

Lovibond® Water Analysis

Tintometer® Group



Lovibond® Comparator 2000+

Simple Methods of Water Analysis

- ✓ Drinking Water
- ✓ Surface, Ground and Raw Water
- ✓ Sewerage and Domestic Effluents
- ✓ Waste Water and Effluents
- ✓ Boiler and Cooling Water
- ✓ Aquaculture

System Components

Comparator instrument to bring the prepared sample and the glass filters together for colour matching



The Lovibond® Comparator 2000+ is a high quality instrument for visually matching the intensity of sample colour with Lovibond® glass filters; it includes an adjustable cell compartment for samples in cells of up to 40 mm path length. Lovibond® Nessleriser systems are longer path length instruments for matching a column of sample in a Nessler cylinder with Lovibond® glass filters; they are designed for measuring concentrations which are below the sensitivity of the Comparator 2000+.

Lovibond® comparator instruments include an integrated prism which causes the sample

and comparison fields to overlap, allowing enhanced colour discrimination and matching. The prism is ultrasonically sealed to prevent contamination of the optics. Both the Comparator 2000+ and the Nessleriser series include the facility to compensate for water samples which are turbid or tinted.



Lighting unit (optional) to ensure constant viewing conditions for colour matching

For consistent and accurate readings when using the Lovibond® Comparator System 2000+ it is important to use a constant light source for matching the sample with the glasses. Northern daylight (Southern daylight in the Southern hemisphere) is the optimum natural lighting for colour matching although users should be aware that it will vary according to the time of day, the weather, the season and exact location. Only by using a Lovibond® lighting unit is it possible to guarantee uniform lighting conditions for colour matching, 24 hours a day and irrespective of ambient lighting. The Daylight Lighting Unit is a standardised bench-top light source which guarantees constant and uniform lighting conditions for colour matching. The Portable Lighting Unit is a constant light source powered by rechargeable batteries for colour matching in any location.



Lovibond Tintometer recommends the use of a standardised light source particularly when the sample is very pale in colour or with dark samples where relatively little light is transmitted through it or where the difference in colour between adjacent glasses is slight.

Test disc containing a series of graded glass standards which have been pre-calibrated to give direct test readings

The Lovibond® range includes a selection of over 200 water test discs covering different measuring ranges for more than 50 test parameters. The unique feature of Lovibond® test discs is that they incorporate coloured glass standards that are colour stable and not affected by UV light or extreme environmental conditions. Each individually graded glass standard represents a discrete step on the measurement range (as opposed to a continuous graduation), aiding colour discrimination and allowing greater accuracy of results.



The table on the following pages provides details of the commonly used Lovibond® test discs that are available for water analysis.

Individual test methods are supplied with the disc. For most tests, the discs are calibrated in mg/l (or parts per million) and the sample volume to be used is stated in the method. In certain tests, the calibration is in micrograms (μg) so that the volume of the sample may be adjusted to cover the required concentration range.

Sample container of the required path length

Lovibond Tintometer supplies a range of precision fused glass and moulded optical cells and cylinders, in a range of dimensions and path lengths.

The table of Lovibond® water test discs include details of the container required for each test.



Order Code	Type	Product
35 42 43	DB424/S	Square 13.5 mm, 10 ml moulded glass cells with stoppers (pack of 5)
35 20 40		Square 13.5 mm, 10ml moulded plastic cells with stoppers (pack of 5)
60 68 90	W680/OG/40	Fused cell, 40 mm path length calibrated at 20 ml
60 67 80	W680/OG/2.5	Fused cell, 2.5 mm path length
60 67 90	W680/OG/5	Fused cell, 5 mm path length
60 68 60	W680/OG/25	Fused cell, 25 mm path length
35 30 80	AF 306/P	Pair of cylinders (50 ml, 113mm) with glass anti-meniscus plungers for Nessleriser 2150
35 42 00	DB 420	Pair of cylinders (250 mm) with glass anti-meniscus plungers for Nessleriser 2250
35 42 30	DB 423	Pair of cylinders 100 ml (288 mm) (ASTM D 1209) with glass anti-meniscus plungers for Nessleriser 1209

Reagents, specific to the test, which produce a colour change in the sample

Included in the Lovibond® Comparator System 2000 is a comprehensive range of chemical reagents which develop the colour in the water sample. For many tests, reagents are available in a convenient tablet form, each tablet containing the correct mix of reagent, buffers and catalysts to ensure accurate dosing. The majority of Lovibond® tablet reagents are available in blister packs for a long shelf-life.

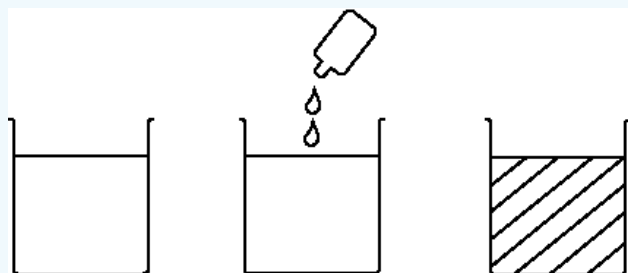
Accessories, as required

There are a range of accessories for use with the Lovibond® Comparator System 2000.

Order Code	Type	Product
17 02 60	DB 426	Cell stand for 10 ml moulded cells, to hold 10 cells
17 02 90	AF 306/S	Stand for 12 Nessler cylinders
36 41 10		Glass stirring rod 4"/10 cm for comparator cells
36 40 80		Glass stirring rod 8"/20 cm for Nessler cylinders
36 41 00		Plastic stirring rod 5"/13 cm
38 02 30		Cleaning brush 4"/10 cm
38 00 30		Cleaning brush 8"/20 cm

Lovibond® Comparator System 2000+

Colorimetric testing is a widely used method of quantitative water analysis which depends on measuring the intensity of colour, produced by the action of an appropriate chemical reagent, to determine the concentration of a particular chemical present in a sample.



A known volume of sample

Add appropriate reagent

Measure intensity of colour produced

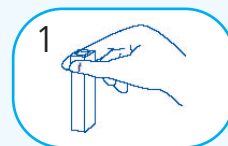
Lovibond Tintometer offers a selection of equipment which can be used to measure the depth of colour in a treated sample to give a quantitative answer:

Lovibond® Comparator System 2000+

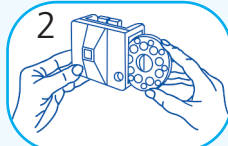
Based on visual comparison with coloured glass filters, which are calibrated to allow direct measurement of concentration levels.

Using the System

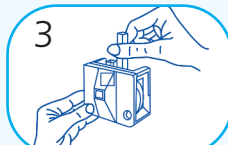
1 Follow the test method for sample preparation, adding the specified reagent to a known volume of sample in the appropriate sample container.



2 Insert the Lovibond® test disc into the comparator instrument.



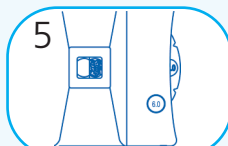
3 Place the sample container in the right hand comparator compartment, and, if specified in the test method, a cell containing a blank of water or untreated sample in the left hand side.



