LETZTEST

EXACT® MICRO 20 PHOTOMETER PARAMETERS

LETZTEST RECOMMENDATIONS

PARAMETER / TEST	PART #	RANGE [mg/l]	% BEST † ACCURACY	# OF TESTS	PRICE €	Health-based Guideline value for drinking-water (WHO, 2017) [mg/l]	LetzTEST Remarks (WHO, 2017)
Ammonia	115932	0.02 – 2.40	5	25	18,49		Not of health concern at levels found in drinking-water. The term ammonia includes the non-ionized (NH3) and ionized (NH4+) species. Ammonia in the environment originates from metabolic, agricultural and industrial processes and from disinfection with chloramine. Natural levels in groundwater and surface water are usually below 0.2 mg/l. Anaerobic groundwaters may contain up to 3 mg/l. Intensive rearing of farm animals can give rise to much higher levels in surface water. Ammonia contamination can also arise from cement mortar pipe linings. Ammonia in water is an indicator of possible bacterial, sewage and animal waste pollution.
Chlorine, Free (DPD–1) *	115933	0.00 – 12.0	5	100	12,99	5.00	Present in most disinfected drinking-water at concentrations of 0.2–1 mg/l. Most individuals are able to taste or smell chlorine in drinking-water at concentrations well below 5 mg/l. The taste threshold for chlorine is below the health-based guideline value of 5 mg/l. For effective disinfection, there should be a residual concentration of free chlorine of ≥ 0.5 mg/l after at least 30 min contact time at pH < 8.0. A chlorine residual should be maintained throughout the distribution system. At the point of delivery, the minimum residual concentration of free chlorine should be 0.2 mg/l.
Chlorine, Total (DPD–4) ***	115934	0.00 – 12.0	5	100	14,99		
Fluoride	115935	0.04 – 1.50	15	25	12,99	1.50	Usually occurs in groundwater. Epidemiological evidence that concentrations above 1,5 mg/l carry an increasing risk of dental fluorosis and that progressively higher concentrations lead to increasing risks of skeletal fluorosis.
Hardness, Total HR (as CaCO3)	115936	90 – 600	12	50	18,49		Not of health concern at levels found in drinking-water. May affect acceptability of drinking-water. Hardness in water is caused by a variety of dissolved polyvalent metallic ions, predominantly calcium and magnesium cations. It is usually expressed as milligrams of calcium carbonate per litre. Not of health concern at levels found in drinking-water. The degree of hardness of drinking-water is important for aesthetic acceptability by consumers and for economic and operational considerations.
Iron, Total (TPTZ) **	115937	0.00 – 8.00	8	50	18,99		Not of health concern at levels found in drinking-water. May affect acceptability of drinking-water. Anaerobic groundwater may contain ferrous iron at concentrations up to several milligrams per litre without discoloration or turbidity in the water when directly pumped from a well. On exposure to the atmosphere, however, the ferrous iron oxidizes to ferric iron, giving an objectionable reddish-brown colour to the water. Iron also promotes the growth of “iron bacteria”, which derive their energy from the oxidation of ferrous iron to ferric iron and in the process deposit a slimy coating on the piping. At levels above 0.3 mg/l, iron stains laundry and plumbing fixtures. There is usually no noticeable taste at iron concentrations below 0.3 mg/l, although turbidity and colour may develop.
Manganese (as Mn^{+2}) **	115938	0.00 – 2.60	6	24	28,99		Not of health concern at levels found in drinking-water. May cause acceptability problems in drinking-water. At levels exceeding 0.1 mg/l, manganese in water supplies may cause an undesirable taste in beverages and stains sanitary ware and laundry. The presence of manganese in drinking-water, like that of iron, may lead to the accumulation of deposits in the distribution system. Concentrations below 0.1 mg/l are usually acceptable to consumers. Even at a concentration of 0.2 mg/l, manganese will often form a coating on pipes,nwhich may slough off as a black precipitate. The health-based value of 0.4 mg/l fornmanganese is higher than this acceptability threshold of 0.1 mg/l (see sections 8.5.1 and 12.1). However, under some conditions, manganese can be at concentrations above 0.1 mg/L and may remain in solution for a longer period compared with its usual solubility in most drinking-water.
Nitrate (as NO_3) (Fresh Water)	115939	0.25 – 32.0	8	50	18,49	50.0	50 mg/l as nitrate ion, to be protective against methaemoglobinaemia and thyroid effects in the most sensitive subpopulation, bottle-fed infants, and, consequently, other population subgroups
Nitrite (as NO_2)	115940	0.00 – 4.00	3	50	17,99	3.00	3 mg/l as nitrite ion, to be protective against methaemoglobinaemia

