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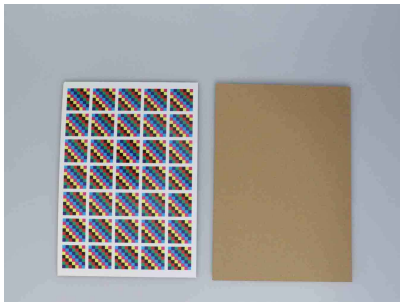

Report 2019L32048 / 1

Date of report	22. October 2019 / 18:57
Type of order	General tests
Client	Durst Phototechnik Digital Technology GmbH, Mr. Matthias Krautgasser
Sender	Durst Phototechnik Digital Technology GmbH
Copy to	Durst Phototechnik Digital Technology GmbH, Mr. Christian Gasser

Report	Sample
2019L32048 / 1	**Durst WT Food MP Ink on Kraftliner White (Classic WKL from Metsä) SPC_049**

Amount	10 cardboards	Received on	8/13/2019
Packing	heat-sealed bag		

This report is a translation of the original version.

Assessment

Based on the assumed surface-to-volume ratio, the results of the analytics as described are in compliance with the Commission Regulation (EU) No 10/2011 and the Swiss Regulation on Food Contact Materials, as far as applicable.

References

- Swiss Regulation on Food Contact Materials SR 817.023.21 (Bedarfsgegenstände VO) of 16.12.2016, updated 01.05.2017
- Commission Regulation (EU) No 10/2011 of 14.01.2011, as amended by No 321/2011 (01.04.2011), No 1282/2011 (28.11.2011), No 1183/2012 (30.11.2012), No 202/2014 (03.03.2014), No 2015/174 (05.02.2015), No 2016/1416 (24.08.2016), No 2017/752 (28.04.2017), No 2018/79 (18.01.2018), No 2018/213 (12.02.2018), No 2018/831 (05.06.2018) and No 2019/37 (10.01.2019)
- EN 1186 Materials and articles in contact with foodstuffs - Plastics, May 2002
- EN 14338 Paper and board intended to come into contact with foodstuffs - Conditions for determination of migration from paper and board using modified polyphenylene oxide (MPPO) as a simulant, March 2004
- BfR XXXVI Recommendation of Bundesinstitut für Risikobewertung (BfR): Paper and board for food contact (as of 01.07.2015)

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

Chemical Analysis

Sample Preparation

To simulate the set-off, the sample material was stored for 10 d at 40°C under pressure (1 kg/dm²).

EU - Migration

The migration was set-up according to Commission Regulation (EU) No 10/2011 and customer instructions. The sample material was exposed to the simulants as follows:

Migration preparation:
- one-sided from the brown paperboard side

- Overall Migration and Specific Migration:
--- simulant E: Tenax, 10 d / 60°C

The migration was performed according to EN 1186 and EN 14338.

GC-QTOF-MS/FID-Screening

After concentrating, the Tenax migration solution was analysed using the GC-QTOF-MS/FID screening method (PTV injection, DB-5 column and electron impact ionization). All relevant substances were compared with the NIST library and our internal library. The concentrations were calculated with the averaged area of the added internal standards IS 1: heptadecane (CAS 629-78-7), IS 3: benzylbutyl phthalate-D4 (CAS 93951-88-3), IS 4: di-n-nonyl phthalate-3,4,5,6-D4 (CAS 1202865-43-7).

Results

Basis of Calculation

The conversion of the measured values to foodstuff is based on the following surface-to-volume ratio (S/V).
For any other S/V the resulting migration values are different which might lead to another general assessment of the sample.

Standard S/V: 6 dm² / 1 kg food (EU cube)

EU - Overall Migration

The limits are 10 mg/dm^2 and 60 mg/kg food according to Regulation (EU) No 10/2011 and the Swiss Regulation on Food Contact Materials. The following deviations are tolerated:
For all simulants except D2: 10 ± 2 mg/dm^2 and 60 ± 12 mg/kg food
For simulant D2: 10 ± 3 mg/dm^2 and 60 ± 20 mg/kg food

The overall migration values obtained with the tested simulants are below the limit.

