

SGS Institut Fresenius GmbH Goerzallee 305A D-14167 Berlin GERMANY

DIN CERTCO
Gesellschaft für Konformitätsbewertung
Alboinstraße 56
12103 Berlin

Test report 3680571

Order no. 4411570
Client no. 10028880



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Environment, Health and Safety

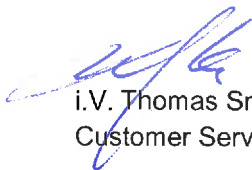
SGS Institut Fresenius GmbH
Goerzallee 305A
14167 Berlin

Berlin, 23.01.2018

Your project: DINplus test Holzindustrie Pauls
Your order no.: 3236495
Date of order: 20.12.2018

Testing period from 03.01.2018 until 22.01.2018
First sample no. 180006997
Sample entry 20.12.2017

SGS Institut Fresenius


i.V. Thomas Smyk
Customer Service

i.V. Oliver Sommer
Customer Service


i.A.

Michaela Sosnová
Customer Service

Sample matrix: Wood pellets
 Sample delivery: Sample sent on behalf of the client
 Sample entry: 20.12.2017
 Testing period: 03.01.2018 until 22.01.2018

Sample no.: 180006997
 Sample name: sample no. 1, 6 mm wood pellets, Production 2017-12-19

Parameter	Unit	LOQ	Method	Result	Limit DIN plus ¹	Lab ⁵
Fines	w-% ar	0,1	DIN EN 15149-1 ⁴	0,1	≤ 0,5 (1,0) ²	B1

Sample no.: 180006998
 Sample name: sample no. 2, 6 mm wood pellets, Production 2017-12-19

Parameter	Unit	LOQ	Method	Result	Limit DIN plus ¹	Lab ⁵
Average diameter	Millimeter		DIN EN ISO 17829	6,0	6 or 8 ± 1	B1
Average length	Millimeter		DIN EN ISO 17829	18,2	3,15 to 40	B1
Pellets < 10 mm	w-% ar		DIN EN ISO 17829	3,51	informational	B1
Overlengths > 40 and ≤ 45 mm	w-% ar		DIN EN ISO 17829	not found	≤ 1	B1
Overlengths > 45 mm	w-% ar		DIN EN ISO 17829	not found	not allowed	B1
Moisture	w-% ar	0,1	DIN EN ISO 18134-2	5,9	≤ 10	B1
Ash (550°C)	w-% d	0,1	DIN EN ISO 18122	0,27	≤ 0,7	B1
Mechanical Durability	w-% ar	0,1	DIN EN ISO 17831-1	98,9	≥ 97,5	B1
Net CV, const. p	MJ/kg ar	0,5	DIN EN 14918 ⁴	17,91	≥ 16,5 to ≤ 19	B1
Bulk density	kg/m ³ ar	1	DIN EN ISO 17828	651	≥ 600 to ≤ 750	B1
Nitrogen	w-% d	0,1	DIN EN ISO 16948	0,15	≤ 0,3	B1
Sulphur total	w-% d	0,01	DIN EN ISO 16994	< 0,01	≤ 0,04	B1
Chlorine total	w-% d	0,01	DIN EN ISO 16994	0,013	≤ 0,02	B1
Arsenic	mg/kg d	1	DIN EN ISO 16968	< 1	≤ 1	B1
Cadmium	mg/kg d	0,3	DIN EN ISO 16968	< 0,3	≤ 0,5	B1
Chromium	mg/kg d	1	DIN EN ISO 16968	< 1	≤ 10	B1
Copper	mg/kg d	2	DIN EN ISO 16968	2	≤ 10	B1
Lead	mg/kg d	3	DIN EN ISO 16968	< 3	≤ 10	B1
Mercury	mg/kg d	0,05	DIN EN ISO 16968	< 0,05	≤ 0,1	B1
Nickel	mg/kg d	1	DIN EN ISO 16968	< 1	≤ 10	B1
Zinc	mg/kg d	1	DIN EN ISO 16968	14	≤ 100	B1
Shrinkage starting temperature SST	°C		DIN CEN/TS 15370-1 ³	1220	-	-- ⁶
Deformation temperature DT	°C		DIN CEN/TS 15370-1 ³	1490	≥ 1200	-- ⁶
Hemisphere temperature HT	°C		DIN CEN/TS 15370-1 ³	> 1490	-	-- ⁶
Flow temperature FT	°C		DIN CEN/TS 15370-1 ³	> 1490	-	-- ⁶

