

# REEF ICP TOTAL

**Methodology:** ICP-OES, photometric and electrochemical methods specific for seawater. Further methods possible via upgrades.

Recommended values are optimized for coral reef aquariums.

**Sample ID:** 20829285

**Analysis ID:** 305087

**Booked upgrades:** non

Sampling Point: 180 gallon

Volume in Liters: 1325

Sampling Date: 05-30-2026

Sample Arrival: 06-08-2026

[To the dosing and action recommendations](#)



## PHYSICAL-CHEMICAL BASIC VALUES

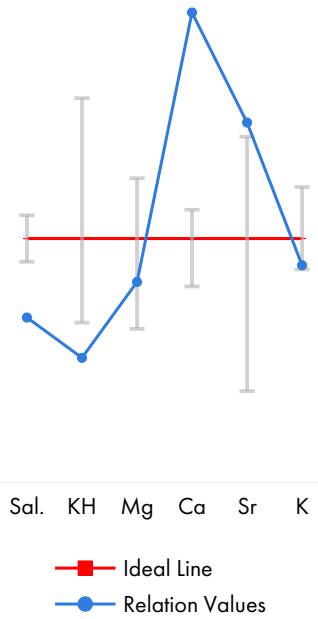
	measured	Reference Range
Electrical Conductivity (mS/cm 25°C)	48,5	51,7 - 53,0 - 54,5
Density (kg/Liter, calculated 25°C)	1,0208	1,022 - 1,023 - 1,024
Relative Density (calculated 25°C)	1,0238	1,026 - - - 1,027
Salinity (psu, calculated)	31,6	34 - 35 - 36
pH Value	7,92	7,9 - 8,3 - 8,4
Carbonate Hardness (°dKH)	6,4	6,5 - 7,3 - 8,5
CO2 Content (mg/l)	0,88	0,04 - - - 2,5
Alkalinity pH 4.3 (mmol/L)	2,28	2,3 - 2,58 - 3,0
Smell	none	none
Color	colorless	colorless

## MACROELEMENTS, CALCIUM BALANCE ELEMENTS, AND HALOGENS in mg/Lit

		measured	Reference Range	rel. 35 psu
Sodium	Na	9830	9500 - 10700 - 11500	10880
Sulfur	S	917	850 - 900 - 950	1015
Sulfate	SO <sub>4</sub> <sup>2-</sup>	2747	2550 - 2700 - 2850	3041
Potassium	K	382	380 - 395 - 420	423
Boron	B	4,67	3,8 - 4,5 - 5,5	5,17
Magnesium	Mg	1278	1200 - 1350 - 1450	1414
Calcium	Ca	543	400 - 425 - 440	601
Strontium	Sr	9,14	6,5 - 8,0 - 9,0	10,12
Chloride	Cl <sup>-</sup>	17430	18700 - 19500 - 20300	19291
Bromine (total bromine, ICP-OES)	Br	63,6	55 - 67 - 75	70,4
Fluoride	F <sup>-</sup>	0,62	0,9 - 1,3 - 1,6	0,69
Iodine (Total Iodine, ICP-OES)	I	* 0,228	0,055 - 0,065 - 0,080	0,252