GC-QTOF-MS/FID-Screening
Folgende Substanzen wurden detektiert:

RRT	Substance	CAS No.	Conc. [mg/dm²]	Standard S/V [mg/kg food]	SML [mg/kg food]
	limit of quantification		0.0017	0.010	
0.69	diisobutyl phthalate	84-69-5	0.0065	0.039	0.3 / BfR XXXVI
0.75	dibutyl phthalate	84-74-2	0.0071	0.042	0.3
0.91	saturated hydrocarbon	C22	0.0055	0.033	
0.98	saturated hydrocarbon	C23	0.0099	0.059	
1.05	saturated hydrocarbon	C24	0.013	0.076	
1.11	saturated hydrocarbon	C25	0.018	0.11	
1.18	saturated hydrocarbon	C26	0.014	0.082	
1.24	saturated hydrocarbon	C27	0.010	0.062	
1.30	saturated hydrocarbon	C28	0.0066	0.040	
1.36	saturated hydrocarbon	C29	0.0039	0.023	
-----	-----	sum	0.081	0.49	e
0.83	fatty acid ester		0.021	0.13	
1.11	fatty alcohol		0.0081	0.048	
-----	-----	sum	0.029	0.18	60
	internal standards				
0.60	*IS 1: heptadecane*				
1.00	*IS 3: benzylbutyl phthalate-D4*				
1.37	*IS 4: di-n-nonyl phthalate-3,4,5,6-D4*				
RRT	*relative retention time*				

[*] or substance with a similar mass spectrum
[e] specific analysis of MOSH/POSH/MOAH recommended

Migration / Extraction

Parameter *Method (location)*	Result	Units	limit / requirement	
Set-Off, 10 d / 40°C *LMPMET0705 gravimetry (Dietikon)*	**done**			
10 d / 60°C				
Overall migration Tenax *LMPMET0705 gravimetry (Dietikon)*	**<1**	mg/dm²	10	LOQ: 1
Overall migration Tenax *LMPMET0705 gravimetry (Dietikon)*	**<6**	mg/kg food	60	LOQ: 6

Specific substances

Parameter *Method (location)*	Result
Tenax	
Screening GC-QTOF-MS/FID *FCMMET03SCR GC-QTOF-MS/FID (Dietikon)*	**done**

Report released by: Tina Richter, Technical Manager
This report is signed electronically and therefore valid.

For further inquiries you can contact your customer consultant:
Mr Dr. Thomas Gude phone number (direct) +41 58 577 10 80

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

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Report 2018L42218 / 1

Date of report	19. December 2018 / 10:44
Your reference	Auftrag v. 16.10.2018
Type of order	General tests
Client	Durst Phototechnik Digital Technology GmbH, Mr. Christian Gasser
Sender	Durst Phototechnik Digital Technology GmbH

Report	Sample
2018L42218 / 1	**Durst WT SP Food Ink**

Amount	5+ A4 panels	Received on	10/18/2018
Packing	aluminium foil		

This report is a translation of the original version.

Assessment

Based on the assumed surface-to-volume ratio, the results of the analytics as described are in compliance with the Commission Regulation (EU) No 10/2011 and the Swiss Regulation on Food Contact Materials.

References

- Commission Regulation (EU) No 10/2011 of 14.01.2011, as amended by No 321/2011 (01.04.2011), No 1282/2011 (28.11.2011), No 1183/2012 (30.11.2012), No 202/2014 (03.03.2014), No 2015/174 (05.02.2015), No 2016/1416 (24.08.2016), No 2017/752 (28.04.2017), No 2018/79 (18.01.2018), No 2018/213 (12.02.2018) and 2018/831 (05.06.2018)
- Swiss Regulation on Food Contact Materials SR 817.023.21 (Bedarfsgegenstände VO) of 16.12.2016, updated 01.05.2017
- EN 1186 Materials and articles in contact with foodstuffs - Plastics, May 2002
- EN 14338 Paper and board intended to come into contact with foodstuffs - Conditions for determination of migration from paper and board using modified polyphenylene oxide (MPPO) as a simulant, March 2004
- BfR XXXVI Recommendation of Bundesinstitut für Risikobewertung (BfR): Paper and board for food contact (as of 01.07.2015)

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

Chemical Analysis

Sample Preparation

To simulate the set-off, the sample material was stored for 10 d at 40°C under pressure (1 kg/dm²).