4 Using standardised lighting, rotate the disc until the closest colour match with the sample is obtained.



5 The value will be shown in the window in the comparator instrument.

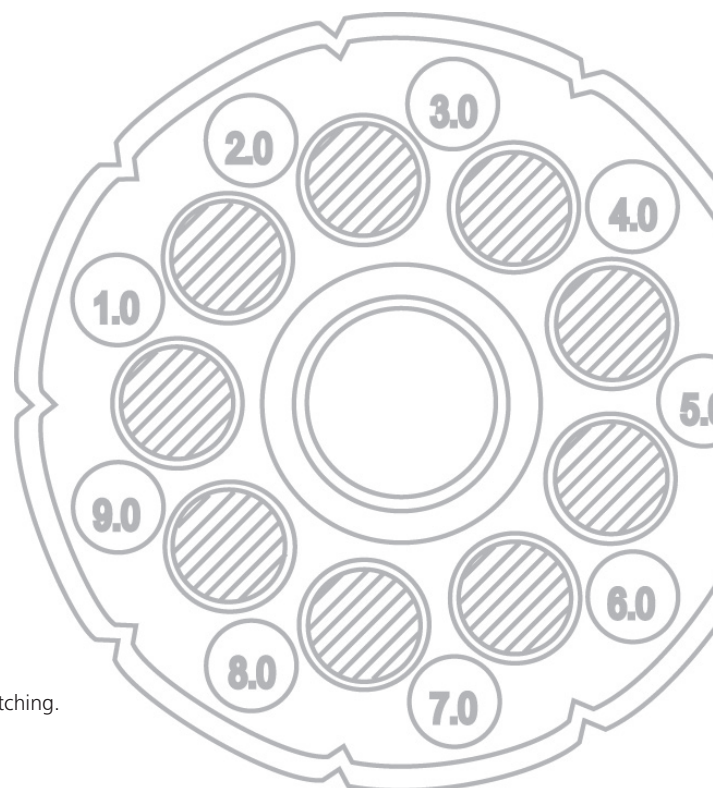


Colorimetric Chemical Analysis using Precalibrated Coloured Glass Filters



- ✓ The equipment is easily used and quick to obtain results.
- ✓ It gives dependable measurements with guaranteed repeatability.
- ✓ It is compact, robust and easily portable.
- ✓ Reagents are mostly available in a convenient tablet form allowing accurate dosage.
- ✓ Set up costs are low and it is inexpensive to operate.
- ✓ Additional measurement ranges and tests are readily added, for more than 50 different parameters.
- ✓ The glass filters used for colour matching are colour stable and not affected by UV light.
- ✓ The comparator system can be used with turbid samples, unlike photometric systems.
- ✓ It includes optional lighting units to guarantee constant viewing conditions for colour matching.
- ✓ The test discs can be certified periodically under an ISO 9001:2000 QA procedure.

For more than 60 years the Lovibond® Comparator System has been used around the world for chemical analysis of water. Today it remains a popular choice for water analysis in all environments, offering a simple and flexible approach which gives reliable results in both laboratory and field testing:



Nessleriser Systems

The Lovibond® Nessleriser Systems are based on the Comparator 2000+. They have a longer path length and are capable of measuring concentrations below the sensitivity of the standard Comparator.

Like the Comparator 2000+ the Nessleriser Systems include a prism to allow colour matching in a single field of view. Systems use either natural light or an electronic daylight unit for a constant light source.

2150 systems use cells with a path length of 113mm and are compatible with any Comparator 2000+ disc with the prefix "N".

2250 systems use cells with a path length of 250mm and are compatible with any Comparator 2000+ disc with the prefix "C".

The AF327 system is specifically designed for Hazen (Platinum-Cobalt) testing to the ASTM D1209 standard and uses a path length of 288mm.

Order Code	Product	Path Length
172150	Nessleriser 2150 System	113mm
172030	Nessleriser 2150 Daylight System	113mm
172250	Nessleriser 2250 System	250mm
172040	Nessleriser 2250 Daylight System	250mm
433270	Nessleriser AF327	288mm
Accessories		
353060	AF306 Nessler Tubes	113mm
353080	AF306/P Nessler Tubes with Plungers	113mm
354200	DB420 Nessler Tubes with Plungers	250mm
354230	DB423 Nessler Tubes with Plungers	288mm



Lovibond® Comparator 2000+ Kits

A wide range of single and multi parameter test kits based on the Comparator 2000 are available. Kits are supplied in a robust carry case with all necessary cells, reagents, discs, instructions and accessories (including additional Nesslerisers and MiniKit titration kits where necessary).

Part numbers for all available single parameter kits can be found in the Table of Water Test Discs and Kits on pages 6 to 14. Listed below are examples of kits for applications across the water industry. Bespoke kits containing customer specified tests can also be supplied on request. Please contact the local Lovibond® representative for further details.



Lovibond® 2000+ Leisure Water Kits

Order Code	Description	Tests	Range
411160	AF116B Chlorine / pH Kit	Chlorine pH	0-4 mg/l 6.8-8.4
416570	AF113C Bromine / pH Kit	Bromine pH	0-6 mg/l 6.8-8.4
411290	AF129 Balanced Water Kit	Chlorine pH Alkalinity Calcium Hardness	0-4 mg/l 6.8-8.4 10-500 mg/l 10-500 mg/l

Lovibond® 2000+ Environmental / Industrial Water Kits

Order Code	Description	Tests	Range
411120	AF112A Chlorine Free and Combined Kit	Chlorine	0-1 mg/l
416241	AF112G Shipboard Chlorine Kit	Chlorine	0.02-0.5 mg/l
413570	AF357 Potable Water Kit	Chloride Chlorine Hardness Hazen pH	0-5000 mg/l 0.02-4 mg/l 0-500 mg/l 10-90 mg/l 6-8.4
413580	AF358 Sewage and Domestic Effluent Kit	Ammonia Chlorine Nitrite Permanganate pH Sulphide	0-1 mg/l 0.1-10 mg/l 0.05-0.5 mg/l 0-60 mg/l BOD 4-9.6 0-0.5 mg/l
411090	AF110 High and Low Chlorine Kit	Chlorine Chlorine (total)	0-1 mg/l 5-50 mg/l
411000	AF100 Water Disinfection Kit	Chlorine pH Sodium Hypochlorite	0.2-50 mg/l 6.8-8.4 2-16%



Table of Lovibond® Water Test Discs

ORDER CODE	TEST (Instrument)	DISC CODE	DISC READINGS / RANGE COVERED	REAGENT CODE	CHEMICAL METHOD BASED ON	ACCESSORIES REQUIRED	APPLICATIONS	KIT PART NUMBER
23 02 05	ALUMINIUM (Comparator)	3/127A	0, 0.05, 0.10, 0.15, 0.20, 0.25, 0.30, 0.40, 0.50 mg/l	517601BT	Aluminium Tablets	13.5 mm cells DB 424	<i>Water treatment processes</i>	411570
23 15 00		3/15	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8 mg/l & "blank"		Haematoxylin	13.5 mm cells DB 424		
23 10 80		3/108	0, 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.4 mg/l		Catechol Violet	13.5 mm cells DB 424		
28 38 90	ALUMINIUM (Nessleriser 2150)	NX	0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5 µg		Haematoxylin	Nessler cylinders AF 306/P		
23 58 00	AMINES (Comparator)	3/58	1, 2, 3, 4, 5, 6, 7, 8, 10 mg/l as octadecylamine	511010	Amine Tablets	Extraction tube AF 260	<i>Boiler water & feed water</i>	412740
23 64 00		3/64	0, 0.25, 0.5, 1, 2 mg/l as octadecylamine	56R013290	Methyl Orange	13.5 mm cells DB 424		56K013201
23 00 60	AMMONIA (Comparator)	3/112	0, 0.05, 0.10, 0.15, 0.20, 0.25, 0.30, 0.35, 0.40 mg/l NH ₄	517611BT	Ammonia Tablets	40 mm cells DB 428	<i>Fish farms/aquaria</i> <i>Industrial effluent, sewage leaks</i> <i>Industrial effluent, sewage leaks</i>	411580
23 00 70		3/113	0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 mg/l N	"	Ammonia Tablets	13.5 mm cells DB 424		411590
23 01 80		3/125	0, 1, 2, 3, 4, 5, 6, 8, 10 mg/l N	"	Ammonia Tablets	2.5 mm cells W680/OG/2.5		411600
23 06 60		3/166	2, 4, 6, 8, 10, 12, 14, 16, 20 mg/l N	"	Nessler's Reagent	13.5 mm cells DB424		
28 31 10	AMMONIA (Nessleriser 2150)	NAA	1, 2, 3, 4, 5, 6, 7, 8, 10 µg NH ₃	465200, 466101	Nessler's Reagent	Nessler cylinders AF 306/P	<i>Water courses as an indicator of organic pollution</i> " "	
28 31 20		NAB	10, 12, 14, 16, 18, 20, 22, 24, 26 µg NH ₃	" "	Nessler's Reagent	Nessler cylinders AF 306/P		
28 31 30		NAC	28, 32, 36, 40, 44, 48, 52, 56, 60 µg NH ₃	" "	Nessler's Reagent	Nessler cylinders AF 306/P		
28 31 40		NAD	60, 65, 70, 75, 80, 85, 90, 95, 100 µg NH ₃	" "	Nessler's Reagent	Nessler cylinders AF 306/P		
23 06 30	BAQUACIL* (Comparator)	3/163	0, 20, 25, 30, 35, 40, 45, 50 75 ppm	515890	Baquatest Tablets	13.5 mm cells DB 424	<i>Swimming Pools</i>	
23 02 20	BORON (Comparator)	3/129	0, 0.2, 0.4, 0.6, 0.8, 1.0, 1.5, 2.0, 2.5 mg/l	515790, 515800	Boron Tablets	13.5 mm cells DB 424	<i>Drinking water and hydroponics</i>	
23 53 10	BROMINE (Comparator)	3/53A	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 2.0 mg/l	511050BT	DPD Tablets	13.5 mm cells DB 424	<i>Swimming Pools and spas</i> <i>Swimming Pools and spas</i>	416530
23 53 20		3/53B	1, 2, 3, 4, 5, 6, 7, 8, 10 mg/l	"	DPD Tablets	13.5 mm cells DB 424		416540
23 53 30		3/53C	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0 mg/l	"	DPD Tablets	13.5 mm cells DB 424		411080
23 89 00	CADMIUM (Comparator)	3/89 ‡	0.5, 1, 1.5, 2, 2.5, 3, 4, 5 µg		Dithizone/Potassium Cyanide	13.5 mm cells DB 424	<i>Effluents</i>	
23 10 20	CHEMICAL OXYGEN DEMAND (Comparator)	4/21 ‡	200, 300, 400, 500, 600 ppm		Dichromate oxidation	13.5 mm cells DB 424	<i>Dairy and malting effluents</i> <i>Dairy and malting effluents</i> <i>Dairy and malting effluents</i> <i>Dairy and malting effluents</i>	
23 10 30		4/21A ‡	100, 125, 150, 175, 200, 225, 250, 275, 300 ppm		Dichromate oxidation	13.5 mm cells DB 424		
23 10 40		4/21B ‡	40, 50, 60, 70, 80, 90, 100, 110, 120 ppm		Dichromate oxidation	13.5 mm cells DB 424		
23 10 50		4/21C ‡	10, 20, 30, 40 ppm		Dichromate oxidation	13.5 mm cells DB 424		
23 71 00	CHLORIDE (Comparator)	3/71	10, 25, 50, 75, 100, 150, 200 mg/l	464801	Mercuric Thiocyanate	13.5 mm cells DB 424	<i>Salinity of water</i> <i>Salinity of water</i>	
23 72 00		3/72	2.5, 5, 7.5, 10, 15, 20, 40, 60, 80 mg/l		Mercuric Thiocyanate	40 mm cells DB 428		
28 37 90	CHLORIDE (Nessleriser 2150)	NOV	1, 2, 3, 4, 5, 6, 7, 8, 10 mg/l	464801	Mercuric Thiocyanate	Nessler cylinders AF 306/P	<i>Salinity of water</i>	

