

Reagents

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

Our test tablets are manufactured in Germany under tightly controlled conditions on most modern machinery.

Maintaining the highest quality standards permits Tintometer to guarantee our tablet reagents for a minimum of 5 years, and some for as long as 10 years.

We can make this promise because each tablet is hermetically sealed within an individual aluminium foil pocket, protecting against challenging environmental conditions. This packaging keeps each tablet in perfect condition, right up until the time it is needed by the user.

Test tablets remain the most consistent and reliable reagent format available, consistently outperforming other reagent formats, and delivering maximum accuracy for the user.

The aluminium foil blister packaging brings added convenience to the tradition of protection achieved in the Lovibond® long established tablet production technology.

With the blister strip, the user just pushes the tablet through the protective foil, straight into the sample. Simple, time-saving and practical.

This type of packaging, long established in pharmaceutical applications, combines all the advantages of protective foil, with convenience for the user.

There are no safety risks if the tablets are used in line with the instructions supplied. Safety data sheets are available for all reagents.

Specifications and Certificate of Analysis

To express the high quality standard of Lovibond® tablet reagents, specifications for each type of tablet as well as a "Certificate of Analysis" for each lot is available in the down-load area at www.lovibond.com.

Tube tests

Lovibond® tube tests enable the user to easily perform highly sensitive and precise water testing.

When using tube tests measurement is considerably faster and easier, particularly in the case of standard and serial tests.

The tube tests contain a precisely measured amount of reagent, thereby avoiding the presence of superfluous chemicals and optimising test safety. Up to six different measuring ranges are available for the various tests.

The tubes are made of special optical glass with a 16 mm in diameter. They are supplied in a storage and dispatch box together with the digestion or auxiliary reagents. This packaging unit contains 24 or 25 reaction vials and up to 2 zero vials for photometer system calibration.



Liquid reagents

As a rule, liquid reagents do not consist of a single preparation but comprise several components that need to be added to the sample in a certain order. As both the size and the number of drops have a decisive effect on the resultant colour complex, the reagents need to be added with a high degree of precision.

The shelf life of liquid reagents is reduced by temporary contact with oxygen in the air when the bottle is opened as well as by unsuitable storage environments (presence of sunlight or high temperatures). Provided that the bottles are stored within the temperature range +6°C to +10°C, the Lovibond® DPD and Phenol Red solutions can be used for a period of two years from the production date.

VARIO Powder Packs

The fast and easy use of VARIO Powder Packs has made them extremely popular for water testing applications in many countries throughout the world.

The Lovibond® Powder Pack programme provides users with a real alternative to existing measurement systems.

The Vario Powder Packs are produced to the same high quality standards that have made Tintometer's tablet reagents so successful for several decades.

Parameters from aluminium and chlorine through to sulphate are just some of the well-known tests that are included in the VARIO Powder Pack range.

Their chemical properties make them compatible to Hach® devices.*

➔ Detailed information see pages 100 - 107



Membrane filter set

For use when preparing samples for photometric measurements

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: 36 61 50
(covers 25 x 0.45 µm membrane filters and two 20 ml syringes)



* 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 devices or systems.

Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 500, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Alkalinity-M	5 - 200 mg/l	610	610	610	610	610	610	615	Acid/Indicator ^{1, 2, 5}	24 mm \emptyset
Alkalinity-M HR	5 - 500 mg/l	-	-	610	610	610	610	615	Acid/Indicator ^{1, 2, 5}	24 mm \emptyset
Alkalinity-P	5 - 300 mg/l	-	-	560	560	-	-	551	Acid/Indicator ^{1, 2, 5}	24 mm \emptyset
Aluminium VARIO	0.01 - 0.25 mg/l	530	-	530	530	530	-	535	Eriochrome cyanine R ²	24 mm \emptyset
Aluminium	0.01 - 0.3 mg/l	530	-	530	530	530	-	535	Eriochrome cyanine R ²	24 mm \emptyset
Ammonia	0.02 - 1 mg/l	610	-	610	610	610	-	676	Indophenole blue ^{2, 3}	24 mm \emptyset
Ammonia VARIO	0.01 - 0.8 mg/l	660	-	660	660	-	-	655	Salicylate ²	24 mm \emptyset
Ammonia VARIO LR	0.02 - 2.5 mg/l	-	-	660	660	-	-	655	Salicylate ²	16 mm \emptyset
Ammonia VARIO HR	1 - 50 mg/l	-	-	660	660	-	-	655	Salicylate ²	16 mm \emptyset
Arsenic (III, V)	0.02 - 0.6 mg/l	-	-	-	-	-	-	507	Silver diethyldithiocarbamate ¹	20 mm \square

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

For other reagent quantities please see our current price list.

Legend

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®

Display	Reagent	Form of reagent/Quantity	Order code
CaCO ₃	ALKA-M-PHOTOMETER	Tablet / 100	51 32 10 BT
CaCO ₃	ALKA-M-HR-PHOTOMETER	Tablet / 100	51 32 40 BT
CaCO ₃	ALKA-P-PHOTOMETER	Tablet / 100	51 32 30 BT
Al	VARIO Aluminum ECR/F20 VARIO Aluminum Hexamine/F20 VARIO Aluminum ECR Masking Reagent	Powder Pack / 100 Powder Pack / 100 Liquid reagent / 25 ml Set	53 50 00
Al	ALUMINIUM No. 1 ALUMINIUM No. 2 Combi pack# ALUMINIUM No.1 / No.2 Combi pack# ALUMINIUM No.1 / No.2	Tablet / 100 Tablet / 100 each 100 each 250	51 54 60 BT 51 54 70 BT 51 76 01 BT 51 76 02 BT
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	51 25 80 BT 51 25 90 BT 51 76 11 BT 51 76 12 BT 46 01 70
NH ₄ - N	VARIO Ammonia Salicylate F10 VARIO Ammonia Cyanurate F10	Powder Pack / 100 Powder Pack / 100 Set	53 55 00
NH ₄ - N	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO Am Diluent Reagent LR VARIO Deionised Water (for Zero)	Powder Pack / 50 Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml Set (Tube test)	53 56 00
NH ₄ - N	VARIO Ammonia Salicylate F5 VARIO Ammonia Cyanurate F5 VARIO Am Diluent Reagent HR VARIO Deionised Water (for Zero)	Powder Pack / 50 Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml Set (Tube test)	53 56 50
As	for chemicals see manual, reagents at specialized chemistry dealer		