EU - Migration

The migration was set-up according to Commission Regulation (EU) No 10/2011 and customer instructions. The sample material was exposed to the simulants as follows:

Migration preparation:
- one-sided from the unprinted, brown side (design colza oil)

- Overall Migration and Specific Migration:
--- simulant E: Tenax, 10 d / 60°C

The migration was performed according to EN 1186 and EN 14338.

GC-QTOF-MS/FID Screening

After concentrating, the Tenax migration solution was analysed using the GC-QTOF-MS/FID screening method (PTV injection, DB-5 column and electron impact ionization). All relevant substances were compared with the NIST library and our internal library. The concentrations were calculated with the averaged area of the added internal standards IS 1: heptadecane (CAS 629-78-7), IS 3: benzylbutyl phthalate-D4 (CAS 93951-88-3), IS 4: di-n-nonyl phthalate-3,4,5,6-D4 (CAS 1202865-43-7).

Results

Basis of Calculation

The conversion of the measured values to foodstuff is based on the following surface-to-volume ratio (S/V).
For any other S/V the resulting migration values are different which might lead to another general assessment of the sample.

Standard S/V: 6 dm² / 1 kg food (EU cube)

EU - Overall Migration

The limits are 10 mg/dm^2 and 60 mg/kg food according to Regulation (EU) No 10/2011 and the Swiss Regulation on Food Contact Materials. The following deviations are tolerated:
For all simulants except D2: 10 ± 2 mg/dm^2 and 60 ± 12 mg/kg food
For simulant D2: 10 ± 3 mg/dm^2 and 60 ± 20 mg/kg food

The overall migration values obtained with the tested simulants are below the limit.

GC-QTOF-MS/FID Screening
The following substances were detected:

RRT	Substance	CAS No.	Conc. [mg/dm²]	Standard S/V [mg/kg food]	SML [mg/kg food]
	limit of quantification		0.0017	0.010	
0.64	diisopropylnaphthalene (isomer)	38640-62-9	0.0066	0.040	BfR XXXVI
0.84	saturated hydrocarbon		0.016	0.095	
0.91	saturated hydrocarbon		0.0051	0.030	
0.98	saturated hydrocarbon		0.0070	0.042	
1.04	saturated hydrocarbon		0.0089	0.053	
1.11	saturated hydrocarbon		0.011	0.065	
1.17	saturated hydrocarbon		0.0080	0.048	
1.24	saturated hydrocarbon		0.0061	0.037	
-----	-----	*sum*	*0.062*	*0.37*	*e*
	internal standards				
0.63	*IS 1: heptadecane*				
1.00	*IS 3: benzylbutyl phthalate-D4*				
1.37	*IS 4: di-n-nonyl phthalate-3,4,5,6-D4*				
RRT	*relative retention time*				

[e] specific analysis of MOSH/MOAH recommended
[BfR XXXVI] as low as technically feasible

Migration / Extraction

Parameter *Method (location)*	Result	Units	limit / requirement	
Set-Off, 10 d / 40°C *LMPMET0705 gravimetry (Dietikon)*	**done**			
10 d / 60°C				
Overall migration Tenax *LMPMET0705 gravimetry (Dietikon)*	**<1**	mg/dm²	10	LOQ: 1
Overall migration Tenax *LMPMET0705 gravimetry (Dietikon)*	**<6**	mg/kg food	60	LOQ: 6

Specific substances

Parameter *Method (location)*	Result
Screening GC-QTOF-MS/FID *FCMMET03SCR GC-QTOF-MS/FID (Dietikon)*	**done**

Report released by: Dr. Thomas Gude, Technical Manager
This report is signed electronically and therefore valid.

