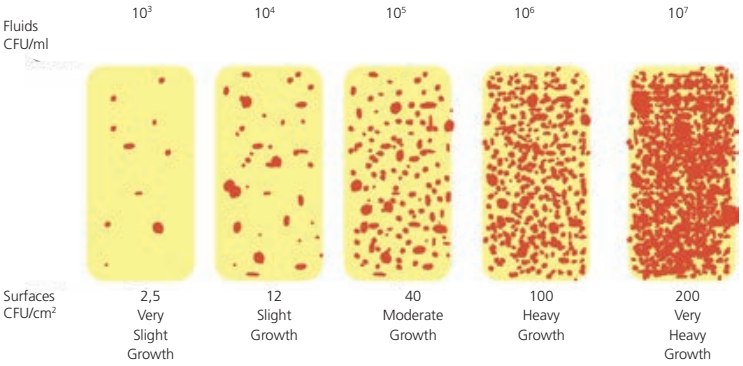
Guidelines to advise on the correct practices to control germs in water systems exist worldwide. Suppressing bacteria levels does substantially reduce the possibility of an outbreak of this often fatal disease. Guidelines recommend introducing a monitoring and control program. This program includes the testing of cooling tower waters with dipslides on a regular basis.

A full range of dipslides is available for semi-quantitative determination of aerobic and anaerobic bacteria populations in industrial and recreational waters. Dipslide accuracy is limited due to the small sample size, but if used correctly and incubated at a constant temperature using the Lovibond® dipslide incubator, they are excellent for trend analysis and can give an early indication of bacteria proliferation.

Dipslides are supplied in a cardboard carton containing 10 slides.

Dipslides have a working shelf life of 6 months.

Results are quantified by comparison to a standard density chart.



Code	Dipslide	Anwendung	Growth
56B010110	D001 TTC/TTC	TVC (Aerobic bacteria)	Red
56B010210	D002 TTC/MALT	TVC/Fungi & Moulds	Red/Green, Black, White: Beige (Yeast)
56B010310	D003 TTC/ROSE	TVC/Fungi & Moulds	Red/Green, Black, White: Beige (Yeast)
56B010410	D004 TTC/MAC	TVC/Coliforms	Red/Red or Yellow
56B010510	D005 TTC/E.COLI	*TVC/ Coliforms & E.coli*	Red/ Red or Yellow (Coliforms) or Blue (*E.coli*) or Cream (*P.aeruginosa*)
56B010610	D006 MAC/PDM	Coliforms/ Pseudomonas	Red/Green (*P.aeruginosa*) or Cream (*P.spp*)
56B010710	D007 TTC/PDM	TVC/ P.aeruginosa	Red/ Green (*P.aeruginosa*) or Cream (*P.spp*)
56B010810	D008 SRB Tube Test	Sulphate Reducing Bacteria	Black Diffusion
56B010910	D009 NRB Tube Test	Nitrite Reducing Bacteria	Pink Diffusion
56B011110	D011 R2A/R2A	Aerobic bacteria	Red

DI 10 Incubator for Dipslides

- Robust design
- Holds up to 12 dipslides
- Excellent temperature stability
- In-car operation
- Programmable incubation period setting

The Lovibond® DI 10 Incubator is designed for the reliable incubation of bacteriological slides, on-site, in a laboratory or even while mobile in a car or van.

National and European guidelines give practical advice on how to monitor, clean, test and ultimately control harmful legionella bacteria in water systems.

Dipslides provide a crucial part in the testing program, but must be used correctly and regularly as part of a planned regime, week on week to be of any meaningful value.

The incubation period and the incubation temperature should be the same each time the test is performed so that bacteria growth is controlled and consistent each time the test is performed. This allows for week by week comparisons to be made and high counts easier to identify. Dipslides are usually incubated at 30˚C for 48 hours, but this can vary depending upon the specific application.

The Lovibond® DI 10 Incubator, when used in conjunction with dipslides, enables effective microbiological monitoring of cooling water in accordance with the many European guidelines.

Order code 56B000701





Lovibond® Dipslide Comparator App

This easy-to-use app offers a choice of different media-specific comparison pallets to qualify the results, suitable for the entire range of Lovibond® Dipslides.

The app can also be used to capture and quantify all results of the NRB and SRB dipslides.

Easy to use

The app offers a simple but effective method for taking pictures and evaluating a dipslide. The evaluation is done visually with an adjacent colour media-specific quantification palette that can be easily moved. This allows the operator a direct comparison.

There is the ability to load any number of customer addresses with a drop-down menu for easy access.

Information screens provide solutions to frequently asked questions. Automatically, all entered data is graphically displayed on site basis.

Fast e-mail option

All photographically recorded results are stored for a period of 90 days.

The photo of the "compared" dipslide can be sent to one or more e-mail addresses for archiving.

As a result, the compliance is improved because the dipslide result is retrieved at any time and can be displayed.

The charts of historical results can be viewed and emailed to customers.

The Lovibond® app can be downloaded from Apple and Android™ stores.

After downloading the app, the user must enter the Dipslide batch number to enable use.

GET IT ON Google Play

Download on the App Store

iOS® is a registered trademark of Cisco, Inc. and licensed to Apple, Inc.

Android™ is a trademark of Google Inc.

Coliform / *E.coli* Test Kit

- Simple one step procedure
- Coliforms and *E.coli* in one test
- 100ml sample (regulatory reporting)
- Captures a CFU / 100 ml within 24 h



Coliform and *E.coli* are good indicators of general bacterial contamination and, because they are easy to test for, make ideal indicator bacteria to monitor in water courses, tanks and pipe work. WHO guidelines on potable water quality state that zero Colony Forming Units (CFU) of coliforms and *E.coli* should be present per 100ml of water sample.

The Lovibond® system tests 100ml samples and will indicate the presence of just one CFU/100 ml.

The presence of only one CFU / 100 ml is indicated by a yellowish staining under UV light within 24 h.

