



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 170



Certificate of Analysis AQ3 170

General Information

In this report an overview is given of analytical data for this sample collected in our proficiency testing program. The consensus values are calculated using a robust statistical model. With this NDA model mean and standard deviation are calculated using all reported data when at least 4 results are left after removal of reported 'lower than' (<) and 0 (= zero) values. No outliers are removed.

This report is divided into two sections: Consensus Values and Indicative Values. The division is made on the reliability of the data. Consensus Values are based on at least 10 results while the relative uncertainty is smaller than 6.25%. Indicative Values are based on a relative uncertainty of maximum 35% with at least 4 and less than 10 results or a relative uncertainty higher than 6.25%.

For each determinand the following parameters are given: mean, standard deviation, coefficient of variation, number of results, median, MAD (Median of Absolute Deviation) and the uncertainty in the assigned value. The confidence limits (at 95 % probability) are calculated for these determinands.

Sample information

QUASIMEME reference materials cover a range of natural SeaWater species from contaminated waters from the North Sea and/or Mediterranean.

This AQ3 sample 170 of Seawater spiked with metals from North Sea is prepared for the QUASIMEME proficiency programs. The results on which the values in this report are based were taken from the periods given in the following table.

Year.Round	Program	Sample Round Id
2022.1	AQ3	QTM328SW



Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Cadmium	µg/l	0.179	0.0283	15.8	17	0.180	0.0200	0.0086	0.165	-	0.194
Cobalt	µg/l	0.444	0.0387	8.7	12	0.456	0.0245	0.0140	0.419	-	0.468
Copper	µg/l	2.62	0.375	14.3	20	2.62	0.267	0.105	2.45	-	2.79
Lead	µg/l	0.396	0.0643	16.2	14	0.389	0.0443	0.0215	0.359	-	0.433
Manganese	µg/l	1.31	0.166	12.6	14	1.30	0.124	0.055	1.22	-	1.41
Nickel	µg/l	1.48	0.249	16.9	17	1.46	0.160	0.076	1.35	-	1.61
Vanadium	µg/l	1.71	0.260	15.2	10	1.73	0.180	0.103	1.53	-	1.89
Zinc	µg/l	4.69	0.589	12.6	18	4.76	0.426	0.173	4.40	-	4.98



Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	1.87	0.438	23.4	18	1.90	0.300	0.129	1.66	-	2.09
Boron	µg/l	4070	266	6.5	8	4110	167	118	3858	-	4292
Chromium	µg/l	0.399	0.0929	23.3	12	0.422	0.0663	0.0335	0.341	-	0.458
Iron	µg/l	1.21	0.375	31.1	6	1.29	0.280	0.192	0.833	-	1.58
Silver	µg/l	0.161	0.0420	26.1	7	0.170	0.0300	0.0198	0.124	-	0.199
Thallium	µg/l	0.155	0.0096	6.2	4	0.153	0.0065	0.0060	0.141	-	0.168
Uranium	µg/l	2.71	0.165	6.1	4	2.74	0.110	0.103	2.48	-	2.94