AquaCare Quality Salts

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AquaCare Sea Salt is packed in following sizes:

4 kg bag	10 kg bag
20 kg bucket	25 kg bag (other sizes possible)

Sea Salt

The AquaCare Sea Salt contains all macro elements (like sodium, chloride, etc.) in the same concentration as in natural sea water (see table). Trace elements are composed with more than 30 years experience. This has two main reasons: first, the concentrations of trace elements are varying in a wide range (factor 100) or the measuring techniques are not valid. Second, the consumption of the animals and losses with precipitation and co skimming demands an other composition than the natural combination. Long experiences in keeping and breeding of many animals underlines the high quality of AquaCare Sea Salt.

Cut of an AquaCare Aquarium

The advantages of AquaCare Sea Salt

- readily soluble in warm water,
- high concentration of soluble calcium i.e. with low calcium requirements and a regular partial water exchange of 10% per month, no post application of soluble calcium (AquaCare solutions V1 + V2 or calcite reactor) is necessary,
- all ingredients (salts) conform to the purity standards of the German and European Pharmacopoeia (DAB and Ph. Eur) and are therefore of high quality,
- many years of success in keeping and breeding confirm the AquaCare concept,
- different packet sizes at agreeable prices.

4 kg-bag .....Order number: 550-004
10 kg-bag .....Order number: 550-010
20 kg-bucket.....Order number: 551-020
25 kg-bag ..... Order number: 550-025

What is sea salt?

Sea water consists of numerous elements and compound. All over the world the ratio between this substances is nearly constant; only the absolute concentration differs.

The Salinity - a value for the salt concentration - differs from 39‰ (Red Sea) to about 0‰ (Baltic Sea). In the average the oceans contain 34,6‰ (Pacific), 34,8‰ (Indic) und 34,9‰ (Atlantic) at the surface. In lagoons the Salinity will be much higher.

Using natural sea water

Natural sea water seems to be the best solution to give marine animals best water quality. But only a few aquarists are able to get natural sea water from the ocean. In the last years the quality of costal water gets bad in many areas. Nowadays even big show aquaria has given up to get natural water. With artificial sea water the quality is better and more stable and lower quantities has to be stored.

Making of artificial sea water

To make artificial sea water you have to care some things, to get good sea water without irritating substances. Sea salt of good quality is easily dissolving in warm water. If white precipitations will occur at low temperatures or low CO_2 concentrations, aeration or a good current should eliminate these solid substances within some hours.

Element	Concentration in mg/l
Oxygen	857.000-880.000
Hydrogen	108.000-110.000
Chlorine	18.918-19.439
Sodium	10.500-10.809
Magnesium	1.261-1.350
Sulphur	884-905
Calcium	400-412
Potassium	380-389
	Concentration in µg/l
Aluminium	0-500
Antimony	0,24-0,33
Argon	4,3-600
Arsenic	3-22
Barium	2-93
Beryllium	0,0007-104
Bismuth	0,017-0,2
Lead	0,02-4
Boron	786-4.600
Bromine	58.651-67.000
Cadmium	0,02-0,25
Caesium	0,4-3
Cerium	0,001-0,4
Chromium	0,05-0,3
Dysprosium	0,000.9*
Iron	0,1-62
Erbium	0,000.8*
Europium	0,000.1*
Fluorine	1.271-1.300
Gadolinium	0,000.7*
Gallium	0,03
Germanium	0,05-0,07
Gold	0,004-0,027
Hafnium	0,007-0,008
Helium	0,006.8-0,006.9
Holmium	0,000.2*
Indium	0,000.1*
Iridium	
Iodine	48-80
Cobalt	0,035-4,1
Carbon DIC	26.939-28.543
Krypton	0,02-2,5
Copper	0,2-13
Lanthanum	0,003-0,3
Lithium	97-195
Lutetium	0,000.2*
Manganese	0,2-11
Molybdenum	0,24-12,2
Neodymium	0,003*
Neon	0,12-0,14
Nickel	0,8-5,4
Niobium	0,01
Osmium	0,004*
Palladium	
Phosphor	0-100
Praseodymium	0,000.6*
Protactinium	$5 \cdot 10^{-8}$-$2 \cdot 10^{-6}$
Mercury	0,02-0,03
Radium	$2 \cdot 10^{-8}$-$27 \cdot 10^{-8}$
Radon	$6 \cdot 10^{-8}$
Rhenium	0,1*
Rhodium	
Rubidium	112-200
Ruthenium	
Samarium	0,000.05*
Scandium	0,000.6-0,04
Selenium	0,09-4
Silver	0,05-1,5
Silicon	0-39.000
Nitrogen DIN	0-700
Strontium	8.100-80.000
Tantalum	0,002-0,002.5
Tellurium	
Terbium	0,000.1*
Thallium	<0,01-0,01
Thorium	0,01-0,05
Thulium	0,000.2*
Titan	1
Uranium	2-4,7
Vanadium	0,3-3,0
Wolfram	0,1
Xenon	0,05-0,052
Ytterbium	0,000.8*
Yttrium	0,001.3-0,3
Zinc	3,9-48,4
Tin	0,01-3
Zirconium	0,022-0,3

