

Reagents

History

For more than thirty years, Tintometer in Dortmund has been manufacturing reagents for water testing and marketing these reagents around the world under the brand name Lovibond®.

Different forms of reagents are required for different fields of application. It is fair to say that, in terms of quality, tablet reagents are the best form of reagent. Thanks to production techniques of the type used in the pharmaceutical industry and stringent internal quality standards, Tintometer is able to produce tablet reagents for water testing with a guaranteed shelf life of 5 or 10 years. These tablets are individually sealed in high-grade, polyethylene-coated aluminium foil and represent the reagent form of choice for everyday water testing applications.

Users in different countries traditionally prefer forms of reagent other than tablets. Lovibond® powder reagents are designed to allow fast and easy testing.

Powder reagents are packed in aluminium foil for a wide range of applications and producers represent an alternative reagent form recently introduced by Tintometer.

Last but not least, liquid reagents are indispensable for many testing tasks. Testing for substances that are hard to detect, for parameters like total nitrogen, or for the aggregate parameter COD, require the use of a wide range of reagents in a form that permits more "aggressive" sample processing. The Lovibond® programme is rounded off by reagent tests and tube tests, making Tintometer GmbH the only reagent producer in the world that offers a complete range of reagent forms.

DPD Reagents

DPD reagents are offered by different manufacturers. For quality reasons, users should validate the products prior to use.

DPD reagents are produced on the basis of international standard methods, e.g. ISO 7393/2. The chemicals are of crystalline **white** nature. If a reagent (tablets or powder) is **not white** but has turned to grey/brownish or purple colours, it has deteriorated. DPD liquid reagents which should be colourless when fresh, may turn into brownish colour if the reagent has deteriorated. The use of such degraded products must be avoided as they will give false results.

Tablets

Our test tablets are manufactured in Germany under tightly controlled conditions on the latest machinery.

Maintaining the highest quality standards permits Tintometer GmbH to guarantee our reagent tablets 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.

Now we have improved even further on this highly successful format. To the tight quality control processes, integral to Lovibond®'s tablet manufacture, and the simple test procedures, we have added new blister packaging.

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

With the new 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.

Each tablet is contained within an individually formed foil cup, lined with the latest aluminium composite material, and guaranteeing product performance.

As a result of improved sealing efficiency, the blister pack has been reduced in size to 91 x 34mm making them even more convenient for storage and shipping.

'BT' is added to the end of the code to identify the new style of packaging. (For example – 511060BT).

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.tintometer.com.



Liquids

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 useful 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 one year 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 more experienced 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 is suitable also for use with Hach-Photometer-Systems.

Determination of Chlorine, Chlorine Dioxide, Bromine and Ozone with Lovibond® Tablet Reagents

Free Chlorine	▶ DPD No.1-Tablet (direct reading of the value)
Combined Chlorine	▶ DPD No.1-Tablet (free Chlorine = A) + DPD No.3-Tablet (total Chlorine = B) Difference between B and A = Combined Chlorine
Total Chlorine	▶ DPD No.4-Tablet (direct reading of the value) or DPD-Tablets No.1 and No.3 together
Monochloramine Dichloramine	▶ DPD No.1-Tablet (free Chlorine = A) + DPD No.2-Tablet (Result = C) Difference between C and A = Monochloramine + DPD No.3-Tablet (Result = B) Difference between B and C = Dichloramine
Chlorine Dioxide and Chlorine Dioxide in presence of Residual Chlorine	▶ DPD No.1-Tablet and DPD No.3-Tablet Glycine-Tablet Acid-Tablet Neutralising-Tablet
Bromine	▶ DPD No.1-Tablet
Ozone	▶ Indigo-Tablet or DPD No.4-Tablet (depends on the method)
Ozone in presence of Chlorine	▶ Indigo-Tablet



