								Description		5017+5019	
				Limit values				Sample number		119115055	
Parameter	Lab	Accr.	Method	GW 1 ar	GW 1 db	GW 2 ar	GW 2 db	LOQ	Unit	ar	db
Biochar properties											
Bulk density	FR	JE02	DIN 51705: 2001-06						kg/m³	291	-
specific surface (BET)	SUIB/o		DIN 66137/DIN ISO 9277						m²/g	-	[redacted]
true density	SUIB/o		DIN 66137/DIN ISO 9277						g/cm³	-	1.7
water holding capacity (WHC)	SB99/o		DIN EN ISO 14238, A						% (w/w)	136.3	-
Moisture	FR	JE02	DIN 51718: 2002-06					0.1	% (w/w)	27.9	-
Ash content (550°C)	FR	JE02	DIN 51719: 1997-07					0.1	% (w/w)	9.8	13.6
Ash content (815°C)	FR	JE02	DIN 51719: 1997-07					0.1	% (w/w)	9.4	13.1
Volatile Compounds	FR	JE02	DIN 51720: 2001-03					0.2	% (w/w)	3.9	5.4
gross calorific value (Ho,V)	FR	JE02	DIN 51900-1: 2004-02					200	kJ/kg	20500	28400
net calorific value (Hu,p)	FR	JE02	DIN 51900-1: 2004-02					200	kJ/kg	19600	28100
Hydrogen	FR	JE02	DIN 51732: 2014-07					0.1	% (w/w)	1.2	1.6
Carbon	FR	JE02	DIN 51732: 2014-07		> 50		> 50	0.2	% (w/w)	56.5	78.3
Total nitrogen	FR	JE02	DIN 51732: 2014-07					0.05	% (w/w)	2.09	2.90
Oxygen	FR	JE02	DIN 51733: 2016-04						% (w/w)	2.9	4.0
Total inorganic carbon (TIC)	FR	JE02	DIN 51726: 2004-06					0.1	% (w/w)	0.2	0.3
carbonate-CO2	FR	JE02	DIN 51726: 2004-06					0.4	% (w/w)	0.9	1.2
carbon (organic)	FR	JE02	berechnet						% (w/w)	56.3	78.0
H/C ratio (molar)	FR	JE02	berechnet		< 0.6		< 0.6			0.25	0.25
H/Corg ratio (molar)	FR	JE02	berechnet		< 0.7		< 0.7			0.25	0.25
O/C ratio (molar)	FR	JE02	berechnet		< 0.4		< 0.4			0.039	0.038
Sulphur (S), total	FR	JE02	DIN 51724-3: 2012-07					0.03	% (w/w)	0.07	0.10
pH in CaCl2	FR		DIN ISO 10390: 2005-12	10		10				10.1	-
Conductivity	FR		BGK III. C2: 2006-09					5	µS/cm	2230	-
salt content	FR		BGK III. C2: 2006-09					0.005	g/kg	5.88	8.16
salt content	FR		BGK III. C2: 2006-09					0.005	g/l	1.71	2.37
thermogravimetry TGA 950°C by N-Atm.	FR		TGA 701 D4C							siehe Anlage	-

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Polychlorinated dibenzodioxins/-furans (17 PCDD/F) by GC-HRMS

