



23.03.2020

Sitomb® as food contact material



Sitomb® has been tested for suitability for food applications. The test result is summarized as follows:

The tested material samples (cuboids with edge dimensions 2.5x10x70mm with 9cm² machined and 9cm² unmachined surface) comply with the applicable national and European regulations for food contact materials*. The tests were carried out in accordance with Regulation (EC) No. 1935/2004 of the European Parliament and Council with the involvement of EFSA (European Food Safety Authority) as well as the "Food and Feed Code (LFGB)" 2013. The analysis results can be taken from the detailed test report available at www.Sitomb.com.

Advantageous properties of Sitomb® in comparison to products made of similar materials such as stainless steel are:



Corrosion resistance: Very good resistance to corrosion and sea water. The resistance to water, seawater, acids and alkalis is better than that of copper. Salt spray test according to DIN 50021: after 1064 hours discoloration is observed, but no corrosion.



Antibacterial effect: Bacteria are not able to survive on the surface of Sitomb®. The spread of bacteria is thus reliably prevented and the effort required for disinfection is reduced. This special property is mainly caused by the high copper content of the material.



Very good **sliding properties** (emergency running properties) – suitable as material for plain bearings, reduces the need for lubricants.



Alloying elements that are particularly critical for food applications and common in stainless steel (e.g. **chromium, nickel, cobalt, lead**) are **not contained**. Sitomb® is **REACH** (Registration, Evaluation, Authorization and Restriction of Chemicals of the European Union) compliant.

* Test conditions: 24h at 40°C in test water with O:V / S:V = 0.6dm²:90ml, 50% of which untreated, cleaned surface and 50% smoothed, cleaned surface. The conducted, exemplary test does not replace individual testing of components and their application.

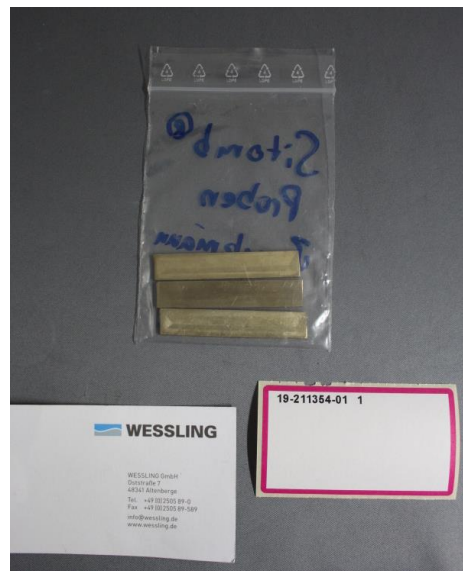
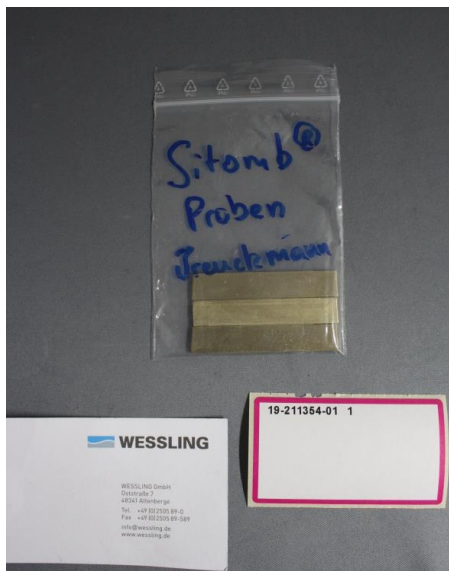
Prüfbericht Nr. / Report No. CAL20-009821-2/hve

Altenberge, 19.02.2020

Ersetzt Prüfbericht Nr. CAL20-009821-1 vom 24.01.2020 /
Replaces test report no. CAL20-009821-1 dated from 24th January 2020