Reagents

Test	Range	Wavelength λ / nm					Method	Cuvette
		MiniDirect	CheckitDirect	CheckitDirect+	PoolDirect	PoolDirect 9 in 1		
Acid Capacity K_{S4,3} Tablets	0.1 - 4 mmol/l	-	-	605	610	-	Acid/Indicator ^{1,2}	24 mm ø
Alkalinity-M (total) Tablets	5 - 200 mg/l	-	-	605	610	610	Acid/Indicator ^{1,2,5}	24 mm ø
Aluminium VARIO Powder reagent	0.01 - 0.25 mg/l	528	-	-	530	-	Eriochrome cyanine R ²	24 mm ø
Aluminium Tablets	0.01 - 0.3 mg/l	-	-	-	530	-	Eriochrome cyanine R ²	24 mm ø
	0.05 - 0.3 mg/l	528	528	-	-	-		
Ammonia Tablets	0.02 - 1 mg/l	660	660	-	610	-	Indophenole blue ^{2,3}	24 mm ø
	0.2 - 10 mg/l ⁴	-	660	-	-	-		
Biguanide (see PHMB)								
Bromine Tablets	0.05 - 13 mg/l	-	-	-	530	530	DPD ⁵	24 mm ø
	0.02 - 13.5 mg/l	-	-	528	-	-		
Chlorine^{a)} Tablets	0.01 - 6 mg/l	528	528	528	530	530	DPD ^{1,2}	24 mm ø
Chlorine^{a)} Liquid reagent	0.01 - 4 mg/l	-	528	528	530	-	DPD ^{1,2}	24 mm ø
	0.02 - 3 mg/l	-	-	-	-	-		
Chlorine VARIO^{a)} Powder reagent	0.01 - 2 mg/l	528	528	528	530	-	DPD ^{1,2}	24 mm ø
	0.1 - 8 mg/l	528	-	-	-	-		
Chlorine HR (KI) Tablets	5 - 200 mg/l	-	470	470	-	-	KI / Acid ⁵	16 mm ø

MSDS (Material Safety Data Sheets): www.tintometer.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
	ALKA-M-PHOTOMETER	Tablet / 100	51 32 10
CaCO ₃	ALKA-M-PHOTOMETER	Tablet / 100	51 32 10
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 51 54 70 51 76 01 51 76 02
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 / 100 tests	51 25 80 51 25 90 51 76 11 51 76 12 46 01 70
Br	DPD No. 1 DPD No. 1 HIGH CALCIUM ^{e)}	Tablet / 100 Tablet / 100	51 10 60 BT 51 57 40
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)}	Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100	51 10 60 BT 51 10 80 BT 51 77 11 51 77 12 51 57 40
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	47 10 10 47 10 20 47 10 30 47 10 56
Cl ₂	VARIO Chlorine FREE-DPD/F10 VARIO Chlorine TOTAL-DPD/F10	Powder Pack / 100 Powder Pack / 100	53 01 00 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 Tablet / 100 each 100 each 250	51 54 80 51 30 00 51 77 21 51 77 22

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

^{b)} Reactor is necessary for COD (150°C), TOC (120°C) and total -chromium, - phosphate, -nitrogen, (100°C)

^{c)} MultiDirect/PoolDirect: 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 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

^{f)} additionally required for determination of chlorine dioxide / 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

