



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 167



Certificate of Analysis AQ3 167

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 167 of Low salinity seawater spiked with metals from North Sea (diluted) 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
2021.2	AQ3	QTM321SW



Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	3.98	0.373	9.4	18	4.01	0.245	0.110	3.80	-	4.17
Cadmium	µg/l	0.234	0.0144	6.1	21	0.237	0.0100	0.0039	0.228	-	0.241
Chromium	µg/l	2.34	0.183	7.8	17	2.38	0.120	0.055	2.24	-	2.43
Cobalt	µg/l	0.849	0.0913	10.8	13	0.850	0.0600	0.0316	0.794	-	0.903
Copper	µg/l	4.34	0.342	7.9	20	4.33	0.223	0.096	4.18	-	4.50
Lead	µg/l	0.428	0.0548	12.8	16	0.433	0.0395	0.0171	0.399	-	0.457
Manganese	µg/l	4.34	0.361	8.3	15	4.33	0.230	0.116	4.14	-	4.54
Nickel	µg/l	1.13	0.217	19.3	16	1.14	0.140	0.068	1.01	-	1.24
Vanadium	µg/l	2.74	0.151	5.5	13	2.75	0.106	0.052	2.65	-	2.83
Zinc	µg/l	6.88	0.821	11.9	19	7.15	0.579	0.236	6.48	-	7.27



Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Boron	µg/l	2430	70	2.9	7	2440	44	33	2367	-	2492
Iron	µg/l	2.64	0.883	33.4	10	2.96	0.668	0.349	2.02	-	3.27
Silver	µg/l	0.410	0.0301	7.3	7	0.410	0.0200	0.0142	0.383	-	0.437
Tin	µg/l	1.30	0.335	25.7	6	1.39	0.216	0.171	0.969	-	1.64