Materialuntersuchung / Material testing

- Proben-Eingang / Sample received: 13.12.2019 / 13th December 2019
- Auftraggeber / Client: Breuckmann GmbH & Co. KG, Dieselstraße 26-28, 42579 Heiligenhaus
- Auftragsdatum / Order date: schriftlicher Auftrag vom 17.12.2019 / in written form dated from 17th December 2019
- Probenahme durch / Sampled by: Auftraggeber / Client
- Untersuchungsbeginn / Beginning of examinations: 03.01.2020 / 3rd January 2020
07.02.2020 / 7th February 2020
- Untersuchungsende / End of examinations: 24.01.2020 / 24th January 2020
19.02.2020 / 19th February 2020
- Proben-Nr. / Sample No. 19-211354-01: Sitomb®



- Weitere Angaben / Further information: CuZn16Si4 Siliziumtombak nach Werksnorm Breuckmann GmbH & Co. KG Sitomb®, Schlagbiegeproben 2,5x10x70mm mit 9cm² bearbeiteter Fläche und 9cm² unbearbeiteter Fläche

Untersuchte Proben / Analysed samples/parts:

Probenummer / Sample No.	Probenbezeichnung / Sample identifier
19-211354-01	Sitomb® – Probe, gesamt / Sitomb® – <i>sample complete</i>
19-211354-01-4	Sitomb® – 1. Migrat Prüfwasser / Sitomb® – <i>1st migrate artificial tap water</i>
19-211354-01-5	Sitomb® – 2. Migrat Prüfwasser / Sitomb® – <i>2nd migrate artificial tap water</i>
19-211354-01-6	Sitomb® – 3. Migrat Prüfwasser / Sitomb® – <i>3rd migrate artificial tap water</i>

Untersuchungsverfahren / Examination methods:

Parameter / Parameter	Methode / Method	Ausführender Standort / Executive lab
Sensorische Prüfung / <i>Organoleptic test</i>	DIN 10955 (2004-06) ^A	Produktanalytik Altenberge
Vorbereitung: Metalllässigkeit von flachen Gegenständen aus Metallen / <i>Preparation: metal release of flat articles that are made of metals</i>	CM/Res (2013)9 (2013-06, ICP-MS + ICP-OES)	Produktanalytik Altenberge
Messung: Metalllässigkeit von flachen Gegenständen aus Metallen / <i>Measurement: metal release of flat articles and that are made of metals</i>	CM/Res (2013)9 (2013-06, ICP-MS + ICP-OES)	Umweltanalytik Hannover

Untersuchungsergebnisse / Results:

1. Sensorische Prüfung (Dreieckstest, 6 Probanden) / Organoleptic test (triangle test, 6 test persons)

Prüfbedingungen / *Test conditions:*

Mineralwasser / *Mineral water* – 24 h, 40 °C

	Geruchsabweichung / <i>Deterioration of smell</i>		Geschmacksabweichung / <i>Deterioration of taste</i>	
	<i>Intensität / Intensity</i>	<i>Signifikanz / Significance</i>	<i>Intensität / Intensity</i>	<i>Signifikanz / Significance</i>
19-211354-01	0	> 20 %	0	10 %
Grenzwert / <i>Limiting value</i> ^[1]	max. 2,5	-	max. 2,5	-
Beurteilung / <i>Assessment</i>	erfüllt / <i>passed</i>		erfüllt / <i>passed</i>	

Intensitätsskala / *Scale of intensity:*
 0 = nicht wahrnehmbar / *imperceptible*
 1 = gerade wahrnehmbar / *just discernible*
 2 = schwach / *discernible*
 3 = deutlich / *clear*
 4 = stark / *strong*

^[1] 61. Mitteilung des Bundesinstituts für Risikobewertung (BfR), Grundlagen der Beurteilung von Lebensmittelbedarfsgegenständen (Bundesgesundheitsblatt 2003, S. 363) / *61st Notification of German Federal Institute for Risk Assessment (BfR), Principles for the Evaluation of Food Contact Materials (Bundesgesundheitsblatt 2003, p. 363)*