Code: **56K009701**

(Further details on this product can be found in our special catalog "Industrial Water")



The **DI 20 incubator** with standard built-in heating and cooling system, is suitable for incubating up to 20 tests.

you will find further information on **page 163**



Lovibond® Legionella Rapid Test Kits

The Lovibond® Legionella Test Kits all contain the fast and accurate test strip, designed to obtain results in 25 mins.

This test is used to detect the presence of Legionella pneumophila serogroup 1 bacteria in water samples from a wide range of sources.

The test operates via a Lateral Flow Immuno-chromatographic Assay (LFICA).

The test strip has an 18 month shelf life from manufacture and is intended for storage at room temperature. 18-22°C (64.4-71.6°F)

The test kits are intended for use as part of an overall water treatment, management and risk reduction approach and, as all testing methods including lab culture testing, should NOT be used as the sole method for assessing risks associated with Legionella bacteria.

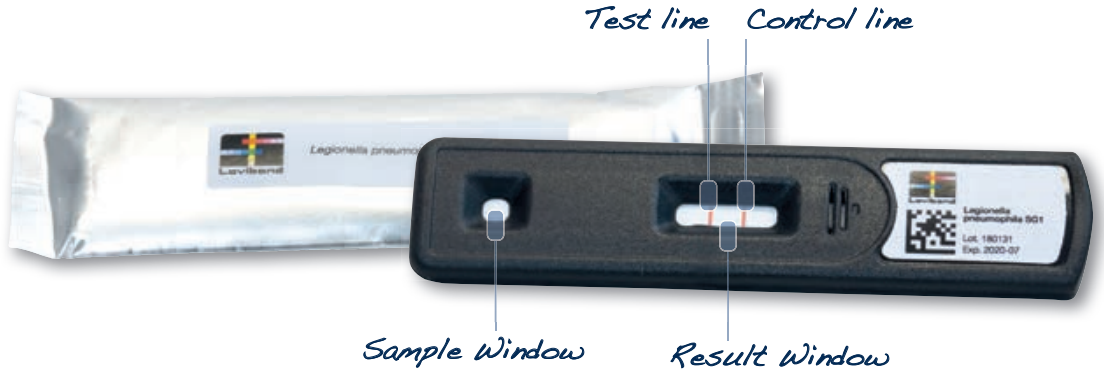
The simple design of the test kit ensure that the test can be used by non technical personnel with little or no training required

Each of the kits have been designed to meet requirements of application and geographical areas.

EU test kits all come with score cards to determine action level:

score of 1 or greater is = ≥ 1000 CFU/l

score of 6 or greater = ≥10,000 CFU/l



Test Kit	Applications	Limit of detection	No of Tests	Code
Field Test Kit	Basic Test, no Filtration	100,000 CFU/l	10	56B006001
Industrial Test Kit	Industrial water	100 CFU/l	5	56B006101
Industrial EU Kit	Industrial water	1000 / 10000 CFU/l	5	56B006106
Industrial Test Kit Refill Pack	Industrial water	100 CFU/l	5	56B006104
Risk Assesment Test Kit	Industrial water	100 CFU/l & 200 CFU/l / Swabbed area	4	56B006501
Risk Assesment EU Test Kit	Industrial water	1000 / 10000 CFU/l & 200 CFU/l / Swabbed area	4	56B006107
Single Syringe Test Kit	Potable Water	100 CFU/l	1	56B006601
Single Syringe EU Test Kit	Potable Water	1000 / 10000 CFU/l	1	56B006105
Swab (Biofilm) Test Kit	Biofilm	200 CFU/l / Swabbed area	5	56B006401
Single Swab Test Kit	Biofilm	200 CFU/l / Swabbed area	1	56B006108


Industrial Legionella Test Kit


Risk assessment Kit


Swab Legionella Test Kit

Applications

- Domestic & industrial hot & cold water systems
- Cooling towers
- Decorative fountains, hot tubs & pools
- Sinks and showers
- Misters, sprinklers, air washers & humidifiers
- Risk assessment

User

- Risk Assessors
- Water Treatment Company
- Facilities Management Company
- Leisure Facility Operator
- Swimming Pool Engineer

Water Safety Kits







Water Safety Kits
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DI 20 Incubator
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Water Safety Kits



Potable Water Test Kits

Clean water is essential for human health and the Tintometer® Group is dedicated to ensure we can deliver technical solutions for testing, wherever they may be needed.

Complete Tintometer® Potable Water Test Kits

The Lovibond® Potable Water Test Kits are designed for both microbiological and physio chemical analysis of some of the most critical parameters to determine the suitability of water for drinking.

Their rugged cases with a compact and lightweight design are lockable, waterproof and simple to use. These kits can be used in the field by non technical personnel quickly and easily and so are perfect for emergency response situations.

All kits come with simple pictoral instructions.

Applications

- Drinking water monitoring
- Drinking water supply
- Emergency Response
- Water purifier

User

- Non Profit Organizations (NGO´s)
- Medical research and development
- Institutes, Universities, Schools
- World Health Organization (WHO)

Analysis	Range	Measuring Instrument	No. of tests	Key Features	Code
Water Safety Kit Basic					56K681250
Chlorine Coliform Conductivity *E.Coli* pH value Turbidity Incubator	0 - 3 mg/l Cl > 1 CFU / 100 ml 0.01- 20.00 mS > 1 CFU / 100 ml 6.2 - 8.2 30 - 300 NTU	Chlorine-pH Tester Plate Count Pocket Tester SD 70 Con Plate Count Chlorine-pH Tester Tube test DI 20	270 200 > 250 250 270	Emergency Response Kit Contains Basic and Simple Tests for Indicative Tests Chemical and Microbiological Analysis in one Kit	
Water Safety Kit Chemical					56K681253
Ammonia Chlorine Conductivity Nitrate pH value Turbidity	0.02 - 1 mg/l N 0 - 4 mg/l Cl 0.01- 20.00 mS 0.08 - 1 mg/l N 0 - 14 0.01-1100 NTU	Photometer MD 600 Photometer MD 600 Pocket Tester SD 70 Con Photometer MD 600 Pocket Tester SD 50 pH Turbidimeter TB 211 IR	250 250 250 250 250 > 250	Chemical Constituent Kit for potable water Contains accurate Indicative Tests	
Water Safety Kit Microbiology		DI 20 Incubator (1 Incubator)			56K681254
Coliform *E.Coli*	>1 CFU / 100 ml >1 CFU / 100 ml	Plate Count Plate Count	200 200	Microbiological testing in a single case Simple pictographic design of DI 20	
Water Safety Kit Microbiology Duo		DI 20 Incubator (2 Incubators)			56K681255
Coliform *E.Coli*	>1 CFU / 100 ml >1 CFU / 100 ml	Plate Count Plate Count	200 200	Microbiological testing in a single case Simple pictographic design of DI 20 Allows simultaneous measurement of thermo tolerant species	