							induced by nitrite from both endogenous and exogenous sources in bottle-fed infants, the most sensitive subpopulation, and, consequently, the general population
pH (fresh)	115942	6.4 – 8.4 pH	0.2 pH	100	10,99		Not of health concern at levels found in drinking-water An important operational water quality parameter
Phosphate (as PO_4)	115943	0.00 – 3.0	8	50	18,49		Phosphate will stimulate the growth of plankton and aquatic plants (algae growth)
Sulfate (as SO_4)	115944	1 – 270	5	50	15,99		Not of health concern at levels found in drinking-water. May affect acceptability of drinking-water. However, because of the gastrointestinal effects resulting from ingestion of drinking-water containing high sulfate levels, it is recommended that health authorities be notified of sources of drinkingwater that contain sulfate concentrations in excess of 500 mg/l. The presence of sulfate in drinking-water may also cause noticeable taste and may contribute to the corrosion of distribution systems.
Turbidity **	N/A	24 – 780 NTU	N/A	N/A			

ALL POSSIBLE PARAMETERS FOR THE EXACT® MICRO 20

PARAMETER / TEST	RANGE [mg/l]	% BEST † ACCURACY	# OF TESTS	Health-based Guideline value in drinking-water (WHO, 2017) [mg/l]	Remarks (WHO, 2017)
Alkalinity, Total (fresh)	10 – 210	7.5	100		
Alkalinity, Total (marine)	25 – 200	7.5	100		
Alkalinity, Total (pool)	8 – 200	7.5	100		
Aluminum	0.01 – 1.20	13	50		
Ammonia	0.02 – 2.40	5	25		Not of health concern at levels found in drinking-water. The term ammonia includes the non-ionized (NH3) and ionized (NH4+) species. Ammonia in the environment originates from metabolic, agricultural and industrial processes and from disinfection with chloramine. Natural levels in groundwater and surface water are usually below 0.2 mg/l. Anaerobic groundwaters may contain up to 3 mg/l. Intensive rearing of farm animals can give rise to much higher levels in surface water. Ammonia contamination can also arise from cement mortar pipe linings. Ammonia in water is an indicator of possible bacterial, sewage and animal waste pollution.
Biguanide	1.6 – 210	7.5	50		
Bromine (DPD–4)	0.01 – 12.0	5	100		
Calcium (as $CaCO_3$)	20 – 400	5	50		
Calcium, UH Marine (as $CaCO_3$)	710 – 1500	10	50		
Chloride (as NaCl)	3 – 270	8	25		Not of health concern at levels found in drinking-water. May affect acceptability of drinking-water. High concentrations of chloride give a salty taste to water and beverages. Taste thresholds for the chloride anion depend on the associated cation and are in the range of 200–300 mg/l for sodium, potassium and calcium chloride. Concentrations in excess of 250 mg/l are increasingly likely to be detected by taste, but some consumers may become accustomed to low levels of chloride-induced taste. No health-based guideline value is proposed for chloride in drinking-water.
Chloride (as NaCl) High Range	50 – 5400	15	25		
Chlorine Dioxide (DPD–1)	0.04 – 7.00	5	100		Present in most disinfected drinking-water at concentrations of 0.2–1 mg/l. Most individuals are able to taste or smell chlorine in drinking-water at concentrations well below 5 mg/l. The taste threshold for chlorine is below the health-based guideline value of 5 mg/l. For effective disinfection, there should be a residual concentration of free chlorine of ≥ 0.5 mg/l after at least 30 min contact time at pH < 8.0. A chlorine residual should be maintained throughout the distribution system. At the point of delivery, the minimum residual concentration of free chlorine should be 0.2 mg/l.
Chlorine, Combined (DPD–3)**	0.01 – 6.20	3	100		
Chlorine, Free (DPD–1)	0.01 – 6.20	3	100	5.00	
Chlorine, Total (DPD–4)	0.01 – 6.20	3	100		
Chlorine, Total High	1 – 270	5	100		
Chromium (VI)	0.01 – 1.80		5	0.05	The guideline value is designated as provisional because of uncertainties in the toxicological database.
Copper (Cu^{+2})	0.01 – 10.0	2	50	2.00	Basis of guideline value derivation: To be protective against acute gastrointestinal effects of copper and provide an adequate margin of safety in populations with normal copper homeostasis
Cyanide	0.01 – 1.10	13	50		
Cyanuric Acid (III)	1 – 110	8	60		
Fluoride	0.04 – 1.50	15	25	1.50	Usually occurs in groundwater. Epidemiological evidence that concentrations above 1,5 mg/l carry an increasing risk of dental fluorosis and that progressively higher concentrations lead to increasing risks of skeletal fluorosis.
Hardness, Tot UH Marine (as $CaCO_3$)	4000 – 8100	8	50		Not of health concern at levels found in drinking-water. May affect acceptability of drinking-water. Hardness in water is caused by a variety of dissolved polyvalent metallic ions, predominantly calcium and magnesium cations. It is usually expressed as milligrams
Hardness, Total HR (as $CaCO_3$)	60 – 600	12	50		