Mr Dr. Thomas Gude phone number (direct) +41 58 577 10 80

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
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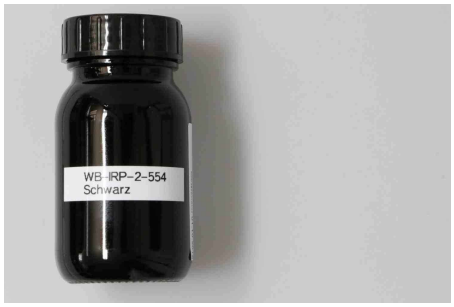

Report 2018L39854 / 1

Date of report	17. October 2018 / 14:03
Your reference	Order of 26.09.2018
Type of order	General tests
Client	Durst Phototechnik Digital Technology GmbH, Mr. Christian Gasser
Sender	Durst Phototechnik Digital Technology GmbH

Report	Sample	Short assessment
2018L39854 / 1	**WT SP Ink Black**	see assessment

Identification	WB-IRP-2-554	Received on	28/09/2018
Amount	100ml		
Packing	glass		

Assessment
A contamination with technical mineral oil could not be identified based on online-LC-GC-FID.

MOSH/MOAH: Online-LC-GC-FID
A contamination with mineral oil could not be identified based on online-LC-GC-FID since no substances in the MOSH/MOAH fractions could be detected.

Please take the following into account:

Based on the recent German Mineral Oil Draft (2017) only MOAH are foreseen for a limit of 0.5 mg/kg if a functional barrier is present.
In a former German Mineral Oil Draft (2014) on paper, cardboard and board, which are manufactured on the basis of recycled fibre as food contact material the following limits are discussed: 24 mg/kg for mineral oil saturated hydrocarbons (MOSH) resp. 6 mg/kg for mineral oil aromatic hydrocarbons (MOAH).
In food, however, limits for MOSH (C20 - C35) of 2 mg/kg food and for MOAH (C16 - C35) of 0.5 mg/kg food are discussed.

Chemical Analysis
MOSH/MOAH: Online-LC-GC-FID
The sample was analysed by a validated HPLC-GC-FID method for saturated (MOSH), aromatic (MOAH) and polyolefinic hydrocarbons (POSH) in the range of C10 to C16, C16 to C20, C20 to C25 and C25 to C35.

Results
MOSH/MOAH: Online-LC-GC-FID

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

No substances in the MOSH/MOAH fractions could be detected.
No POSH could be detected.

References

- Meeting BfR-Commission for articles of daily use of 14. April 2011
<<http://www.bfr.bund.de/cm/216/uebergaenge_von_mineraloel_aus_verpackungsmaterialien_auf_lebensmittel.pdf>>
- Scientific Opinion on Mineral Oil Hydrocarbons in Food (EFSA Journal 2012;10(6):2704)
- Protocol of the 10. meeting of the BfR-Commission for articles of daily use of 18.05.2013
- Draft of the 22nd Regulation for changing the German Regulation on food contact utensils, version: 24.07.2014
- Draft of the 22nd Regulation for changing the German Regulation on food contact utensils, version: 24.02.2017

Residues / Contaminants

Parameter *Method (location)*	Result	Units	
Online LC-GC-FID			
MOSH / POSH C10-C16 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C16-C20 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C20-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C25-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C16-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	
MOSH / POSH C16-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	
MOAH C10-C16 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C16-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C25-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C16-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	

Report released by: Torsten Tonak, Technical Manager
This report is signed electronically and therefore valid.

For further inquiries you can contact your customer consultant:
Mr Dr. Thomas Gude phone number (direct) +41 58 577 10 80

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

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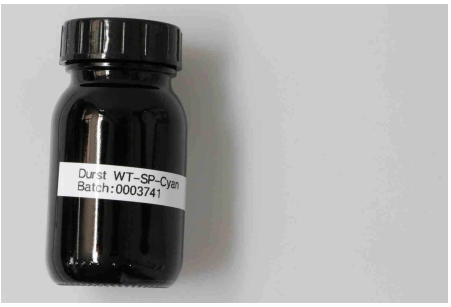

Report 2018L39854 / 2

Date of report	17. October 2018 / 14:04
Your reference	Order of 26.09.2018
Type of order	General tests
Client	Durst Phototechnik Digital Technology GmbH, Mr. Christian Gasser
Sender	Durst Phototechnik Digital Technology GmbH

Report	Sample	Short assessment
2018L39854 / 2	**WT SP Ink Cyan**	see assessment

Identification	0003741	Received on	28/09/2018
Amount	100ml		
Packing	glass		

Assessment
A contamination with technical mineral oil could not be identified based on online-LC-GC-FID.

