Water Analysis

MACHEREY-NAGEL

VISOCOLOR® - Visual and photometric test kits

Water analysis made easy

- Versatile - Colorimetric and titrimetric tests
- Precise - Mobile compact photometers
- All in one - Complete mini-laboratories

MN Since 1911

Welcome

MACHEREY-NAGEL was founded in 1911 in Dueren (Germany) as a manufacturer of special filter papers. Since then we have established ourselves as one of the world's leading companies in the field of chemical and biomolecular analysis. In addition to our product lines for rapid tests and water analysis we offer a wide selection of products for filtration, chromatography and bioanalysis.

We are able to look back on decades of experience in the field of rapid tests and water analysis. In the 1950s we launched the first generation of rapid tests, in 1976 our first photometer. Over the years we have steadily refined and improved our products. This makes us one of the leading and most reliable manufacturers for water analysis.

Our headquarters are located in Dueren. Our commercial and administrative areas, research and development departments as well as our productions are based there. In addition we run three branches in Switzerland, France and the USA with more than 600 employees. Furthermore, a globally operating network of qualified and specially trained distributors in more than 150 countries, ensures worldwide availability of MN products and services.

As a privately owned company, the term family is of highest importance to us. We understand all customers as part of the MN family – our philosophy of a successful, trusting, and long term cooperation. This fundamental understanding of customer relationships goes hand in hand with our focus on quality. For more than 100 years, our customers can rely on products "Made in Germany". From conviction, we think and act in the long term.

VISOCOLOR® – Visual test kits

VISOCOLOR® test kits are compact and flexible test kits, which allow a chemical analysis without additional accessories and without the need for any prior experience. They are suitable for analysis in labs, in school or directly on-site.

MACHEREY-NAGEL offers three product lines for visual determination (*VISOCOLOR*® *alpha*, *VISOCOLOR*® *ECO* and *VISOCOLOR*® *HE*) with different accuracies, precisions and sensitivities for universal use depending on the analytical requirement. For each product line there are colorimetric and titrimetric measuring methods to determine all important water and waste water parameters. Additionally the new *VISOCOLOR*® Powder Pillows offer an easy and comfortable way of photometric tests.

For photometric evaluation of most *VISOCOLOR*® *ECO* tests and all *VISOCOLOR*® Powder Pillows compact photometers PF-12^{Plus} and PF-3 enable a mobile and quantitative evaluation.

To complete the *VISOCOLOR*® product range, test kits can be sold individually or in rugged reagent cases as portable mini-laboratories.

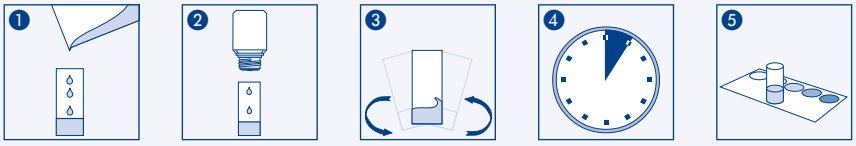
VISOCOLOR®

Colorimetric and titrimetric test kits

VISOCOLOR® alpha is the most simple version of colorimetric and titrimetric test kits. These tests are suitable for visual evaluation only and are very convenient in performance, because of the used multicomponent reagents. Therefore, the test kits are limited in precision and accuracy but represent an inexpensive method for screening tests of non-turbid and uncolored water samples. The reagent bottles are packed in practical blister packs. The color comparison chart for colorimetric evaluations, as well as the test instructions, are provided on the cardboard back, which is also used for opening and closing of the package.