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 19 20 75)

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 CaCO₃

i) high range by dilution

j) Vacu-vials® is a Chemetrics Trademark

including stirring rod

Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Biguanide (see PHMB)										
Boron	0.1 - 2 mg/l	-	-	430	430	-	-	450	Azomethine ³	24 mm \emptyset
Bromine	0.05 - 13 mg/l 0.05 - 1 mg/l 0.1 - 3 mg/l 0.05 - 6.5 mg/l	530 - - -	530 - - -	530 - - -	530 - - -	530 - - -	530 - - -	- 510 510 510	DPD ⁵	24 mm \emptyset 50 mm \square 10 mm \square 24 mm \emptyset
Bromine Powder	0.05 - 4.5 mg/l	-	-	530	530	-	-	-	DPD ^{1,2}	24 mm \emptyset
Cadmium (Cd²⁺)	0.025 - 0.75 mg/l	-	-	-	-	-	-	525	Cadion	16 mm \emptyset
Chloride	0.5 - 25 mg/l 5 - 250 mg/l ¹⁾	530 530	- -	530 -	530 -	- -	- -	450 -	Silver nitrate/turbidity	24 mm \emptyset
Chloride	5 - 60 mg/l	-	-	-	-	-	-	455	Iron (III)-thiocyanate ⁴	24 mm \emptyset
Chloride	0.5 - 20 mg/l	430	-	430	-	-	-	-	Mercury thiocyanate / Iron nitrate	24 mm \emptyset
Chlorine ^{a)}	0.01 - 6 mg/l 0.02 - 0.5 mg/l 0.1 - 6 mg/l 0.02 - 3 mg/l	530 - - -	530 - - -	530 - - -	530 - - -	530 - - -	530 - - -	- 510 510 510	DPD ^{1,2}	24 mm \emptyset 50 mm \square 10 mm \square 24 mm \emptyset
Chlorine HR (DPD) ^{a)}	0.1 - 10 mg/l	530	530	530	530	530	530	510	DPD ^{1,2}	24 mm \emptyset

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Legend

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Display	Reagent	Form of reagent/Quantity	Order code
B	BORON No. 1 BORON No. 2 Combi pack# BORON No.1 / No.2 Combi pack# BORON No.1 / No.2	Tablet / 100 Tablet / 100 each 100 each 200	51 57 90 51 58 00BT 51 76 81BT 51 76 82BT
Br	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)} DPD Nitrite GLYCINE ^{f)} Combi pack# DPD No.1 / GLYCINE Combi pack# DPD No.1 / GLYCINE	Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 250 Tablet / 100 each 100 each 250	51 10 50 BT 51 10 80 BT 51 77 11 BT 51 77 12 BT 51 57 40 BT 51 57 30 BT 51 77 81 BT 51 77 82 BT 50 26 91 51 21 70 BT 51 77 31 BT 51 77 32 BT
Br	Chlorine TOTAL-DPD/F10	Powder Pack / 100	53 01 20
Cd	Spectroquant® 1.14834.0001 ^{d)}	Tube test / 25	42 07 50
Cl	CHLORIDE T1 CHLORIDE T2 Combi pack# CHLORIDE T1 / T2 Combi pack# CHLORIDE T1 / T2	Tablet / 100 Tablet / 100 each 100 each 250	51 59 10 BT 51 59 20 BT 51 77 41 BT 51 77 42 BT
Cl	Chlorid-51 / Chlorid-52	Reagent test (Liquid reagent) approx. 50-75 Tests	2 41 90 31
Cl ⁻	KS251 (Chloride Reagent A) KS253 (Chloride Reagent B)	Liquid reagent / 65 ml Liquid reagent / 65 ml Set	56L025165 56L025365 56R018490
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	51 10 50 BT 51 10 80 BT 51 77 11 BT 51 77 12 BT 51 57 40 BT 51 57 30 BT 51 77 81 BT 51 77 82 BT
Cl ₂	DPD No. 1 HR DPD No. 3 HR	Tablet / 100 Tablet / 100	51 15 00 BT 51 15 90 BT

^{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 19 20 75)

^{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 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 CaCO₃

ⁱ⁾ high range by dilution

^{j)} Vacu-vials® is a Chemetrics Trademark

including stirring rod

Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Chlorine ^{a)}	0.02 - 4 mg/l 0.02 - 3 mg/l	530 -	530 -	530 -	530 -	530 -	- -	- 510	DPD ^{1,2}	24 mm \emptyset 24 mm \emptyset
Chlorine Powder MR	0,02 - 3,5 mg/l	530	-	530	530	-	-	510	DPD ^{1,2}	24 mm \emptyset
Chlorine Powder ^{a)}	0.02 - 2 mg/l 0.1 - 8 mg/l	530 530	- -	530 530	530 -	530 530	- -	510 -	DPD ^{1,2}	24 mm \emptyset 24 mm \emptyset multy vial
Chlorine HR (KI)	5 - 200 mg/l	530	-	530	530	-	-	470	KI / Acid ⁵	16 mm \emptyset
Chlorine dioxide	0.02 - 11 mg/l 0.05 - 1 mg/l 0.05 - 2.5 mg/l	530 - -	530 - -	530 - -	530 - -	530 - -	- - -	- 510 510	DPD/Glycine ^{1,2}	24 mm \emptyset 50 mm \square 24 mm \emptyset
Chlorine dioxide Powder	0.04 - 3.8 mg/l	530	-	530	530	-	-	-	DPD ^{1,2}	24 mm \emptyset
Chromium (III, VI) ^{b)}	0.005 - 0.5 mg/l 0.02 - 2 mg/l	- -	- -	- 530	- 530	- -	- -	542 542	1,5-Diphenylcarbozide ^{1,2}	50 mm \square 16 mm \emptyset
COD LR (ISO 15705:2002) ^{b)}	0 - 150 mg/l	430	430	430	430	-	-	420	Dichromate / H ₂ SO ₄ ^{1,2}	16 mm \emptyset
COD MR (ISO 15705:2002) ^{b)}	0 - 1500 mg/l	610	610	610	610	-	-	620	Dichromate / H ₂ SO ₄ ^{1,2}	16 mm \emptyset
COD HR ^{b)}	0 - 15000 mg/l	610	610	610	610	-	-	620	Dichromate / H ₂ SO ₄ ^{1,2}	16 mm \emptyset
Copper ^{a)}	0.05 - 5 mg/l 0.05 - 1 mg/l 0.3 - 5 mg/l 0.5 - 5 mg/l	560 - 530 -	560 - - -	560 - - -	560 - - -	560 - - -	560 - - -	- 559 - 559	Biquinoline ⁴	24 mm \emptyset 50 mm \emptyset 24 mm \emptyset 24 mm \emptyset