MOSH/MOAH: Online-LC-GC-FID
A contamination with mineral oil could not be identified based on online-LC-GC-FID since no substances in the MOSH/MOAH fractions could be detected.

Please take the following into account:

Based on the recent German Mineral Oil Draft (2017) only MOAH are foreseen for a limit of 0.5 mg/kg if a functional barrier is present.
In a former German Mineral Oil Draft (2014) on paper, cardboard and board, which are manufactured on the basis of recycled fibre as food contact material the following limits are discussed: 24 mg/kg for mineral oil saturated hydrocarbons (MOSH) resp. 6 mg/kg for mineral oil aromatic hydrocarbons (MOAH).
In food, however, limits for MOSH (C20 - C35) of 2 mg/kg food and for MOAH (C16 - C35) of 0.5 mg/kg food are discussed.

Chemical Analysis
MOSH/MOAH: Online-LC-GC-FID
The sample was analysed by a validated HPLC-GC-FID method for saturated (MOSH), aromatic (MOAH) and polyolefinic hydrocarbons (POSH) in the range of C10 to C16, C16 to C20, C20 to C25 and C25 to C35.

Results
MOSH/MOAH: Online-LC-GC-FID

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

No substances in the MOSH/MOAH fractions could be detected.
No POSH could be detected.

References

- Meeting BfR-Commission for articles of daily use of 14. April 2011
<<http://www.bfr.bund.de/cm/216/uebergaenge_von_mineraloel_aus_verpackungsmaterialien_auf_lebensmittel.pdf>>
- Scientific Opinion on Mineral Oil Hydrocarbons in Food (EFSA Journal 2012;10(6):2704)
- Protocol of the 10. meeting of the BfR-Commission for articles of daily use of 18.05.2013
- Draft of the 22nd Regulation for changing the German Regulation on food contact utensils, version: 24.07.2014
- Draft of the 22nd Regulation for changing the German Regulation on food contact utensils, version: 24.02.2017

Residues / Contaminants

Parameter *Method (location)*	Result	Units	
Online LC-GC-FID			
MOSH / POSH C10-C16 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C16-C20 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C20-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C25-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C16-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	
MOSH / POSH C16-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	
MOAH C10-C16 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C16-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C25-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C16-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	

Report released by: Torsten Tonak, Technical Manager
This report is signed electronically and therefore valid.

For further inquiries you can contact your customer consultant:
Mr Dr. Thomas Gude phone number (direct) +41 58 577 10 80

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

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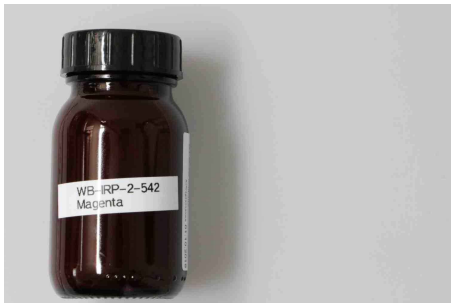

Report 2018L39854 / 3

Date of report	17. October 2018 / 14:04
Your reference	Order of 26.09.2018
Type of order	General tests
Client	Durst Phototechnik Digital Technology GmbH, Mr. Christian Gasser
Sender	Durst Phototechnik Digital Technology GmbH

Report	Sample	Short assessment
2018L39854 / 3	**WT SP Ink Magenta**	see assessment

Identification	WB-IRP-2-542	Received on	28/09/2018
Amount	100ml		
Packing	glass		

Assessment
A contamination with technical mineral oil could not be identified based on online-LC-GC-FID.

MOSH/MOAH: Online-LC-GC-FID
A contamination with mineral oil could not be identified based on online-LC-GC-FID since no substances in the MOSH/MOAH fractions could be detected.