Hardness, Total LR (as $CaCO_3$)	1 – 80	10	100		of calcium carbonate per litre. Not of health concern at levels found in drinking-water. The degree of hardness of drinking-water is important for aesthetic acceptability by consumers and for economic and operational considerations.
Hydrogen Peroxide	0.3 – 100	8	100		
Iron, Total (TPTZ)	0.03 – 6.0	3	50		Not of health concern at levels found in drinking-water. May affect acceptability of drinking-water. Anaerobic groundwater may contain ferrous iron at concentrations up to several milligrams per litre without discoloration or turbidity in the water when directly pumped from a well. On exposure to the atmosphere, however, the ferrous iron oxidizes to ferric iron, giving an objectionable reddish-brown colour to the water. Iron also promotes the growth of "iron bacteria", which derive their energy from the oxidation of ferrous iron to ferric iron and in the process deposit a slimy coating on the piping. At levels above 0.3 mg/l, iron stains laundry and plumbing fixtures. There is usually no noticeable taste at iron concentrations below 0.3 mg/l, although turbidity and colour may develop.
Manganese	0.01 – 1.50	6	24		Not of health concern at levels found in drinking-water. May cause acceptability problems in drinking-water. At levels exceeding 0.1 mg/l, manganese in water supplies may cause an undesirable taste in beverages and stains sanitary ware and laundry. The presence of manganese in drinking-water, like that of iron, may lead to the accumulation of deposits in the distribution system. Concentrations below 0.1 mg/l are usually acceptable to consumers. Even at a concentration of 0.2 mg/l, manganese will often form a coating on pipes,nwhich may slough off as a black precipitate. The health-based value of 0.4 mg/l fornmanganese is higher than this acceptability threshold of 0.1 mg/l (see sections 8.5.1 and 12.1). However, under some conditions, manganese can be at concentrations above 0.1 mg/L and may remain in solution for a longer period compared with its usual solubility in most drinking-water.
Metals	0.05 – 2.5	6	25		
Molybdate	0.01 – 3.00	5	50		
Nitrate (as NO_3) (fresh)	0.12 – 30.0	15	50	50.0	50 mg/l as nitrate ion, to be protective against methaemoglobinaemia and thyroid effects in the most sensitive subpopulation, bottle-fed infants, and, consequently, other population subgroups
Nitrate (as NO_3) (marine)	1.00 – 20	15	50	3.00	3 mg/l as nitrite ion, to be protective against methaemoglobinaemia induced by nitrite from both endogenous and exogenous sources in bottle-fed infants, the most sensitive subpopulation, and, consequently, the general population
Nitrite (as NO_2)	0.01 – 1.80	5	50		
Ozone (DPD–4)	0.01 – 2.00	4	100		
Peracetic Acid	0.01 – 430	7	100		
Permanganate (DPD–1)	0.01 – 5	2	100		
pH (fresh)	6.4 – 8.4 pH	0.2 pH	100		Not of health concern at levels found in drinking-water An important operational water quality parameter
pH (pool/salt)	6.4 – 8.4 pH	0.2 pH	100		
pH-BT (fresh)	5.1 – 9.2 pH	0.2 pH	50		
pH-BT (marine)	5.1 – 9.2 pH	0.2 pH	50		
pH, Acid	3.2 – 6 pH	0.3 pH	50		
Phosphate (as PO_4)	0.03 – 4.0	4	50		Phosphate indicates agricultural activities and will stimulate the growth of plankton and aquatic plants in water (algae growth)
Quaternary Ammonia Compound QAC	2 – 80	6	50		
Sulfate (as SO_4)	2 – 210	10	50		Not of health concern at levels found in drinking-water. May affect acceptability of drinking-water. However, because of the gastrointestinal effects resulting from ingestion of drinking-water containing high sulfate levels, it is recommended that health authorities be notified of sources of drinkingwater that contain sulfate concentrations in excess of 500 mg/l. The presence of sulfate in drinking-water may also cause noticeable taste and may contribute to the corrosion of distribution systems.
Sulfide (as S^{2-})	0.01 – 1.6	6	50		
Turbidity	4-900 NTU				

* Combined Chlorine DPD-3 Test requires Free Chlorine DPD-1 (486637) to be run first.

** Test uses a non-standard test method. Visit exactidip.com for details.

*** Requires the use of 2 strips if reading is above 6 ppm.