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Display	Reagent	Form of reagent/Quantity	Order code
Cl ₂	DPD 1 Buffer solution DPD 1 Reagent solution DPD 3 Solution	Liquid reagent / 15 ml	47 10 10
		Liquid reagent / 15 ml	47 10 20
		Liquid reagent / 15 ml	47 10 30
		Set	47 10 56
Cl ₂	VARIO Chlorine FREE-DPD/F10 VARIO Chlorine TOTAL-DPD/F10	Powder Pack / 100	53 01 80
		Powder Pack / 100	53 01 90
Cl ₂	VARIO Chlorine FREE-DPD/F10 VARIO Chlorine TOTAL-DPD/F10	Powder Pack / 100	53 01 00
		Powder Pack / 100	53 01 20
Cl ₂	ACIDIFYING GP CHLORINE HR (KI) Combi pack# CHLORINE HR (KI)/ACIDIFYING GP Combi pack# CHLORINE HR (KI)/ACIDIFYING GP	Tablet / 100	51 54 80 BT
		Tablet / 100	51 30 00 BT
		each 100	51 77 21 BT
		each 250	51 77 22 BT
ClO ₂	DPD No. 1 DPD No. 3 Combi pack# DPD No.1 / No.3 Combi pack# DPD No.1 / No.3 GLYCINE ^{f)} Combi pack# DPD No.1 / GLYCINE Combi pack# DPD No.1 / GLYCINE 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	51 10 50 BT
		Tablet / 100	51 10 80 BT
		each 100	51 77 11 BT
		each 250	51 77 12 BT
		Tablet / 100	51 21 70 BT
		each 100	51 77 31 BT
		each 250	51 77 32 BT
		Tablet / 100	51 57 40 BT
		Tablet / 100	51 57 30 BT
		each 100	51 77 81 BT
		each 250	51 77 82 BT
ClO ₂	Chlorine FREE-DPD/F10 GLYCINE ^{f)}	Powder Pack / 100	53 01 00
		Tablet / 100	51 21 70 BT
Cr	PERSULF. RTG FOR CR Chromium Hexavalent	Powder Pack / 100	53 73 00
		Powder Pack /100	53 73 10
O ₂	Reaction tube 0-150 mg/l Reaction tube 0-150 mg/l, mercury free* *without chloride removal	Tube test / 25	2 42 07 20
		Tube test / 25	2 42 07 10
O ₂	Reaction tube 0-1500 mg/l Reaction tube 0-1500 mg/l, mercury free* *without chloride removal	Tube test / 25	2 42 07 21
		Tube test / 25	2 42 07 11
O ₂	Reaction tube 0-15000 mg/l Reaction tube 0-15000 mg/l, mercury free* *without chloride removal	Tube test / 25	2 42 07 22
		Tube test / 25	2 42 07 12
Cu	COPPER No. 1 COPPER No. 2 Combi pack# COPPER No.1 / No.2 Combi pack# COPPER No.1 / No.2	Tablet / 100	51 35 50 BT
		Tablet / 100	51 35 60 BT
		each 100	51 76 91 BT
		each 250	51 76 92 BT

^{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)

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^{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

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^{g)} Reagent recovers most insoluble iron oxides without digestion

^{h)} additionally required for samples with hardness values above 300 mg/l CaCO₃

ⁱ⁾ high range by dilution

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Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Copper ^{a)}	0.05 - 4 mg/l	-	-	560	-	-	-	-	Bicinchoninate	24 mm \emptyset
Copper, free VARIO	0.05 - 5 mg/l	560	-	560	560	560	-	560	Bicinchoninate	24 mm \emptyset
Cyanide	0.01 - 0.5 mg/l 0.005 - 0.2 mg/l	-	-	580	580	-	-	585 585	Pyridine-barbituric acid ¹	24 mm \emptyset 50 mm \square
Cyanuric acid	0 - 160 mg/l	530	530	530	530	530	530	530	Melamine	24 mm \emptyset
DEHA	20 - 500 μ g/l	-	-	560	560	-	-	562	PPST ³	24 mm \emptyset
DEHA VARIO	20 - 500 μ g/l	560	-	560	560	-	-	562	PPST ³	24 mm \emptyset
Fluoresceine (only MD 640)	10 - 400 ppb			> 395					Fluorescence	24 mm \emptyset
Fluoride	0.05 - 2 mg/l 0.05 - 1.5 mg/l	580 -	- -	580 -	580 -	- -	- -	- 580	SPADNS ²	24 mm \emptyset
Formaldehyde	1 - 5 mg/l 0.02 - 1 mg/l	- -	- -	- -	- -	- -	- -	585 585	H ₂ SO ₄ / Chromotropic acid	10 mm \square 50 mm \square
Formaldehyde	0.1 - 5 mg/l	-	-	-	-	-	-	575	H ₂ SO ₄ / Chromotropic acid	16 mm \emptyset
Hardness, calcium	50 - 900 mg/l	-	-	560	560	-	-	-	Murexide ⁴	24 mm \emptyset
Hardness, calcium	0 - 500 mg/l	560	560	560	560	560	560	-	Murexide ⁴	24 mm \emptyset
Hardness, total	2 - 50 mg/l 20 - 500 mg/l ⁵⁾	560 560	- -	560 560	560 560	560 560	- -	571 571	Metallphthalein ³	24 mm \emptyset
Hazen (Pt-Co-units ; APHA)	0 - 500 mg/l 0 - 500 mg/l	430 -	- -	430 -	430 -	- -	- -	- 455	Direct reading ^{1,2}	24 mm \emptyset 50 mm \square