Please take the following into account:

Based on the recent German Mineral Oil Draft (2017) only MOAH are foreseen for a limit of 0.5 mg/kg if a functional barrier is present.
In a former German Mineral Oil Draft (2014) on paper, cardboard and board, which are manufactured on the basis of recycled fibre as food contact material the following limits are discussed: 24 mg/kg for mineral oil saturated hydrocarbons (MOSH) resp. 6 mg/kg for mineral oil aromatic hydrocarbons (MOAH).
In food, however, limits for MOSH (C20 - C35) of 2 mg/kg food and for MOAH (C16 - C35) of 0.5 mg/kg food are discussed.

Chemical Analysis
MOSH/MOAH: Online-LC-GC-FID
The sample was analysed by a validated HPLC-GC-FID method for saturated (MOSH), aromatic (MOAH) and polyolefinic hydrocarbons (POSH) in the range of C10 to C16, C16 to C20, C20 to C25 and C25 to C35.

Results
MOSH/MOAH: Online-LC-GC-FID

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

No substances in the MOSH/MOAH fractions could be detected.
No POSH could be detected.

References

- Meeting BfR-Commission for articles of daily use of 14. April 2011
<<http://www.bfr.bund.de/cm/216/uebergaenge_von_mineraloel_aus_verpackungsmaterialien_auf_lebensmittel.pdf>>
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- Draft of the 22nd Regulation for changing the German Regulation on food contact utensils, version: 24.07.2014
- Draft of the 22nd Regulation for changing the German Regulation on food contact utensils, version: 24.02.2017

Residues / Contaminants

Parameter *Method (location)*	Result	Units	
Online LC-GC-FID			
MOSH / POSH C10-C16 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C16-C20 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C20-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C25-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C16-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	
MOSH / POSH C16-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	
MOAH C10-C16 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C16-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C25-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C16-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	

Report released by: Torsten Tonak, Technical Manager
This report is signed electronically and therefore valid.

For further inquiries you can contact your customer consultant:
Mr Dr. Thomas Gude phone number (direct) +41 58 577 10 80

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

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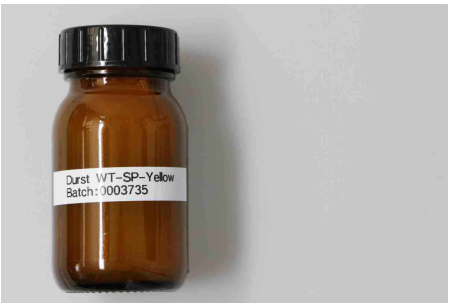

Report 2018L39854 / 4

Date of report	17. October 2018 / 14:04
Your reference	Order of 26.09.2018
Type of order	General tests
Client	Durst Phototechnik Digital Technology GmbH, Mr. Christian Gasser
Sender	Durst Phototechnik Digital Technology GmbH

Report	Sample	Short assessment
2018L39854 / 4	**WT SP Ink Yellow**	see assessment

Identification	0003735	Received on	28/09/2018
Amount	100ml		
Packing	glass		

Assessment
A contamination with technical mineral oil could not be identified based on online-LC-GC-FID.

MOSH/MOAH: Online-LC-GC-FID
A contamination with mineral oil could not be identified based on online-LC-GC-FID since no substances in the MOSH/MOAH fractions could be detected.

Please take the following into account:

Based on the recent German Mineral Oil Draft (2017) only MOAH are foreseen for a limit of 0.5 mg/kg if a functional barrier is present.
In a former German Mineral Oil Draft (2014) on paper, cardboard and board, which are manufactured on the basis of recycled fibre as food contact material the following limits are discussed: 24 mg/kg for mineral oil saturated hydrocarbons (MOSH) resp. 6 mg/kg for mineral oil aromatic hydrocarbons (MOAH).
In food, however, limits for MOSH (C20 - C35) of 2 mg/kg food and for MOAH (C16 - C35) of 0.5 mg/kg food are discussed.