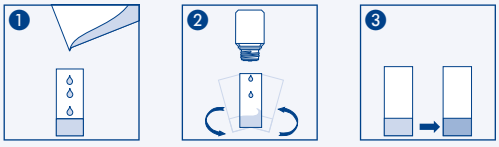
How it's done

Colorimetric



Fill with sample | Add reagent | Mix | Wait | Analyze

Titrimetric

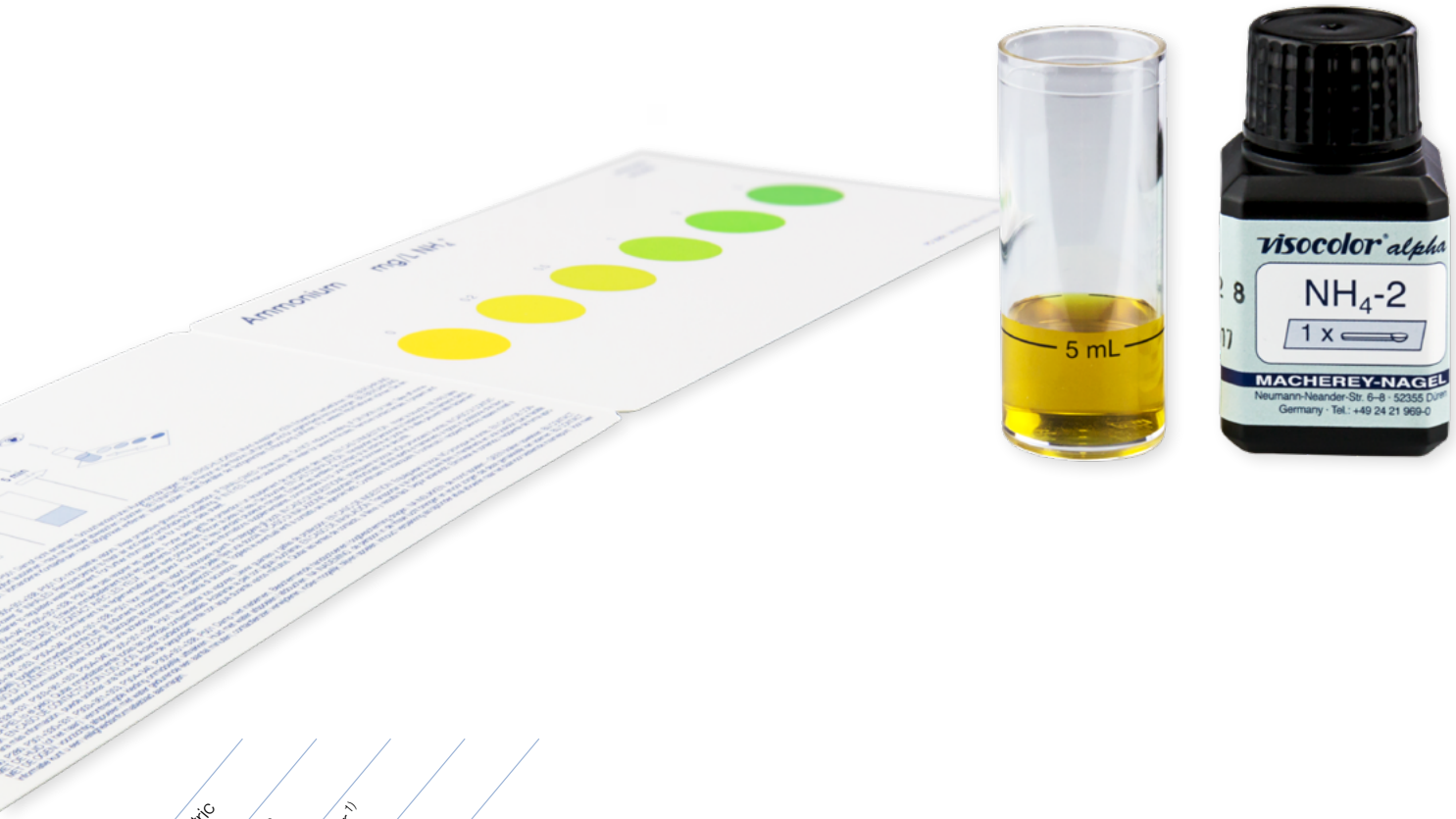


Fill with sample | Add reagent and mix | Color change

Ordering information

Test	REF	Measuring range	Number of tests	Shelf life	Method
■ Ammonium	935012	0 · 0.2 · 0.5 · 1 · 2 · 3 mg/L NH_4^+	50	1.5 years	Indophenol
■ Carbonate hardness	935016	1 drop equals 1.25 °e	100	1.5 years	Mixed indicator
■ Chlorine, free	935019	0.25 · 0.5 · 1.0 · 1.5 · 2.0 mg/L Cl_2	150	1.5 years	DPD
■ Nitrate	935065	2 · 8 · 15 · 30 · 50 mg/L NO_3^-	100	1.5 years	Azo dye
■ Nitrite	935066	0.05 · 0.10 · 0.25 · 0.5 · 1.0 mg/L NO_2^-	200	1.5 years	Sulfanilic acid / 1-naphthylamine
■ pH 5–9	935075	pH 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	200	3 years	Mixed indicator
■ Phosphate	935079	2 · 5 · 10 · 15 · 20 mg/L PO_4^{3-}	70	2 years	Molybdenum phosphorous blue
■ Residual hardness	935080	0.00 · 0.05 · 0.10 · 0.19 · 0.38 °e	200	1 year	Mixed indicator
■ Total hardness	935042	1 drop equals 1.25 °e	100	1.5 years	Complexometric titration

[1] Please see the instruction leaflet.
GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see SDS.



Test	Sea water [1]	GHS	Colorimetric	Titrimetric
Ammonium	■	■	■	
Carbonate hardness	■			■
Chlorine, free	■	■	■	
Nitrate	■	■	■	
Nitrite	■	■	■	
pH 5–9	■	■	■	
Phosphate	■	■	■	
Residual hardness		■	■	
Total hardness	■	■		■

Colorimetric and titrimetric test kits

VISOCOLOR® ECO presents a product group of colorimetric and titrimetric test kits, which allow even the determination of low limiting values with sufficient accuracy. The high sensitivity and accuracy is accomplished by single reagents which can be dosed precisely and by the possibility to compensate turbidity and color of water samples.

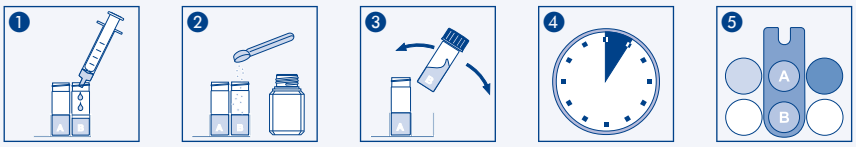
The results are evaluated visually with high-quality color comparison cards, which are adjusted to the original colors of standard solutions. In addition, there is the possibility to evaluate most *VISOCOLOR® ECO* tests also photometrically with the compact photometers PF-3 and PF-12^{Plus}. This enables a quantitative evaluation of the test kit.

Budget-priced refill packs are available for photometric evaluation as well as for replacement of consumed chemicals.

All *VISOCOLOR® ECO* test kits are delivered in a practical cardboard box with plastic inlay and easy to understand instruction manual. In addition, pictogram instructions can be downloaded for every test kit on the MACHEREY-NAGEL website.

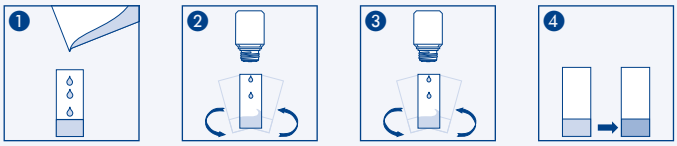
How it's done

Colorimetric



Fill with sample | Add reagent | Mix | Wait | Analyze

Titrimetric



Fill with sample | Add indicator | Add titration solution and mix | Color change

Good to know

Most *VISOCOLOR® ECO* tests can also be evaluated photometrically on the compact photometers PF-3 and PF-12^{Plus}.

Ordering information

Test	REF	REF refill	Measuring range (visual)	Measuring range (photometric) [4]	Number of tests
■ Alkalinity TA	–	931204	–	0.4–17.5 °e / 5–250 mg/L $CaCO_3$	100
■ Aluminum	931006	931206	0 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 · 0.50 mg/L Al^{3+}	–	50
■ Ammonium 3	931008	931208	0 · 0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 mg/L NH_4^+	0.1–2.5 mg/L NH_4^+	50
■ Ammonium 15	931010	931210	0 · 0.5 · 1 · 2 · 3 · 5 · 7 · 10 · 15 mg/L NH_4^+	0.5–8.0 mg/L NH_4^+	50
■ Bromine	–	931211	–	0.10–13.00 mg/L Br_2	200
■ Calcium	931012	–	1 drop equals 5 mg/L Ca^{2+}	–	100
■ Carbonate hardness	931014	–	1 drop equals 1.25 °e	–	100
■ Chloride	931018	931218	1 · 2 · 4 · 7 · 12 · 20 · 40 · 60 mg/L Cl^-	1–50 mg/L Cl^-	90
■ Chlorine + pH see Swimming pool					

[1] Please see the instruction leaflet.
[2] For evaluation with the PF-12 / PF-12^{Plus}, a special filter is required.
[3] Additionally required with first order: Oxygen sample bottle, REF 915498.
[4] Measuring range for photometric evaluation with the PF-12^{Plus}. Range on other photometers can be different.
GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see SDS.
refill: Refill pack

Easy

- Chemical analysis without further accessories
- No extensive training necessary
- Color-coded reagents with clear dosing instructions

Safe

- Pictogram test instructions
- Reaction basis according to international standards
- Compensation of turbidity and color

Unique

- High quality test kits
- Budget-priced refill packs
- Ecologically friendly disposal of used reagents