Water Safety Kit Basic

The Lovibond® Basic Potable Water Test Kit is ideal for emergency situations and disaster relief efforts and combines microbiological methods and simple chemical methods of analysis.

The kit can also be used for surveillance and monitoring of water quality at the source, in water storage tanks, in treatment plants, at the consumer level etc.

Its compact design and simplistic tests ensure that the most common tests used for indication of potability are performed rapidly and simply

This test kit incorporates our rapid tester for Chlorine / pH , our pocket conductivity tester, a simple turbidity tube and our DI 20 incubator for testing *E.Coli* and Coliform into one case. This allows the kit to be transported easily and used in areas that are otherwise difficult to test in.

Water Safety Kit Chemical

The Lovibond® Water Safety Kit Chemical combines some of the most popular Tintometer® water analysis products into one case designed for the analysis of chemical constituents that indicate the potability of water and its effective safety for human consumption.

It comprises our MD 600 photometer, TB211 IR turbidity meters and SD 50 AND SD 70 pocket testers.

This kit can be used in conjunction with the Deluxe micrcobiology cases to provide a complete suite of tests for potability of water.

The kit comes with reagents for Chlorine, Ammonia, Nitrite, Nitrate, ph, Conductivity, Turbidity but can be expanded using our reagent packs featured from pages 88 to include any of the tests for the MD 600.

Water Safety Kits Microbiology

The Lovibond® Water Safety Kits Microbiology contains all the equipment necessary to preform the microbiological analysis component for safe drinking water.

The kits can also be used for surveillance and monitoring of water quality at the source, in water storage tanks, in treatment plants, at the consumer level etc.

The kits are available with 1 or 2 DI 20 incubators.

The Water Safety Kit Microbiology Duo allows the simultaneous measurement of *E.Coli* / Coliforms and thermo-tolerant *E.Coli* / Coliforms which require two separate incubation temperatures.

These kits can be used in conjunction with the Water Safety Kit Chemical to complete a superior suite of tests for water potability

This test kit incorporates our new DI 20 incubator, vacuum filtration, re-useable stainless steel micro plates.

DI 20 Incubator



Our new DI 20 incubator has been designed to allow the user to reach global drinking water standards for testing, even in difficult environments.

The DI 20 incubator is a high quality, portable, lightweight incubator for microbiological testing of water using plates. It is the only incubator of its type to come with heating and cooling as standard ensuring the samples are incubated at the correct temperature no matter what ambient conditions.

Its innovative design also includes a small petri dish holder utilising our re-usable stainless steel micro plates, the dishes allow each incubator to perform up to 20 tests.

Its sleek design and intuitive pictographic buttons ensure that it can be used with little or no training and its LED lights allow users to see at a glance how far through a cycle the incubation is, and that the temperature is stable.

Technical Data

Voltage input	12 V DC, 4 Amps
Power leads	UK, EU, USA and Battery
Operating Temperature	5° C - 50° C
Incubation temperature	20° C - 47° C
Temperature resolution	0.1° C
Temperature Accuracy	+/- 0.5° C
Dimensions	116 x 165 x 116 mm
Weight	approx. 600 g
Time to reach temperature	30 min. max

Code: 56B000714
(DI 20, Power leads, 50 Petri dishes, Power Supply)

Accessoires

Code	Item
197139	Petri Dish Holder
400855	Petri Dishes, 10 pc.
19803550	Power Pack
136300	Power Cable Set
190630	USB Cable
192340	Lead Acid Battery
197259	Battery Cable