no BT blister tablets, including stirring rod, 10 cm

Reagents

Test	Range	Wavelength λ / nm					Method	Cuvette
		MiniDirect	CheckitDirect	CheckitDirect+	PoolDirect	PoolDirect 9 in 1		
Chlorine dioxide Tablets	0.05 - 11 mg/l	-	-	-	530	-	DPD/Glycine ^{1,2}	24 mm \emptyset
	0.01 - 3.8 mg/l	528	-	-	-	-		24 mm \emptyset
	0.1 - 11 mg/l	-	-	528	-	-		24 mm \emptyset
Chloride Tablets	0.5 - 25 mg/l	-	528	-	-	-	Silver nitrate / turbidity	24 mm \emptyset
	5 - 250 mg/l ¹⁾	-	528	-	-	-		
Copper ^{a)} Tablets	0.05 - 5 mg/l	528	528	528	560	560	Biquinoline ⁴	24 mm \emptyset
Copper free Tablets	0.02 - 1 mg/l	-	580	-	-	-	Zincon ³ / EDTA	24 mm \emptyset
Cyanuric acid Tablets	2 - 160 mg/l ¹⁾	528	-	528	530	530	Melamine	24 mm \emptyset
Hardness, calcium Tablets	50 - 900 mg/l	-	-	-	560	560	Murexide ⁴	24 mm \emptyset
Hardness, calcium Tablets	0 - 500 mg/l ¹⁾	-	-	528	560	560	Murexide ⁴	24 mm \emptyset
Hardness, total Tablets	2 - 50 mg/l	-	-	-	560	-	Metallphthalein ³	24 mm \emptyset
	50 - 500 mg/l ¹⁾	-	528	-	-	-		
Hydrogen peroxide Tablets	0.03 - 3 mg/l	-	-	-	530	-	DPD/Catalyst ⁵	24 mm \emptyset
Iodine Tablets	0.05 - 3.6 mg/l	-	-	-	530	-	DPD ⁵	24 mm \emptyset
Iron (II, III) soluble Tablets	0.02 - 1 mg/l	528	528	528	560	-	PPST ³	24 mm \emptyset
	0.2 - 10 mg/l ¹⁾	-	528	-	-	-		24 mm \emptyset
Manganese Tablets	0.05 - 4 mg/l	-	430	-	-	-	Formaldoxime	24 mm \emptyset

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

Display	Reagent	Form of reagent/Quantity	Order code
ClO ₂	DPD No. 1	Tablet / 100	51 10 60 BT
	DPD No. 3	Tablet / 100	51 10 80 BT
	Combi pack [#] DPD No.1 / No.3	each 100	51 77 11
	Combi pack [#] DPD No.1 / No.3	each 250	51 77 12
	GLYCINE ^{†)}	Tablet / 100	51 21 70
	Combi pack [#] DPD No.1 / GLYCINE	each 100	51 77 31
	Combi pack [#] DPD No.1 / GLYCINE DPD No.1 High Calcium ^{e)}	each 250 Tablet / 100	51 77 32 51 57 40
Cl	CHLORIDE T1	Tablet / 100	51 59 10
	CHLORIDE T2	Tablet / 100	51 59 20
Cu	COPPER No. 1	Tablet / 100	51 35 50
	COPPER No. 2	Tablet / 100	51 35 60
	Combi pack [#] COPPER No.1 / No.2	each 100	51 76 91
	Combi pack [#] COPPER No.1 / No.2	each 250	51 76 92
Cu	COPPER/ZINC LR	Tablet / 100	51 26 20
	EDTA	Tablet / 100	51 23 90
	DECHLOR	Tablet / 100	51 23 50
	(necessary if high level of residual chlorine is available in the sample)		
Cys	CYANURIC ACID	Tablet / 100	51 13 20 BT
CaCO ₃	CALCHECK	Tablet / 100	51 56 50
CaCO ₃	CALCIO H No.1	Tablet / 100	51 10 30
	CALCIO H No.2	Tablet / 100	51 10 40
	Combi pack [#] CALCIO H No.1 / No.2	each 100	51 77 61
	Combi pack [#] CALCIO H No.1 / No.2	each 250	51 77 62
CaCO ₃	HARDCHECK P	Tablet / 100	51 56 60
H ₂ O ₂	HYDROGENPEROXIDE LR	Tablet / 100	51 23 80
I	DPD No. 1	Tablet / 100	51 10 60 BT
Fe	IRON LR	Tablet / 100	51 53 70
	IRON (II) LR	Tablet / 100	51 54 20
Mn	MANGANESE LR 1	Tablet / 100	51 60 80
	MANGANESE LR 2	Tablet / 100	51 60 90
	Combi pack [#] MANGANESE LR 1 / LR 2	each 100	51 76 21
	Combi pack [#] MANGANESE LR 1 / LR 2	each 250	51 76 22

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

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^{e)} alternative reagent, used instead of DPD No.1 in case of turbidity in the water sample caused by high concentration of calcium and/or high conductivity

^{f)} additionally required for determination of chlorine dioxide / 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