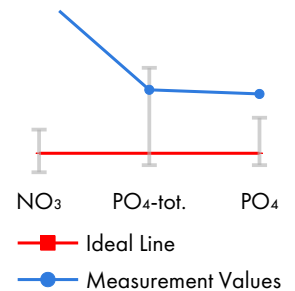
## RELATION VALUES OF MACROELEMENTS AND HALOGENS

		measured	Reference Range
Salinity Meas. : Target Value	Sal.	0,9	0,97 - 1,00 - 1,03
KH Measurement : Target Value	KH	0,88	0,90 - 1,00 - 1,17
Magnesium : Salinity	Mg	40,4	33,3 - 38,6 - 42,6
Calcium : Salinity	Ca	17,2	11,1 - 12,1 - 12,9
Strontium: Salinity	Sr	0,29	0,18 - 0,23 - 0,26
Potassium : Salinity	K	12,1	10,6 - 11,3 - 12,4
Boron : Salinity	B	0,15	0,11 - 0,13 - 0,16
Chloride : Salinity	Cl <sup>-</sup>	551	519 - 557 - 597
Sulfate : Salinity	SO <sub>4</sub> <sup>2-</sup>	86,9	71 - 77 - 84
Chloride : Sulfate	Cl <sup>-</sup> /SO <sub>4</sub> <sup>2-</sup>	6,34	6,6 - 7,2 - 8,0
Magnesium : Calcium	Mg/Ca	2,35	2,7 - 3,2 - 3,6
Calcium : Strontium	Ca/Sr	59,4	44 - 53 - 68
Bromine : Fluoride	Br <sup>-</sup> /F <sup>-</sup>	102,6	34 - 52 - 83
Fluoride : Iodine	F <sup>-</sup> /I	2,7	11 - 20 - 29
Fluoride : Sulfur : Strontium	FSS	79,5	80 - 100 - 120



## MACRO NUTRIENTS in mg/Liter

		measured	Reference Range
Nitrate	NO <sub>3</sub> <sup>-</sup>	38,7	1 - 10
Nitrite	NO <sub>2</sub> <sup>-</sup>	0,08	n.d. - 0,15
Phosphorus (ICP-OES)	P	0,048	0,006 - 0,060
Total Phosphate (calculated)	PO <sub>4</sub> <sup>3-</sup> <sub>tot.</sub>	0,147	0,02 - 0,18
ortho-Phosphate (photometric)	PO <sub>4</sub> <sup>3-</sup>	0,14	0,02 - 0,10
Silicon	Si	0,15	0,1 - 0,2
Silicate (calculated)	SiO <sub>2</sub>	0,33	0,2 - 0,4

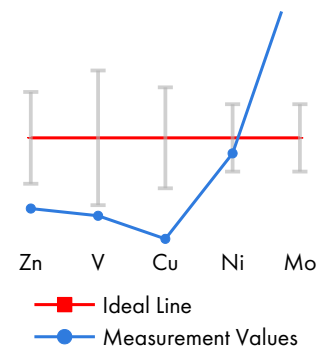


## ORGANIC FACTORS

		measured	Reference Range
Nitrate : ortho-Phosphate	NO <sub>3</sub> <sup>-</sup> /PO <sub>4</sub> <sup>3-</sup>	276,43	90 - 110
Total Phosphate : ortho-Phosphate	PO <sub>4</sub> <sup>3-</sup> <sub>tot.</sub> /PO <sub>4</sub> <sup>3-</sup>	1,05	1,00
Total Phosphate : Iodine	PO <sub>4</sub> <sup>3-</sup> /I	0,65	0,13 - 1,67
SAK254 (m <sup>-1</sup> )		not measured	only with SAK254 upgrade
NPOC (mg/l)	C	not measured	only with organic upgrade
TN <sub>b</sub> (mg/l)	N	not measured	only with organic upgrade

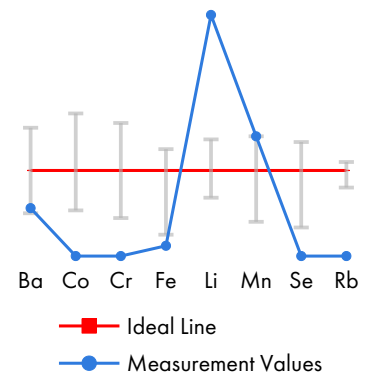
## Dynamic Elements in µg/Liter

		measured	Reference Range
Zinc	Zn	1,65	3 - 5,5 - 8
Vanadium	V	1,37	2 - 6 - 10
Copper	Cu	n.d.	2 - 4 - 6
Nickel	Ni	3,81	3 - 4,5 - 6
Molybdenum	Mo	41,6	10 - 15 - 20