Composition of sea water with a Salinität von 35‰ after following authors (*only one value):
A. DEMAYO in WHEAST (ed.) et al. 1984: Handbook of Chemistry and Physics. 65th edition. Boca Raton, Florida: CRC Press./ SMITH, F.G.W. 1974: Handbook of Marine Science, Vol. II, Cleveland: CRC. in: TARDENT, P. 1993: Meeresbiologie. Eine Einführung. 2. Aufl. Stuttgart, New York: Thieme. / SPOTTE 1979 in ADEY, W. & LOVELAND, K. 1991: Dynamic Aquaria - Building living ecosystems. San Diego, New York, Boston, Sydney, Tokyo, Toronto: Academic Press, Inc. / SVENDRUP et al. 1942 in ADEY, W. & LOVELAND, K. 1991: Dynamic Aquaria - Building living ecosystems. San Diego, New York, Boston, Sydney, Tokyo, Toronto: Academic Press, Inc..

Sea water should be made in glass or plastic (poly ethylene PE, poly propylene PP, poly acrylic glass PMMA, or poly sterol PS) tanks. You should never use metal or weekender containing materials. Sea water is aggressive and is able to leach harmful substances out of false materials. The warmed water should have low concentrations of salt (low TDS or conductivity). The best way is reverse osmosis water or water conditioned with ion exchanger (mixed bed filter). If tap water is used many substances like fertilizers (nitrate, phosphate, silica acid) or rest concentrations of pesticides. These bad substances will promote blue green algae (cyano bacteria) or will damage sensitive animals. The Salinity of the fresh sea water should be controlled after one day. At 35‰ salinity sea water has a density of ρ_{20} = 1,0245 kg/l, a specific weight of 1,0301 kg/kg (20°C), a refraction index of n_{20} = 1,3393 and a electrical conductivity of κ_{20} = 47,5 mS/cm or κ_{25} = 53,9 mS/cm.

For an exact measurement of all above values it is important that the composition of artificial sea water is nearly the same than natural sea water. Otherwise the measurement of low quality sea water will be false. Aquaristic conductivity meters should be controlled and calibrated at 35‰ every month. If you calibrate below 30‰ these instruments (two-electrodes-technique or cell constants below 5/cm) will show 2-3 mS/cm less.

Refilling of evaporated water

The more light is over the aquarium the more water will evaporate. If you do not refill with pure water (R.O. water) the salinity will rise with the time. To refill the water you have to take water with very low salt content to prevent a changing in the salt components. Best way is a continuous refilling with an automatic refill system like the AquaCare *BasiTech*. If you refill manually pump the water slowly to the aquarium. Otherwise an osmotic shock will occur. Please check the salinity every month. If the salinity is to high take a little bit sea water out of the tank and refill it with R.O. water. If the salinity is too low, fill fresh sea water to the tank. The evaporation will rise the salinity.