Shelf life	Method	PF-12^{Plus}	PF-3 Drinking Water	PF-3 Fish	PF-3 Pool	PF-3 Soil	Colorimetric	Titrimetric	Sea water [1]	GHS	Test
1 year	Bromophenol blue	■	■		■		■		■		Alkalinity TA
2 years	Chromazurol S						■		■		Aluminum
1.5 years	Indophenol	■		■		■	■		■	■	Ammonium 3
1.5 years	Indophenol	■					■		■	■	Ammonium 15
2 years	DPD	■	■		■		■		■		Bromine
1.5 years	Complexometric titration							■	■	■	Calcium
2 years	Mixed indicator							■	■	■	Carbonate hardness
1 year	Mercury(II)-thiocyanate / Iron(III)-nitrate	■					■			■	Chloride
											Chlorine + pH see Swimming pool

Test	REF	REF refill	Measuring range (visual)	Measuring range (photometric) [4]	Number of tests
■ Chlorine 1, free + total	931035	931235	< 0.1 · 0.1 · 0.2 · 0.3 · 0.4 · 0.6 · 0.9 · 1.2 · 2.0 mg/L Cl_2	0.05–2.00 mg/L Cl_2	150
■ free Chlorine 2	931016	931216	< 0.1 · 0.1 · 0.2 · 0.3 · 0.4 · 0.6 · 0.9 · 1.2 · 2.0 mg/L Cl_2	0.10–2.00 mg/L Cl_2	150
■ Chlorine 2, free + total	931015	931215	< 0.1 · 0.1 · 0.2 · 0.3 · 0.4 · 0.6 · 0.9 · 1.2 · 2.0 mg/L Cl_2	0.10–2.00 mg/L Cl_2	150
■ free Chlorine 6	–	931219	–	0.05–6.00 mg/L Cl_2	400
■ Chlorine 6, free + total	–	931217	–	0.05–6.00 mg/L Cl_2	200
■ Chlorine dioxide	931021	931221	< 0.2 · 0.2 · 0.4 · 0.6 · 0.8 · 1.1 · 1.7 · 2.3 · 3.8 mg/L ClO_2	0.20–3.80 mg/L ClO_2	150
■ Chromium(VI)	931020	931220	0.02 · 0.05 · 0.10 · 0.15 · 0.20 · 0.30 · 0.40 · 0.50 mg/L Cr(VI)	0.02–0.50 mg/L Cr(VI)	140
■ Copper	931037	931237	0 · 0.1 · 0.2 · 0.3 · 0.5 · 0.7 · 1.0 · 1.5 mg/L Cu^{2+}	0.1–5.0 mg/L Cu^{2+}	100
■ Cyanide	931022	931222	0 · 0.01 · 0.02 · 0.03 · 0.05 · 0.07 · 0.10 · 0.15 · 0.20 mg/L CN^-	0.01–0.20 mg/L CN^-	100
■ Cyanuric acid	931023	931223	10 · 15 · 20 · 30 · 40 · 60 · 80 · 100 mg/L Cya	10–100 mg/L Cya	100
■ DEHA	931024	931224	0 · 0.01 · 0.03 · 0.05 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 mg/L DEHA	–	125
■ Detergents, anionic	931050	931250	0.1 · 0.25 · 0.5 · 1.0 · 2.0 · 5.0 mg/L MBAS	–	50
■ Detergents, cationic	931051	931251	0 · 1 · 3 · 5 · 10 · 15 · 20 mg/L CTAB	–	50
■ Fluoride	–	931227	–	0.1–2.0 mg/L F^-	150
■ Hydrazine	931030	931230	0 · 0.05 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 mg/L N_2H_4	0.05–0.40 mg/L N_2H_4	130
■ Iron 1	931025	931225	0 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 · 0.50 · 1.0 mg/L Fe	0.04–2.00 mg/L Fe	200
■ Iron 2	931026	931226	0 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 · 0.50 · 1.0 mg/L Fe	0.04–2.00 mg/L Fe	100
■ Manganese	931038	931238	0 · 0.1 · 0.2 · 0.3 · 0.5 · 0.7 · 0.9 · 1.2 · 1.5 mg/L Mn	0.1–5.0 mg/L Mn	70
■ Nickel	931040	931240	0 · 0.1 · 0.2 · 0.3 · 0.5 · 0.7 · 0.9 · 1.2 · 1.5 mg/L Ni^{2+}	0.04–5.00 mg/L Ni^{2+}	150
■ Nitrate	931041	931241	0 · 1 · 3 · 5 · 10 · 20 · 30 · 50 · 70 · 90 · 120 mg/L NO_3^-	4–60 mg/L NO_3^-	110
■ Nitrite	931044	931244	0 · 0.02 · 0.03 · 0.05 · 0.07 · 0.1 · 0.2 · 0.3 · 0.5 · mg/L NO_2^-	0.02–0.50 mg/L NO_2^-	120
■ Oxygen [3]	931088	931288	0 · 1 · 2 · 3 · 4 · 6 · 8 · 10 mg/L O_2	1–8 mg/L O_2	50
■ pH 4.0–9.0	931066	931266	pH: 4.0 · 5.0 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	–	450
■ pH 6.0–8.2	–	931270	–	pH 6.1–8.4	150
■ Phosphate	931084	931284	0 · 0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 · 5 mg/L PO_4-P	0.2–5.0 mg/L PO_4-P	80
■ Potassium	931032	931232	2 · 3 · 4 · 6 · 8 · 10 · 15 mg/L K^+	2–25 mg/L K^+	60
■ Silica	931033	931233	0 · 0.2 · 0.4 · 0.6 · 1.0 · 1.5 · 2.0 · 2.5 · 3.0 mg/L SiO_2	0.2–3.0 mg/L SiO_2	80
■ Silica HR 200	–	931234	–	10–200 mg/L SiO_2 [2]	100
■ Sulfate	931092	931292	25 · 30 · 35 · 40 · 50 · 60 · 70 · 80 · 100 · 120 · 150 · 200 mg/L SO_4^{2-}	20–200 mg/L SO_4^{2-}	100
■ Sulfide	931094	931294	0.1 · 0.2 · 0.3 · 0.4 · 0.5 · 0.6 · 0.7 · 0.8 mg/L S^{2-}	0.05–0.80 mg/L S^{2-}	90
■ Sulfite	931095	–	1 drop equals 1 mg/L SO_3^{2-}	–	60
■ Swimming pool	931090	931290	Chlorine: < 0.1 · 0.1 · 0.2 · 0.3 · 0.4 · 0.6 · 0.9 · 1.2 · 2.0 mg/L Cl_2 pH: 6.9 · 7.2 · 7.4 · 7.6 · 7.8 · 8.2	–	150
■ Total hardness	931029	–	1 drop equals 1.25 °e	–	110
■ Zinc	931098	931298	0 · 0.5 · 1 · 2 · 3 mg/L Zn^{2+}	0.1–3.0 mg/L Zn^{2+}	120