* Baquacil is a trade mark of Zeneca Biocides

‡ Laboratory method; not suitable as a test kit

Table of Lovibond® Water Test Discs

ORDER CODE	TEST (Instrument)	DISC CODE	DISC READINGS / RANGE COVERED	REAGENT CODE	CHEMICAL METHOD BASED ON	ACCESSORIES REQUIRED	APPLICATIONS	KIT CODE	
23 40 10	CHLORINE (Comparator) DPD	3/40A	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l *	511050BT, 511080BT	DPD Tablets	13.5 mm cells DB 424	<i>Drinking water</i>	411120	
23 41 40		3/40J	0.1, 0.2, 0.3, 0.4, 0.6, 0.8, 1.0, 1.5, 2.0 mg/l *	" "	DPD Tablets	13.5 mm cells DB 424		411125	
23 40 90		3/40S	1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.5, 3.0, 4.0 mg/l *	" "	DPD Tablets	13.5 mm cells DB 424			
23 40 20		3/40B	0.2, 0.4, 0.6, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0 mg/l *	" "	DPD Tablets	13.5 mm cells DB 424		411130	
23 40 60		3/40E	0.02, 0.04, 0.06, 0.08, 0.1, 0.15, 0.2, 0.25, 0.3 mg/l *	" "	DPD Tablets	40 mm cells DB 428		<i>Swimming pools</i> <i>Drinking water</i>	411250
29 59 20		-	0.02, 0.04, 0.06, 0.08, 0.1, 0.2, 0.3, 0.4, 0.5 mg/l *	" "	DPD Tablets	40 mm cells DB 428			
23 40 70		3/40F	0.2, 0.25, 0.3, 0.35, 0.4, 0.5, 0.6, 0.7, 0.8 mg/l *	" "	DPD Tablets	40 mm cells DB 428		<i>Shipboard chlorination</i>	
23 40 81		3/40HN	2, 3, 4, 5, 6, 7, 8, 9, 10 mg/l *	" "	DPD Tablets	5 mm cells W680/OG/S			411123
23 39 30		3/40K	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, 6.0 mg/l *	" "	DPD Tablets	13.5 mm DB 424		411121	
23 39 20		3/40P	2.0, 2.3, 2.5, 2.7, 3.0, 3.2, 3.6, 4.0, 5.0 mg/l *	" "	DPD Tablets	13.5 mm DB 424		4 11127	
23 20 60		3/2APH	2, 3, 4, 5, 6, 7, 8, 9, 10 mg/l total Cl ₂	517721BT	Potassium Iodide Tablets	40 mm cells DB 428		<i>Water mains, food processing</i>	418883
23 20 70		3/2ARP	5, 10, 15, 20, 25, 30, 35, 40, 50 mg/l total Cl ₂	" "	Potassium Iodide Tablets	13.5 mm cells DB424			418881
23 20 90		3/2IOD	5, 10, 25, 50, 75, 100, 150, 200, 250 mg/l total Cl ₂	" "	Potassium Iodide Tablets	13.5 mm cells DB424		<i>Water mains, food processing</i>	418880
23 21 10		3/2Hypo	2, 4, 6, 8, 10, 12, 14, 16% w/w available Cl ₂	" "	Potassium Iodide Tablets	13.5 mm cells DB424			<i>Storage test on Sodium Hypochlorite</i>
23 25 10		3/25A	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l		Neutral o-Tolidine**	40 mm cells DB 428			
23 25 20		3/25B	0.25, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0 mg/l		Neutral o-Tolidine**	13.5 mm cells DB 424			
23 20 10	3/2A	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l		Acid o-Tolidine**	13.5 mm cells DB 424				
23 20 80	3/2B	1.2, 1.4, 1.6, 1.8, 2.0 mg/l		Acid o-Tolidine**	13.5 mm cells DB 424				
23 20 20	3/2AB	0.15, 0.25, 0.5, 0.75, 1.0, 1.25, 1.5, 1.75, 2.0 mg/l		Acid o-Tolidine**	13.5 mm cells DB 424				
23 20 50	3/2APC	1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0 mg/l		Acid o-Tolidine**	5 mm cells W680/OG/5				
23 20 30	3/2APA	0.02, 0.04, 0.06, 0.08, 0.1, 0.15, 0.2, 0.25, 0.3 mg/l		Acid o-Tolidine**	40 mm cells DB 428				
23 20 40	3/2APB	0.2, 0.25, 0.3, 0.35, 0.4, 0.5, 0.6, 0.7, 0.8 mg/l		Acid o-Tolidine**	40 mm cells DB 428				
28 34 50	CHLORINE DPD (Nessleriser 2150)	NDPB	0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.1 mg/l	511230BT, 511250BT	DPD Tablets	Nessler cylinders AF 306/P	<i>Potable water treatment</i>		
28 34 60		NDPC	0.02, 0.04, 0.06, 0.08, 0.1, 0.12, 0.14, 0.16, 0.2 mg/l	" "	DPD Tablets	Nessler cylinders AF 306/P		<i>Potable water treatment</i>	
28 34 40		NDP	0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5 mg/l	" "	DPD Tablets	Nessler cylinders AF 306/P		<i>Potable water treatment</i>	
28 34 70		NDPD	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l	" "	DPD Tablets	Nessler cylinders AF 306/P		<i>Potable water treatment</i>	
28 33 10		NCA	0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09 mg/l		Acid o-Tolidine**	Nessler cylinders AF 306/P			
28 33 30		NCB	0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.45, 0.5 mg/l		Acid o-Tolidine**	Nessler cylinders AF 306/P			
28 33 20		NCAB	0.02, 0.04, 0.06, 0.08, 0.1, 0.2, 0.3, 0.4, 0.5 mg/l		Acid o-Tolidine**	Nessler cylinders AF 306/P			
28 34 90	CHLORINE (Nessleriser 2250)	CBA	0.002, 0.004, 0.006, 0.008, 0.01, 0.015, 0.02, 0.025, 0.03 mg/l	471056	DPD Liquid	250 mm cylinders DB 420	<i>Aquaria, effluents</i>		

