



QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 180



Certificate of Analysis AQ3 180

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 180 of Low sal. Seawater spiked with high conc. 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
2023.1	AQ3	QTM346SW



Consensus Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Copper	µg/l	245	24.2	9.9	17	244	16.0	7.3	233	-	257
Cadmium	µg/l	20.1	1.87	9.3	17	20.4	1.20	0.57	19.2	-	21.1
Lead	µg/l	94.7	8.78	9.3	17	95.6	6.03	2.66	90.2	-	99.2
Cobalt	µg/l	70.8	5.45	7.7	13	70.0	3.00	1.89	67.6	-	74.1
Iron	µg/l	144	5.7	4.0	13	144	4.0	2.0	140.5	-	147.3
Manganese	µg/l	196	7.4	3.8	12	197	4.5	2.7	191	-	200
Arsenic	µg/l	76.5	4.63	6.1	13	77.3	2.90	1.61	73.7	-	79.2
Chromium	µg/l	98.7	4.26	4.3	14	98.3	2.75	1.42	96.3	-	101.2
Nickel	µg/l	406	25.5	6.3	16	409	19.1	8.0	392	-	419
Zinc	µg/l	441	41.9	9.5	16	445	24.0	13.1	419	-	463
Vanadium	µg/l	414	19.6	4.7	11	419	11.0	7.4	401	-	427



Indicative Values AQ3

Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Silver	µg/l	27.2	3.53	13.0	6	27.6	2.53	1.80	23.7	-	30.7
Boron	µg/l	1101	35.5	3.2	8	1104	23.5	15.7	1072	-	1130
Tin	µg/l	74.4	3.28	4.4	9	75.0	1.90	1.37	71.9	-	76.9
Magnesium	mg/l	314	6.1	2.0	6	312	3.9	3.1	308	-	320
Strontium	mg/l	1.78	0.050	2.8	6	1.79	0.020	0.025	1.73	-	1.83