[#] no BT blister tablets, including stirring rod, 10 cm

Reagents

Test	Range	Wavelength λ / nm					Method	Cuvette
		MiniDirect	CheckitDirect	CheckitDirect+	PoolDirect	PoolDirect 9 in 1		
Oxygen , activ Tablets	0.1 - 10 mg/l	-	-	-	530	-	DPD	
Ozone (DPD) Tablets	0.02 - 1 mg/l	-	-	-	530	530	DPD/Glycine ⁵	24 mm \emptyset 50 mm \square
Ozone (Indigo) Tablets	0.05 - 0.5 mg/l	-	605	-	-	-		24 mm \emptyset
PHMB (Biguanide) Tablets	2 - 60 mg/l	-	-	-	560	-	Buffer/Indicator	24 mm \emptyset
Phosphate LR , ortho Tablets	0.05 - 4 mg/l 0.1 - 4 mg/l	- 660	660 -	- -	610 -	- -	Phosphomolybdic acid/ Ascorbic acid ²	24 mm \emptyset
Phosphate HR , ortho Tablets	10 - 100 mg/l	-	470	-	-	-	Vanadomolybdate ²	24 mm \emptyset
pH value Tablets	6.5 - 8.4 pH	528	-	528	560	560	Phenol red ⁵	24 mm \emptyset
pH value Liquid reagent	6.5 - 8.4 pH	528	-	528	560	-	Phenol red ⁵	24 mm \emptyset
Sodium hypochlorite Tablets	0.2 - 16 %	-	-	-	530	-	Potassium iodide ⁵	24 mm \emptyset
Sulphate VARIO Powder reagent	5 - 100 mg/l	-	-	-	530	-	Bariumsulfat-Turbidity ²	24 mm \emptyset
Turbidity	0.1 - 1100 NTU	-	875	-	-	-	Nephelometric	24 mm \emptyset
Urea Tablet/Liquid reagent	0.1 - 2.5 mg/l 0.2 - 5 mg/l ¹⁾	- -	660 660	660 -	610 -	- -	Urease / Indophenol	24 mm \emptyset

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Display	Reagent	Form of reagent/Quantity	Order code
O ₂	DPD No. 4	Tablet / 100	51 12 20 BT
O ₃	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	Tablet / 100 Tablet / 100 each 100 each 250 Tablet / 100 each 100 each 250	51 10 60 BT 51 10 80 BT 51 77 11 51 77 12 51 21 70 51 77 31 51 77 32
O ₃	OZONE	Tablet / 100	51 31 70
PHMB	PHMB PHOTOMETER	Tablet / 100	51 61 00
PO ₄	PHOSPHATE No. 1 LR PHOSPHATE No. 2 LR Combi pack [#] PHOSPHATE No.1 LR / No.2 LR Combi pack [#] PHOSPHATE No.1 LR / No.2 LR	Tablet / 100 Tablet / 100 each 100 each 200	51 30 40 51 30 50 51 76 51 51 76 52
PO ₄	PHOSPHATE No. 1 HR PHOSPHATE No. 2 HR Combi pack [#] PHOSPHATE No.1 HR / No.2 HR Combi pack [#] PHOSPHATE No.1 HR / No.2 HR	Tablet / 100 Tablet / 100 each 100 each 200	51 58 10 51 58 20 51 76 61 51 76 62
pH	PHENOLRED / PHOTOMETER	Tablet / 100	51 17 70 BT
pH	PHENOLRED Solution	Liquid reagent / 15 ml	47 10 40
NaOCl	ACIDIFYING GP CHLORINE HR (KI) Combi pack [#] CHLORINE HR (KI)/ACIDIFYING GP Combi pack [#] CHLORINE HR (KI)/ACIDIFYING GP	Tablet / 100 Tablet / 100 each 100 each 250	51 54 80 51 30 00 51 77 21 51 77 22
SO ₄	VARIO Sulpha 4 / F10	Powder Pack / 100	53 21 60
NTU	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	Liquid reagent / 15 ml Liquid reagent / 10 ml Tablet / 100 Tablet / 100 each 100 each 250	45 93 00 45 94 00 51 25 80 51 25 90 51 76 11 51 76 12

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