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Display	Reagent	Form of reagent/Quantity	Order code
Cu	KS240 (Coppercol Reagent 1) KS241 (Coppercol Reagent 2) KS242 (Coppercol Reagent 3) COPPER No.2	Liquid reagent / 30 ml Liquid reagent / 30 ml Powder / 10 g Tablet / 100 Set	56L024030 56L024130 56L024210 51 35 60 BT 56R023355
Cu	Vario Cu 1 F10	Powder Pack / 100	53 03 00
CN	Cyanid-11 / Cyanid-12 / Cyanid-13	Reagent test (Powder, Liquid reagent) / 200 Tests	2 41 88 75
Cys	CyA-TEST	Tablet / 100	51 13 70 BT
DEHA	DEHA Solution DEHA	Liquid reagent / 100 ml Tablet / 100	46 11 81 51 32 20 BT
DEHA	VARIO OXYSCAV 1 RGT VARIO DEHA 2 RGT	Powder Pack / 200 Solution / 100 ml Set	53 60 00
Fluoresceine	no reagents required		
F	SPADNS Reagent Fluoride Standard Reagent solution and standard required	Liquid reagent / 250 ml Liquid reagent / 500 ml Solution / 30 ml	46 74 81 46 74 82 20 56 30
HCHO	Spectroquant® 1.14678.0001 ^{d)}	Reagent test / ca. 50-75 Tests	42 07 51
HCHO	Spectroquant® 1.14500.0001 ^{d)}	Tube test / 25	42 07 52
CaCO ₃	CALCHECK	Tablet / 100	51 56 50 BT
CaCO ₃	Combi pack# CALCIO H No.1 / No.2 Combi pack# CALCIO H No.1 / No.2	each 100 each 250	51 77 61 BT 51 77 62 BT
CaCO ₃	HARDCHECK P	Tablet / 100 Tablet / 250	51 56 60 BT 51 56 61 BT
Pt-Co-units	no reagents required	-	-

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Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Hydrazine	0.05 - 0.5 mg/l	430	-	430	430	-	-	455	Dimethylamino-benzaldehyde ³	24 mm \emptyset
Hydrazine	0.01 - 0.6 mg/l 0.005 - 0.6 mg/l	-	-	430	430	-	-	-	Dimethylamino-benzaldehyde ³	24 mm \emptyset
Hydrazine ^{cl}	0.01 - 0.7 mg/l	-	-	430	430	-	-	-	PDMAB	24 mm \emptyset
Hydrogen peroxide	0.03 - 3 mg/l 0.01 - 0.5 mg/l 0.03 - 1.5 mg/l	-	-	530	530	530	-	-	DPD/Catalyst ⁵	24 mm \emptyset 50 mm \square 24 mm \emptyset
Hydrogen peroxide	1 - 50 mg/l 40 - 500 mg/l ^h	-	430	430	430	-	-	-	Peroxotitanium acid	24 mm \emptyset
Iodine	0.05 - 3.6 mg/l	-	-	530	530	530	-	510	DPD ⁵	24 mm \emptyset
Iron (II, III) soluble	0.02 - 1 mg/l 0.01 - 0.5 mg/l 0.1 - 1 mg/l	560	560	560	560	560	560	-	PPST ³	24 mm \emptyset 50 mm \square 10 mm \square
Iron VARIO (II, III) soluble	0.02 - 3 mg/l 0.1 - 3 mg/l	530	-	530	530	-	-	-	1,10-Phenanthroline ²	24 mm \emptyset
Iron VARIO, total ^{g)}	0.02 - 1.8 mg/l 0.1 - 1.8 mg/l	580	-	580	580	-	-	-	TPTZ ^{g)}	24 mm \emptyset
Iron LR (Fe ²⁺/₃₊)	0.03 - 2.0 mg/l 0.03 - 2.0 mg/l	560 530	-	560	-	-	-	-	Ferrozine / Thioglycolate	24 mm \emptyset
Iron LR 2 (Fe ²⁺ and Fe ³⁺)	0.03 - 2.0 mg/l	-	-	560	-	-	-	-	Ferrozine / Thioglycolate	24 mm \emptyset
Iron HR	0.1 - 10 mg/l	-	-	530	-	-	-	-	Thioglycolate	24 mm \emptyset

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

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Legend

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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®

Display	Reagent	Form of reagent/Quantity	Order code
N ₂ H ₄	Hydrazine Test Powder Spoon	Powder / 30 g	46 29 10 38 49 30
N ₂ H ₄	VARIO Hydra 2 Rgt Solution	Solution / 100 ml	53 12 00
N ₂ H ₄	Vacu-vial® ^{d)}	Test Kit / 30 Adapter for Vacu-vials® ^{d)}	38 04 70 19 20 75
H ₂ O ₂	HYDROGENPEROXIDE LR	Tablet / 100	51 23 80 BT
H ₂ O ₂	H ₂ O ₂ reagent solution	Liquid reagent / 15 ml	42 49 91
I	DPD No. 1	Tablet / 100	51 10 50 BT
Fe	IRON LR (Fe ²⁺ and Fe ³⁺) IRON (II) LR (Fe ²⁺)	Tablet / 100 Tablet / 100	51 53 70 BT 51 54 20 BT
Fe	VARIO Ferro F10	Powder Pack / 100	53 05 60
Fe	VARIO IRON TPTZ F10	Powder Pack / 100	53 05 50
Fe	KS61 (Ferrozine / Thioglycolate, FE5) KS63 (Thioglycolate Reagenz, FE6) KP962 (Ammonia 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
Fe	KS60 FE1 (Acetate Buffer) KS63 FE6 (Thioglycolate Reagent) KS65 FE7 (Ferrozine Reagent)	Liquid reagent / 65 ml Liquid reagent / 65 ml Liquid reagent / 65 ml Set	56L006065 56L006365 56L006565 56R023490
Fe	KS160 TH2 FE8 (Total Hardness Buffer) KS63 FE6 (Thioglycolate Reagent)	Liquid reagent / 65 ml Liquid reagent / 65 ml Set	56L016065 56L006365 56R023590

^{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 19 20 75)