[1] Please see the instruction leaflet. / [2] For evaluation with the PF-12 / PF-12^{Plus}, a special filter is required. / [3] Additionally required with first order: Oxygen sample bottle, REF 915498.
[4] Measuring range for photometric evaluation with the PF-12^{Plus}. Range on other photometers can be different.
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refill: Refill pack

Shelf life	Method	PF-12Plus	PF-3 Drinking Water	PF-3 Fish	PF-3 Pool	PF-3 Soil	Colorimetric	Titrimetric	Sea water [1]	GHS	Test
2 years	DPD	■	■		■		■		■		Chlorine 1. free + total
1.5 years	DPD	■	■		■		■			■	free Chlorine 2
1.5 years	DPD	■	■		■		■			■	Chlorine 2. free + total
2 years	DPD	■	■		■		■		■		free Chlorine 6
2 years	DPD	■	■	■	■		■		■		Chlorine 6. free + total
1.5 years	DPD	■	■		■		■			■	Chlorine dioxide
1.5 years	Carbazide	■					■		■	■	Chromium(VI)
2 years	Cuprizone	■		■			■		■		Copper
1 year	Barbituric acid / pyridine	■					■		■	■	Cyanide
1.5 years	Triazine (turbidity)	■	■		■		■		■	■	Cyanuric acid
1 year	Redox reaction						■		■		DEHA
2 years	Methylene blue						■		■	■	Detergents, anionic
2 years	Bromphenol blue						■		■	■	Detergents, cationic
1.5 years	SPADNS	■	■		■		■		■	■	Fluoride
1 year	4-Dimethylaminobenzaldehyde	■					■		■	■	Hydrazine
2 years	Triazine	■	■	■	■		■		■	■	Iron 1
2 years	Triazine	■	■	■	■		■		■		Iron 2
1.5 years	Formaldoxime	■					■		■	■	Manganese
1.5 years	Dimethylglyoxime	■					■		■	■	Nickel
1.5 years	Azo dye	■		■		■	■		■		Nitrate
1.5 years	Sulfanilic acid / 1-naphthylamine	■		■			■		■		Nitrite
1 year	Winkler	■		■			■		■	■	Oxygen [3]
3 years	Mixed inidicator						■		■	■	pH 4.0–9.0
1.5 years	Mixed indicator	■	■	■	■		■		■		pH 6.0–8.2
3 years	Phosphorous molybdenum blue	■		■		■	■		■	■	Phosphate
3 years	Potassium tetraphenyl borate (turbidity)	■				■	■		■	■	Potassium
3 years	Silicomolybdenum blue	■		■			■		■	■	Silica
3 years	Silicomolybdenum blue	■	■		■		■		■	■	Silica HR 200
3 years	Barium sulfate (turbidity)	■					■		■	■	Sulfate
3 years	DPD	■					■		■	■	Sulfide
1 year	Iodometric titration							■	■	■	Sulfite
1.5 years	DPD Mixed indicator						■		■	■	Swimming pool
1.5 years	Complexometric titration							■	■	■	Total hardness
1 year	Zincon	■					■		■	■	Zinc

Colorimetric and titrimetric test kits

VISOCOLOR® HE test kits are highly sensitive colorimetric and titrimetric tests to determine even the lowest limiting values.

The exact dosing of the single reagents as well as the compensation of turbidity and color are the basis for a highly precise analysis. Maximum sensitivity and accuracy are achieved by the use of longer measuring tubes and larger sample volumes. The sensitivity of *VISOCOLOR® HE* is 10 to 100 times higher compared to other *VISOCOLOR®* tests.

The visual evaluation of the colorimetric test kits is done with high-quality color comparison disks, which are adjusted to the original color of standard solutions.

Refill packs are available as replacement for consumed reagents. Every *VISOCOLOR® HE* test kit is delivered in a robust box with plastic inlay and an easy to understand instruction leaflet.

Good to know

VISOCOLOR® HE test kits reach the highest sensitivity and accuracy in visual analytics.

Ordering information

Test	REF	REF refill	Measuring range	Number of tests	Shelf life
Acidity AC 7 (base capacity)	915006	915206	0.2–7.2 mmol/L H^+ (1 syringe filling)	200	2 years
Alkalinity AL 7 (acid capacity)	915007	915207	0.2–7.2 mmol/L OH^- (1 syringe filling)	200	2 years
Ammonium	920006	920106	0.0 · 0.02 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 · 0.40 · 0.50 mg/L NH_4^+	110	1 year
Calcium CA 20	915010	915210	0.6–25.0 °e / 0.1–3.6 mmol/L Ca^{2+} (1 syringe filling)	200	2 years
Carbonate hardness C 20	915003	915203	0.6–25.0 °e / 0.2–7.2 mmol/L H^+ (1 syringe filling)	200	2 years
Chloride CL 500	915004	915204	5–500 mg/L Cl^- (1 syringe filling)	300	2 years
Chlorine, free + total	920015	920115	0.0 · 0.02 · 0.04 · 0.06 · 0.10 · 0.15 · 0.20 · 0.30 · 0.40 · 0.60 mg/L Cl_2	160	2 years
Copper	920050	920150	0.0 · 0.04 · 0.07 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 · 0.50 mg/L Cu^{2+}	150	2 years
Cyanide	920028	920128	0.0 · 0.002 · 0.004 · 0.007 · 0.010 · 0.015 · 0.020 · 0.025 · 0.030 · 0.040 mg/L CN^-	50	1 year
Iron	920040	920140	0.0 · 0.01 · 0.02 · 0.03 · 0.04 · 0.05 · 0.07 · 0.10 · 0.15 · 0.20 mg/L Fe	300	2 years
Manganese	920055	920155	0.0 · 0.03 · 0.06 · 0.10 · 0.15 · 0.20 · 0.25 · 0.30 · 0.40 · 0.50 mg/L Mn	100	1.5 years
Nitrite	920063	920163	0.0 · 0.005 · 0.010 · 0.015 · 0.02 · 0.03 · 0.04 · 0.06 · 0.08 · 0.10 mg/L NO_2^-	150	2 years
Oxygen SA 10	915009	915209	0.2–10.0 mg/L O_2 (1 syringe filling)	100	1.5 years
pH 4.0–10.0	920074	920174	pH 4.0 · 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0 · 10.0	500	2 years
Phosphate	920082	920182	0.0 · 0.05 · 0.10 · 0.15 · 0.20 · 0.3 · 0.4 · 0.6 · 0.8 · 1.0 mg/L PO_4-P	300	2 years
Phosphate (DEV)	920080	920180	0.0 · 0.01 · 0.02 · 0.03 · 0.05 · 0.07 · 0.10 · 0.15 · 0.20 · 0.25 mg/L PO_4-P	100	2 years
Silica	920087	920187	0.0 · 0.01 · 0.02 · 0.03 · 0.05 · 0.07 · 0.10 · 0.15 · 0.20 · 0.30 mg/L Si	120	2 years
Sulfite SU 100	915008	915208	2–100 mg/L SO_3^{2-} (1 syringe filling)	100	3 years
Total hardness H 2	915002	915202	0.06–2.50 °e / 0.01–0.36 mmol/L Ca^{2+} (1 syringe filling)	200	1.5 years
Total hardness H 20 F	915005	915205	0.6–25.0 °e / 0.1–3.6 mmol/L Ca^{2+} (1 syringe filling)	200	1.5 years

