

TOTAL REEF ICP TEST



Sample ID: 019943Q

Sample type: Seawater

Volume aquarium in Litre: 600

Sample name: Peninsula Style

Sampling date: 07-30-2023

Date of receipt: 08-02-2023

Method: ICP-OES (inductively coupled plasma with optical emission spectrometry) and further procedures specifically for seawater.

Recommended values are optimized for coral reef aquariums.

You can find detailed information on the elements as well as recommendations for action and precise dosing instructions at:

<https://lab.faunamarin.de/en/home/analysis/79046>

Basic physical-chemical values

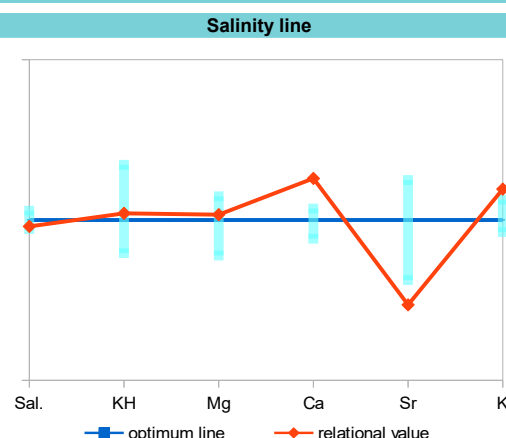
	measured	reference range
Conductivity (mS/cm 25°C)	52.2	51,7 - 53,0 - 54,5
Density (kg/Liter 25°C)	1.023	1,022 - 1,023 - 1,024
Specific density (25°C)	1.026	1,026 - - 1,027
Salinity (ppt, psu)	34.3	34,0 - 35,0 - 36,0
pH level	7.95	7,90 - 8,30 - 8,40
Carbonate hardness (in °dKH)	7.4	6,5 - 7,3 - 8,5
CO ₂ (mg/l)	2.41	0,04 - - 2,5
acid binding capacity pH 4,3 (mmol/L)	2.64	2,3 - 2,58 - 3,0
odor	none	none
colour	none	none

Major elements, lime elements and halogens in mg/Litre (1 mg = 0,001 g)

	measured	reference range	rel. 35 psu
Chloride Cl ⁻	19003	18700 - 19500 - 20300	19374
Sodium Na	10520	9500 - 10700 - 11500	10725
Sulphur S	841	850 - 900 - 950	857
Sulphate SO ₄ ²⁻	2520	2550 - 2700 - 2850	2569
Potassium K	433	380 - 395 - 420	441
Boron B	5.76	3,80 - 4,50 - 5,50	5.87
Magnesium Mg	1372	1200 - 1350 - 1450	1399
Calcium Ca	480	400 - 425 - 440	489
Strontium Sr	5.88	6,50 - 8,00 - 9,00	5.99
Bromine Br	75.6	55,0 - 67,0 - 75,0	77.1
Fluoride F ⁻	0.88	0,90 - 1,30 - 1,60	0.9
Iodine (total iodine, ICP-OES) I	0.066	0,055 - 0,065 - 0,080	0.067

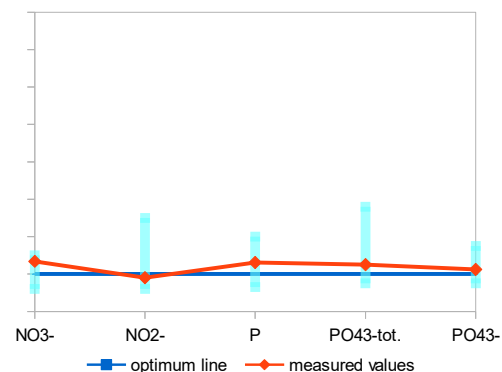
Relational values major elements and halogens - graphic representation salinity line

	relational value	reference range
Salinity measured : nominal Sal.	0.98	0,97 - 1,00 - 1,03
KH measured : nominal KH	1.02	0,90 - 1,00 - 1,17
Magnesium : Salinity Mg	40	33,3 - 38,6 - 42,6
Calcium : Salinity Ca	14	11,1 - 12,1 - 12,9
Strontium: Salinity Sr	0.17	0,18 - 0,23 - 0,26
Potassium : Salinity K	12.6	10,6 - 11,3 - 12,4
Boron : Salinity B	0.17	0,11 - 0,13 - 0,16
Chloride : Salinity Cl ⁻	554	519 - 557 - 597
Sulphate : Salinity SO ₄ ²⁻	73.4	71,0 - 77,0 - 84,0
Chloride : Sulphate Cl ⁻ /SO ₄ ²⁻	7.54	6,60 - 7,20 - 8,00
Magnesium : Calcium Mg/Ca	2.86	2,70 - 3,20 - 3,60
Calcium : Strontium Ca/Sr	81.6	44,0 - 53,0 - 68,0
Bromide : Fluoride Br ⁻ /F ⁻	85.9	34,0 - 52,0 - 83,0
Fluoride : Iodine F ⁻ /I	13.3	11,0 - 20,0 - 29,0