Pool Analytics





Pooltester
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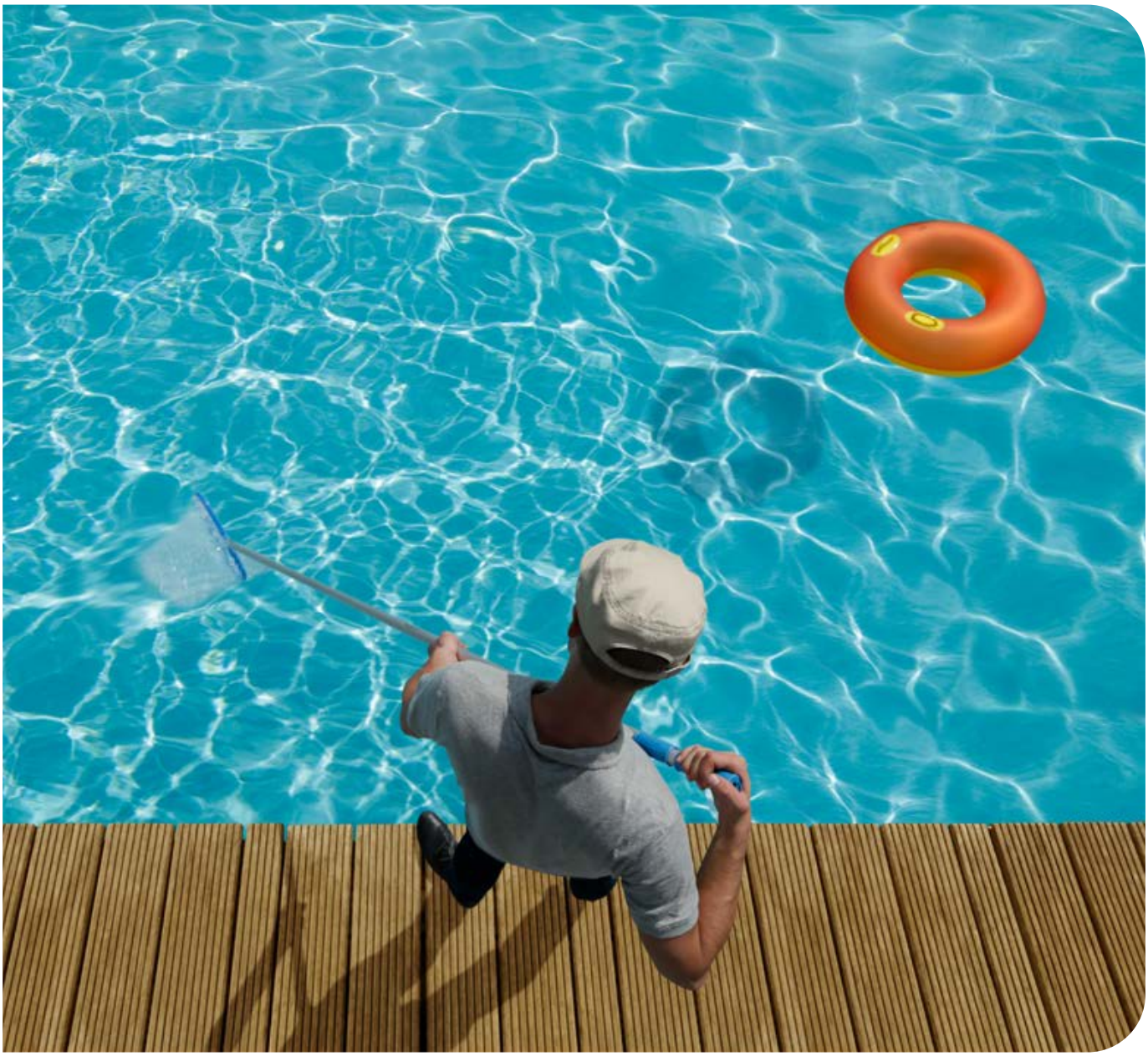


Scuba II
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PM Photometer
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Pooltester





Water Treatment

pH value

The pH value of pool & spa water should generally be between the slightly acidic value of 6.5 and the slightly basic value of 7.6. Due to the use of various water treatment chemicals as well as ambient environmental effects, pool owners have to determine the pH of the water and correct the value as necessary.

Disinfection

Nowadays, pool owners can choose from a range of modern water treatment agents that are often used in combination.

These water treatment chemicals are only effective within a limited pH range. Therefore in addition to checking the concentration of the water treatment chemicals, the owner / operator should also monitor the pH value of pool water and adjust it if necessary.

Rapid Tests

Three-Chamber Tester

The Three-Chamber Tester is a competitively priced unit for the determination of disinfectants and the pH value. Interferences from the colour of the pool water are eliminated by the third, middle chamber.

Pooltester

The Pooltester is designed for the simultaneous determination of the most popular water treatment agents and the pH value.

Multipooltester

Additionally the Multipooltester allows the determination of cyanuric acid, total alkalinity and calcium hardness.



Compact Pool Test Kits

Item	Code
Chlorine-Bromine-pH LR, in mini case [1] Bromine 0.2-6.8 mg/l Chlorine 0.1-3.0 mg/l pH value 6.8 – 8.2	157700
Chlorine-Bromine-pH LR, in blister [2] Bromine 0.2-6.8 mg/l Chlorine 0.1-3.0 mg/l pH value 6.8-8.2	157520
Chlorine-pH HR, in blister [2] Chlorine 0.5-6.0 mg/l pH value 6.8-8.2	158010
Active Oxygen-pH, in blister [2] Acitive Oxygen 0 -10 mg/l pH value 6.8-8.2	157610
Biguanide (PHMB)-pH, in blister [2] Biguanide (PHMB) 10-100 mg/l pH value 6.8-8.2	156150
4 in 1 , in plastic case Chlorine LR 0.1-3.0 mg/l pH value 6.8-8.2 Cyanuric acid 20-200 mg/l Alkalinity-m 50-300 mg/l	151700

[1] Packaging unit 10 pcs.

[2] Packaging unit 6 pcs.

Delivery content

- Three-Chamber-Tester in a bubble pack or mini case
- Tablet reagents
- Instruction manual



POOLTESTER

Item	Code
Chlorine-pH LR [4] Chlorine 0.1-3.0 mg/l pH value 6.8-8.2	151600
Chlorine-pH HR [4] Chlorine 0.5-6.0 mg/l pH value 6.8-8.2	151601
Bromine-pH [4] Bromine 1.0-8.0 mg/l pH value 6.8-8.2	151604
Active Oxygen-pH [4] O_2 0-10 mg/l pH value 6.8-8.2	151605
Copper LR/HR-pH [4] Copper LR 0.1-1.0 mg/l & HR 0.5-5.0 mg/l pH value 6.8-8.2	155190
Active Oxygen-Copper-pH [4] O_2 0-10 mg/l Copper 0.1-1.0 mg/l pH value 6.8-8.2	155235
Biguanide (PHMB)-Hydrogen Peroxide (H_2O_2)-pH [4] PHMB 10–100 mg/l H_2O_2 5–50 mg/l pH value 6.8–8.2	156100
Phosphate Test Kit [3] 0-1000 ppb (0-1mg/l PO_4)	157800

[3] Packaging unit 24 pcs.

[4] Packaging unit 6 pc

Delivery content

- Pooltester in a sturdy plastic box
- Tablet reagents for 20 tests
- Instruction manual



Multi Pooltester

Item	Code
5 in 1 Multi-Pooltester [5] Chlorine 0.1 - 3.0 mg/l pH value 6.8 - 8.2 Cyanuric acid 20 - 200 mg/l Alkalinity-m 20 - 800 mg/l Calcium hardness 20 - 800 mg/l	151900

[5] Packaging unit 5 pcs.