2. Metalllässigkeit / Release of metals

Prüfbedingungen / Test conditions:

Prüfwasser / Artificial tap water

24 h, 40 °C

O:V / S:V = 0,6 dm²: 90 ml

Parameter / Parameter	Einheit Unit	19-211354-01-4 1. Migrat / 1 st migrate	19-211354-01-5 2. Migrat / 2 nd migrate	19-211354-01-6 3. Migrat / 3 rd migrate	Richtwert Reference value [2]
Aluminium / Aluminium	mg/kg	< 0,1	< 0,1	< 0,1	5
Antimon / Antimony	mg/kg	< 0,01	< 0,01	< 0,01	0,04
Arsen / Arsenic	mg/kg	< 0,002	< 0,002	< 0,002	0,002
Barium / Barium	mg/kg	< 0,01	< 0,01	< 0,01	1,2
Beryllium / Beryllium	mg/kg	< 0,01	< 0,01	< 0,01	0,01
Blei / Lead	mg/kg	< 0,002	< 0,002	< 0,002	0,010
Cadmium / Cadmium	mg/kg	< 0,001	< 0,001	< 0,001	0,005
Chrom / Chromium	mg/kg	< 0,01	< 0,01	< 0,01	0,250
Cobalt / Cobalt	mg/kg	< 0,01	< 0,01	< 0,01	0,02
Eisen / Iron	mg/kg	< 0,1	< 0,1	< 0,1	40
Kupfer / Copper	mg/kg	0,06	0,09	0,02	4
Lithium / Lithium	mg/kg	< 0,01	< 0,01	< 0,01	0,048
Mangan / Manganese	mg/kg	< 0,01	< 0,01	< 0,01	1,8
Molybdän / Molybdenum	mg/kg	< 0,01	< 0,01	< 0,01	0,12
Nickel / Nickel	mg/kg	< 0,01	< 0,01	< 0,01	0,14
Quecksilber / Mercury	mg/kg	< 0,001	< 0,001	< 0,001	0,003
Silber / Silver	mg/kg	< 0,01	< 0,01	< 0,01	0,08
Thallium / Thallium	mg/kg	< 0,0001	< 0,0001	< 0,0001	0,0001
Vanadium / Vanadium	mg/kg	< 0,01	< 0,01	< 0,01	0,01
Zink / Zinc	mg/kg	1,9	1,5	1,5	5
Zinn / Tin	mg/kg	< 0,1	< 0,1	< 0,1	100

[2] gemäß / according to EDQM Technical guide on Metals and alloys used as food contact materials; Strasbourg Juni / June 2013 (Die Summe der Werte im 1. und 2. Migrat darf nicht das 7-fache des angegebenen Referenzwertes überschreiten. Außerdem darf der Wert des 3. Migrates den angegebenen Referenzwert nicht überschreiten. / The sum of 1st and 2nd migrate mustn't exceed seven times the mentioned reference value. Furthermore the value of the 3rd migrate mustn't exceed the mentioned reference value.)

Beurteilung:

Nach Art und Umfang der durchgeführten Untersuchungen entspricht die vorliegende Probe den geltenden Bestimmungen des Lebensmittel-, Bedarfsgegenstände- und Futtermittelgesetzbuches (LFGB) und der Verordnung (EG) Nr. 1935/2004 für den Kontakt mit wässrigen, alkoholischen und fettigen Lebensmitteln gemäß dem „EDQM Technical guide on Metals and alloys used as food contact materials“.

Assessment:

With regard to manner and extent of the performed examinations the present sample complies with the current legal requirements of German “Lebensmittel-, Bedarfsgegenstände- und Futtermittelgesetzbuch (LFGB)” and of Regulation (EC) No. 1935/2004 with aqueous, alcoholic and fatty foodstuffs with reference to “EDQM Technical guide on Metals and alloys used as food contact materials”.

Doris Podien

(Staatl. gepr. Lebensmittelchemikerin / Sachverständige / Food Chemist / Scientific Expert)