## PHYSIOLOGICALLY RELEVANT TRACE ELEMENTS in µg/Liter

		measured	Reference Range
Barium	Ba	5,6	5 - max. 50
Cobalt	Co	n.d.	n.d. - max. 1,9
Chromium	Cr	n.d.	n.d. - max. 2,3
Iron	Fe	0,24	n.d. - max. 2,5
Lithium	Li	* 620	180 - max. 350
Manganese	Mn	0,14	n.d. - max. 0,25
Selenium	Se	n.d.	n.d. - max. 2,0

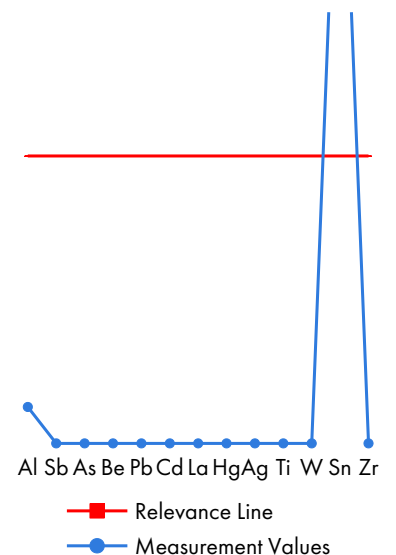


only with ICP-MS upgrade:

Rubidium	Rb	not measured	
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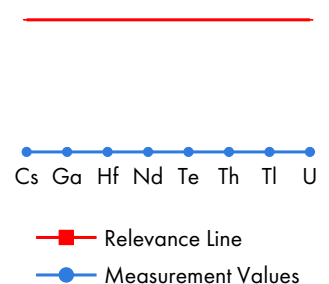
## OTHER TRACE ELEMENTS AND POTENTIAL POLLUTANTS in µg/Liter

		measured	Reference Range
Aluminum	Al	3,8	5 - 30
Antimony	Sb	n.d.	n.d. - max. 10
Arsenic	As	n.d.	n.d.
Beryllium	Be	n.d.	n.d.
Lead	Pb	n.d.	n.d.
Cadmium	Cd	n.d.	n.d.
Lanthanum	La	n.d.	2 - 10
Mercury	Hg	n.d.	n.d.
Silver	Ag	n.d.	n.d. - max. 10
Titanium	Ti	n.d.	n.d. - 3,5
Tungsten	W	n.d.	n.d. - max. 30
Tin	Sn	12,5	n.d. - max. 10
Zirconium	Zr	n.d.	n.d. - 2,2



only with ICP-MS upgrade:

Cesium	Cs	not measured	
Gallium	Ga	not measured	
Hafnium	Hf	not measured	
Neodymium	Nd	not measured	
Tellurium	Te	not measured	
Thorium	Th	not measured	
Thallium	Tl	not measured	
Uranium	U	not measured	