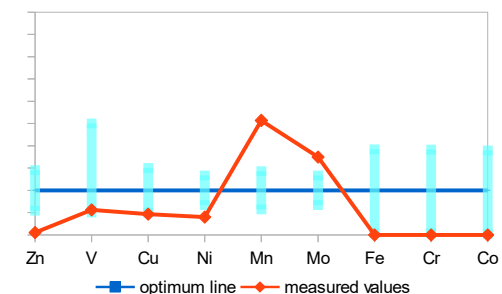
Macronutrients in mg/Litre (1 mg = 0,001 g)			Nutrients	
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		measured	reference range		
Nitrate	NO ₃ ⁻	8.4	1,00	-	10,0
Nitrite	NO ₂ ⁻	0.04	< 0,20		
Phosphorus (ICP-OES)	P	0.021	< 0,06		
Total Phosphate (calculated)	PO ₄ ³⁻ _{tot.}	0.06	0,02	-	0,18
Ortho-Phosphate (photometric)	PO ₄ ³⁻	0.05	0,02	-	0,10
Silicon	Si	0.18	0,10	-	0,20
Silicate (calculated)	SiO ₂	0.38	0,20	-	0,40
Relational values					
Total Phosphate : Nitrate		130	90	-	110
Total Phosphate : Ortho-Phosphate		1.34	~ 1,00		
Total Phosphate : Iodine		0.98	0,13	-	1,67



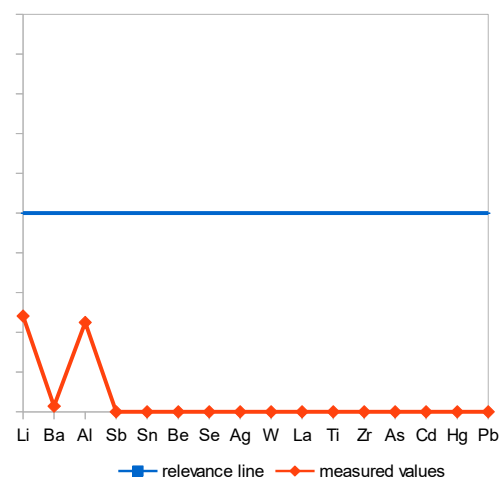
Physiologically relevant trace elements and color-relevant micronutrients in µg/Litre (1 µg = 0,000001 g)			Dynamic Elements	
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		measured	reference range		
Zinc	Zn	0.3	3,00	-	8,00
Vanadium	V	2.25	2,00	-	10,0
Copper	Cu	1.87	2,00	-	6,00
Nickel	Ni	1.8	3,00	-	6,00
Manganese	Mn	0.45	0,10	-	0,25
Molybdenum	Mo	26.2	10,0	-	20,0
Iron	Fe	n.n.	0,05	-	2,50
Chrome	Cr	n.n.	0,05	-	2,30
Cobalt	Co	n.n.	0,02	-	1,90



Other trace elements and potential harmful substances in µg/Litre (1 µg = 0,000001 g)			Relevance line	
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		measured	reference range		
Lithium	Li	241	180	-	350
Barium	Ba	5.7	5,00	-	50,0
Aluminium	Al	13.5	5,00	-	30,0
Antimony	Sb	n.n.	< 10,0		
Tin	Sn	n.n.	< 10,0		
Beryllium	Be	n.n.	0,05	-	1,40
Selenium	Se	n.n.	0,90	-	5,50
Silver	Ag	n.n.	< 10,0		
Tungsten	W	n.n.	< 30,0		
Lanthanum	La	n.n.	2,00	-	10,0
Titanium	Ti	n.n.	0,50	-	3,50
Zirconium	Zr	n.n.	1,00	-	2,20
Arsenic	As	n.n.	< 1,00		
Cadmium	Cd	n.n.	< 1,00		
Mercury	Hg	n.n.	< 1,00		
Lead	Pb	n.n.	< 1,00		



Osmosis water in mg/Liter (1 mg = 0,001 g)		
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		measured	reference range
Calcium	Ca	n.n.	n.n.
Potassium	K	0.5	n.n.
Magnesium	Mg	n.n.	n.n.
Sodium	Na	n.n.	n.n.
Sulphur	S	n.n.	n.n.
Phosphorus (ICP-OES)	P	n.n.	n.n.
Total Phosphate (calculated)	PO ₄ ³⁻ _{tot.}	n.n.	n.n.
Silicon	Si	0.02	n.n.
Silicate (calculated)	SiO ₂	0.05	n.n.

in µg/Liter (1 µg = 0,000001 g)		
Aluminium	Al	n.n.
Lead	Pb	n.n.
Cadmium	Cd	n.n.
Chrome	Cr	n.n.
Iron	Fe	n.n.
Copper	Cu	n.n.
Lithium	Li	n.n.
Nickel	Ni	n.n.
Mercury	Hg	n.n.
Tin	Sn	n.n.
Zinc	Zn	n.n.

Measured values of type "> 24" indicate that the concentration is above the calibrated range and therefore cannot be determined definitively. In these cases it is indicated how much at least is present (e.g. 24 µg/l). Abbreviations: n.g. (not measured), n.n. (not detectable).