[1] Please see the instruction leaflet.
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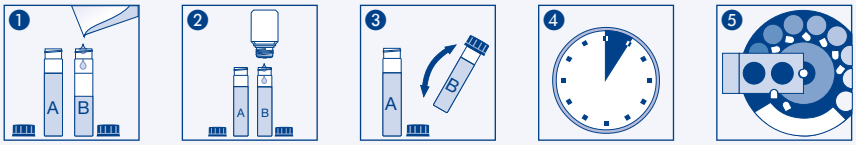
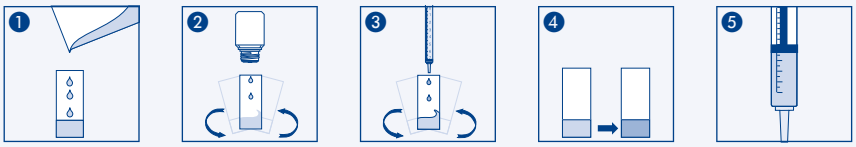
refill.: Refill pack

How it's done

Colorimetric



Titrimetric



Method	Colorimetric	Titrimetric	Sea water [1]	GHS	Test
Phenolphthalein		■	■	■	Acidity AC 7 (base capacity)
Methyl red		■	■	■	Alkalinity AL 7 (acid capacity)
Indophenol	■			■	Ammonium
Complexometric titration		■	■	■	Calcium CA 20
Mixed indicator		■	■	■	Carbonate hardness C 20
Mercurimetric titration		■	■	■	Chloride CL 500
DPD	■		■		Chlorine, free + total
Cuprizon	■		■		Copper
Barbituric acid / pyridine	■		■	■	Cyanide
Triazine	■				Iron
Formaldoxime	■			■	Manganese
Sulfanilic acid / 1-naphthylamine	■		■	■	Nitrite
Winkler		■	■	■	Oxygen SA 10
Mixed indicator	■		■	■	pH 4.0–10.0
Phosphorous molybdenum blue	■		■	■	Phosphate
Phosphorous molybdenum blue	■		■	■	Phosphate (DEV)
Silico molybdenum blue	■		■	■	Silica
Iodometric titration		■	■	■	Sulfite SU 100
Complexometric titration		■		■	Total hardness H 2
Complexometric titration		■	■	■	Total hardness H 20 F

VISOCOLOR® Power Pillows

Photometric reagents Powder Pillows

VISOCOLOR® Powder Pillows are photometric tests that combine easiest dosing of reagents with photometric precision. Each *VISOCOLOR*® Powder Pillow contains the exact amount of reagents needed for a determination. The individually packaged portions not only stand out due to their very long shelf life, but also avoid the use of hazardous substances wherever possible. Easy to understand test instructions with pictograms in 6 languages are available on MACHEREY-NAGEL homepage. *VISOCOLOR*® Powder Pillows can be evaluated on compact photometers PF-12^{Plus}.

How it's done

Application *VISOCOLOR*® Powder Pillows

Fill with sample | Add Powder Pillow | Mix | Wait | Analyze

Good to know

VISOCOLOR® Powder Pillows for chlorine can be directly inserted into HACH* photometers. They are ready to use with pre-programmed methods and equipment of HACH*, no further calibration is needed.

Ordering information

Test	REF	Number of tests	Measuring range	Shelf life	Method
free Chlorine	936220 936220.1	100 1000	0.03–6.00 mg/L Cl_2	5 years	DPD
total Chlorine, Ozone	936221 936221.1	100 1000	0.03–6.00 mg/L Cl_2 / 0.03–4.00 mg/L O_3	5 years	DPD
Iron	936227	100	0.03–3.00 mg/L Fe	3 years	Phenanthroline
Nitrate	936226	100	1.0–50 mg/L NO_3-N	3 years	Azo dye
pH	936222	100	pH: 6.2–8.2	5 years	Mixed indicator
Silica LR [1]	936224	100	0.02–2.10 mg/L SiO_2	3 years	Silicomolybdenum blue
Silica HR [2]	936225	100	2–210 mg/L SiO_2	3 years	Molybdosilic acid
Sulfate	936223	100	15–200 mg/L SO_4^{2-}	5 years	Barium sulfate (turbidity)

[1] Measuring range for photometric evaluation on *NANOCOLOR*® *VIS* II. Range on other photometers can be different.
[2] For evaluation with the PF-12^{Plus}, a special filter (450 nm) is required.
GHS: Globally harmonized system: This product contains harmful substances which must be specially labeled as hazardous. For detailed information please see the SDS.

Easy

- Dosing without spoon or pipette
- Pictogram instruction for each test
- No zero measurement necessary

Safe

- Photometric precision for best results
- Reaction basis according to international standards
- Extremely long shelf life

Unique

- Optimal price / performance-ratio
- Works on competitor´s instruments
- Ecologically friendly disposal of used reagents

Spectrophotometers	PF-12^{Plus}	PF-3 Drinking Water	PF-3 Fish	PF-3 Pool	PF-3 Soil	Competitor compatible	Sea Water	GHS	Test
■	■	■	■	■		■	■		free Chlorine
■	■	■	■	■		■	■		total Chlorine, Ozone
■	■	■		■		■	■	■	Iron
■	■	■		■	■	■	■	■	Nitrate
■	■	■		■			■		pH
■	■	■	■	■		■	■	■	Silica LR
■	■	■	■	■		■	■	■	Silica HR
■	■	■		■			■	■	Sulfate

Compact photometer PF-12^{Plus}

Increased flexibility

The compact photometer PF-12^{Plus} is a device tailored for mobile water analysis. Icon-based menu guidance and a clear taskbar make the PF-12^{Plus} an easy to use photometer for all fields of water and wastewater analysis without the need for extensive training. The device comes in a rugged case equipped with useful accessories and is therefore particularly popular with users for the direct analysis at the point of sampling.