Green Chemistry

Delivery content

- 5 in 1 Multi Pooltester
- Pooltester Chlorine - pH LR in a robust plastic case
- Cyanuric acid tube
- Dilution / shaker tube, 100 ml
- Dilution / shaker tube, 30 ml
- Cleaning brush
- Stirring rod
- 20 tablet reagents each DPD No. 1 Rapid, DPD No. 3 Rapid, Phenol Red Rapid
- 10 tablet reagents each CyA-Test, Alk-Test, CAL-Test
- Instruction manual
- Statements (phrases-H and P)

Refill Packs

Item	Code
Chlorine / Bromine/ pH* 30 DPD No.1 / RAPID-tablets and 30 PHENOL RED / RAPID-tablets	515884
Active Oxygen - pH* 30 DPD No.4 / RAPID-tablets and 30 PHENOL RED / RAPID-tablets	515934
Active Oxygen - Copper- pH* 20 DPD No.4 / RAPID-tablets 20 COPPER No.1-tablets and 20 PHENOL RED / RAPID-tablets	515865
PHMB/H_2O_2 - pH 20 PHMB-, 20 H_2O_2-, 20 ACIDIFYING PT- and 20 PHENOL RED / RAPID-tablets	515870
PHMB - pH* 30 PHMB-tablets and 30 PHENOL RED / RAPID-tablets	516155
Copper - pH* 30 COPPER No.1-tablets and 30 PHENOL RED / RAPID-tablet	515778
Combi pack for Three-Chamber-Tester 4 in 1 20 DPD No.1/ RAPID-, 20 PHENOL RED / RAPID-, 20 CyA-TEST- 20 ALK LR-tablets	515935
Combi pack for Multipooltester 5 in 1 20 DPD No.1/ RAPID-, 20 DPD No.3/ RAPID-, 20 PHENOL RED / RAPID-, 20 CyA-TEST- 10 ALK TEST- 10 CAL-TEST-tablets	515980

* Each pack contains 12 units

Reagents

Item	Quantity	Code
Acidifying PT	100 pc. 250 pc.	515490BT 515491BT
ALK LR	100 pc.	516040BT
ALK TEST	100 pc.	515570BT
Bromthymolblue RAPID	100 pc. 250 pc.	511630BT 511631BT
CAL TEST	100 pc.	515580BT
Copper No.1	100 pc. 250 pc.	513550BT 513551BT
Cyanuric Acid (CyA-TEST)	100 pc. 250 pc.	511370BT 511371BT
DPD No.1 / RAPID	100 pc. 250 pc. 500 pc.	511310BT 511311BT 511312BT
DPD No.3 / RAPID	100 pc. 250 pc. 500 pc.	511290BT 511291BT 511292BT
DPD No.4 / RAPID	100 pc. 250 pc. 500 pc.	511570BT 511571BT 511572BT
Hydrogenperoxide HR	100 pc. 250 pc.	515940BT 515941BT
PHENOL RED/RAPID (pH)	100 pc. 250 pc. 500 pc.	511790BT 511791BT 511792BT
PHMB (Biguanide)	100 pc. 250 pc.	515890BT 515891BT

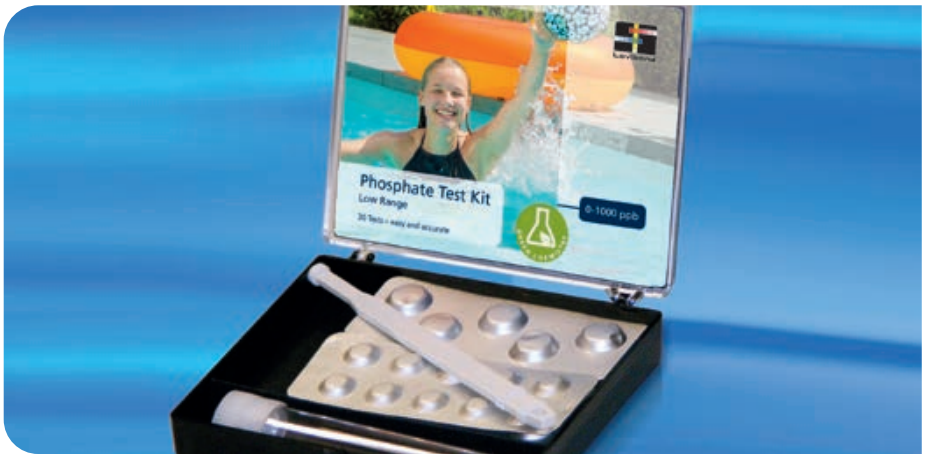
also suitable for seawater

Green Chemistry



Lovibond®-RAPID tablets DPD and PHENOL RED will dissolve quickly, have a guaranteed 10 year shelf-life and are provided in green-printed foil packaging.

Material Safety Data Sheets: **www.lovibond.com**



Scuba II

Electronic Pooltester



Modern, ergonomic design

Watertight housing*

Large display

User-friendly Handling

* as defined in IP 68, 1 hour at 0.1 meter

Scuba II

Every pool owner should check the most important parameters in the pool at regular intervals. This is the only way to ensure that water quality is maintained at the right level and to arrange dosing in an optimum manner.

The Scuba II enables the operator to check the pool water quickly and accurately. The integrated sample chamber is filled by immersing it in the water. A tablet reagent is added and generates a characteristic colour which can be measured using the photometric principle. The result is then displayed on the screen.

Six parameters, **free chlorine**, **total chlorine**, **pH**, **alkalinity**, **cyanuric acid** and **bromine** are measured within a few minutes. Water analysis becomes a pleasure rather than a chore and more time is left for enjoying the pleasure of the pool.

If the Scuba II falls into the water it will simply float and, of course, it is watertight.

Why not try this compact test equipment – after all, the knowledge that you are safe in a thoroughly hygienic pool is worth it.