Cut of a AquaCare Aquarium

Changing of water

A regularly water change is very important. AquaCare recommends minimum 1% per month even if robust animals are kept. If you keep sensitive animals 5 to 25% water change is the best way. The quantity depends on the concentration of nitrate and phosphate of the aquarium water. The more fertilizing substances are in the water the higher the water change.

Dosing of additives

Even you use a sea salt of high quality some important substances will be used very fast by corals. The more light is mounted the faster the substances will decline.

Dissolved chalk (hydrogen carbonate and calcium) should not be to low. Otherwise the pH value will oscillate very high and will hurt sensitive animals. The Carbonate hardness (KH) should never be below 7°dH, calcium not below 400 mg/l. If these factors will decrease - and in high productivity aquariums this will occur within 1-2 days - animals like *Tridacna*, hard corals, tube worms and algae like chalk algae or *Halimedia* have problems to survive. In a good working aquarium system with strong skimming trace elements, iodine, strontium and magnesium should be dosed, too, to prevent deficiency.

AquaCare *Mineral Salt*

Acropora colonies at low tide

The AquaCare *Mineral Salt* is used to harden up soft water, e.g. R.O. water. For soft water aquaria like Amazonian tanks a minimum of hardness is useful. With this *Mineral Salt* it is possible to bring hardness and important minerals into the very poor R.O. water. If you need higher degrees of hardness and a higher pH value you can dose more of the salt. Fishes of the East African sees like Tanganyika and Malawi has ideal conditions with the combination of R.O. water and AquaCare *Mineral salt*: the pH is over 7 and stable and additionally the salt concentration is higher.

For sea water aquaria you can use the AquaCare *Mineral Salt* to bring minerals into the aquarium. If you use the solutions V1 (KH-plus) and V2 (Calcium-plus) in high amounts you can prevent the changing of the salt water composition if you use the *Mineral Salt*, too.

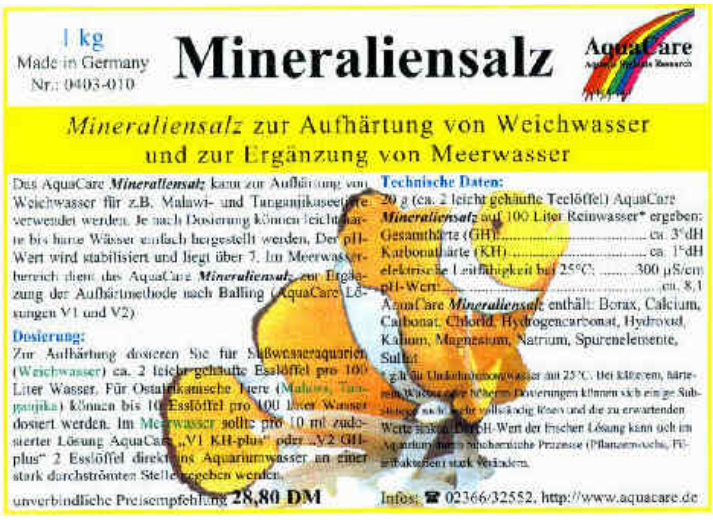
Composition of the *Mineral Salt*

The AquaCare *Mineral Salt* contains following substances:
Borax, Calcium, Carbonate, Chloride, Hydrogen Carbonate, Hydroxid, Potassium, Magnesium, Sodium, Sulphate.

20 grams (ca. 2 tea spoons) AquaCare *Mineral Salt* to 100 litres water* raises following values:

Total Hardness: ..... about 3°dH
Carbonate Hardness: ..... about 1°dH
electrical conductivity, 25°C: ..... 300 µS/cm
pH value: ..... about 8,1

* this is for Reverse Osmosis water at 25°C. If the water is colder or if you use very high dosing of the Mineral Salt some substance will not dissolve totally. The precipitates are not harmful for animal, plant and micro organisms. The pH will change in the aquarium because natural biological processes like plants growth and filter bacteria will occur.



750 g AquaCare *Mineral Salt* ..... Order number 571-008
15 kg AquaCare *Mineral Salt* ..... Order number 571-150