* Can be used for free, combined and total chlorine measurements

** The use of o-Tolidine is controlled in the UK by the Carcinogenic Substances Regulations 1967

Table of Lovibond® Water Test Discs

ORDER CODE	TEST (Instrument)	DISC CODE	DISC READINGS / RANGE COVERED	REAGENT CODE	CHEMICAL METHOD BASED ON	ACCESSORIES REQUIRED	APPLICATIONS	KIT PART NUMBER
29 22 60	CHLORINE DIOXIDE (Comparator)	3/40AD	0.19, 0.38, 0.57, 0.76, 0.95, 1.14, 1.33, 1.52, 1.9 mg/l	511050BT, 512170BT	DPD Tablets	13.5 mm cells DB 424	Water treatment, cooling towers	56k014501
29 21 60		3/40BD	0.38, 0.76, 1.14, 1.9, 2.85, 3.8, 4.75, 5.7, 7.6 mg/l	" "	DPD Tablets	13.5 mm cells DB 424	Water treatment, cooling towers	
29 79 70		3/40ED	0.04, 0.08, 0.11, 0.15, 0.19, 0.28, 0.38, 0.48, 0.57 mg/l	" "	DPD Tablets	40 mm cells DB 428	Water treatment, cooling towers	419811
23 05 70		3/157	0.25, 0.5, 0.75, 1.0, 1.25, 1.5, 2.0, 3.0, 5.0 mg/l	517721BT, 512170BT	Potassium Iodide Tablets	40 mm cells DB 428	Water treatment, cooling towers	421540
28 34 50	CHLORINE DIOXIDE (Nessleriser 2150)	NDPB	0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.1 mg/l as Cl ₂	511230BT, 512170BT	DPD Tablets	Nessler cylinders AF 306/P		
28 34 60		NDPC	0.02, 0.04, 0.06, 0.08, 0.1, 0.12, 0.14, 0.16, 0.2 mg/l as Cl ₂	" "	DPD Tablets	Nessler cylinders AF 306/P		
28 34 40		NDP	0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5 mg/l as Cl ₂	" "	DPD Tablets	Nessler cylinders AF 306/P		
23 59 00	CHROMIUM (Comparator)	3/59	10, 20, 30, 40, 50, 60, 70, 80, 100 µg		Diphenylcarbazide	13.5 mm cells DB 424	Plating effluents. Chromium VI and total chromium	413630
23 10 60		4/35	100, 150, 200, 250, 300, 350, 400, 500, 600 mg/l Cr as sodium chromate		Colour of chromate ion	13.5 mm cells DB 424	Heating systems where chromate s used as a rust inhibitor	
28 31 70	CHROMIUM (Nessleriser 2150)	NOK	2, 3, 4, 5, 6, 7, 8, 9, 10 µg		Diphenylcarbazide	Nessler cylinders AF 306/P		
23 31 00	COBALT (Comparator)	3/31 ‡	10, 25, 50, 75, 100, 125, 150, 175, 200 µg		Thiocyanate	13.5 mm cells DB 424		
28 38 60	COBALT (Nessleriser 2150)	NTA ‡	1, 2, 3, 4, 5, 6, 7, 8, 9 µg		Nitroso-R salt	Nessler cylinders AF 306/P		
28 38 70		NTB ‡	10, 12.5, 15, 17.5, 20, 22.5, 25, 27.5, 30 µg		Nitroso-R salt	Nessler cylinders AF 306/P		
23 00 50	COPPER (Comparator)	3/106	0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 mg/l	51260BT	Copper/Zinc Low Range Tablets	13.5 mm cells DB 424	Industrial water/waste water	411620
23 00 40		3/110	0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 mg/l	512340BT	Copper/Zinc High Range Tablets	13.5 mm cells DB 424	Industrial water/waste water	
23 06 80		3/168	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l	517692BT	Copper Tablets	40 mm cells DB 428		56K014801
23 04 50		3/149	0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 mg/l	517692BT	Copper Tablets	13.5 mm cells DB 424		
23 39 00		3/39	2.5, 5, 10, 15, 20, 25, 30, 40, 50 µg		Zinc Dibenzylidithio-carbamate	13.5 mm cells DB 424	Trade effluents	
23 05 00		3/5	2.5, 5, 10, 15, 20, 25, 30, 40, 50 µg		Sodium Diethyldithio-carbamate	13.5 mm cells DB 424		
23 10 90		3/109	0.0125, 0.025, 0.05, 0.075, 0.1, 0.125, 0.15, 0.2, 0.25 mg/l		Copper 3/109 Tablets	Special extractor AF 262	Domestic water supplies	
28 34 10	COPPER (Nessleriser 2150)	NDA	2.5, 5.0, 10, 15, 20, 25, 30, 35, 40 µg		Dithio-oxamide	Nessler cylinders AF 306/P		
28 34 30		NDB	30, 35, 40, 50, 60, 70, 80, 90, 100 µg		Dithio-oxamide	Nessler cylinders AF 306/P		
23 33 00	CYANIDE (Comparator)	3/33 ‡	0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 mg/l		Benzidine Pyridine	13.5 mm cells DB 424	Not for use in UK	413620
23 86 00		3/86	0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 mg/l		p-Phenylene diamine dihydrochloride	13.5 mm cells DB 424	Effluents. Measures free and simple complexes	
28 36 60	CYANIDE (Nessleriser 2150)	NOC ‡	0.02, 0.04, 0.06, 0.08, 0.1, 0.12, 0.14, 0.16, 0.2 mg/l		Pyridine pyrazolone	Nessler cylinders AF 306/P	River water, sewage and trade effluents	
23 04 60	DEHA (Comparator)	3/150	8, 16, 24, 32, 40, 48, 56, 64, 80 µg/l. Disc reading should be multiplied by 2 for true DEHA concentration	513220BT, 461181	Iron reduction	40 mm cells DB 428	Oxygen scavenger - boiler water	416400
23 48 00	DETERGENTS (Comparator)	3/48 ‡	1, 2, 3, 4, 6, 8, 10, 12 16 mg/l active material		Methylene Blue	13.5 mm cells DB 424	Measures anionic detergents	