								Description		5017+5019	
				Limit values				Sample number		119115055	
Parameter	Lab	Accr.	Method	GW 1 ar	GW 1 db	GW 2 ar	GW 2 db	LOQ	Unit	ar	db
2,3,7,8-TetraCDD	GF/o	A026	Internal					0.18	ng/kg dw	-	< 0.18
1,2,3,7,8-PentaCDD	GF/o	A026	Internal					0.24	ng/kg dw	-	< 0.24
1,2,3,4,7,8-HexaCDD	GF/o	A026	Internal					0.48	ng/kg dw	-	< 0.48
1,2,3,6,7,8-HexaCDD	GF/o	A026	Internal					0.48	ng/kg dw	-	< 0.48
1,2,3,7,8,9-HexaCDD	GF/o	A026	Internal					0.48	ng/kg dw	-	< 0.48
1,2,3,4,6,7,8-HeptaCDD	GF/o	A026	Internal					0.54	ng/kg dw	-	< 0.54
OctaCDD	GF/o	A026	Internal					2.2	ng/kg dw	-	< 2.2
2,3,7,8-TetraCDF	GF/o	A026	Internal					0.32	ng/kg dw	-	< 0.32
1,2,3,7,8-PentaCDF	GF/o	A026	Internal					0.44	ng/kg dw	-	< 0.44
2,3,4,7,8-PentaCDF	GF/o	A026	Internal					0.44	ng/kg dw	-	< 0.44
1,2,3,4,7,8-HexaCDF	GF/o	A026	Internal					0.40	ng/kg dw	-	< 0.40
1,2,3,6,7,8-HexaCDF	GF/o	A026	Internal					0.40	ng/kg dw	-	< 0.40
1,2,3,7,8,9-HexaCDF	GF/o	A026	Internal					0.40	ng/kg dw	-	< 0.40
2,3,4,6,7,8-HexaCDF	GF/o	A026	Internal					0.40	ng/kg dw	-	< 0.40
1,2,3,4,6,7,8-HeptaCDF	GF/o	A026	Internal					0.52	ng/kg dw	-	< 0.52
1,2,3,4,7,8,9-HeptaCDF	GF/o	A026	Internal					0.38	ng/kg dw	-	< 0.38
OctaCDF	GF/o	A026	Internal					3.2	ng/kg dw	-	< 3.2
WHO(2005)-PCDD/F TEQ (lower-bound)	GF/o	A026	Internal		< 20		< 20		ng/kg dw	-	ND
WHO(2005)-PCDD/F TEQ (upper-bound)	GF/o	A026	Internal					0.92	ng/kg dw	-	0.92
I-TEQ (NATO/CCMS) (lower-bound)	GF/o	A026	Internal		< 20		< 20		ng/kg dw	-	ND
I-TEQ (NATO/CCMS) (upper-bound)	GF/o	A026	Internal						ng/kg dw	-	0.901

Polychlorinated biphenyl (12 WHO PCB) by GC-HRMS

								Description		5017+5019	
				Limit values				Sample number		119115055	
Parameter	Lab	Accr.	Method	GW 1 ar	GW 1 db	GW 2 ar	GW 2 db	LOQ	Unit	ar	db
PCB 77	GF/o	A026	Internal					3.6	ng/kg dw	-	6.9
PCB 81	GF/o	A026	Internal					0.78	ng/kg dw	-	0.78
PCB 105	GF/o	A026	Internal					7.8	ng/kg dw	-	20
PCB 118	GF/o	A026	Internal					28	ng/kg dw	-	55
PCB 114	GF/o	A026	Internal					0.94	ng/kg dw	-	1.2
PCB 123	GF/o	A026	Internal					0.80	ng/kg dw	-	1.1
PCB 126	GF/o	A026	Internal					1.0	ng/kg dw	-	< 1.0
PCB 156	GF/o	A026	Internal					4.4	ng/kg dw	-	6.8
PCB 157	GF/o	A026	Internal					0.90	ng/kg dw	-	0.97
PCB 167	GF/o	A026	Internal					2.2	ng/kg dw	-	2.8
PCB 169	GF/o	A026	Internal					2.4	ng/kg dw	-	< 2.4
PCB 189	GF/o	A026	Internal					0.80	ng/kg dw	-	< 0.80
WHO(2005)-PCB TEQ (lower-bound)	GF/o	A026	Internal						ng/kg dw	-	0.00331
WHO(2005)-PCB TEQ (upper-bound)	GF/o	A026	Internal					0.17	ng/kg dw	-	0.18
WHO(2005)-PCDD/F+PCB TEQ (lower-bound)	GF/o	A026	Internal						ng/kg	-	0.00331
WHO(2005)-PCDD/F+PCB TEQ (upper-bound)	GF/o	A026	Internal						ng/kg	-	1.10