Safe

- Easy handling for precise results
- GLP-conform storage of all measurement results
- Comfortable data export and data backup

Mobile

- Flexible power supply via batteries or accu-pack
- Backlit graphic display also for critical lighting conditions
- Robust and waterproof according to IP68

Versatile

- Compatible with *VISOCOLOR*® *ECO* tests and *VISOCOLOR*® Powder Pillows
- Nephelometric turbidity measurement and NTU-Check
- Applicable in all fields of water and waste water analysis

Good to know

Turbidity – a source of error:
Turbidity is often underestimated since it is not always visually recognizable. During each measurement, the compact photometer PF-12^{Plus} automatically measures the turbidity and warns the user in case of an interference.

Ordering information

Description	REF
Compact photometer PF-12^{Plus} for evaluation of *VISOCOLOR*® *ECO*, *VISOCOLOR*® Powder Pillows and *NANOCOLOR*® tube tests, incl. software DVD, manual, 4 batteries, 4 empty test tubes, funnel, beaker, syringe, USB cable, calibration cuvette, cleaning cloth and certificate in rugged case	919250

Small, strong, smart

The compact photometer PF-3 comes in multiple versions, equipped with three LEDs and interference filters, designed to meet the analysis requirements of specific applications. Together with the approved *VISOCOLOR*® *ECO* tests and the easy to use *VISOCOLOR*® Powder Pillows, the PF-3 is perfectly suited for mobile analysis directly at the place of sampling. Optionally, the device comes in a practical case with pre-equipped test kits, in a cardboard box or in an empty case for individual combination.

Simple

- Intuitive operation with only four keys
- Flat menu structure
- Bright display for safe readings

Robust

- Glass fiber reinforced housing for extreme durability
- Water- and dustproof according to IP68
- Shock-resistant optics

Flexible

- Various case solutions including reagents
- Additional parameters available free of charge
- Compatible with *VISOCOLOR*® *ECO* tests and *VISOCOLOR*® Powder Pillows

Ordering information

Description	REF
Compact photometer PF-3 Pool (Cl_2, pH, Cya, TA), in a cardboard box for evaluation of *VISOCOLOR*® *ECO* tests, *VISOCOLOR*® Powder Pillows and *NANOCOLOR*® tube tests incl. manual, batteries and certificate	919340
Compact photometer PF-3 Soil (NH_4, K, NO_3, PO_4), in a cardboard box for evaluation of *VISOCOLOR*® *ECO* tests and *NANOCOLOR*® tube tests incl. manual, batteries and certificate	919341
Compact photometer PF-3 COD (COD), in a cardboard box for evaluation of *NANOCOLOR*® tube tests incl. manual, batteries and certificate	919342
Compact photometer PF-3 Drinking Water (Cl_2, pH, F, Fe, ClO_2), in a cardboard box for evaluation of *VISOCOLOR*® *ECO* tests, *VISOCOLOR*® Powder Pillows and *NANOCOLOR*® tube tests incl. manual, batteries and certificate	919343
Compact photometer PF-3 Fish (NH_4, Cl_2, pH, Fe, SiO_2, PO_4, NO_3, NO_2, O_2, Cu), in a cardboard box for evaluation of *VISOCOLOR*® *ECO* tests and *NANOCOLOR*® tube tests incl. manual, batteries and certificate	919345

Additional versions and tests will follow successively. All current options can be found at *www.mn-net.com/PF-3*

VISOCOLOR® reagent cases

Compact laboratories for special applications

The rugged cases with premium foam inlays allow a fast and direct analysis at the point of interest. All needed test instructions as well as analytical accessories are already included for especially easy and convenient handling.

The reagent cases together with the *VISOCOLOR*® tests give water attendants, fish farmers and other persons that are interested in water analysis the possibility to determine important analytical values for the evaluation of water quality within a short time.

The prepacked reagent cases can be used for a wide area of applications like swimming pools, drinking water analysis, schools, monitoring of fishing waters and of course for general water analysis.

Ordering information

Reagent case	REF	Dimensions	Application	GHS	PF-3	PF-12^{Plus}	Test
VISOCOLOR® *ECO* Reagent case	931301	340 x 275 x 83 mm	General	■			*VISOCOLOR*® *ECO* Ammonium 3 *VISOCOLOR*® *ECO* Carbonate hardness *VISOCOLOR*® *ECO* Total hardness *VISOCOLOR*® *ECO* Nitrate *VISOCOLOR*® *ECO* Nitrite *VISOCOLOR*® *ECO* pH 4.0–9.0 *VISOCOLOR*® *ECO* Phosphate
VISOCOLOR® Reagent case	931304	450 x 360 x 140 mm	General	■			*VISOCOLOR*® *ECO* Ammonium 3 *VISOCOLOR*® *ECO* Nitrite *VISOCOLOR*® *ECO* pH 4.0–9.0 *VISOCOLOR*® *ECO* Phosphate *VISOCOLOR*® *HE* Alkalinity AL 7 *VISOCOLOR*® *HE* Total hardness H 20 F *VISOCOLOR*® *HE* Oxygen SA 10
VISOCOLOR® Reagent case for environmental analysis	914353	450 x 360 x 140 mm	General	■		■	*VISOCOLOR*® *ECO* Ammonium 15 *VISOCOLOR*® *ECO* Iron 2 *VISOCOLOR*® *ECO* Nitrate *VISOCOLOR*® *ECO* Nitrite *VISOCOLOR*® *ECO* pH 4.0–9.0 *VISOCOLOR*® *ECO* Phosphate *VISOCOLOR*® *HE* Carbonate hardness C 20 *VISOCOLOR*® *HE* Total hardness H 20 F
Reagent case with PF-3 Pool (Cl_2 liquid)	934118	340 x 275 x 83 mm	Swimming pool	■	■		*VISOCOLOR*® *ECO* Alkalinity TA *VISOCOLOR*® *ECO* Chlorine 2, free + total *VISOCOLOR*® *ECO* Cyanuric acid *VISOCOLOR*® *ECO* pH 6.0–8.2
Reagent case with PF-3 Pool (Cl_2 solid)	934119	340 x 275 x 83 mm	Swimming pool	■	■		*VISOCOLOR*® *ECO* Alkalinity TA *VISOCOLOR*® *ECO* Chlorine 6, free + total *VISOCOLOR*® *ECO* Cyanuric acid *VISOCOLOR*® *ECO* pH 6.0–8.2
Reagent case with PF-3 Drinking Water (Cl_2 liquid)	934124	340 x 275 x 83 mm	Drinking water	■	■		*VISOCOLOR*® *ECO* Chlorine 2, free + total *VISOCOLOR*® *ECO* Chlorine dioxide *VISOCOLOR*® *ECO* Iron 2 *VISOCOLOR*® *ECO* Fluoride *VISOCOLOR*® *ECO* pH 6.0–8.2
Reagent case with PF-3 Drinking Water (Cl_2 solid)	934125	340 x 275 x 83 mm	Drinking water	■	■		*VISOCOLOR*® *ECO* Chlorine 6, free + total *VISOCOLOR*® *ECO* Chlorine dioxide *VISOCOLOR*® *ECO* Iron 2 *VISOCOLOR*® *ECO* Fluoride *VISOCOLOR*® *ECO* pH 6.0–8.2
Reagent case *VISOCOLOR*® School	933100	275 x 230 x 83 mm	Schools	■			*VISOCOLOR*® School Ammonium *VISOCOLOR*® School Total hardness *VISOCOLOR*® School Nitrate *VISOCOLOR*® School Nitrite *VISOCOLOR*® School pH 4.0–9.0 *VISOCOLOR*® School Phosphate
Reagent case *VISOCOLOR*® Fish	933101	275 x 230 x 83 mm	Fishing waters	■			*VISOCOLOR*® Fish Ammonium *VISOCOLOR*® Fish Total hardness *VISOCOLOR*® Fish Nitrate *VISOCOLOR*® Fish Nitrite *VISOCOLOR*® Fish pH 4.0–9.0 *VISOCOLOR*® Fish Phosphate

