



# QUASIMEME

Quality assurance of information  
for marine environmental monitoring

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## Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 169

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## Certificate of Analysis    AQ3 169

### 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 169 of Seawater unspiked from Nort 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	QTM327SW



### Consensus Values AQ3

#### Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	1.41	0.265	18.8	17	1.48	0.190	0.080	1.28	-	1.55
Copper	µg/l	3.10	0.450	14.5	19	3.15	0.312	0.129	2.89	-	3.32
Manganese	µg/l	0.891	0.1104	12.4	12	0.885	0.0817	0.0398	0.821	-	0.960
Zinc	µg/l	3.67	0.480	13.1	15	3.65	0.350	0.155	3.41	-	3.93



### Indicative Values AQ3

#### Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Boron	µg/l	4020	184	4.6	8	4010	131	81	3869	-	4168
Cadmium	µg/l	0.0236	0.0135	57.3	10	0.0305	0.0100	0.0054	0.0141	-	0.0332
Chromium	µg/l	0.164	0.0862	52.5	9	0.170	0.0600	0.0359	0.0990	-	0.229
Cobalt	µg/l	0.0415	0.0058	14.0	8	0.0400	0.0040	0.0026	0.0368	-	0.0463
Iron	µg/l	1.29	0.631	49.0	6	1.43	0.459	0.322	0.657	-	1.92
Lead	µg/l	0.0368	0.0188	50.9	8	0.0450	0.0130	0.0083	0.0215	-	0.0521
Nickel	µg/l	0.503	0.1167	23.2	11	0.520	0.0790	0.0440	0.425	-	0.580
Vanadium	µg/l	1.32	0.323	24.5	10	1.32	0.204	0.128	1.09	-	1.55
Uranium	µg/l	2.65	0.068	2.6	4	2.68	0.052	0.042	2.56	-	2.75