Polychlorinated biphenyl (7 PCB) by GC-HRMS

								Description		5017+5019	
				Limit values				Sample number		119115055	
Parameter	**Lab**	**Accr.**	**Method**	GW 1 ar	GW 1 db	GW 2 ar	GW 2 db	**LOQ**	**Unit**	**ar**	**db**
PCB 28	GF/o	A026	Internal					0.082	µg/kg dw	-	0.33
PCB 52	GF/o	A026	Internal					0.061	µg/kg dw	-	0.13
PCB 101	GF/o	A026	Internal					0.098	µg/kg dw	-	0.12
PCB 118	GF/o	A026	Internal					0.028	µg/kg dw	-	0.055
PCB 138	GF/o	A026	Internal					0.072	µg/kg dw	-	0.079
PCB 153	GF/o	A026	Internal					0.12	µg/kg dw	-	< 0.12
PCB 180	GF/o	A026	Internal					0.030	µg/kg dw	-	< 0.030
Total 6 ndl-PCB (lower-bound)	GF/o	A026	Internal		< 200		< 200		µg/kg dw	-	0.660
Total 6 ndl-PCB (upper-bound)	GF/o	A026	Internal						µg/kg dw	-	0.807
Total 7 Indicator PCB (lower-bound)	GF/o	A026	Internal		< 200		< 200		µg/kg dw	-	0.715
Total 7 Indicator PCB (upper-bound)	GF/o	A026	Internal					0.46	µg/kg dw	-	< 0.46
Elements from the micro wave pressure digestion acc. to DIN 22022-1: 2014-07											
Arsenic (As)	FR	JE02	DIN EN ISO 17294-2: 2005-02		< 13		< 13	0.8	mg/kg	-	< 0.8
Lead (Pb)	FR	JE02	DIN EN ISO 17294-2: 2005-02		< 150		< 120	2	mg/kg	-	< 2
Cadmium (Cd)	FR	JE02	DIN EN ISO 17294-2: 2005-02		< 1.5		< 1	0.2	mg/kg	-	< 0.2
Copper (Cu)	FR	JE02	DIN EN ISO 17294-2: 2005-02		< 100		< 100	1	mg/kg	-	30
Nickel (Ni)	FR	JE02	DIN EN ISO 17294-2: 2005-02		< 50		< 30	1	mg/kg	-	4
Mercury (Hg)	FR	JE02	DIN 22022-4: 2001-02		< 1		< 1	0.07	mg/kg	-	0.34
Zinc (Zn)	FR	JE02	DIN EN ISO 17294-2: 2005-02		< 400		< 400	1	mg/kg	-	144
Chromium (Cr)	FR	JE02	DIN EN ISO 17294-2: 2005-02		< 90		< 80	1	mg/kg	-	5
Boron (B)	FR	JE02	DIN EN ISO 17294-2: 2005-02					1	mg/kg	-	19
Manganese (Mn)	FR	JE02	DIN EN ISO 17294-2: 2005-02					1	mg/kg	-	216
Elements fr. the borate digestion of ash 550 °C acc. to DIN 51729-11: 1998-11											