^{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 CaCO₃

ⁱ⁾ high range by dilution

^{j)} Vacu-vials® is a Chemetrics Trademark

[#] including stirring rod

Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Iron, total, Fe in Mo	0.01 - 1.8 mg/l	580	-	580	-	-	-	-	Fe in Mo	24 mm \emptyset
Lead (Pb²⁺)	0.1 - 5 mg/l	-	-	-	-	-	-	520	4-(2-Pyridylazo)-resorcine	10 mm \square
Lead (Pb²⁺)	0.1 - 5 mg/l	-	-	-	-	-	-	515	4-(2-Pyridylazo)-resorcine	16 mm \emptyset
Manganese	0.2 - 4 mg/l	530	-	530	530	-	-	450	Formaldehyde	24 mm \emptyset
Manganese VARIO LR	0.01 - 0.7 mg/l	560	-	560	560	-	-	558	PAN	24 mm \emptyset
Manganese VARIO HR	0.1 - 18 mg/l	530	-	530	530	-	-	525	Periodate oxidation ²	24 mm \emptyset
Manganese	0.05 - 5 mg/l	-	-	430	-	-	-	-	Formaldehyde	24 mm \emptyset
Molybdate / Molybdenum	1 - 50 mg/l 1 - 30 mg/l 0.6 - 30 mg/l	- - 430	- - -	430 - -	430 - -	- - -	- - -	- 366 -	Thioglycolate ⁴	24 mm \emptyset
Molybdate / Molybdenum VARIO LR	0.5 - 5 mg/l 0.03 - 3 mg/l	- 610	- -	610 -	610 -	- -	- -	610 -	Mercaptoacetic acid	24 mm \emptyset
Molybdate / Molybdenum VARIO HR	0.5 - 66 mg/l 0.3 - 40 mg/l	- 430	- -	430 -	430 -	- -	- -	420 -	Mercaptoacetic acid	24 mm \emptyset
Molybdate / Molybdenum HR	1 - 100 mg/l 0.6 - 60 mg/l	- 430	- -	430 -	- -	- -	- -	- -	Thioglycolate ⁴	24 mm \emptyset
Nickel	0.02 - 1 mg/l 0.2 - 7 mg/l	- -	- -	- 430	- 430	- -	- -	443 443	Dimethylglyoxime ^{2,3}	50 mm \square 24 mm \emptyset

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Display	Reagent	Form of reagent/Quantity	Order code
Fe	VARIO (Fe in Mo) Rgt 1 VARIO (Fe in Mo) Rgt 2	Powder Pack / 100 Powder Pack / 100 Set	53 03 10 53 03 20 53 60 10
Pb	Spectroquant® 1.09717.0001 ^{d)}	Reagent test / 50 Tests	42 07 53
Pb	Spectroquant® 1.14833.0001 ^{d)}	Tube test / 25	42 07 54
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	51 60 80 BT 51 60 90 BT 51 76 21 BT 51 76 22 BT
Mn	VARIO Ascorbic Acid VARIO Alkaline-Cyanide VARIO PAN Indicator VARIO Rochelle Salt Solution ^{h)}	Powder Pack / 100 Liquid reagent / 60 ml Liquid reagent / 60 ml Set 30 ml	 53 50 90 53 06 40
Mn	VARIO Manganese Citrate Puffer F10 VARIO Sodiumperiodate F10	Powder Pack / 100 Powder Pack / 100 Set	 53 51 00
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
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	51 30 60 BT 51 30 70 BT 51 76 31 BT 51 76 32 BT
MoO ₄ Mo	VARIO Molybdenum 1 LR F20 VARIO Molybdenum 2 LR required accessory: mixing cylinder (not included)	Powder Pack / 100 Liquid reagent/ 50 ml Set	 53 54 50
MoO ₄ Mo	VARIO Molybdenum HR1 F10 VARIO Molybdenum HR2 F10 VARIO Molybdenum HR3 F10	Powder Pack / 100 Powder Pack / 100 Powder Pack / 100 Set	 53 53 00
MoO ₄	KS63 (Thioglycolate Reagent)	Liquid reagent / 65 ml	56L006365
Ni	Nickel-51, Nickel-52	Reagent test (Powder, Liquid reagent) / 50 Tests	2 41 90 33

^{a)} determination of free, combined and total

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^{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 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 CaCO₃

ⁱ⁾ high range by dilution

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including stirring rod

Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Nickel	0.1 - 10 mg/l	-	-	560	560	-	-	-	Nioxime	24 mm \emptyset
Nitrate	0.08 - 1 mg/l 0,35 - 4,4 mg/l	-	-	530	-	-	-	-	Zinc reduction / NED	24 mm \emptyset
Nitrate VARIO	1 - 30 mg/l 4,4 - 132 mg/l	-	-	430	430	-	-	410	Chromotropic acid	16 mm \emptyset
Nitrate	0.5 - 14 mg/l 2,2 - 62 mg/l	-	-	-	-	-	-	340 340	2,6-Dimethylphenole ³	16 mm \emptyset
Nitrite	0.01 - 0.5 mg/l 0,03 - 0,16 mg/l	-	-	560	560	-	-	545 545	N-(1-Naphthyl)-ethylenediamine ^{2,3}	24 mm \emptyset
Nitrite	0.03 - 0.6 mg/l 0,1 - 2 mg/l 0.3 - 3 mg/l 1 - 10 mg/l	-	-	-	-	-	-	545 545 545 545	Sulfanilic/Naphthylamine ¹	16 mm \emptyset
Nitrite LR VARIO	0.01 - 0.3 mg/l 0,03 - 1 mg/l	-	-	530 530	530 530	-	-	507 507	Diazotation	24 mm \emptyset
Nitrogen-total ^{b)}	0.5 - 14 mg/l 5 - 140 mg/l ¹⁾	-	-	-	-	-	-	340	2,6-Dimethylphenole 2,3	16 mm \emptyset
Nitrogen VARIO, total LR ^{b)}	0.5 - 25 mg/l	-	-	430	430	-	-	410	Persulphate-digestion method	16 mm \emptyset
Nitrogen VARIO, total HR ^{b)}	5 - 150 mg/l	-	-	430	430	-	-	410	Persulphate-digestion method	16 mm \emptyset

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⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Display	Reagent	Form of reagent/Quantity	Order code
Ni	NICKEL No.1 NICKEL No.2	Tablet / 100 Tablet / 100	51 56 30 BT 51 56 40 BT
NO ₃ - N NO ₃	NITRATE TEST Powder NITRATE TEST Tablet NITRITE LR Nitrate test tube	Powder / 15 g Tablet / 100 Tablet / 100	46 52 30 50 28 10 51 23 10BT 36 62 20
NO ₃ - N NO ₃	VARIO Nitrate Chromotropic VARIO Nitra X Reagent tube VARIO Deionised Water (for Zero)	Powder Pack / 50 Reaction tube / 50 Bottle, 100 ml Set (Tube test)	53 55 80
NO ₃ - N NO ₃	Reaction tube, Nitrat-111	Tube test Liquid reagent / 24	2 42 07 02
NO ₂ - N NO ₂	NITRITE LR	Tablet / 100	51 23 10 BT
NO ₂ - N NO ₂ NO ₂ - N NO ₂	Reaction tube, Nitrit-101	Tube test (Powder) / 24	2 41 90 18
NO ₂ - N NO ₂	VARIO Nitri 3	Powder Pack / 100	53 09 80
N	Digestion reagent, Compensation reagent, Nitrat-111	Tube test (Powder, Liquid reagent) / 24	2 42 07 03
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)	Digestion tubes / 50 Powder Pack / 50 Powder Pack / 50 Powder Pack / 50 Reaction tubes / 50 Bottle, 100 ml Set (Tube test)	53 55 50
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)	Digestion tubes / 50 Powder Pack / 50 Powder Pack / 50 Powder Pack / 50 Reaction tubes / 50 Bottle, 100 ml Set (Tube test)	53 55 60