Technical Data

Optics	temperature-compensated LED (λ = 530 nm) and photo-sensor
Power supply	2 batteries (AAA), capacity approx. 90 tests
Auto-Off	automatic switch-off approx. 5 minutes after last key press
Display	LCD-display
Dimensions (L x W x H)	145 x 70 x 45 mm
Weight	approx. 165 g (incl. batteries)
Operating conditions	temperature: 5 – 40 °C relative humidity: 30 – 90 %, non-condensing
Approval	CE

Refill pack

Article	**Code**
Refill pack for Scuba II 20 DPD No.1 Photometer tablets 10 DPD No.3 Photometer tablets 10 PHENOL RED Photometer tablets 10 CyA-Test tablets 10 Alka-M-Photometer tablets Packaging unit = 12 packs	525600

Green Chemistry

Determination	Range	Resolution	Accuracy
Chlorine, free	0.1 - 6 mg/l Cl_2	0.1 mg/l	0 - 1 mg/l ± 0.1 mg/l ; 1 - 2 mg/l ± 0.2 mg/l 2 - 3 mg/l ± 0.4 mg/l ; 3 - 6 mg/l ± 0.5 mg/l
Chlorine, total	0.1 - 6 mg/l Cl_2	0.1 mg/l	0 - 1 mg/l ± 0.1 mg/l ; 1 - 2 mg/l ± 0.2 mg/l 2 - 3 mg/l ± 0.4 mg/l ; 3 - 6 mg/l ± 0.5 mg/l
pH-value	6.5 - 8.4 pH	0.1 pH	± 0.2 pH
Cyanuric acid	1 - 160 mg/l	1.0 mg/l	1 - 50 mg/l ± 10 mg/l ; 50 - 160 mg/l ± 20 mg/l
Alkalinity (total)	0 - 300 mg/l $CaCO_3$	1.0 mg/l	± 50 mg/l
Bromine	0.2 - 13.5 mg/l Br_2	0.1 mg/l	0 - 2 mg/l ± 0.2 mg/l 2 - 4 mg/l ± 0.4 mg/l 4 - 7 mg/l ± 0.8 mg/l 7 - 13.5 mg/l ± 1.1 mg/l

Delivery content

- Scuba II in a robust plastic box
- Tablet reagents
  20 DPD No.1 Phenol Red Photometer
  10 DPD No.3
  10 CyA-Test
  10 Alka-M-Photometer
- 2 batteries (AAA)
- Stirring rod
- Instruction manual

Order code: 216100-17

Get the clip!



http://scuba-II.lovibond.com

PM Photometer

All pool parameters in one instrument



The **Bluetooth®** word mark is a registered trademark owned by Bluetooth SIG, Inc. and any use by Lovibond® Tintometer GmbH is under license. IOS® is a registered trademark of Cisco, Inc. and licensed to Apple, Inc. Android™ is a trademark of Google, Inc.

PM 600 / PM 620 / PM 630

The Lovibond® PM 600 series of photometers has simplified the pool water analysis decisively. The PM 600 and PM 620 Photometers meet all requirements of demanding pool operators for a modern water analysis. The series is extended by the PM 630 with **Bluetooth®** data transmission.

The **PM 600** focusses on the main pool parameters required for balanced water including: Alkalinity, Bromine, Chlorine, Cyanuric Acid, Iron, Calcium Hardness, Copper, Sodium Hypochlorite, Ozone and pH-value.

The **PM 620** also has the following detection methods: Aluminium, Ammonia, Biguanides (PHMB), Chlorine dioxide, Total Hardness, Urea, Iodine, Phosphate, Acid capacity $KS_{4.3}$, Oxygen (active), Sulphate und Hydrogen peroxide.

The **PM 630** corresponds to the PM 620. It is additionally equipped with a **Bluetooth®** interface. This allows data to be transferred quickly and easily to a smartphone or tablet.

All instruments have a back-lit display. Operator guidance displays information about the measurement range and reagent type, as well as automatic countdown timers for accurate response times. The internal memory is capable of storing up to 1000 results with date, time and sample ID. These results can be retrieved and transmitted at any time.

Technical Data

Display	Graphic-display
Interfaces	Infrared[1] (PM 600 / PM 620), **Bluetooth®** 4.0 (PM 630), RJ45 socket for Internet updates[1]
Optics	LEDs, interference filters and photo sensor
Wavelength Accuracy	± 1 nm
Photometric Accuracy*	2 % FS (T = 20 °C – 25 °C)
Photometric Resolution	0.005 A
Operation	Acid and solvent resistant, touch-sensitive keypad with audible feedback via integrated beeper
Power Supply	4 batteries (Mignon AA/LR6)
Auto-Off	approx. 20 minutes after last keypress with audible signal
Dimensions	approx. 210 x 95 x 45 mm (unit) approx. 395 x 295 x 106 mm (case)
Weight (unit)	approx. 450 g
Ambient Conditions	5–40 °C at max. 30–90 % rel. humidity (non condensing)
Language Selection	German, English, French, Spanish, Italian, Portuguese, Polish, Indonesian
Memory Capacity	approx. 500 data sets (PM 630) approx. 1000 data sets (PM 600, PM 620)
Approval	CE

[1] optional available: connection cable with integrated electronics (RS 232 / RJ-45 plug)

* tested with standard solutions

Reference Standard Kits

The reference standards are used to check the photometric accuracy and reproducibility of the photometer's chlorine method.

An adjustment of the overall system from photometric meter and reagents is not possible with the reference standard kits. Consider using our ValidCheck Chlorine (see page 83).

The shelf life is two years from the date of manufacture when used and stored properly.

Reference Standard Kit Chlorine 215630
0.2* and 1.0* mg/l
for tablet and VARIO methods [1)]

Reference Standard Kit Chlorine 215635
0.5* and 2.0* mg/l
for tablet methods only

Reference Standard Kit Chlorine 215636
1.0* and 4.0* mg/l
for tablet methods only

Reference Standard Kit pH 215665
7.45* pH

* Approximate figure, actual figure specified in certificate of analysis enclosed

[1)] The standard values mentioned in kit 215630 for the VARIO method are for photometer PM 620 only, because this method is not available on the PM 600

Verification Standard Kit

The verification standards for the photometer PM 600/620/630 are used to check the photometric accuracy and reproducibility of all wavelengths in the instruments. The shelf life of the standards is two years from the date of manufacture when used and stored properly. The measurements are in units of mAbs.

