

TOTAL REEF ICP TEST



Sample ID: 20170301
Sample type: Seawater
Volume aquarium in Litre: 750
Sample name: RSR 750
Sampling date: 03-28-2023
Date of receipt: 04-03-2023

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/60406>

Basic physical-chemical values

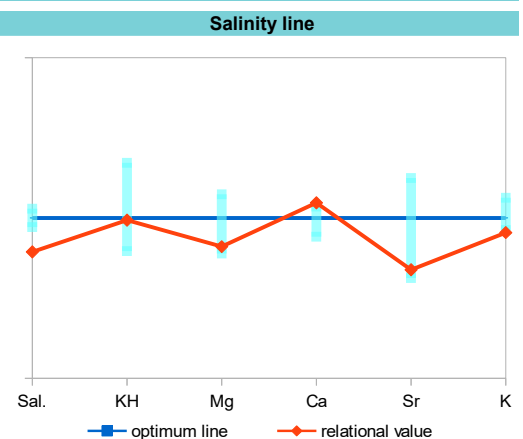
	measured	reference range
Conductivity (mS/cm 25°C)	48.1	51,7 - 53,0 - 54,5
Density (kg/Liter 25°C)	1.021	1,022 - 1,023 - 1,024
Specific density (25°C)	1.024	1,026 - - - 1,027
Salinity (ppt, psu)	31.3	34,0 - 35,0 - 36,0
pH level	7.9	7,90 - 8,30 - 8,40
Carbonate hardness (in °dKH)	7.2	6,5 - 7,3 - 8,5
CO ₂ (mg/l)	2.63	0,04 - - - 2,5
acid binding capacity pH 4,3 (mmol/L)	2.57	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 ⁻	17344	18700 - 19500 - 20300	19374
Sodium Na	9498	9500 - 10700 - 11500	10610
Sulphur S	745	850 - 900 - 950	832
Sulphate SO ₄ ²⁻	2232	2550 - 2700 - 2850	2493
Potassium K	377	380 - 395 - 420	421
Boron B	3.53	3,80 - 4,50 - 5,50	3.94
Magnesium Mg	1229	1200 - 1350 - 1450	1373
Calcium Ca	445	400 - 425 - 440	497
Strontium Sr	6.71	6,50 - 8,00 - 9,00	7.5
Bromine Br	64.7	55,0 - 67,0 - 75,0	72.3
Fluoride F ⁻	0.6	0,90 - 1,30 - 1,60	0.67
Iodine (total iodine, ICP-OES) I	0.008	0,055 - 0,065 - 0,080	0.009

Relational values major elements and halogens - graphic representation salinity line

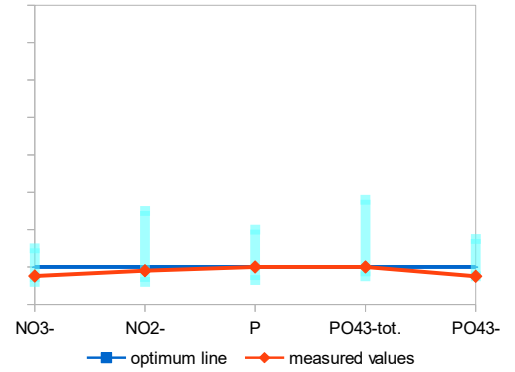
	relational value	reference range
Salinity measured : nominal Sal.	0.9	0,97 - 1,00 - 1,03
KH measured : nominal KH	0.99	0,90 - 1,00 - 1,17
Magnesium : Salinity Mg	39.2	33,3 - 38,6 - 42,6
Calcium : Salinity Ca	14.2	11,1 - 12,1 - 12,9
Strontium: Salinity Sr	0.21	0,18 - 0,23 - 0,26
Potassium : Salinity K	12	10,6 - 11,3 - 12,4
Boron : Salinity B	0.11	0,11 - 0,13 - 0,16
Chloride : Salinity Cl ⁻	554	519 - 557 - 597
Sulphate : Salinity SO ₄ ²⁻	71.2	71,0 - 77,0 - 84,0
Chloride : Sulphate Cl ⁻ /SO ₄ ²⁻	7.77	6,60 - 7,20 - 8,00
Magnesium : Calcium Mg/Ca	2.76	2,70 - 3,20 - 3,60
Calcium : Strontium Ca/Sr	66.3	44,0 - 53,0 - 68,0
Bromide : Fluoride Br ⁻ /F ⁻	107.8	34,0 - 52,0 - 83,0
Fluoride : Iodine F ⁻ /I	75	11,0 - 20,0 - 29,0