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 19 20 75)

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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 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 CaCO₃

i) high range by dilution

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including stirring rod

Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Oxygen, activ	0.1 - 10 mg/l	-	-	530	530	530	-	-	DPD	
Oxygen, dissolved ^{c)}	10 - 800 μ g/l	530	-	530	530	-	-	-	Rhodazine D TM	13 mm \emptyset
Ozone	0.02 - 1 mg/l 0.02 - 0.5 mg/l 0.02 - 2 mg/l	- - 530	- - -	- - 530	- - 530	- - 530	- - 530	510 510 -	DPD/Glycine ⁵	24 mm \emptyset 50 mm \square 24 mm \emptyset
Phenols	0.1 - 5 mg/l	-	-	-	-	-	-	507	4-Aminoantipyrine ¹	24 mm \emptyset
PHMB (Biguanide)	2 - 60 mg/l	-	-	560	560	560	-	-	Buffer/Indicator	24 mm \emptyset
Phosphate-total LR ^{b)}	0.07 - 3 mg/l 0.2 - 10 mg/l	- -	- -	- -	- -	- -	- -	690 690	Phosphomolybdic acid/ Ascorbic acid ²	16 mm \emptyset
Phosphate-total HR ^{b)}	1.5 - 20 mg/l 5 - 60 mg/l	- -	- -	- -	- -	- -	- -	690 690	Phosphomolybdic acid/ Ascorbic acid ²	16 mm \emptyset
Phosphate LR, ortho	0.016 - 1,3 mg/l 0.05 - 4 mg/l	660 660	- -	660 660	660 660	610 610	610 610	710 710	Phosphomolybdic acid/ Ascorbic acid ²	24 mm \emptyset
Phosphate HR, ortho	0,33 - 26 mg/l 1 - 80 mg/l	- -	- -	430 430	430 430	- -	- -	470 470	Vanadomolybdate ²	24 mm \emptyset
Phosphate VARIO ortho	0.02 - 0,83 mg/l 0.06 - 2.5 mg/l	660 660	- -	660 660	660 660	- -	- -	890 890	Phosphomolybdenum blue/ Ascorbic acid ²	24 mm \emptyset
Phosphate VARIO ortho	0.02 - 1,6 mg/l 0.06 - 5 mg/l	- -	- -	660 660	660 660	- -	- -	890 890	Phosphomolybdenum blue/ Ascorbic acid ²	16 mm \emptyset
Phosphate-ortho	1 - 20 mg/l 3 - 60 mg/l	- -	- -	- -	- -	- -	- -	438 438	Vanadomolybdate ²	16 mm \emptyset

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⁴ Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980

⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Display	Reagent	Form of reagent/Quantity	Order code
O ₂	DPD No. 4	Tablet / 100	51 12 20 BT
O ₂	Vacu-vial® [Ⓜ])	Liquid reagent / 30 Adapter for Vacu-vials® [Ⓜ])	38 04 50 19 20 75
O ₃	DPD No. 1 DPD No. 3 Combi pack# DPD No.1 / No.3 Combi pack# DPD No.1 / No.3 GLYCINE [Ⓝ]) Combi pack# DPD No.1 / GLYCINE Combi pack# DPD No.1 / GLYCINE	Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100 each 100 each 250	51 10 50 BT 51 10 80 BT 51 77 11 BT 51 77 12 BT 51 21 70 BT 51 77 31 BT 51 77 32 BT
C ₆ H ₅ O _H	PHENOLE No. 1 PHENOLE No. 2	Tablet / 100 Tablet / 100	51 59 50 BT 51 59 60 BT
PHMB	PHMB PHOTOMETER	Tablet / 100	51 61 00 BT
PO ₄ - P PO ₄	Reaction tube, Phosphat-101, Phosphat- 102, Phosphat-103	Tube test (Powder, Liquid reagent) / 24	2 41 90 19
PO ₄ - P PO ₄	Reaction tube, Phosphat-101, Phosphat-102, Phosphat-103	Tube test (Powder, Liquid reagent) / 24	2 42 07 00
PO ₄ - P PO ₄	PHOSPHATE No. 1 LR PHOSPHATE No. 2 LR Combi pack# PHOSPHATE No.1 LR / No.2 LR	Tablet / 100 Tablet / 100 each 100	51 30 40 BT 51 30 50 BT 51 76 51 BT
PO ₄ - P PO ₄	PHOSPHATE No. 1 HR PHOSPHATE No. 2 HR Combi pack# PHOSPHATE No.1 HR / No.2 HR	Tablet / 100 Tablet / 100 each 100	51 58 10 BT 51 58 20 BT 51 76 61 BT
PO ₄ - P PO ₄	VARIO PHOSPHATE RGT, F10	Powder Pack / 100	53 15 50
PO ₄ - P PO ₄	VARIO Dilution Vial VARIO PHOSPHATE RGT, F10 VARIO Deionised Water (for Zero)	50 Tubes Powder Pack / 50 Bottle, 100 ml Set (Tube test)	53 52 00
PO ₄ - P PO ₄	Reaction tube	Tube test / 24	2 42 07 01