‡ Laboratory method; not suitable as a test kit

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29 68 10	DICHLOROPHEN (PANACIDE*) IN WATER (Comparator)	3/57B	20, 30, 40, 50, 60, 70, 80, 90, 100 mg/l		4-amino antipyrine	5 mm cells W680/OG/5	Cooling towers, air conditioning plant etc	
28 37 40	FLUORIDE (Nessleriser 2150)	NOO	0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3 mg/l	511400, 511410	Acid alizarin zirconium Tablets	Nessler cylinders AF 306/P	Cooke, Dixon and Sawyer method	416070
28 37 30		NOM	0, 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6 mg/l	" "	Acid alizarin zirconium Tablets	Nessler cylinders AF 306/P	Tablet method for natural and added fluoride	
28 37 80		NOT	0.2, 0.3, 0.4, 0.5, 1.1, 1.2, 1.3, 1.4, 1.5 mg/l	" "	Acid alizarin zirconium Tablets	Nessler cylinders AF 306/P	Control of drinking water fluoridation	
23 10 70	HARDNESS, TOTAL (Comparator)	4/38	0, 5, 10, 15, 20, 25, 30, 40, 60 mg/l CaCO ₃		Hardness Eriochrome Powder	13.5 mm cells DB 424	Hardness in boiler water	
24 28 01	HAZEN SCALE (Comparator)	4/28	50, 75, 100, 150, 200, 250, 300, 400, 500 mg Pt/l	N/A	Straight colour match to sample	40 mm cells DB 428*	APHA, ASTM & British Standards	
24 28 50	HAZEN SCALE (Comparator)	4/28A	200, 225, 250, 300, 350, 400, 450, 500 mg Pt/l	N/A	Straight colour match to sample	40 mm cells DB 428*	APHA, ASTM & British Standards	
28 41 70	HAZEN SCALE (Nessleriser 2150)	NSH	10, 20, 30, 40, 50, 60, 70, 80, 90 mg Pt/l	N/A	Straight colour match to sample	Nessler cylinders AF 306/P**	APHA, ASTM & ISO Standards	433250
28 41 20		NSB	70, 85, 100, 125, 150, 175, 200, 225, 250 mg Pt/l	" "	Straight colour match to sample	Nessler cylinders AF 306/P**	APHA, ASTM & ISO Standards	"
28 41 30		NSX	50, 60, 70, 80, 100, 150, 200, 250, 300 mg Pt/l	" "	Straight colour match to sample	Nessler cylinders AF 306/P**	APHA, ASTM & ISO Standards	"
28 41 50	HAZEN SCALE (Nessleriser 2250)	CAA	0, 2.5, 5, 7.5, 10, 15, 20, 25, 30 mg Pt/l	N/A	Straight colour match to sample	250 mm cylinders DB 420**	APHA, ASTM & ISO Standards	433280
28 41 60		CAB	30, 35, 40, 45, 50, 55, 60, 65, 70 mg Pt/l	" "	Straight colour match to sample	250 mm cylinders DB 420**	APHA, ASTM & ISO Standards	
28 39 70	HAZEN SCALE (Nessleriser 1209)	1209/1	0, 2.5, 5, 7.5, 10, 15, 20, 25, 30 mg Pt/l	N/A	Straight colour match to sample	100 ml cylinders DB 423 **	Conforms to path length requirements specified in ASTM D1209	433270
28 39 80		1209/2	30, 35, 40, 45, 50, 55, 60, 65, 70 mg Pt/l	" "	Straight colour match to sample	100 ml cylinders DB 423 **		
23 01 90	HYDRAZINE (Comparator)	3/126	0, 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.4, 0.5 mg/l	462910	Hydrazine test powder	13.5 mm cells DB 424	Boiler water	56K015001
23 02 90		3/135	0.02, 0.04, 0.06, 0.08, 0.1, 0.12, 0.14, 0.16, 0.2 mg/l	" "	Hydrazine test powder	40 mm cells DB 428	Boiler water	
23 85 00		3/85	0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 mg/l	461261	p-dimethyl-amino-benzaldehyde	13.5 mm cells DB 424	Simple single reagent	
28 37 00	HYDRAZINE (Nessleriser 2150)	NOH	0, 0.5, 1, 2, 3, 4, 6, 8, 10 µg	" "	p-dimethyl-amino-benzaldehyde	Nessler cylinders AF 306/P	Boiler water	
23 50 00	HYDROGEN PEROXIDE (Comparator)	3/50A	0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5 mg/l	512380	Hydrogen Peroxide Low Range Tablets	13.5 mm cells DB 424		56K015201
23 50 10		3/50B	0.1, 0.2, 0.3, 0.4, 0.6, 1.0, 1.5, 2.0, 3.0 mg/l	" "	" "	13.5 mm cells DB 424		411350
23 50 20		3/50E	0.01, 0.02, 0.03, 0.04, 0.05, 0.07, 0.09, 0.12, 0.15 mg/l	" "	" "	40 mm cells DB 428		
23 00 80		3/114	2, 4, 6, 8, 10, 12, 14, 16, 20 mg/l	513530, 513010	"Hydrogen Peroxide High Range Tablets	13.5 mm cells DB 424		411481
23 00 90		3/115	10, 20, 30, 40, 50, 60, 70, 80, 100 mg/l	513530, 513010	" "	13.5 mm cells DB 424		
29 64 70		3/105	3, 5, 10, 15, 20, 30, 40, 50, 70 mg/l		Potassium Titanium Oxalate	13.5 mm cells DB 424	Sewage treatment	411480
23 77 10	IODINE (Comparator)	3/77A	0.4, 0.7, 1.1, 1.4, 1.8, 2.2, 2.5, 2.9, 3.6 mg/l	511050BT	DPD Tablets	13.5 mm cells DB 424		
23 77 20		3/77B	0.7, 1.4, 2.2, 3.6, 5.4, 7.2, 9.0, 11, 14 mg/l		DPD Tablets	13.5 mm cells DB 424		

* Registered Trade Mark of Coalite Chemicals

** Use of a standardised lighting unit is recommended for pale coloured samples

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22 03 80	IRON (Comparator)	3/144	0.02, 0.04, 0.06, 0.08, 0.1, 0.15, 0.2, 0.25, 0.3 mg/l	515370BT	Iron Low Range Tablets	40 mm cells DB 428	<i>Measures total soluble iron</i>	413780
23 01 00		3/116	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l	515370BT, 515420	Iron Low Range Tablets	13.5 mm cells DB 424	<i>Measures total soluble iron</i>	
23 01 10		3/117	1, 2, 3, 4, 5, 6, 7, 8, 10 mg/l	515380	Iron High Range Tablets	13.5 mm cells DB 424	<i>Measures total soluble iron</i>	
23 88 00		3/88	0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.5, 0.75, 1.0 mg/l		o-Phenanthroline	40 mm cells DB 428	<i>Measures ferrous and ferric iron</i>	
23 06 00		3/6	10, 20, 30, 40, 50, 60, 70, 80, 100 µg		Thioglycollic acid	13.5 mm cells DB 424	<i>Measures total iron</i>	
23 10 10		APFE	0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4.5, 5 mg/l		Thioglycollic acid	40 mm cells DB 428	<i>Measures total iron</i>	
23 11 00		3/11	2, 4, 6, 8, 10, 12.5, 15, 20, 25 µg		Thiocyanate	13.5 mm cells DB 424	<i>Measures ferric iron</i>	
23 05 90		3/159	10, 20, 30, 40, 50, 60, 80, 110, 140 µg		o-Phenanthroline	13.5 mm cells DB 424	<i>Measures ferric iron</i>	
28 37 20	IRON (Nessleriser 2150)	NOL	0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.10 mg/l	515370BT, 515420	Iron Low Range Tablets	Nessler cylinders AF 306/P	<i>Measures total soluble iron</i>	
28 35 10		NEA	2, 4, 6, 8, 10, 12, 14, 16, 18 µg		Thioglycollic Acid	Nessler cylinders AF 306/P	<i>Measures total iron</i>	
28 35 30		NEB	20, 25, 30, 35, 40, 45, 50, 55, 60 µg		Thioglycollic Acid	Nessler cylinders AF 306/P	<i>Measures total iron</i>	
28 35 20		NEAB	5, 10, 15, 20, 25, 30, 40, 50, 60 µg		Thioglycollic Acid	Nessler cylinders AF 306/P	<i>Measures total iron</i>	
23 05 30	LEAD (Comparator)	3/153 ‡	1, 2, 4, 6, 8, 10, 12, 16, 20 µg		Dithizone/Cyanide	13.5 mm cells DB 424	<i>Low levels in drinking water</i>	
23 28 00	MAGNESIUM (Comparator)	3/28	0, 1, 2, 3, 4, 5, 7, 10 mg/l		Titan Yellow	13.5 mm cells DB 424		
23 06 90	MANGANESE (Comparator)	3/169	0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 mg/l	517621BT	Manganese LR Tablets	13.5 mm cells DB 424	<i>Total manganese in natural and industrial water supplies</i>	56K015601
23 21 50		3/21	5, 10, 15, 20, 25, 30, 40, 50, 60 µg		Formaloxime Hydrochloride	13.5 mm cells DB 424		
23 55 00		3/55	0.03, 0.06, 0.09, 0.12, 0.15, 0.18, 0.21, 0.25, 0.3 µg		Luecomalachite green	13.5 mm cells DB 424		
28 39 20	MANGANESE (Nessleriser 2150)	NZZ	0.025, 0.05, 0.075, 0.1, 0.15, 0.2, 0.3, 0.4, 0.5 mg/l		Formaloxime Hydrochloride	Nessler cylinders AF 306/P		
28 39 40	MANGANESE (Nessleriser 2250)	CCA	0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.5, 0.75, 1.0 mg/l		Formaloxime	250 mm cylinders DB 420		
23 06 20	MOLYBDATE (Comparator)	3/162	0, 1, 2, 3, 4, 5, 6, 8, 10 mg/l MoO ₄	56R015750	Dihydroxybenzene disulphonic acid	40 mm cells DB 428	<i>Industrial water systems</i>	56K015701
23 03 20		3/137	5, 10, 15, 20, 25, 30, 35, 40, 50 mg/l MoO ₄	517631BT	Molybdate Tablets	40 mm cells DB 428	<i>Industrial water systems</i>	56K015801
23 03 30		3/138	10, 20, 30, 40, 60, 80, 100, 120, 150 mg/l MoO ₄	517631BT	Molybdate Tablets	13.5 mm cells DB 424	<i>Industrial water systems</i>	412920
23 36 00	NICKEL (Comparator)	3/36	1, 2, 3, 4, 5, 6, 7, 8, 10 mg		Dimethyl glyoxime	13.5 mm DB 424	<i>Effluents</i>	
23 01 70	NITRATE (Comparator)	3/124	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l N	502810, 465230, 512310, 366220	Zinc reduction to nitrite (Nitrate Test Powder)	13.5 mm cells DB 424	<i>Aquaria & drinking water</i>	56K016001
23 17 00		3/17 ‡	5, 10, 20, 30, 40, 50, 60, 70, 80, 100 µg N		Phenol 2:4 disulphonic acid	13.5 mm cells DB 424		
23 32 00		3/32 ‡	1, 2, 3, 4, 5, 6, 7, 8, 9 mg/l N		Brucine	13.5 mm cells DB 424		
23 56 00		3/17 ‡	10, 20, 40, 60, 80, 100, 120, 160, 200 µg N		Phenol 2:4 disulphonic acid	13.5 mm cells DB 424		
23 03 60		3/142	10, 20, 30, 40, 50, 60, 70, 80, 100 mg/l N	517641	Nitrate No 1/No 2 tablets	13.5 mm cells DB 424		