								Description		5017+5019	
				Limit values				Sample number		119115055	
Parameter	Lab	Accr.	Method	GW 1 ar	GW 1 db	GW 2 ar	GW 2 db	LOQ	Unit	ar	db
Phosphorus as P2O5	FR	JE02	DIN EN ISO 11885 (E22): 2009-09					0.1	% (w/w)	-	16.5
Magnesium as MgO	FR	JE02	DIN EN ISO 11885 (E22): 2009-09					0.1	% (w/w)	-	6.9
Calcium as Calciumoxid	FR	JE02	DIN EN ISO 11885 (E22): 2009-09					0.1	% (w/w)	-	12.8
Potassium as K2O	FR	JE02	DIN EN ISO 11885 (E22): 2009-09					0.1	% (w/w)	-	26.4
Sodium as Na2O	FR	JE02	DIN EN ISO 11885 (E22): 2009-09					0.1	% (w/w)	-	0.6
Iron as Fe2O3	FR	JE02	DIN EN ISO 11885 (E22): 2009-09					0.1	% (w/w)	-	0.9
Silicon as SiO2	FR	JE02	DIN EN ISO 11885 (E22): 2009-09					0.1	% (w/w)	-	30.4
sulphur as SO3	FR	JE02	DIN EN ISO 11885 (E22): 2009-09					0.1	% (w/w)	-	1.3
Elements fr. the borate digestion of ash 550°C acc. to DIN 51729-11:1998-11 (OS)											
Calcium (Ca)	FR	JE02	DIN EN ISO 11885 (E22): 2009-09						% (w/w)	-	1.3
Iron (Fe)	FR	JE02	DIN EN ISO 11885 (E22): 2009-09						% (w/w)	-	0.1
Potassium (K)	FR	JE02	DIN EN ISO 11885 (E22): 2009-09						% (w/w)	-	3.0
Magnesium (Mg)	FR	JE02	DIN EN ISO 11885 (E22): 2009-09						% (w/w)	-	0.6
Sodium (Na)	FR	JE02	DIN EN ISO 11885 (E22): 2009-09						% (w/w)	-	0.1
Phosphorus	FR	JE02	DIN EN ISO 11885 (E22): 2009-09						% (w/w)	-	1.0
Sulphur (S)	FR	JE02	DIN EN ISO 11885 (E22): 2009-09						% (w/w)	-	0.1
Silicon (Si)	FR	JE02	DIN EN ISO 11885 (E22): 2009-09						% (w/w)	-	1.9
Elements from toluene extraction											

								Description		5017+5019	
				Limit values				Sample number		119115055	
Parameter	Lab	Accr.	Method	GW 1 ar	GW 1 db	GW 2 ar	GW 2 db	LOQ	Unit	ar	db
Naphthalene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	0.4
Acenaphthylene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Acenaphthene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Fluorene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Phenanthrene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	0.2
Anthracene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Fluoranthene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	0.2
Pyrene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	0.2
Benz(a)anthracene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Chrysene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Benzo(b)fluoranthene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Benzo(k)fluoranthene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Benzo(a)pyrene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Indeno(1,2,3-cd)pyrene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Dibenz(a,h)anthracene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Benzo(g,h,i)perylene	FR	JE02	DIN EN 16181:2019-08					0.1	mg/kg	-	< 0.1
Total 16 EPA-PAH excl. LOQ	FR	JE02	DIN EN 16181:2019-08		< 12		< 4		mg/kg	-	1.0

Explanations

LOQ - Limit of quantification
ar - as received
db - dry basis
Lab - Abbreviation of the performing laboratory
Accr. - Abbreviation of the accreditation of the performing laboratory

The parameters identified by FR have been performed by the laboratory Eurofins Umwelt Ost GmbH (Bobritzsch-Hilbersdorf). The accreditation code JE02 identifies the parameters accredited according to DIN EN ISO/IEC 17025:2005 D-PL-14081-01-00 .
The parameters identified by GF have been performed by the laboratory Eurofins GfA Lab Service GmbH (Hamburg). The accreditation code A026 identifies the parameters accredited according to DIN EN ISO/IEC 17025:2005 D-PL-14629-01-00 .
The parameters identified by SB99 have been performed by the laboratory GEOS Freiberg (Freiberg).
The parameters identified by SUIB have been performed by the laboratory TU Bergakademie Freiberg (IEC) (Freiberg).

/o - The analysis has been outsourced.

Explanations regarding Limits

Analysis performed according to guidelines for sustainable production of biochar of the european biochar certificate.
GW 1: basic quality grade (refered to dry basis)
GW 2: premium quality grade (refered to dry basis)

Ho,V / Hu,p: complies calorific value at constant volume or pressure

EUROFINS UMWELT assumes no responsibility for the legal liability of the cited limits.