

Kunststoff-Institut Lüdenscheid GmbH | Karolinenstraße 8 | 58507 Lüdenscheid

CD-Color GmbH & Co. KG
Mr. Miri
Wetterstraße 58
58313 Herdecke

Lüdenscheid, 17 August 2020

Order number : **OT 20.0066**
Order : **Cleanability test**
Your order : **none**
Operator : **Sven-Patrick Holtfurth**

Dear Mr. Miri,

please find enclosed the test report with the results of the performed investigations.
We remain at your disposal for any further question.

Kunststoff-Institut Lüdenscheid

by order Sven-Patrick Holtfurth

Test report

Customer: CD-Color GmbH & Co. KG
Wetterstraße 58
58313 Herdecke

Order: Cleanability test
Order number: OT 20.0066
Report number: ~~OT 20.0066~~

This report is comprised of 8 pages.

Lüdenscheid, 17 August 2020

Kunststoff-Institut Lüdenscheid

By order Sven-Patrick Holtfurth

by order Dr. Annika Reitz.

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1. Task

The company CD-Color GmbH & Co. KG in 58313 Herdecke commissioned the Kunststoff-Institut Lüdenscheid with the conduction of cleanability tests.

2. Provided material

On 18th of March 2020 the following samples were placed at Kunststoff-Institut Lüdenscheid's disposal:

short description of the samples		amount	detailed description of the samples
sample 1	LUCITE flowcoat	15 pcs.	white-coated test-card
sample 2	matt latex paint	15 pcs.	white-coated test-card

Table 1: Overview of sample description

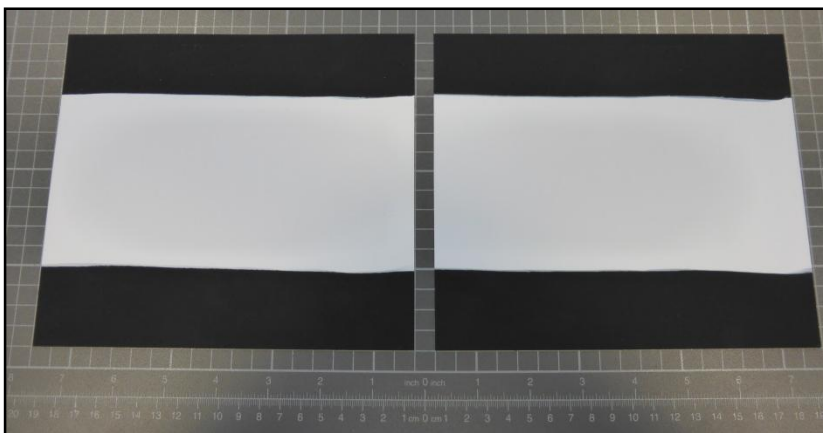


Figure 1: Sample as provided (exemplary)

3. Evaluation

3.1 Period of performance

The examination was done during the 13th and 14th calendar week 2020.

3.2 Cleanability test according to KIMW 004*

This test determines the cleanability of coated and uncoated plastics surfaces.

The test-media are applied onto the surface by using rubber-stamp pads. For this purpose, the rubber-stamp pad is soaked with the required media until saturation by using a pipette or spatula and is then mounted into the stamp-case. The printing plate is then dampened by repeated pressing of the stamp case. Afterwards the printing plate is applied onto the surface. Per medium one hub is performed. Before evaluation the samples are stored for 24 h in standardized climate conditions acc. to DIN 50014 -23/50-2.



Figure 2: Rubber stamp and stamp case.

description	code
Coca-Cola (red label)	CC
orange juice (100 %.concentrate)	OS
instant coffee (3 g into 100 ml of water)	IK
synth. sweat solution (acc. to BMW PR506)	HS
hand cream (acc. to PV9364)	HC
sunscreen (acc. to PV3964)	SC
highlighter (blue)	TM
red wine	RW

Table 2: Used media

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For subsequent cleaning of the surface a Lineartester 249 (Erichsen Co.) is used. The testing is performed acc. to PV 3906 (2018-12).

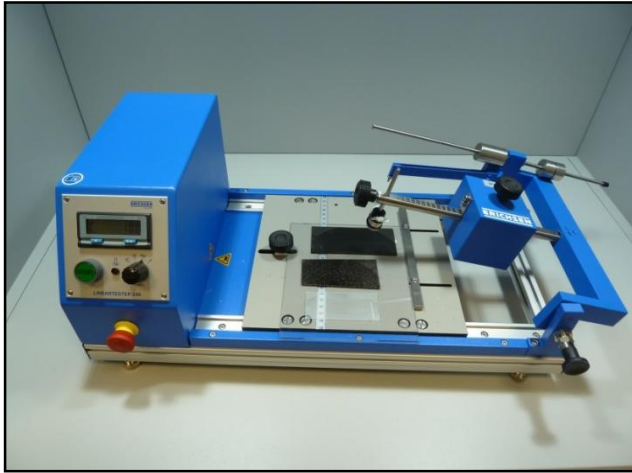


Figure 3: Lineartester 249, Erichsen Co.