‡ Laboratory method; not suitable as a test kit

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23 32 00 23 56 00	NITRATE (Comparator) <i>continued</i>	3/32 ‡ 3/56	1, 2, 3, 4, 5, 6, 7, 8, 9 mg/l N 10, 20, 40, 60, 80, 100, 120, 160, 200 µg N		Brucine Phenol 2:4 disulphonic acid	13.5 mm cells DB 424 13.5 mm cells DB 424		
28 35 70 28 35 60	NITRATE (Nessleriser 2150)	NHP ‡ NH ‡	2.5, 5, 7.5, 10, 12.5, 15, 20, 25, 30 µg N 2, 4, 6, 8, 10, 12, 15, 18, 25 µg N		Phenol 2:4 disulphonic acid 2:4-xylene-I-ol	Nessler cylinders AF 306/P Nessler cylinders AF 306/P		
23 00 30 23 83 00 23 93 10 23 93 20	NITRITE (Comparator)	3/103 3/83 3/93A 3/93B	0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.5 mg/l N 1, 2, 3, 5, 7, 9, 11, 13, 15 µg N 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09, 0.1% 0.10, 0.11, 0.12, 0.14, 0.15, 0.16, 0.18, 0.20%	512310	Nitrite Low Range Tablets Cleve's Acid Cleve's Acid Cleve's Acid	13.5 mm cells DB 424 13.5 mm cells DB 424 25 mm cells W680/OG/25 25 mm cells W680/OG/25	<i>Pickling brines</i> <i>Pickling brines</i>	56K016201
28 39 60 28 35 80	NITRITE (Nessleriser 2150)	NJP NJ	0.002, 0.004, 0.006, 0.01, 0.015, 0.02, 0.03, 0.04, 0.05 mg/l N 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 µg N	512310, 502371	Nitrite LR Tablets Cleve's Acid	Nessler cylinders AF 306/P Nessler cylinders AF 306/P	<i>Fish farms/aquaria</i>	
	NITROGEN		(See Ammonia, Nitrate, Nitrite)					
23 03 00 23 06 50	OXYGEN, DISSOLVED (Comparator)	3/3 3/165	4, 5, 6, 7, 8, 9, 10, 11, 12 mg/l 2, 3, 4, 5, 6, 7, 8, 10, 12 mg/l	461150, 461160, 461170 " "	Alsterberg's Method Alsterberg's Method	13.5 mm cells DB 424 13.5 mm cells DB 424	<i>Natural waters, lakes, ponds</i> <i>Natural waters, lakes, ponds</i>	413870 56K016301
28 36 80 28 35 90 28 36 00 28 39 00 28 39 10 28 38 00 28 38 10	OXYGEN, DISSOLVED (Nessleriser 2150)	NOE NKA NKB NYA ‡ NYB ‡ NOWA ‡ NOWB ‡	0, 0.005, 0.01, 0.015, 0.03, 0.055, 0.08, 0.1, 0.12 ml/l 0.05, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 ml/l 0.4, 0.5, 0.6, 0.7, 0.8, 1.0, 1.2, 1.4, 1.6 mg/l 0.001, 0.003, 0.005, 0.007, 0.009, 0.012, 0.015, 0.018, 0.02 ml/l 0.025, 0.03, 0.035, 0.04, 0.045, 0.05, 0.06, 0.08, 0.1 ml/l 0.002, 0.003, 0.005, 0.006, 0.008, 0.01, 0.011, 0.013, 0.014 ml/l 0.016, 0.024, 0.032, 0.04, 0.047, 0.053, 0.063, 0.071, 0.079 ml/l	461150, 461160, 461170 " "	Indigo carmine Alsterberg's Method Alsterberg's Method Modification of Alsterberg's Method Modification of Alsterberg's Method Acid o-Tolidine* Acid o-Tolidine*	Special glass cylinders AF 315 Nessler cylinders AF 306/P Nessler cylinders AF 306/P Nessler cylinders AF 306/P Nessler cylinders AF 306/P Nessler cylinders AF 306/P Nessler cylinders AF 306/P	<i>Special for boiler water</i>	
23 67 00 23 67 10 23 67 70 23 04 40	OZONE (Comparator)	3/67 3/67A 3/67S 3/148	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l 0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.10 mg/l 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4, 0.45 mg/l 0, 0.05, 0.10, 0.15, 0.20, 0.25, 0.30, 0.40, 0.50 mg/l	511220BT, 512170BT " " " " 513170	DPD Tablets DPD Tablets DPD Tablets Ozone Tablets	13.5 mm cells DB 424 40 mm cells DB 428 13.5 mm cells, DB 424 40 mm cells DB 428	<i>Swimming pools, water disinfection</i> <i>Swimming pools, water disinfection</i> <i>Swimming pools, water disinfection</i> <i>New "Standard Method" based on indigo trisulphonate for treated water and swimming pools</i>	413810 413880
28 37 60 28 37 70	OZONE (Nessleriser 2150)	NOR NOS	0.01, 0.02, 0.04, 0.06, 0.1, 0.15, 0.2, 0.25, 0.3 mg/l 0.2, 0.4, 0.6, 0.8, 1.0, 1.5, 2.0, 2.5 mg/l	511261, 512170BT	DPD Tablets Potassium Iodide	Nessler cylinders AF 306/P Nessler cylinders AF 306/P		
23 04 30	PERMANGANATE VALUE (Comparator)	3/3A	0, 5, 10, 15, 20, 30, 40, 50, 60 mg/l		Acid permanganate	13.5 mm cells DB 424	<i>Approx. measure of oxidisable matter (organic & inorganic) in effluents & river water</i>	

* The use of o-Tolidine is controlled in the UK by the Carcinogenic Substances Regulations 1967 ‡ Laboratory method; not suitable as a test kit