Chemical Analysis
MOSH/MOAH: Online-LC-GC-FID
The sample was analysed by a validated HPLC-GC-FID method for saturated (MOSH), aromatic (MOAH) and polyolefinic hydrocarbons (POSH) in the range of C10 to C16, C16 to C20, C20 to C25 and C25 to C35.

Results
MOSH/MOAH: Online-LC-GC-FID

LOD: limit of detection
LOQ: limit of quantification
na: not in the accredited range
nd: not detectable

No substances in the MOSH/MOAH fractions could be detected.
No POSH could be detected.

References

- Meeting BfR-Commission for articles of daily use of 14. April 2011
<<http://www.bfr.bund.de/cm/216/uebergaenge_von_mineraloel_aus_verpackungsmaterialien_auf_lebensmittel.pdf>>
- Scientific Opinion on Mineral Oil Hydrocarbons in Food (EFSA Journal 2012;10(6):2704)
- Protocol of the 10. meeting of the BfR-Commission for articles of daily use of 18.05.2013
- Draft of the 22nd Regulation for changing the German Regulation on food contact utensils, version: 24.07.2014
- Draft of the 22nd Regulation for changing the German Regulation on food contact utensils, version: 24.02.2017

Residues / Contaminants

Parameter *Method (location)*	Result	Units	
Online LC-GC-FID			
MOSH / POSH C10-C16 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C16-C20 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C20-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C25-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOSH / POSH C16-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	
MOSH / POSH C16-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	
MOAH C10-C16 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C16-C25 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C25-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	LOQ: 50 LOD: 10
MOAH C16-C35 *LSPMET20 MOSH/MOAH LC/GC-FID (Dietikon)*	**not detected**	mg/kg	

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Institut für Lacke und Farben Magdeburg gGmbH

Institut für Lacke und Farben Magdeburg gGmbH
Fichtestraße 29 | 39112 Magdeburg

P R Ü F B E R I C H T

Prüfbericht Nr.:	180114
Auftraggeber:	Durst Phototechnik Digital Technology GmbH Herr Christian Gasser Julius-Durst-Straße 11 9900 Lienz ÖSTERREICH
Vertragsnummer/Datum:	20.06.2018
Angebot Nr.:	180121
Unteraufträge:	180107
Archivierung der Proben:	vier Wochen
Prüfgegenstand:	getrocknete schwarze Tinte
Prüfziel:	Bestimmung der Elementmigration nach DIN EN 71-3: 2017-10*)
Herkunft der Proben:	vom Auftraggeber angeliefert
Eingangsdatum der Proben:	20.06.2018
Beginn der Prüfung:	22.06.2018
Ende der Prüfung:	14.08.2018
Labor:	Materialanalytik
Prüfverfahren:	siehe Punkt 2
Seitenzahl:	4

Die mit *) gekennzeichneten Prüfverfahren sind keine akkreditierten Prüfverfahren.

1. Prüfgegenstand

Tabelle 1: Auflistung der untersuchten Prüfgegenstände.

Probenbezeichnung iLF	Probenbezeichnung Auftraggeber
E-180114-P1	Tinte WT MP

2. Durchführung der Prüfungen

2.1 DIN EN 71-3: 2017-10: Sicherheit von Spielzeug - Teil 3: Migration bestimmter Elemente*)

Prüfbedingungen: Probenpräparation nach Norm, Abtrennung von Feststoffen erfolgte nach der Wärmelagerung durch Filtration des Extrakts mit einem Papierfilter

Auswertung: Bestimmung der Elemente **Aluminium** (Al), **Antimon** (Sb), **Barium** (Ba), **Bor** (B), **Cobalt** (Co), **Mangan** (Mn), **Selen** (Se), **Strontium** (Sr) und **Zinn** (Sn) durch induktiv gekoppelte Plasma-Atom-Emissionsspektrometrie (ICP-OES) gemäß DIN EN ISO 11885

Bestimmung der Elemente **Blei** (Pb), **Cadmium** (Cd), **Chrom** (Cr), **Kupfer** (Cu), **Nickel** (Ni) und **Zink** (Zn) mittels Atomabsorptionsspektrometrie (AAS) nach DIN EN ISO 15586

Quantifizierung von **Arsen** (As) mit Hilfe von AAS unter Verwendung des Hydridverfahrens gemäß DIN EN ISO 11969

Bestimmung von **Quecksilber**(Hg) mittels AAS nach DIN EN ISO 12846

Bestimmung der **Organozinnverbindungen** mittels Gaschromatographie und Kopplung mit Massenspektrometrie nach Derivatisierung in Anlehnung an EN 71-3

3. Prüfergebnisse

Tabelle 2: Grenzwerte und Analysenergebnisse der Probe E-180114-P1.