Verification Standard Kit **215680**

Delivery Content

- Instrument in carrying case
- 4 batteries (AA)
- 3 round vials 24 mm ø
- Syringe, brush, stirring rod
- 1 plastic beaker 100 ml
- Reagents for
  Chlorine (free, combined, total)
  pH value
  Calcium Hardness
  Acid capacity $KS_{4.3}$ (Alkalinity-m)
- Instruction Manual
- Certificate of Compliance and Warranty information

PM 600 (13 Parameters, Infrared)
Order code: 214060

PM 620 (34 Parameters, Infrared)
Order code: 214065

PM 630 (34 Parameters, **Bluetooth®**)
Order code: 214070

Green Chemistry

Bluetooth® is a wireless technology subject to regional approval. The use of the PM 630 with **Bluetooth®** is currently only permitted within Europe, the USA, Japan and in Canada. The use of the PM 630 will also be possible in other regions in the future. For current regions and further information, visit: **bluetooth.lovibond.com**
Regions in which the PM 630 with **Bluetooth®** can currently be used (status: 01/2019): within Europe (according R&TTE Directive 1999/5/EC) ; USA (according to FCC part 15, comprised in FCC ID QOQBLE113) ; Canada (comprised in IC 5123A-BGTBLE113), Japan (includes CAB ID 007-ABO 103)

Data transfer

PM 600 and **PM 620** can transfer data via an optional infrared module (IRIM) to the PC.

Code: 214050

For the **PM 630**, a set of software and **Bluetooth®** dongle is available for data transfer to the PC.

Code: 2444480

Aqua LX® App

The system is further enhanced by the free Lovibond® App, **AquaLX®**, enabling the immediate review, process and evaluation of measured results directly on-site. Data trends can be monitored with easy-to-view graphical displays with set minimum and maximum values.

Furthermore, additional personalized information, like sample takers or place of sampling can be added. Records can be transferred at the touch of a button by email either as a graphic or database record, simplifying the transfer, management and sharing of results.

PoolM8 App

AquaLX® compliments the Langelier Index App, **PoolM8**, which negates the need for complex calculations for Balanced Water. By simply entering the results of the parameters (pH; Total Alkalinity; Calcium Hardness; Total Dissolved Solid; Temperature.), the App automatically determines and displays the results which can then be saved to create a history and, again, shared via email.

GET IT ON Google Play

Download on the App Store

Reagents (Codes), from page 88

Applications of Lovibond® Reagents

Parameter	Reagent	Application
Acid capacity $K_{S4.3}$	ALKA-M-PHOTOMETER	
Acid concentration	ACID CONCENTRATION	
Alkalinity-m	ALKA-M-PHOTOMETER	
Alkalinity-p	ALKA-P-PHOTOMETER	
Aluminium	ALUMINIUM No. 1 ALUMINIUM No. 2	
Aluminium	VARIO Aluminum ECR/F20 VARIO Aluminum Hexamine/F20 VARIO Aluminum Masking Reagent	
Amine	Amine	B
Ammonia vario	VARIO Ammonia Salicylate F10 VARIO Ammonia Cyanurate F10	
Ammonia	AMMONIA No. 1 AMMONIA No. 2 Conditioning powder	
Ammonia LR	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO Am Diluent Reagent LR	
Ammonia HR	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO Am Diluent Reagent HR	
Arsenic (III, V)	Chemicals see manual	
Boron	BORON No. 1 BORON No. 2	
Bromine	DPD 1 Buffer solution DPD 1 Reagent solution	
Bromine	DPD No. 1 DPD No. 1 HIGH CALCIUM	
Cadmium (Cd^{2+})	Spectroquant® 1.14834.0001	
Chlorine	DPD No. 1 RAPID DPD No. 3 RAPID DPD No. 4 RAPID	
Chlorine	DPD No. 1 DPD No. 3 DPD No. 1 HIGH CALCIUM	
Chlorine	DPD 1 Buffer solution DPD 1 Reagent solution DPD 3 Solution	
Chlorine	VARIO Chlorine FREE-DPD/F10 VARIO Chlorine TOTAL-DPD/F10	

= Drinking water / Raw water
= Waste Water
= Seawater
B = Boiler- and Cooling water related
P = Pool Water related
RT = Reagent Test
KT = Tube Test

Parameter	Reagent	Application
Chlorine HR (KI)	ACIDIFYING GP CHLORINE HR (KI)	
Chlorine dioxide	DPD No. 1 DPD No. 3 GLYCINE	
Chlorine dioxide	DPD 1 Buffer solution DPD 1 Reagent solution	
Chloride	CHLORIDE T1 CHLORIDE T2	
Chloride	RT (Chlorid-51 / Chlorid-52)	
Chromium	PERSULF. RGT FOR CR Chromium Hexavalent	
COD LR	Reaction tube 3-150 mg/l	
COD MLR	Reaction tube 15-300 mg/l	
COD MR	Reaction tube 20-1500 mg/l	
COD HR	Reaction tube 200-15000 mg/l	
Colour (Spectral Absorption Coefficient)	---	
Copper	COPPER No. 1 COPPER No. 2	
Copper, free	VARIO Cu 1 F 10	
Cyanide	Reagent test set, consists of: Cyanid-11/ -12 / -13	
Cyanuric acid	CyA-TEST, CyA-HR Test	
DEHA	DEHA Solution DEHA	B
DEHA	VARIO OXYSCAV 1 Rgt VARIO DEHA 2 Rgt Solution	B
Fluoride	SPADNS-Reagent Fluoride-Standard	
Fluoride	Fluoride A-Z Fluoride Excess Al	
Formaldehyde	Spectroquant® 1.14678.0001	
Formaldehyde	Spectroquant® 1.14500.0001	

= Drinking water / Raw water
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P = Pool Water related
RT = Reagent Test
KT = Tube Test