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ar - result calc. to 'as received' state

d - result calc. to 'bone dry' state

LOQ - Limit of quantitation

-
- 1) Issue 06/2015
 - 2) Value is valid for packing units up to 20kg; Value in parenthesis is valid for bigger packing units and bulk ware
 - 3) Determination was performed under oxidizing conditions. Pre ashing temperature was 815°C.
 - 4) Deviant to the requirements of DINplus, regarding applicable standards according to DIN EN ISO 17225-2 the respective ones according to DIN EN 14961-2 were applied instead, approved by DIN CERTCO.
 - 5) The laboratory locations of the SGS Group Germany and Switzerland according to the above abbreviations are listed at <http://www.institut-fresenius.de/filestore/89/laborstandortkuerzelsgs2.pdf>
 - 6) Analysis was performed by an accredited cooperation partner

*** End of test report ***

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Test report 3680570

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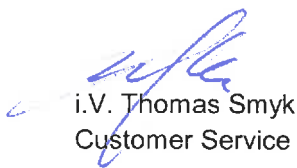
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Sample no.: 180006997
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Parameter	Unit	LOQ	Method	Result	Limit ENplus® ¹			Lab ⁵
					A1	A2	B	
Fines	w-% ar	0,1	DIN EN 15149-1 ⁴	0,1	≤ 1 (≤ 0,5) ²			B1

Sample no.: 180006998
 Sample name: sample no. 2, 6 mm wood pellets, Production 2017-12-19

Parameter	Unit	LOQ	Method	Result	Limit ENplus® ¹			Lab ⁵
					A1	A2	B	
Average diameter	Millimeter		DIN EN ISO 17829	6,0	6 or 8 ± 1			B1
Average length	Millimeter		DIN EN ISO 17829	18,2	3,15 to 40			B1
Overlengths > 40 and ≤ 45 mm	w-% ar		DIN EN ISO 17829	not found	≤ 1			B1
Overlengths > 45 mm	w-% ar		DIN EN ISO 17829	not found	not allowed			B1
Moisture	w-% ar	0,1	DIN EN ISO 18134-2	5,9	≤ 10			B1
Ash (550°C)	w-% d	0,1	DIN EN ISO 18122	0,27	≤ 0,7	≤ 1,2	≤ 2,0	B1
Mechanical Durability	w-% ar	0,1	DIN EN ISO 17831-1	98,9	≥ 98,0	≥ 97,5		B1
Net CV, const. p	MJ/kg ar	0,5	DIN EN 14918 ⁴	17,91	≥ 16,5			B1
Net CV, const. p	kWh/kg ar	0,14	DIN EN 14918 ⁴	4,975	≥ 4,6			B1
Bulk density	kg/m ³ ar	1	DIN EN ISO 17828	651	≥ 600 to ≤ 750			B1
Nitrogen	w-% d	0,1	DIN EN ISO 16948	0,15	≤ 0,3	≤ 0,5	≤ 1,0	B1
Sulphur total	w-% d	0,01	DIN EN ISO 16994	< 0,01	≤ 0,04	≤ 0,05		B1
Chlorine total	w-% d	0,01	DIN EN ISO 16994	0,013	≤ 0,02		≤ 0,03	B1
Shrinkage starting temperature SST	°C		DIN CEN/TS 15370-1 ³	1220	-			-- ⁶
Deformation temperature DT	°C		DIN CEN/TS 15370-1 ³	1490	≥ 1200	≥ 1100		-- ⁶
Hemisphere temperature HT	°C		DIN CEN/TS 15370-1 ³	> 1490	-			-- ⁶
Flow temperature FT	°C		DIN CEN/TS 15370-1 ³	> 1490	-			-- ⁶
Arsenic	mg/kg d	1	DIN EN ISO 16968	< 1	≤ 1			B1
Cadmium	mg/kg d	0,3	DIN EN ISO 16968	< 0,3	≤ 0,5			B1
Chromium	mg/kg d	1	DIN EN ISO 16968	< 1	≤ 10			B1
Copper	mg/kg d	2	DIN EN ISO 16968	2	≤ 10			B1
Lead	mg/kg d	3	DIN EN ISO 16968	< 3	≤ 10			B1
Mercury	mg/kg d	0,05	DIN EN ISO 16968	< 0,05	≤ 0,1			B1
Nickel	mg/kg d	1	DIN EN ISO 16968	< 1	≤ 10			B1
Zinc	mg/kg d	1	DIN EN ISO 16968	14	≤ 100			B1

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ar - result calc. to 'as received' state

d - result calc. to 'bone dry' state

LOQ - Limit of quantitation

1) Issue 3.0, August 2015

2) Limit is set for bulk pellets at factory gate or when loading trucks for deliveries to end-users; limit in parenthesis is set for sealed bags or sealed big bags

3) Determination was performed under oxidizing conditions. Pre ashing temperature was 815°C.

4) Since ISO standards are not completely published, the respective CEN standards were applied in accordance with ENplus® handbook 3.0.

5) The laboratory locations of the SGS Group Germany and Switzerland according to the above abbreviations are listed at <http://www.institut-fresenius.de/filestore/89/laborstandortkuerzelsgs2.pdf>

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