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22 12 60	pH VALUE (Comparator) Narrow range	2/1Y	0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8	511600	Cresol Red	13.5 mm cells DB 424	<i>Almost any aqueous solution. Nessler method more suitable for unbuffered water</i>		
22 12 50		2/1W	1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6	511710	m-Cresol Purple	13.5 mm cells DB 424			
22 10 10		2/1A	1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6, 2.8	511650	Thymol Blue	13.5 mm cells DB 424		" "	
22 10 30		2/1B	2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4	511620	Bromophenol Blue	13.5 mm cells DB 424		" "	
22 13 30		2/1ZG	2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4		Methyl Orange	13.5 mm cells DB 424		" "	
22 12 40		2/1V	3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4, 4.6		"BDH 3046"	13.5 mm cells DB 424		" "	
22 10 50		2/1C	3.6, 3.8, 4.0, 4.2, 4.4, 4.6, 4.8, 5.0, 5.2	511760	Bromocresol Green	13.5 mm cells DB 424		" "	
22 10 60		2/1CC	4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0		"BDH 4080"	13.5 mm cells DB 424		" "	
22 10 70		2/1D	4.4, 4.6, 4.8, 5.0, 5.2, 5.4, 5.6, 5.8, 6.0		"BDH 4460"	13.5 mm cells DB 424		" "	
22 10 80		2/1E	4.4, 4.6, 4.8, 5.0, 5.2, 5.4, 5.6, 5.8, 6.0	451631	Methyl Red	13.5 mm cells DB 424		" "	
22 10 90		2/1F	4.8, 5.0, 5.2, 5.4, 5.6, 5.8, 6.0, 6.2, 6.4		Chlorophenol Red	13.5 mm cells DB 424		" "	
22 11 00		2/1G	5.2, 5.4, 5.6, 5.8, 6.0, 6.2, 6.4, 6.6, 6.8	511730	Bromocresol Purple	13.5 mm cells DB 424		" "	56K016701
22 11 10		2/1H	6.0, 6.2, 6.4, 6.6, 6.8, 7.0, 7.2, 7.4, 7.6	511640BT	Bromothymol Blue	13.5 mm cells DB 424		" "	56K016801
22 11 30		2/1J	6.8, 7.0, 7.2, 7.4, 7.6, 7.8, 8.0, 8.2, 8.4	511750BT	Phenol Red	13.5 mm cells DB 424		" "	56K016901
22 11 40		2/1K	7.2, 7.4, 7.6, 7.8, 8.0, 8.2, 8.4, 8.6, 8.8	511600	Cresol Red	13.5 mm cells DB 424		" "	
22 12 70		2/1Z	7.6, 7.8, 8.0, 8.2, 8.4, 8.6, 8.8, 9.0, 9.2	511710	m-Cresol Purple	13.5 mm cells DB 424		" "	
22 11 90		2/1L	8.0, 8.2, 8.4, 8.6, 8.8, 9.0, 9.2, 9.4, 9.6	511650	Thymol Blue	13.5 mm cells DB 424		" "	
22 12 30		2/1U	8.6, 8.8, 9.0, 9.2, 9.4, 9.6, 9.8, 10.0		"BDH 8610"	13.5 mm cells DB 424		" "	
22 13 20		2/1ZF	8.6, 8.8, 9.0, 9.2, 9.4, 9.6, 9.8, 10.0, 10.2		Phenolphthalein	13.5 mm cells DB 424		" "	
22 12 00		2/1M	9.0, 9.5, 10.0, 10.5, 11.0		"BDH 9011"	13.5 mm cells DB 424		" "	
22 12 20	pH VALUE (Comparator) Broad range	2/1P	4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 9.4, 10.0, 11.0	451770	Universal	13.5 mm cells DB 424	" "	56K016901	
22 13 10		2/1ZE	1, 3, 5, 6, 7, 8, 9, 11, 13		"BDH Full Range"	13.5 mm cells DB 424	" "		
28 11 10	pH VALUE (Nessleriser 2150)	NLM	1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6, 2.8	511650	Thymol Blue	Nessler cylinders AF 306/P	<i>Almost any aqueous solution. Nessler method more suitable for unbuffered water</i>		
28 11 20		NLN	2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4	511620	Bromophenol Blue	Nessler cylinders AF 306/P			
28 11 50		NLR	3.0, 3.2, 3.4, 3.6, 3.8, 4.0, 4.2, 4.4, 4.6		"BDH 3046"	Nessler cylinders AF 306/P		" "	
28 10 10		NLA	3.6, 3.8, 4.0, 4.2, 4.4, 4.6, 4.8, 5.0, 5.2	511760	Bromocresol Green	Nessler cylinders AF 306/P		" "	
28 11 70		NLT	4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0		"BDH 4080"	Nessler cylinders AF 306/P		" "	
28 11 30		NLO	4.4, 4.6, 4.8, 5.0, 5.2, 5.4, 5.6, 5.8, 6.0		"BDH 4460"	Nessler cylinders AF 306/P		" "	
28 11 00		NLL	4.4, 4.6, 4.8, 5.0, 5.2, 5.4, 5.6, 5.8, 6.0	451631	Methyl Red	Nessler cylinders AF 306/P		" "	
28 10 20		NLB	5.2, 5.4, 5.6, 5.8, 6.0, 6.2, 6.4, 6.6, 6.8	511730	Bromocresol Purple	Nessler cylinders AF 306/P		" "	
28 10 30		NLC	6.0, 6.2, 6.4, 6.6, 6.8, 7.0, 7.2, 7.4, 7.6	511640BT	Bromothymol Blue	Nessler cylinders AF 306/P		" "	
28 10 40		NLD	6.8, 7.0, 7.2, 7.4, 7.6, 7.8, 8.0, 8.2, 8.4	511750BT	Phenol Red	Nessler cylinders AF 306/P		" "	