Applications of Lovibond® Reagents

Parameter	Reagent	Application
Hardness, total	HARDCHECK P	
Hardness, total	Hardness Yes/No	
Hardness, total	T Hardness-Test	
Hardness, total	Total Hardness	
Hazen (Pt-Co-Scale; APHA)	---	
Hydrazine	Hydrazine Test Powder Spoon	B
Hydrazine	Vacu-vials® / Chemetrics K-5003	B
Hydrogen peroxide	HYDROGENPEROXIDE LR	P
Iodine	DPD No. 1	
Iron (II, III) soluble	Vario Ferro F10	
Iron (II, III) soluble	IRON LR IRON (II) LR	
Iron	IRON HR	
Iron (TPTZ)	Vario TPTZ F10	
Lead (Pb^{2+})	Spectroquant® 1.09717.0001	
Lead (Pb^{2+})	Spectroquant® 1.14833.0001	
Manganese	MANGANESE LR 1 MANGANESE LR 2	
Manganese	VARIO Ascorbic Acid VARIO Alkaline-Cyanide VARIO PAN Indicator	
Molybdate	MOLYBDATE No. 1 HR MOLYBDATE No. 2 HR	
Nickel	RT (Nickel-51, Nickel-52)	
Nitrate	KT (Nitrat-111)	
Nitrate	VARIO Nitrate Chromotropic VARIO Nitra X Reagent tube VARIO Deionised water	
Nitrate	NITRITE LR Nitrate Test Tablets Nitrate Test Powder	
Nitrite	KT (Nitrit-101)	
Nitrite	NITRITE LR	

= Drinking water / Raw water
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= Seawater
B = Boiler- and Cooling water related
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RT = Reagent Test
KT = Tube Test

Parameter	Reagent	Application
Nitrite	Nitrite No.1 Nitrite No.2	
Nitrogen, total	KT (Reagent for digestion, Reagent for compensation, Nitrat-111)	
Nitrogen, total LR	VARIO TN HYDROX. LR tubes VARIO PERSULFATE Reagent VARIO TN Reagent A VARIO TN Reagent B VARIO TN ACID LR/HR tubes VARIO Deionised water	
Nitrogen, total HR	VARIO TN HYDROX HR tubes VARIO PERSULFATE Reagent VARIO TN Reagent A VARIO TN Reagent B VARIO TN ACID LR/HR tubes VARIO Deionised water	
Oxygen, active	DPD No. 4	P
Oxygen, active	INDIGO CARMINE	
Oxygen, dissolved	Vacu-vials® / Chemetrics K-7553	
Ozone	DPD No. 1 DPD No. 3 GLYCINE	
Ozone	Ozone	
Phenols	Phenole No. 1 Phenole No. 2	P
PHMB (Biguanide)	PHMB PHOTOMETER	P
Phosphate-Organo	ORGANO-PHOSPHONATE No.1 ORGANO-PHOSPHONATE No.2	B
Phosphate HR	PHOSPHATE HR	
Phosphate-total* (PMB)	KT (Phosphate-101, Phosphate-102, Phosphate-103)	
Phosphate-total* (PMB)	KT (Phosphate-101, Phosphate-102, Phosphate-103)	
Phosphate-ortho (VM)	KT	
Phosphate LR, ortho	PHOSPHATE LR No. 1 PHOSPHATE LR No. 2	
Phosphate HR, ortho	PHOSPHATE HR No. 1 PHOSPHATE HR No. 2	
Phosphate, ortho	VARIO Phos 3 F10	

= Drinking water / Raw water
= Waste Water
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P = Pool Water related
RT = Reagent Test
KT = Tube Test

Applications of Lovibond® Reagents

Parameter	Reagent	Application
Phosphate, ortho	VARIO Dilution Vial VARIO Phos 3 F10 VARIO VE-Wasser	
Phosphate-total*	VARIO Acid Reagent Vial VARIO Phos 3 F10 VARIO Potassium Persulfate VARIO Sodium hydroxide 1,54 N VARIO Deionised water	
Phosphate, acid hydrolyzable	Content see: Phosphate, total, set, additional: VARIO Sodium hydroxide 1,00 N	
pH value	BROMOCRESOLPURPLE/PHOTOMETER	
pH value	PHENOLRED / PHOTOMETER	
pH value	PHENOLRED RAPID	
pH value	PHENOLRED Solution	
pH value	THYMOLBLUE/PHOTOMETER	
pH value	BROMTHYMOLBLUE	
pH value	METHYL RED	
pH value	CRESOL RED	
pH value	BROMOPHENOL BLUE	
pH value	BROMOCRESOL GREEN	
pH value	M-CRESOLPURPLE	
pH value	UNIVERSAL PH	
Potassium	POTASSIUM T	
QAC	QAC Test	
QAC LR	QAC LR	
QAC HR	QAC HR	
Silica	SILICA No. 1 SILICA No.2 SILICA PR	
Silica	VARIO LR Amino Acid F F10 VARIO Citric Acid F10 VARIO Molybdate 3 Rgt-Solution	B
Silica	VARIO Silica HR Acid Rgt F10 VARIO Silica Citric Acid F10 VARIO Silica Molybdate F10	

= Drinking water / Raw water
= Waste Water
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B = Boiler- and Cooling water related
P = Pool Water related
RT = Reagent Test
KT = Tube Test

*included determination of total phosphorous need to be modified to be used in sea water

Parameter	Reagent	Application
Sulphate	SULFATE T	
Sulphate	VARIO Sulpha 4 / F10	
Sulphate	SULFATE No.1 SULFATE No.2	
Sulphide	SULFIDE No. 1 SULFIDE No. 2	
Sulphite	SULFITE LR	
Sulphite	SULFITE No.1 SULFITE No.2 HR SULFITE No.2 LR	B
Surfactants (anionic)	Spectroquant® 1.14697.0001	
Tannin	TANNIN No.1 TANNIN No.2	B
TOC	Spectroquant® 1.14879.0001	
Turbidity	---	
Urea	UREA-Reagent 1 UREA-Reagent 2 AMMONIA No. 1 AMMONIA No. 2	P
Zinc	COPPER / ZINC LR EDTA DECHLOR	

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RT = Reagent Test
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