



# QUASIMEME

Quality assurance of information  
for marine environmental monitoring

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## Certificate of Analysis



Metals in seawater

REFERENCE MATERIAL

AQ3 sample 166

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## Certificate of Analysis    AQ3 166

### 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 166 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
2021.2	AQ3	QTM320SW



## Consensus Values AQ3

### Method: Metals - AQ3

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Arsenic	µg/l	3.40	0.513	15.1	17	3.46	0.345	0.155	3.13	-	3.66
Cadmium	µg/l	0.110	0.0178	16.2	17	0.112	0.0125	0.0054	0.101	-	0.119
Chromium	µg/l	1.70	0.175	10.3	16	1.69	0.110	0.055	1.61	-	1.80
Cobalt	µg/l	0.462	0.0621	13.4	12	0.462	0.0420	0.0224	0.423	-	0.501
Copper	µg/l	6.85	0.583	8.5	20	6.72	0.405	0.163	6.58	-	7.12
Lead	µg/l	2.44	0.264	10.8	21	2.41	0.190	0.072	2.32	-	2.56
Manganese	µg/l	3.27	0.329	10.1	15	3.25	0.220	0.106	3.09	-	3.46
Nickel	µg/l	1.30	0.184	14.2	16	1.30	0.126	0.058	1.20	-	1.40
Vanadium	µg/l	2.01	0.122	6.1	13	1.99	0.090	0.042	1.93	-	2.08
Zinc	µg/l	38.1	3.24	8.5	20	38.3	2.23	0.91	36.6	-	39.6



### Indicative Values AQ3

**Method: Metals - AQ3**

<b>Element</b>	<b>Unit</b>	<b>Mean</b>	<b>Std.Dev.</b>	<b>CV %</b>	<b>N</b>	<b>Median</b>	<b>MAD</b>	<b>Uncertainty</b>	<b>95 % confidence limits</b>		
Boron	µg/l	4330	157	3.6	7	4300	100	74	4190	-	4470
Iron	µg/l	2.91	0.819	28.2	10	3.01	0.605	0.324	2.33	-	3.48
Silver	µg/l	0.153	0.0071	4.7	7	0.151	0.0050	0.0034	0.146	-	0.159
Tin	µg/l	0.390	0.0933	24.0	5	0.396	0.0715	0.0522	0.282	-	0.497