Element	Migrationswerte in mg / kg	
	Grenzwerte[1)]	E-180059-P1
Aluminium (Al)	70000	18,4
Antimon (Sb)	560	< 0,002
Arsen (As)	47	0,3
Barium (Ba)	18750	< 0,2
Blei (Pb)	160	< 0,2
Cadmium (Cd)	17	< 0,02
Chrom (gesamt)	460,2	< 0,2
Chrom (III) Cr(III)	460	< 0,2[2)]
Kupfer (Cu)	7700	0,2
Nickel (Ni)	930	3,4
Zink (Zn)	46000	36,8
Chrom (VI) Cr(VI)	0,2	< 0,2[3)]
Cobalt (Co)	130	< 0,2
Mangan (Mn)	15000	< 0,2
Quecksilber (Hg)	94	< 0,01
Selen (Se)	460	< 0,02
Zinn (Sn)	180000	< 1,2
Strontium (Sr)	56000	< 0,2
Bor (B)	15000	< 1,2
Monomethylzinn	12	< 0,1
Monobutylzinn		0,3
Dibutylzinn		< 0,1
Tributylzinn		< 0,1
Tetrabutylzinn		< 0,1
Monooctylzinn		< 0,4
Dioctylzinn		< 0,2
Dipropylzinn		< 0,3
Diphenylzinn		< 0,5
Triphenylzinn		< 0,1

[1)] Grenzwerte der Kategorie III: Die Migration löslicher Elemente bzw. Verbindungen aus Spielzeugmaterial darf die entsprechend der Kategorie des vorliegenden Materials (siehe Punkt 4 der Norm) festgelegten Grenzwerte für die Elemente Aluminium (Al), Antimon (Sb), Arsen (As), Barium (Ba), Bor (B), Cadmium (Cd), Chrom (III), Chrom (VI), Cobalt (Cd), Kupfer (Cu), Blei (Pb), Mangan (Mn), Quecksilber (Hg), Nickel (Ni), Selen (Se), Strontium (Sr), Zinn (Sn) und Zink (Zn) sowie für Organozinnverbindungen nicht überschreiten.

[2)] Unter der Annahme, dass alles Chrom als Cr(III) vorläge, wäre dieser Grenzwert (460 mg / kg) nicht überschritten.

[3)] Unter der Annahme, dass alles Chrom als Cr(VI) vorläge, wäre auch dieser Grenzwert (0,2 mg / kg) nicht überschritten.

4. Zusammenfassende Bewertung

Die untersuchte Probe E-180114-P1 (Tinte WP MP) erfüllt bezüglich der gefundenen Gehalte an Elementen bzw. an Organozinnverbindungen und den Konzentrationsvorgaben die Anforderungen der Norm DIN EN 71-3 Sicherheit von Spielzeug - Teil 3: Migration bestimmter Elemente.

Magdeburg, 16.08.2018
Institut für Lacke und Farben Magdeburg gGmbH

Dr. Norbert Pietschmann
Geschäftsführer

Dr. Bernd Neumann
wiss. Mitarbeiter

Anmerkungen:

Die Prüfergebnisse beziehen sich nur auf die Prüfgegenstände. Bei dem vorliegenden Prüfbericht handelt es sich um einen reduzierten Prüfbericht, der nicht alle von den verwendeten Normen geforderten Prüfbedingungen enthält. Eine **auszugsweise** Veröffentlichung der Ergebnisse darf nur mit Zustimmung des Instituts für Lacke und Farben Magdeburg gGmbH erfolgen.