Macronutrients
in mg/Litre (1 mg = 0,001 g)

		measured	reference range
Nitrate	NO ₃ ⁻	2.6	1,00 - 10,0
Nitrite	NO ₂ ⁻	0.04	< 0,20
Phosphorus (ICP-OES)	P	0.013	< 0,06
Total Phosphate (calculated)	PO ₄ ³⁻ _{tot.}	0.04	0,02 - 0,18
Ortho-Phosphate (photometric)	PO ₄ ³⁻	0.02	0,02 - 0,10
Silicon	Si	0.18	0,10 - 0,20
Silicate (calculated)	SiO ₂	0.39	0,20 - 0,40
Relational values			
Total Phosphate : Nitrate		65	90 - 110
Total Phosphate : Ortho-Phosphate		2.34	~ 1,00
Total Phosphate : Iodine		4.98	0,13 - 1,67

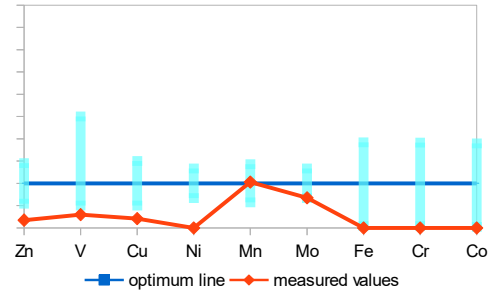
Nutrients



Physiologically relevant trace elements and color-relevant micronutrients
in µg/Litre (1 µg = 0,000001 g)

		measured	reference range
Zinc	Zn	0.96	3,00 - 8,00
Vanadium	V	1.18	2,00 - 10,0
Copper	Cu	0.84	2,00 - 6,00
Nickel	Ni	n.n.	3,00 - 6,00
Manganese	Mn	0.18	0,10 - 0,25
Molybdenum	Mo	10.1	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

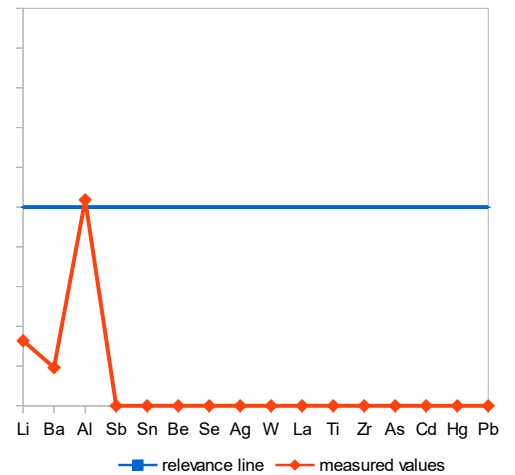
Dynamic Elements



Other trace elements and potential harmful substances
in µg/Litre (1 µg = 0,000001 g)

		measured	reference range
Lithium	Li	164	180 - 350
Barium	Ba	38.5	5,00 - 50,0
Aluminium	Al	31.1	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

Relevance line



Osmosis water

in mg/Liter (1 mg = 0,001 g)		measured	reference range
Calcium	Ca	n.n.	n.n.
Potassium	K	n.n.	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)		measured	reference range
Aluminium	Al	n.n.	n.n.
Lead	Pb	n.n.	n.n.
Cadmium	Cd	n.n.	n.n.
Chrome	Cr	n.n.	n.n.
Iron	Fe	n.n.	n.n.
Copper	Cu	n.n.	n.n.
Lithium	Li	n.n.	n.n.
Nickel	Ni	n.n.	n.n.
Mercury	Hg	n.n.	n.n.
Tin	Sn	n.n.	n.n.
Zinc	Zn	n.n.	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).