‡ Laboratory method; not suitable as a test kit

Table of Lovibond® Water Test Discs

ORDER CODE	TEST (Instrument)	DISC CODE	DISC READINGS / RANGE COVERED	REAGENT CODE	CHEMICAL METHOD BASED ON	ACCESSORIES REQUIRED	APPLICATIONS	KIT PART NUMBER
28 10 50	pH VALUE (Nessleriser 2150) Continued	NLE	7.2, 7.4, 7.6, 7.8, 8.0, 8.2, 8.4, 8.6, 8.8	511600	Cresol Red	Nessler cylinders AF 306/P	<i>Almost any aqueous solution. Nessler method more suitable for unbuffered water</i>	
28 10 90		NLK	7.6, 7.8, 8.0, 8.2, 8.4, 8.6, 8.8, 9.0, 9.2	511710	m-Cresol Purple	Nessler cylinders AF 306/P		
28 10 60		NLF	8.0, 8.2, 8.4, 8.6, 8.8, 9.0, 9.2, 9.4, 9.6	511650	Thymol Blue	Nessler cylinders AF 306/P		
28 10 70		NLG	9.0, 9.5, 10.0, 10.5, 11.0		"BDH 9011"	Nessler cylinders AF 306/P		
28 10 80		NLH	4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 9.4, 10.0, 11.0	451770	Universal	Nessler cylinders AF 306/P		
28 11 80		NLU	1, 3, 5, 6, 7, 8, 9, 11, 13		"BDH Full Range"	Nessler cylinders AF 306/P		
23 43 00	PHENOLS, MONOHYDRIC (Comparator)	3/43	0, 0.5, 1, 1.5, 2.0, 2.5, 3, 3.5, 4 µg		4 amino-antipyrène	13.5 mm cells DB 424	<i>For phenol, ortho and meta substituted phenols</i>	
28 38 30	PHENOLS, TOTAL TAR ACIDS (Nessleriser 2150)	NP	0.01, 0.02, 0.03, 0.04, 0.05, 0.06, 0.07, 0.08, 0.09 parts per 100, 000		Sulphanilic acid	Nessler cylinders AF 306/P	<i>Road run-off</i>	
23 02 70	PHOSPHATE* (Comparator)	3/133	0, 0.25, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0 mg/l PO ₄	517652BT	Phosphate Low Range Tablets	13.5 mm cells DB 424	<i>Natural and drinking water</i>	419290
23 03 10		3/136	0, 5, 10, 15, 20, 25, 30, 35, 40 mg/l PO ₄	511980	Phosphate High Range Tablets	13.5 mm cells DB 424	<i>Industrial and boiler water</i>	56K019201
23 07 00		3/7	20, 40, 60, 80, 100, 130, 160, 190, 220 µg P ₂ O ₅		Ammonium molybdate & stannous chloride	13.5 mm cells DB 424		
23 04 00		3/4 ‡	5, 10, 20, 30, 40, 50, 60, 80, 100 µg P ₂ O ₅		Ammonium molybdate & metol	13.5 mm cells DB 424		
23 12 00		3/12	0, 10, 20, 30, 40, 50, 60, 70, 80 mg/l PO ₄		Ammonium molybdate & hydroquinone	13.5 mm cells DB 424		
23 38 00		3/38	10, 20, 30, 40, 50, 60, 70, 80, 100 mg/l PO ₄		Ammonium molybdate/vanadate	13.5 mm cells DB 424		
23 51 00		3/51‡	2, 5, 10, 15, 20, 30, 40, 60, 80 mg/l PO ₄		Ammonium molybdate & ascorbic acidn	13.5 mm cells DB 424		
23 60 00		3/60	10, 20, 30, 40, 50, 60, 80, 100 mg/l PO ₄	56R017490	Vanadomolybdate single reagent	13.5 mm cells DB 424		56K017401
23 70 00	3/70	0, 10, 20, 30, 40, 50, 60, 80, 100 mg/l PO ₄	511980	Phosphate High Range Tablets	13.5 mm cells DB 424	<i>Simplified field method for boiler water</i>	416200	
28 36 10	PHOSPHATE* (Nessleriser 2150)	NMB ‡	2, 4, 6, 8, 10, 12, 14, 17, 20 µg P ₂ O ₅		Ammonium molybdate & stannous chloride	Nessler cylinders AF 306/P	<i>Simplified field method for boiler water</i>	
28 36 20		NMC ‡	5, 10, 15, 20, 25, 30, 40, 50, 60 µg P ₂ O ₅		Ammonium molybdate & metol	Nessler cylinders AF 306/P		
28 37 50		NOP	10, 20, 30, 40, 50, 60, 70, 80, 100 µg PO ₄		Phosphate Nessleriser Tablets	Nessler cylinders AF 306/P		
28 38 20		NOX	1, 2, 3, 4, 5, 6, 7, 8, 10 mg/l PO ₄		Phosphate Nessleriser Tablets	Nessler cylinders AF 306/P		
28 39 50		NMD ‡	10, 20, 30, 40, 50, 60, 70, 80, 100 µg PO ₄		Ammonium molybate / ascorbic acid	Nessler cylinders AF 306/P		<i>For orthophosphate, poly phosphate & total phosphorus</i>
	PHOSPHORUS		See Phosphate					
	PLATINUM-COBALT COLOUR		See Hazen Colour					
23 01 20	QUATERNARY AMMONIUM COMPOUNDS (Comparator)	3/118	0, 2, 4, 6, 8, 10, 12, 15, 20 mg/l active QAC	515390	QAC Low Range Tablets	40 mm cells W680/OG/40	<i>Swimming pools, cooling towers</i>	56K017601
23 01 30		3/119	0, 20, 40, 60, 80, 100, 120, 150, 200 mg/l active QAC	515400	QAC High Range Tablets	13.5 mm cells, DB 424	<i>Washing & rinse water</i>	56K017701

* Without pretreatment all colorimetric methods respond only to orthophosphate ‡ Laboratory method; not suitable as a test kit

Table of Lovibond® Water Test Discs

ORDER CODE	TEST (Instrument)	DISC CODE	DISC READINGS / RANGE COVERED	REAGENT CODE	CHEMICAL METHOD BASED ON	ACCESSORIES REQUIRED	APPLICATIONS	KIT PART NUMBER
23 03 40	SILICA (SiO ₂) (Comparator)	3/139	0.4, 0.6, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 mg/l	517672	Silica Tablets	13.5 mm cells DB 424	<i>Natural & treated water</i>	411980
23 04 20		3/147	1, 2, 3, 4, 5, 6, 7, 8, 10 mg/l	517672	Silica Tablets	13.5 mm cells DB 424		56K017901
23 02 50		3/140	0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 1.0 mg/l		1-Amino-2-naphthol-4-sulphonic acid	40 mm cells DB 428	<i>Boiler water</i>	56K018001
23 13 00		3/13 ‡	2.5, 5, 7.5, 10, 12.5, 15, 17.5, 20, 25 mg/l	460241	Ammonium molybdate	40 mm cells DB 428		
28 36 30	SILICA (SiO ₂) (Nessleriser 2150)	NN ‡	1, 2, 4, 6, 8, 10, 12, 16, 20 mg/l	460241	Ammonium molybdate	Nessler cylinders AF 306/P	<i>"Take-off boost" water in jet aircraft</i>	
28 36 40		NN Special ‡	2, 3 mg/l only	460241	Ammonium molybdate	Nessler cylinders AF 306/P		
28 38 80		NV ‡	0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0 mg/l		1-Amino-2-naphthol-4-sulphonic acid	Nessler cylinders AF 306/P	<i>Boiler water</i>	
	SODIUM HYPOCHLORITE		See Chlorine, Disc Code 3/2 Hypo					
23 29 10	SUGAR (Comparator)	3/29A	0, 5, 10, 15, 30, 45, 60, 75, 100 mg/l		alpha-Naphthol	5 mm cells W680/OG/5	<i>Sugar in boiler water or drain water in sugar refineries</i>	
23 02 10	SULPHIDE (Comparator)	3/128	0, 0.05, 0.10, 0.15, 0.20, 0.25, 0.30, 0.40, 0.50 mg/l S	502930, 502940	Sulphide Tablets	13.5 mm cells DB 424	<i>Fresh water and lightly polluted effluents</i>	
23 01 60	SULPHITE (Comparator)	3/123	5, 10, 15, 20, 25, 30, 35, 40, 50 mg/l Na ₂ SO ₃		Potassium iodide/iodate	40 mm cells DB 428	<i>Boiler water</i>	
28 36 50	SULPHITE (Nessleriser 2150)	NOB	2, 5, 10, 15, 20, 25, 30, 40, 50 mg/l Na ₂ SO ₃		Potassium iodide/iodate	Nessler cylinders AF 306/P	<i>Boiler water</i>	
23 39 90	SWIMMING POOLS (Comparator)	3/40CZ	0.5, 1.0, 1.5, 2.0, 4.0 mg/l Cl ₂ ; 7.0, 7.4, 7.6, 8.0 pH	511050BT, 511080BT, 511750BT	DPD Tablets for Chlorine Phenol Red for pH	13.5 mm cells DB 424	<i>Combined disc with restricted ranges</i>	
23 40 50		3/40D	0.5, 1, 2, 3, 4, 6 mg/l Cl ₂ ; 7.0, 7.5, 8.0 pH	" " "	DPD Tablets for Chlorine, Phenol Red for pH	13.5 mm cells DB 424	<i>Combined disc with restricted ranges</i>	
23 06 10	TANNIN (Comparator)	3/161	0, 2, 4, 6, 8, 10, 12, 16, 20 mg/l Tannic acid		Folin & Ciocalteu's Reagent	13.5 mm cells DB 424	<i>Corrosion inhibitors in industrial water systems</i>	
23 63 00	THIOCYANATE (Comparator)	3/63 ‡	5, 10, 15, 20, 30, 40, 50, 60, 70 mg/l (SCN ion)		Ferric chloride	10 mm cells W680/OG/10	<i>Effluent from carbonising plants</i>	
23 35 00	TIN (Comparator)	3/35 ‡	1, 2, 3, 4, 5, 6, 8, 10, 12 mg/l		Dithiol	13.5 mm cells DB 424		
23 20 00	VANADIUM (Comparator)	3/20	10, 20, 30, 40, 50, 60, 70, 80, 100 µg		8-Hydroxyquinoline	13.5 mm cells DB 424		
23 69 00	ZINC (Comparator)	3/69	0, 2.5, 5, 10, 15, 20, 30, 40, 50 µg		Brilliant Green	13.5 mm cells DB 424	<i>Industrial water/waste water</i>	56K018201
23 04 70		3/151	0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 1.0 mg/l	512620BT	Copper/Zinc LR Tablets	13.5 mm cells DB 424		
23 03 90		3/145	0.02, 0.06, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35, 0.4 mg/l	512620BT	Copper/Zinc LR Tablets	40 mm cells DB 428		
23 00 20		3/102	0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0 mg/l	512340BT	Copper/Zinc HR Tablets	13.5 mm cells DB 424		

‡ Laboratory method; not suitable as a test kit



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