GHS: Global harmonized system: This product contains harmful substances which must be specially labelled as hazardous. For detailed information please see SDS.

VISOCOLOR® reagent cases

Measuring range (visual)	Measuring range (photometric)	No. of tests	Reagent cases
0 · 0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 mg/L NH_4^+	–	50	*VISOCOLOR*® *ECO*
1 drop corresponds to 1.25 °e	–	100	Reagent case
1 drop corresponds to 1.25 °e	–	110	
0 · 1 · 3 · 5 · 10 · 20 · 30 · 50 · 70 · 90 · 120 mg/L NO_3^-	–	110	
0 · 0.02 · 0.03 · 0.05 · 0.07 · 0.1 · 0.2 · 0.3 · 0.5 mg/L NO_2^-	–	120	
pH: 4.0 · 5.0 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	–	450	
0 · 0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 · 5 mg/L PO_4-P	–	80	
0 · 0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 mg/L NH_4^+	–	50	*VISOCOLOR*®
0 · 0.02 · 0.03 · 0.05 · 0.07 · 0.1 · 0.2 · 0.3 · 0.5 mg/L NO_2^-	–	120	Reagent case
pH: 4.0 · 5.0 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	–	450	
0 · 0.2 · 0.3 · 0.5 · 0.7 · 1 · 2 · 3 · 5 mg/L PO_4-P	–	80	
0.2–7.2 mmol/L OH^- (1 syringe)	–	200	
0–20.0 °d / 0–3.6 mmol/L Ca^{2+} (1 syringe)	–	200	
0–10.0 mg/L O_2 (1 syringe)	–	100	
–	0.5–8.0 mg/L NH_4^+	50	*VISOCOLOR*®
–	0.04–2.00 mg/L Fe	100	Reagent case for environ-
–	4–60 mg/L NO_3^-	110	mental analysis
–	0.02–0.50 mg/L NO_2^-	120	
pH: 4.0 · 5.0 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	–	450	
–	0.2–3.0 mg/L PO_4-P	80	
0–20.0 °d / 0–7.2 mmol/L H^+ (1 syringe)	–	200	
0–20.0 °d / 0–3.6 mmol/L Ca^{2+} (1 syringe)	–	200	
–	0.3–14 °d / 5–250 mg/L $CaCO_3$	100	Reagent case with PF-3
–	0.10–2.00 mg/L Cl_2	150	Pool (Cl_2 liquid)
–	10–100 mg/L Cya	100	
–	pH 6.1–8.4	150	
–	0.3–14 °d / 5–250 mg/L $CaCO_3$	100	Reagent case with PF-3
–	0.05–6.00 mg/L Cl_2	200	Pool (Cl_2 solid)
–	10–100 mg/L Cya	100	
–	pH 6.1–8.4	150	
–	0.10–2.00 mg/L Cl_2	150	Reagent case with PF-3
–	0.20–3.80 mg/L ClO_2	150	Drinking Water (Cl_2 liquid)
–	0.04–2.00 mg/L Fe	100	
–	0.1–2.0 mg/L F^-	150	
–	pH 6.1–8.4	150	
–	0.05–6.00 mg/L Cl_2	200	Reagent case with PF-3
–	0.20–3.80 mg/L ClO_2	150	Drinking Water (Cl_2 solid)
–	0.04–2.00 mg/L Fe	100	
–	0.1–2.0 mg/L F^-	150	
–	pH 6.1–8.4	150	
0 · 0.2 · 0.5 · 1 · 3 mg/L NH_4^+	–	50	Reagent case
1 drop corresponds to 1.25 °e	–	50	*VISOCOLOR*® School
0 · 1 · 5 · 10 · 20 · 50 · 90 mg/L NO_3^-	–	50	
0 · 0.02 · 0.05 · 0.1 · 0.2 · 0.5 mg/L NO_2^-	–	50	
pH: 4.0 · 5.0 · 6.0 · 7.0 · 8.0 · 9.0	–	50	
0 · 0.5 · 1.5 · 3 · 6 · 15 mg/L PO_4^{3-}	–	50	
0 · 0.2 · 0.5 · 1 · 3 mg/L NH_4^+	–	50	Reagent case
1 drop corresponds to 1.25 °e	–	50	*VISOCOLOR*® Fish
0 · 1 · 5 · 10 · 20 · 50 · 90 mg/L NO_3^-	–	50	
0 · 0.02 · 0.05 · 0.1 · 0.2 · 0.5 mg/L NO_2^-	–	50	
pH: 4.0 · 5.0 · 6.0 · 7.0 · 8.0 · 9.0	–	50	
0 · 0.5 · 1.5 · 3 · 6 · 15 mg/L PO_4^{3-}	–	50	