## OSMOSIS WATER

in mg/Liter		measured	Reference Range
<b>Boron</b>	B	n.d.	n.d.
<b>Calcium</b>	Ca	n.d.	n.d.
<b>Potassium</b>	K	n.d.	n.d.
<b>Magnesium</b>	Mg	n.d.	n.d.
<b>Sodium</b>	Na	n.d.	n.d.
<b>Sulfur</b>	S	n.d.	n.d.
<b>Bromine (total bromine, ICP-OES)</b>	Br	n.d.	n.d.
<b>Iodine (Total Iodine, ICP-OES)</b>	I	n.d.	n.d.
<b>Phosphorus (ICP-OES)</b>	P	n.d.	n.d.
<b>Total Phosphate (calculated)</b>	PO <sub>4</sub> <sup>3-</sup> tot.	n.d.	n.d.
<b>Silicon</b>	Si	0,06	n.d.
<b>Silicate (calculated)</b>	SiO <sub>2</sub>	0,13	n.d.
in µg/Liter			
<b>Barium</b>	Ba	n.d.	n.d.
<b>Copper</b>	Cu	n.d.	n.d.
<b>Iron</b>	Fe	n.d.	n.d.
<b>Lithium</b>	Li	n.d.	n.d.
<b>Nickel</b>	Ni	n.d.	n.d.
<b>Zinc</b>	Zn	n.d.	n.d.
<b>Aluminum</b>	Al	n.d.	n.d.
<b>Antimony</b>	Sb	n.d.	n.d.
<b>Arsenic</b>	As	n.d.	n.d.
<b>Beryllium</b>	Be	n.d.	n.d.
<b>Lead</b>	Pb	n.d.	n.d.
<b>Cadmium</b>	Cd	n.d.	n.d.
<b>Chromium</b>	Cr	n.d.	n.d.
<b>Cobalt</b>	Co	n.d.	n.d.
<b>Lanthanum</b>	La	n.d.	n.d.
<b>Manganese</b>	Mn	n.d.	n.d.
<b>Molybdenum</b>	Mo	n.d.	n.d.
<b>Mercury</b>	Hg	n.d.	n.d.
<b>Selenium</b>	Se	n.d.	n.d.
<b>Silver</b>	Ag	n.d.	n.d.
<b>Strontium</b>	Sr	n.d.	n.d.
<b>Titanium</b>	Ti	n.d.	n.d.
<b>Thallium</b>	Tl	n.d.	n.d.
<b>Vanadium</b>	V	n.d.	n.d.
<b>Tungsten</b>	W	n.d.	n.d.
<b>Tin</b>	Sn	n.d.	n.d.
<b>Zirconium</b>	Zr	n.d.	n.d.

## Overview of dosages

Product	Total quantity	spread over ...	corresponds	Priority	Checkbox
SALINITY	no need for action				
ELEMENTALS S	No dosage				
ELEMENTALS K	No dosage				
ELEMENTALS B	No dosage				
ELEMENTALS MG	No dosage				
ELEMENTALS SR	No dosage				
ELEMENTALS BR	No dosage				
ELEMENTALS F	450,5 ml	2 days	225,3 ml/day	2	<input type="checkbox"/> <input type="checkbox"/>
TRACE I	Water change			2	
ELEMENTALS N	Water change			2	
ELEMENTALS P	No dosage				
TRACE ZN	5,1 ml	2 days	2,6 ml/day	3	<input type="checkbox"/> <input type="checkbox"/>
TRACE V	12,3 ml	3 days	4,1 ml/day	3	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
TRACE CU	53,0 ml	2 days	26,5 ml/day	3	<input type="checkbox"/> <input type="checkbox"/>
TRACE NI	No dosage				
TRACE MO	Water change			3	
TRACE BA	No dosage				
TRACE CO	3,1 ml	1 day	3,1 ml/day	4	<input type="checkbox"/>
TRACE CR	31,3 ml	3 days	10,4 ml/day	4	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
TRACE FE	No dosage				
TRACE LI	No dosage				
TRACE MN	No dosage				
TRACE SE	84,8 ml	4 days	21,2 ml/day	4	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
TRACE RB	only with ICP-MS upgrade				

### Upgrade options for a Reef ICP Total:

**ICP-MS upgrade:** Analysis of all trace elements (except aluminum and lithium) using ICP-MS with up to 1000x higher sensitivity than ICP-OES and analysis of exclusive elements. ICP-MS exclusive elements cannot be determined using ICP-OES, or at least not with sufficient sensitivity. Labeling of measured values determined using ICP-MS: **MS**

**Organic upgrade:** Determination of the concentrations of organic carbon (NPOC) and total nitrogen (TNb).

**SAK254 upgrade:** Determination of the indicator value for the concentration of unsaturated organic compounds.

### Detection limits

Time-averaged detection limits for all relevant values are published regularly on lab.fauamarin.de.

### Abbreviations:

ICP-OES (inductively coupled plasma with optical emission spectrometry), ICP-MS (inductively coupled plasma with mass spectrometry), SAK254 (spectral absorption coefficient at 254 nm), NPOC (not easily expelled organic carbon), TNb (total bound nitrogen), n.d. (not detectable).

\* Measured value is too far outside the calibration range and cannot be precisely determined.