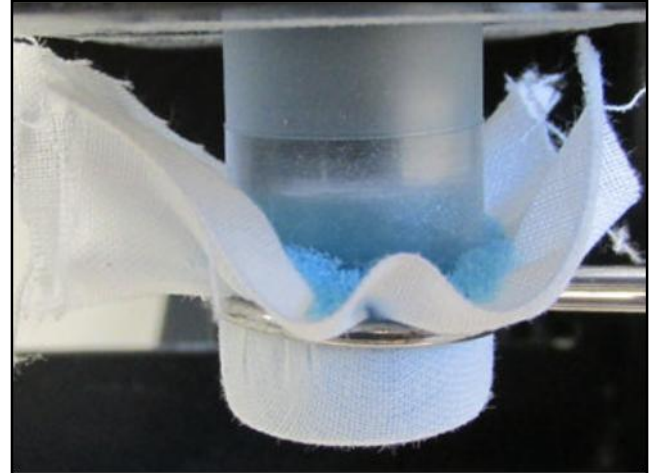


Figure 4: Mounted cloth onto the rubbing device inclusive foam-material pad

Between the rubbing device and the cloth (undyed cloth acc. to DIN EN ISO 105-X12) a polyurethane foam-pad is mounted, to balance possible asperity and to protect the surface. The surface is cleaned by using dry and wet cloth. A "wet" cloth is a cloth that is soaked with distilled water by insertion for at least 1 minute and afterwards being dried between two filter papers (ashless) and a load of 10 N.

Parameter of the cleanability test:

- number of strokes: 10
- load: 9 N
- frequency: 1 stroke per second
- path length: min. 55 mm
- cleaning method: dry and wet

The cleaning is performed vertical to the applied medium.

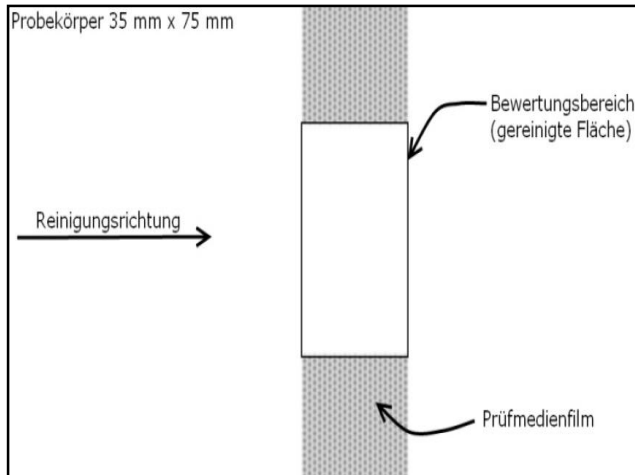


Figure 5: Sample after cleaning

The samples are evaluated in a light chamber by using standard illuminant D65. The samples are evaluated at a distance to the eye of approx. 30 cm directly after cleaning. The viewing angle is chosen by determination of the greatest contrast of cleaned and uncleaned areas. The evaluation is carried out using the classification numbers acc. to BMW PR 506:

Index number	State	Example
9 - 10	o.k. condition	no remains of the test medium
8	o.k. condition	minimal remains of the test medium
7	perception of quality is uninfluenced	marginal remains of the test medium
6	visual and haptical characteristic feature	considerable remains of the test medium
5	unacceptable visual and haptical characteristic feature	immense remains of the test medium

Table 3: Index numbers of the evaluation

4. Results

The determined results are listed in Table 4.

Results							
Sample	Test / specification	Parameter	Unit	Results		Requirements	Rating
1 LUCITE Flowcoat	Cleanability test acc. to KIMW 004	Coca-Cola	index number	dry	wet		
				8	10		
1 LUCITE Flowcoat	Cleanability test acc. to KIMW 004	orange juice	index number	dry	wet		
				5	8		
1 LUCITE Flowcoat	Cleanability test acc. to KIMW 004	instant coffee	index number	dry	wet		
				5	7		
1 LUCITE Flowcoat	Cleanability test acc. to KIMW 004	synth. Sweat	index number	dry	wet		
				7	9		
1 LUCITE Flowcoat	Cleanability test acc. to KIMW 004	hand cream	index number	dry	wet		
				6	7		
1 LUCITE Flowcoat	Cleanability test acc. to KIMW 004	sunscreen	index number	dry	wet		
				6	8		
1 LUCITE Flowcoat	Cleanability test acc. to KIMW 004	highlighter	index number I	dry	wet		
				5	8		
1 LUCITE Flowcoat	Cleanability test acc. to KIMW 004	red wine	index number	dry	wet		
				5	9		

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Results							
Sample	Test / specification	Parameter	Unit	Results		Requirements	Rating
2 latex paint MATT	Cleanability test acc. to KIMW 004	Coca-Cola	index number	dry	wet		
				5	6		
2 latex paint MATT	Cleanability test acc. to KIMW 004	orange juice	index number	dry	wet		
				5	7		
2 latex paint MATT	Cleanability test acc. to KIMW 004	instant coffee	index number	dry	wet		
				5	6		
2 latex paint MATT	Cleanability test acc. to KIMW 004	synth. Sweat	index number	dry	wet		
				7	8		
2 latex paint MATT	Cleanability test acc. to KIMW 004	hand cream	index number	dry	wet		
				6	8		
2 latex paint MATT	Cleanability test acc. to KIMW 004	sunscreen	index number	dry	wet		
				5	6		
2 latex paint MATT	Cleanability test acc. to KIMW 004	highlighter	index number	dry	wet		
				5	6		
2 latex paint MATT	Cleanability test acc. to KIMW 004	red wine	index number	dry	wet		
				5	5		

Table 4: Overview of the test results

Note:

**non-accredited testing-method*

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