QUASIMEME

Quality assurance of information
for marine environmental monitoring

Certificate of Analysis

Biota

REFERENCE MATERIAL

Biota sample 375

WAGENINGEN
UNIVERSITY & RESEARCH

Certificate of Analysis   Biota 375

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 % probabilty) are calculated for these determinands.

The results of each determinand is expressed on a wet weight basis.

Sample information

QUASIMEME reference materials cover a range of natural Biota species from contaminated waters from the North Sea and/or Mediterranean. The supplied wet test materials are homogenised and sterilised by autoclaving.

This Biota sample 375 of Mussel tissue spiked with contaminants from Kattegat, Denmark 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	BT10	QPF031BT
2023.1	BT4	QPH110BT
2023.1	BT8	QSP086BT
2023.1	BT9	QBC076BT

Indicative Values   BT10

Method: Perfluorinated alkyl substances - BT10

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
n-PFOS	µg/kg	-	-	-	5	12.6	1.6	-	-	-	-
PFOSA	µg/kg	9.52	1.153	12.1	6	9.60	0.575	0.588	8.37	-	10.7
PFBA	µg/kg	-	-	-	4	1.62	0.4	-	-	-	-
PFPeA	µg/kg	-	-	-	5	1.90	0.1	-	-	-	-
PFHxA	µg/kg	19.4	2.35	12.1	7	19.2	1.23	1.11	17.3	-	21.5
PFHpA	µg/kg	2.96	0.643	21.8	7	2.94	0.440	0.304	2.38	-	3.53
PFOA	µg/kg	12.8	0.90	7.0	7	13.0	0.50	0.43	12.0	-	13.6
PFNA	µg/kg	2.18	0.327	15.0	7	2.20	0.120	0.155	1.89	-	2.47
PFDA	µg/kg	2.11	0.225	10.7	7	2.10	0.100	0.106	1.90	-	2.31
PFUnDA	µg/kg	3.90	0.495	12.7	7	3.93	0.300	0.234	3.46	-	4.34
PFDoA	µg/kg	12.0	0.34	2.8	7	12.0	0.20	0.16	11.67	-	12.27
PFTrDA	µg/kg	1.85	1.155	62.4	7	1.76	0.660	0.546	0.818	-	2.88
PFTeDA	µg/kg	2.84	0.483	17.0	7	3.00	0.260	0.228	2.41	-	3.27
n-PFBS	µg/kg	1.89	0.243	12.9	6	1.90	0.145	0.124	1.64	-	2.13
n-PFHxS	µg/kg	4.35	0.594	13.7	6	4.39	0.440	0.303	3.76	-	4.94
n-PFHps	µg/kg	-	-	-	4	0.300	0.0	-	-	-	-
total-PFOS	µg/kg	14.0	1.48	10.5	6	14.0	1.01	0.75	12.6	-	15.5

Consensus Values   BT4

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Pyrene	µg/kg	4.41	0.753	17.1	14	4.41	0.378	0.251	3.98	-	4.84
Fluoranthene	µg/kg	8.39	1.635	19.5	16	8.44	1.106	0.511	7.52	-	9.26
Benzo[a]anthracene	µg/kg	3.16	0.544	17.2	15	3.23	0.432	0.176	2.86	-	3.46
Anthracene	µg/kg	3.57	0.537	15.1	14	3.54	0.280	0.179	3.26	-	3.87

Method: Polycyclic aromatic hydrocarbons - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Chrysene + Triphenylene	µg/kg	-	-	-	4	4.66	0.5	-	-	-	-
Benzo[e]pyrene	µg/kg	-	-	-	4	3.09	1.0	-	-	-	-
Indeno[1,2,3-cd]pyrene	µg/kg	0.399	0.1214	30.4	8	0.417	0.0650	0.0536	0.300	-	0.498
Phenanthrene	µg/kg	9.72	2.142	22.0	15	9.67	1.326	0.691	8.54	-	10.9
Benzo[g,h,i]perylene	µg/kg	0.677	0.1191	17.6	10	0.684	0.0795	0.0471	0.593	-	0.761
Benzo[b]fluoranthene	µg/kg	2.66	0.543	20.4	11	2.57	0.337	0.205	2.30	-	3.02
Benzo[a]pyrene	µg/kg	1.59	0.335	21.0	15	1.61	0.260	0.108	1.41	-	1.78
Naphthalene	µg/kg	5.80	1.886	32.5	10	5.48	1.112	0.746	4.47	-	7.13
Dibenz[ah]anthracene	µg/kg	1.17	0.297	25.5	8	1.14	0.190	0.131	0.923	-	1.41
Benzo[k]fluoranthene	µg/kg	2.54	0.572	22.5	9	2.75	0.416	0.238	2.11	-	2.98
Fluorene	µg/kg	1.69	0.255	15.1	8	1.76	0.211	0.113	1.48	-	1.90
Acenaphthylene	µg/kg	19.4	2.68	13.8	8	18.8	1.47	1.19	17.2	-	21.6
2-methylphenanthrene	µg/kg	-	-	-	4	0.903	0.3	-	-	-	-
Chrysene	µg/kg	3.36	0.971	28.9	13	3.24	0.460	0.337	2.78	-	3.95
Acenaphthene	µg/kg	4.26	1.176	27.6	10	4.24	0.691	0.465	3.43	-	5.09
C2-phenanthren.+ anthracen.	µg/kg	-	-	-	4	3.13	1.2	-	-	-	-

Method: Lipids - BT4

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Total-Lipid	%	2.85	0.253	8.9	6	2.82	0.115	0.129	2.60	-	3.10

Method: Organometals - BT8

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
Tributyltin (TBT)	µg Sn/kg	22.3	4.96	22.2	10	23.0	1.91	1.96	18.9	-	25.8
Dibutyltin (DBT)	µg Sn/kg	5.87	1.000	17.0	9	5.95	0.546	0.417	5.12	-	6.63
Monobutyltin (MBT)	µg Sn/kg	8.95	3.013	33.7	9	9.16	1.562	1.256	6.68	-	11.2
Triphenyltin (TPhT)	µg Sn/kg	2.09	0.876	42.0	6	2.35	0.489	0.447	1.21	-	2.96

Indicative Values   BT9

Method: Brominated Flame Retardants - BT9

Element	Unit	Mean	Std.Dev.	CV %	N	Median	MAD	Uncertainty	95 % confidence limits		
BDE28	µg/kg	1.90	0.407	21.5	7	1.87	0.226	0.192	1.53	-	2.26
BDE47	µg/kg	2.22	0.448	20.2	7	2.19	0.260	0.212	1.82	-	2.62
BDE99	µg/kg	2.08	0.602	28.9	7	2.21	0.375	0.284	1.55	-	2.62
BDE100	µg/kg	2.13	0.482	22.6	7	2.17	0.286	0.228	1.70	-	2.56
BDE153	µg/kg	2.03	0.304	15.0	7	1.94	0.290	0.144	1.76	-	2.30
BDE154	µg/kg	2.07	0.465	22.5	7	2.05	0.211	0.220	1.65	-	2.49
BDE183	µg/kg	2.17	0.614	28.3	7	2.29	0.410	0.290	1.62	-	2.72
BDE66	µg/kg	2.61	0.405	15.5	6	2.51	0.172	0.207	2.21	-	3.02
BDE85	µg/kg	-	-	-	5	2.31	0.1	-	-	-	-
Total lipid	(%)	-	-	-	4	3.17	0.4	-	-	-	-