VISOCOLOR® reagent cases

Ordering information

Reagent case	REF	Dimensions	Application	GHS	PF-3	PF-12^{Plus}	Test
Reagent case *VISOCOLOR*® Fish with PF-3 Fish	934127	395 x 295 x 106 mm	Fishing waters	■	■		QUANTOFIX® Chloride QUANTOFIX® Multi-stick for aquarium owners *VISOCOLOR*® *ECO* Ammonium 3 *VISOCOLOR*® *ECO* Chlorine 6, free + total *VISOCOLOR*® *ECO* Iron 2 *VISOCOLOR*® *ECO* Silica *VISOCOLOR*® *ECO* Copper *VISOCOLOR*® *ECO* Nitrate *VISOCOLOR*® *ECO* Nitrite *VISOCOLOR*® *ECO* pH 6.0–8.2 *VISOCOLOR*® *ECO* Phosphate *VISOCOLOR*® *ECO* Oxygen *VISOCOLOR*® *HE* Alkalinity AL 7 *VISOCOLOR*® *HE* Phosphate
VISOCOLOR® Reagent case for soil analysis. with accessories	931601	500 x 420 x 175 mm	Soil	■			pH-Fix 2.0–9.0 QUANTOFIX® Ammonium QUANTOFIX® Nitrate/Nitrite *VISOCOLOR*® *ECO* Potassium *VISOCOLOR*® *HE* pH 4.0–10.0 *VISOCOLOR*® *HE* Phosphate
VISOCOLOR® Reagent case for soil analysis with PF-3 Soil. with accessories	934220	500 x 420 x 175 mm	Soil	■	■		pH-Fix 2.0–9.0 QUANTOFIX® Nitrate/Nitrite *VISOCOLOR*® *ECO* Ammonium 3 *VISOCOLOR*® *ECO* Potassium *VISOCOLOR*® *ECO* Nitrate *VISOCOLOR*® *ECO* Phosphate
VISOCOLOR® Reagent case for soil analysis with PF-3 Soil	934210	340 x 275 x 83 mm	Soil	■	■		*VISOCOLOR*® *ECO* Ammonium 3 *VISOCOLOR*® *ECO* Potassium *VISOCOLOR*® *ECO* Nitrate *VISOCOLOR*® *ECO* Phosphate

GHS: Global harmonized system: This product contains harmful substances which must be specially labelled as hazardous. For detailed information please see SDS.

Measuring range (visual)	Measuring range (photometric)	No. of tests	Reagent cases
0 · 500 · 1000 · 1500 · 2000 · ≥3000 mg/L Cl^-	–	100	Reagent case *VISOCOLOR*® Fish with PF-3 Fish
Total hardness: 0 · 5 · 10 · 15 · 20 · 25 °d	–	100	
Carbonate hardness: 0 · 3 · 6 · 10 · 15 · 20 °d	–	100	
pH: 6.4 · 6.8 · 7.2 · 7.6 · 8.0 · 8.4	–	100	
–	0.1–2.5 mg/L NH_4^+	50	
–	0.05–6.00 mg/L Cl_2	200	
–	0.04–2.00 mg/L Fe	100	
–	0.2–3.0 mg/L SiO_2	80	
–	0.1–5.0 mg/L Cu^{2+}	100	
–	4–60 mg/L NO_3^-	110	
–	0.02–0.50 mg/L NO_2^-	120	
–	pH 6.1–8.4	100	
–	0.2–5.0 mg/L PO_4-P	80	
–	1–8 mg/L O_2	50	
0.2–7.2 mmol/L OH^- (1 syringe)	–	200	
0.0 · 0.05 · 0.10 · 0.15 · 0.20 · 0.3 · 0.4 · 0.6 · 0.8 · 1.0 mg/L PO_4-P	–	300	
pH: 2.0 · 2.5 · 3.0 · 3.5 · 4.0 · 4.5 · 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	–	100	*VISOCOLOR*® Reagent case for soil analysis. with accessories
0 · 10 · 25 · 50 · 100 · 200 · 400 mg/L NH_4^+	–	100	
Nitrate: 0 · 10 · 25 · 50 · 100 · 250 · 500 mg/L NO_3^-	–	100	
Nitrite: 0 · 1 · 5 · 10 · 20 · 40 · 80 mg/L NO_2^-	–	100	
2 · 3 · 4 · 6 · 8 · 10 · 15 mg/L K^+	–	60	
pH: 4.0 · 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0 · 10.0	–	500	
0.0 · 0.05 · 0.10 · 0.15 · 0.20 · 0.3 · 0.4 · 0.6 · 0.8 · 1.0 mg/L PO_4-P	–	100	
pH: 2.0 · 2.5 · 3.0 · 3.5 · 4.0 · 4.5 · 5.0 · 5.5 · 6.0 · 6.5 · 7.0 · 7.5 · 8.0 · 8.5 · 9.0	–	100	*VISOCOLOR*® Reagent case for soil analysis with PF-3 Soil. with accessories
Nitrate: 0 · 10 · 25 · 50 · 100 · 250 · 500 mg/L NO_3^-	–	100	
Nitrite: 0 · 1 · 5 · 10 · 20 · 40 · 80 mg/L NO_2^-	–	100	
–	0.1–2.5 mg/L NH_4^+	50	
–	2–25 mg/L K^+	60	
–	4–60 mg/L NO_3^-	110	
–	0.2–5.0 mg/L PO_4-P	80	
–	0.1–2.5 mg/L NH_4^+	50	*VISOCOLOR*® Reagent case for soil analysis with PF-3 Soil
–	2–25 mg/L K^+	60	
–	4–60 mg/L NO_3^-	110	
–	0.2–5.0 mg/L PO_4–P	80	

VISOCOLOR® reagent cases

Reagent cases for individual solutions

With our reagent case program we also fulfill individual customer requests. The user can choose between reagent case versions with tests for visual evaluation and possible combinations with the compact photometers PF-3 and PF-12^{Plus}.

The reagent cases for individual solutions can be individually equipped and offer a flexible combination of *VISOCOLOR*® tests with test strips, test papers and accessories.

Good to know

Starting at a minimum quantity of 50 cases, we offer entirely individual solutions in different sizes with a foam inlay designed exactly to the customers´ specifications and needs.

Ordering information

Reagent case	REF	Dimensions	*VISOCOLOR*® *alpha*	*VISOCOLOR*® *ECO*	*VISOCOLOR*® *HE*	pH-Fix	PEHANON®	Indicator papers
VISOCOLOR® *ECO* Reagent case	931303	340 x 275 x 83 mm		■				
VISOCOLOR® Reagent case	931305	450 x 360 x 140 mm	■	■	■	■	■	■
VISOCOLOR® Reagent case with PF-3 Pool	934102	340 x 275 x 83 mm		■				
VISOCOLOR® Reagent case with PF-3 Drinking Water	934402	340 x 275 x 83 mm		■				
VISOCOLOR® Reagent case with PF-3 Soil	934202	340 x 275 x 83 mm		■				
VISOCOLOR® Reagent case with PF-3 Fish	934602	340 x 275 x 83 mm		■				
VISOCOLOR® Reagent case with PF-12^{Plus}	914351	450 x 360 x 140 mm	■	■	■	■	■	■

Duotest and Tritest	QUANTOFIX®	AQUADUR®	Qualitative test papers	Thermometer	Oxygen bottle	Pipettes	Reagent case
				■	■		*VISOCOLOR*® *ECO* Reagent case
■	■	■	■	■	■		*VISOCOLOR*® Reagent case
							VISOCOLOR® Reagent case with PF-3 Pool
							VISOCOLOR® Reagent case with PF-3 Drinking Water
							VISOCOLOR® Reagent case with PF-3 Soil
							VISOCOLOR® Reagent case with PF-3 Fish
■	■	■	■	■	■		*VISOCOLOR*® Reagent case with PF-12^{Plus}

Index of catalog numbers

Trademarks

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