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Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Phosphate VARIO ^{b)} acid hydrolyzable and total	acid hydrolyzable: 0.02 - 1.6 mg/l 0.06 - 5 mg/l	-	-	660	660	-	-	890	Acid digestion Phosphomolybdenum blue/ Ascorbic acid ² Acid-/ Persulphate digestion Phosphomolybdic acid/ Ascorbic acid ²	16 mm \emptyset
	total: 0.02 - 1.1 mg/l 0.06 - 3.5 mg/l	-	-	660	660	-	-	890		16 mm \emptyset
Phosphate VARIO total ^{b)}	0.02 - 1.1 mg/l	-	-	660	660	-	-	890	Acid-/ Persulphate digestion Ascorbic acid ²	16 mm \emptyset
	0.06 - 3.5 mg/l	-	-	660	660	-	-	890		16 mm \emptyset
Phosphate, ortho ^{c)}	1,6 - 13 mg/l 5 - 40 mg/l	-	-	430	430	-	-	-	Vanadomolybdate ²	
		-	-	430	430	-	-	-		
Phosphate, ortho ^{c)}	0.016 - 1,6 mg/l 0.05 - 5 mg/l	-	-	660	660	-	-	-	Stannous chloride ²	
		-	-	660	660	-	-	-		
Phosphate LR	0.033 - 3,3 mg/l 0.1 - 10 mg/l	-	-	660	-	-	-	-	Phosphomolybdic acid/ Ascorbic acid ²	24 mm \emptyset
		-	-	660	-	-	-	-		
Phosphate HR, ortho	1,63 - 26 mg/l 5 - 80 mg/l	430	-	430	-	-	-	-	Vanadomolybdate ²	24 mm \emptyset
		430	-	430	-	-	-	-		
Phosphonate VARIO	0.02 - 125 mg/l	-	-	660	660	-	-	660	Persulfate UV-Oxidation	24 mm \emptyset
pH value	5.2 - 6.8	-	-	560	560	560	-	-	Bromcresol purple ⁵	24 mm \emptyset
pH value	6.5 - 8.4	560	560	560	560	560	560	558	Phenol red ⁵	24 mm \emptyset
pH value	6.5 - 8.4	560	560	560	560	560	-	558	Phenol red ⁵	24 mm \emptyset
pH value	8.0 - 9.6	-	-	560	560	560	-	-	Thymol blue ⁵	24 mm \emptyset

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⁴ Photometrische Analyse, Lange/Vejdelek, Verlag Chemie; 1980

⁵ Colorimetric Chemical Analytical Methods, 9th Edition, Lovibond®

Display	Reagent	Form of reagent/Quantity	Order code
PO ₄ - P PO ₄	VARIO Acid Reagent Vial VARIO PHOSPHATE RGT, F10 VARIO Deionised Water (for Zero) 1N NaOH	50 Tubes Powder Pack / 50 Bottle, 100 ml Bottle / 100 ml	
PO ₄ - P PO ₄	1,54 N NaOH VARIO Potassium Persulfate F10	Bottle / 100 ml Powder Pack / 50 Set (Tube test)	53 52 50
PO ₄ - P PO ₄	VARIO Acid Reagent Vial VARIO PHOSPHATE RGT, F10 VARIO Deionised Water (for Zero) 1,54 N NaOH VARIO Potassium Persulfate F10	50 Tubes Powder Pack / 50 Bottle, 100 ml Bottle / 100 ml Powder Pack / 50 Set (Tube test)	53 52 10
PO ₄ - P PO ₄	Vacu-vial [®] ^{j)}	Test Kit / 30 Adapter for Vacu-vials [®] ^{j)}	38 04 60 19 20 75
PO ₄ - P PO ₄	Vacu-vial [®] ^{j)}	Test Kit / 30 Adapter for Vacu-vials [®] ^{j)}	38 04 80 19 20 75
PO ₄ - P PO ₄	KS80 (CRP Reagent) KP119 (Ascorbic acid)	Liquid reagent / 2 x 65 ml Powder / 20 g Set	56L008065 56P011920 56R023765
PO ₄ - P PO ₄	KS228 (Ammonia Molybdate) KS229 (Ammonia Metavanadate)	Liquid reagent / 65 ml Liquid reagent / 65 ml Set	56L022865 56L022965 56R019090
	Option Polyphosphate KS278 (50 % Sulfuric Acid) KS135 (Phenolphthalein Indicator) KS144 (Calcium Hardness Buffer) KP962 (Ammonium Persulphate Powder)	Liquid reagent / 65 ml Liquid reagent / 65 ml Liquid reagent / 65 ml Powder / 40 g	56L027865 56L013565 56L014465 56P096240
PO ₄	VARIO Potassium Persulfate F10 VARIO PHOSPHATE RGT, F10	Powder Pack / 100 Powder Pack / 200 Set	53 52 20
pH	BROMOCRESOLPURPLE/PHOTOMETER	Tablet / 100	51 57 00 BT
pH	PHENOLRED / PHOTOMETER	Tablet / 100	51 17 70 BT
pH	PHENOLRED Solution	Liquid reagent / 15 ml	47 10 40
pH	THYMOLBLUE / PHOTOMETER	Tablet / 100	51 57 10 BT

^{a)} determination of free, combined and total

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^{c)} MultiDirect: Adapter is necessary for Vacu-vials[®] (Order code 19 20 75)

^{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 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 CaCO₃

ⁱ⁾ high range by dilution

^{j)} Vacu-vials[®] is a Chemetrics Trademark

including stirring rod

Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Polyacrylates	1 - 30 mg/l	530	-	660	-	-	-	-	Turbidity	24 mm \emptyset
Potassium	0.7 - 12 mg/l	-	-	430	430	-	-	-	Tetraphenylborate-	24 mm \emptyset
	1 - 10 mg/l	-	-	-	-	-	-	730	Turbidity ⁴	24 mm \emptyset
PTSA (only MD 640)	10 - 1000 ppb			> 395					Fluorescence	24 mm \emptyset
Silica	0.05 - 4 mg/l	660	-	660	660	-	-	-	Silicomolybdate ^{2,3}	24 mm \emptyset
	0.05 - 3 mg/l	-	-	-	-	-	-	820		
Silica VARIO LR	0.1 - 1.6 mg/l	660	-	660	660	-	-	815	Heteropolyblue ²	24 mm \emptyset
Silica VARIO HR	1 - 90 mg/l	430	-	430	430	-	-	-	Silicomolybdate ^{2,3}	24 mm \emptyset 24 mm \emptyset
	1 - 100 mg/l	-	-	-	-	-	-	452		
Silica	0.1 - 8 mg/l	-	-	430	-	-	-	-	Heteropolyblue ²	24 mm \emptyset
Sodiumhypochlorite	0.2 - 16 %	-	-	530	530	530	530	-	Potassium iodide ⁵	24 mm \emptyset
Spectral Absorption-coefficient	0 - 50 m ⁻¹	-	-	-	-	-	-	436 525 620	Direct reading ¹ ISO 7887:1994	50 mm \square
Sulphate VARIO	5 - 100 mg/l	530	-	530	530	530	-	-	Bariumsulphate Turbidity ²	24 mm \emptyset
	2 - 100 mg/l	-	-	-	-	-	-	450		
	50 - 1000 mg/l	-	-	530	530	-	-	530		

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

For other reagent quantities please see our current price list.

Legend

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®

Display	Reagent	Form of reagent/Quantity	Order code
Polyacryl	KS255 (Polyacrylate Reagent 1) KS256 (Polyacrylate Reagent 2) KS336 (Propan-2-ol) C18 (Cartouche) KS173 (2,4 Dinitrophenol) KT183 (Nitric Acid)	Liquid reagent / 65 ml Liquid reagent / 65 ml Set Liquid reagent / 65 ml Liquid reagent / 65 ml Liquid reagent / 65 ml	56L025565 56L025665 56R019165 56L033665 56A020101 56L017365 56L018365
K	POTASSIUM T	Tablet / 100	51 56 70
PTSA	no reagents required		
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	51 31 30 BT 51 31 40 BT 51 76 71 BT 51 76 72 BT 51 31 50 BT
SiO ₂	VARIO Amino Acid F10 VARIO Citric Acid F10 VARIO Molybdate 3 Reagent solution	Powder Pack / 100 Powder Pack / 200 Liquid reagent / 2 x 50 ml Set	53 56 90
SiO ₂	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	53 57 00
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
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	51 54 80 BT 51 30 00 BT 51 77 21 BT 51 77 22 BT 41 44 70
-	no reagents required	-	-
SO ₄	VARIO Sulpha 4 / F10	Powder Pack / 100	53 21 60

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i) high range by dilution

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Reagents

Test	Range	Wave lengths λ / nm							Method	Cuvette
		MD 100 & MD 110	MD 200	MD 600, MD 610 & MD 640	MultiDirect	PM 620 & PM 630	PM 600	SpectroDirect		
Sulphate	5 - 100 mg/l	-	-	610	610	610	-	-	Bariumsulphate Turbidity ²	24 mm \emptyset
Sulphide	0.04 - 0.5 mg/l	-	-	660	660	-	-	668	DPD/Catalyst ^{3,4}	24 mm \emptyset
Sulphite	0.1 - 5 mg/l	-	-	430	430	-	-	-	DTNB	24 mm \emptyset
	0.1 - 10 mg/l	-	-	-	-	-	-	405		10 mm \emptyset
	0.05 - 4 mg/l	-	-	-	-	-	-	405		24 mm \emptyset
Surfactants (anionic)	0,05 - 2 mg/l	-	-	660	660	-	-	660	Methylene blue ¹	16 mm \emptyset
Surfactants (cationic)	0,05 - 1,5 mg/l	-	-	610	610	-	-	610	Disulphine blue	16 mm \emptyset
Surfactants (non ionic)	0,1 - 7,5 mg/l	-	-	610	610	-	-	610	TBPE	16 mm \emptyset
Suspended solids	5 - 750 mg/l	660	-	660	660	-	-	- 660	Turbidity/Attenuated Radiation	24 mm \emptyset 50 mm \square
TOC ^{b)}	5 - 80 mg/l	-	-	-	-	-	-	596	H ₂ SO ₄ / Indicator	16 mm \emptyset
TOC ^{b)}	50 - 800 mg/l	-	-	-	-	-	-	596	H ₂ SO ₄ / Indicator	16 mm \emptyset
Triazoles (UV lamp requested)	1 - 16 mg/l	430	-	430	-	-	-	-	Catalyzed UV Digestion	24 mm \emptyset
Turbidity	5 - 500	-	-	-	-	-	-	860	Attenuated Radiation Method Attenuated Radiation Method	50 mm \square
	0 - 1000	-	-	530	530	-	-	-		24 mm \emptyset
Urea	0.1 - 2.5 mg/l	610	610	610	610	610	-	-	Urease / Indophenol	24 mm \emptyset
	0.2 - 5 mg/l ⁵⁾	610	610	-	-	-	-	-		
	0.1 - 2 mg/l	-	-	-	-	-	-	676		
Zinc	0.02 - 1 mg/l	-	-	610	610	-	-	-	Zincon ³ /EDTA	24 mm \emptyset
	0.02 - 0.5 mg/l	-	-	-	-	-	-	616		
Zinc	0.1 - 2.5 mg/l	-	-	610	-	-	-	-	Zincon ³ /EDTA	24 mm \emptyset

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Display	Reagent	Form of reagent/Quantity	Order code
SO ₄	SULFATE T	Tablet / 100	51 54 50 BT
S	SULFIDE No. 1 SULFIDE No. 2	Tablet / 100 Tablet / 100	50 29 30 50 29 40
SO ₃	SULFITE LR	Tablet / 100	51 80 20 BT
MBAS	Spectroquant® 1.02552.0001	Tube test / 25	42 07 63
CTAB	Spectroquant® 1.01764.0001	Tube test / 25	42 07 65
Triton® X-100	Spectroquant® 1.01787.0001	Tube test / 25	42 07 64
-	no reagents required	-	-
TOC	Spectroquant® 1.14878.0001 ^{d)}	Tube test / 25 Aluminium screwcaps / 6 pc.	42 07 61 42 07 57
TOC	Spectroquant® 1.14879.0001 ^{d)}	Tube test / 25 Aluminium screwcaps / 6 pc.	42 07 56 42 07 57
Benzotriazole	VARIO Triazole Rgt F25	Powder Pack / 100	53 22 00
FAU FAU	no reagents required	-	-
CH ₄ N ₂ O	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 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	45 93 00 45 94 00 51 25 80 BT 51 25 90 BT 51 76 11 BT 51 76 12 BT 51 61 10 BT 51 78 00 BT
Zn	COPPER/ZINC LR EDTA DECHLOR (in case of high levels of residual chlorine)	Tablet / 100 Tablet / 100 Tablet / 100	51 26 20 BT 51 23 90 BT 51 23 50 BT
Zn	KS243 (Zinc Reagent 1) KP244 (Zinc Reagent 2)	Liquid reagent / 65 ml Powder / 20 g Set	56L024365 56L024420 56R023965

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