Forschungsinstitut für Pigmente und Lacke e.V.
Allmandring 37, D-70569 Stuttgart
Tel.: 0711/68780-0, Fax: 0711/68780-79
e-Mail: fpl@fpl.uni-stuttgart.de

Test Report

Customer: JUB Kemična industrija d.d.
1262 Dol pri Ljubljani 28
Slowenien

Number of commission: -

Date of commission: 28.04.2005 by Mr. Marco Saksida

Storing of sample material: All samples are stored 25 month after delivering the results to the customer, unless the sample material was used up or destroyed by chemical reaction or any other agreements were made.

Item of contract: **Interior wall paint :**

- **Jupol Briljant**

Purpose of testing: **DIN EN 13300 (November 2001), water-borne coating materials and coating systems for interior walls and ceilings**

1) Measurement of gloss, determination of the reflectance (ISO 2813)

2) Determination of contrast ratio (VDL-standard 09, ISO 6504-3)

3) Wet scrub resistance (EN ISO 11998)

DIN EN 1062-1 (Dec. 1996), coating materials and coating systems for exterior masonry and concrete

4) Determination and classification of water vapour transmission rate (DIN EN ISO 7783-2)

and

5) Determination of the resistance of interior wall paints to 4 disinfectants (ISO 2812-1)

Sample taking: by the customer

Beginning of tests: 10.05.2005

End of tests: 28.06.2005

Designation of the laboratory: Application technique

Testmethods: see purpose of testing

Enclosures: enclosure 1- 5

Test result:

1) Measurement of gloss, determination of the reflectance (ISO 2813)

Application with the automatical film applicator, 400 µm gap clearance.

Interior wall paint	Dried film thickness	gloss (reflectance) at 60 °	85 °	Classification due to DIN EN 13 300
Jupol Briljant	approx. 186 µm	-	6,3 ± 0,3	matt

2) Determination of contrast ratio (VDL-standard 09, ISO 6504-3)

Application quantity due to the producer`s recommendation :

Interior wall paint	Contrast ratio Yb/Yw	At a spreading rate of:	Classification due to DIN EN 13 300
Jupol Briljant	99,7 % 99,6 %	8,5 m²/l 9 m²/l	class 1 class 1

The calculations for the contrast ratio of the interior wall paints are documented in enclosure 1-2:

Classification due to DIN EN 13300 in relation to the contrast ratio:

class 1: ≥ 99 ,5%
class 2: ≥ 98 und < 99 ,5 %
class 3: ≥ 95 und < 98 %
class 4: < 95 %

3) Wet scrub resistance (EN ISO 11998)

Conditions:
- substrate: PVC film (Leneta Co.)
- gap clearance of the doctor blade: 400 µm
  Application with the automatical film applicator

- drying: 28 days at 23 °C and 50 % relative humidity,

The calculations for the wet scrub resistance are documented in enclosure 3.

Interior wall paint	Loss of dried film thickness	Classification due to DIN EN 13 300 (200 scrub cycles)
Jupol Briljant	11,6 ± 0,5 µm	class 2 (≥ 5 µm und < 20 µm)

4) Determination and classification of water vapour transmission rate (DIN EN ISO 7783-2)

Samples:
The following coating systems were applied on glas frits (Fa. Robu, porosity 4, test area: 61 cm²).
Number of samples: 4

	Material quantity on glass frits/ dried film thickness	
Jupol Briljant	1) 252 g/m² 2) 300 g/m² 3) 313 g/m² 4) 277 g/m²	139 µm 166 µm 173 µm 153 µm

After 28 days of drying unter the conditions of the climate chamber (23 °C/50 % relative humidity), the determination of the water vapour transmission of the samples followed by weighing daily the loss of water.

The following values were determined (calculation of the sd-value, see enclosure 4):

Interior wall paint	**sd- value (m)**	**V (g/(m² d)**	**μ (-)**	**Classification due to DIN EN 1062-1**
Jupol Briljant	0,045 0,043 0,046 0,043	452 474 443 474	324 259 266 281	class: I, high (sd < 0,14 m)
Mean value (standard deviation)	0,044 (± 0,0015)	461 (± 15,7)	283 (± 29)	

Annotations:

- Diffusion equivalent airlayer thickness = sd
- Water vapour transmission rate V = 21/sd
- Water vapour transmission resistance μ = sd/coating thickness s

5) Determination of the resistance of interior wall paints to 4 disinfectants (ISO 2812-1)

Method 2: The coatings were charged with compressed paper-board pads, soaked with the disinfectants. The pads were covered with watch glasses

Test temperature: 23 °C ± 2 °C

Disinfectants	concentration [%]	test period (h)
Hexaquart S (Braun)	1,00	1,0
Surfanios Citron (Anios)	0,25	4,0
Incidur (Ecolab)	0,50 0,75 3,00	4,0 1,0 1,0
Kohrsolin FF (Bode Chemie)	0,75 1,00 3,00	1,0 0,5 0,5

Disinfectants	composition (active agents)
Hexaquart S	Didecyldimethylammoniumchloride, Benzalkoniumchloride
Surfanios Citron	Didecyldimethylammoniumchloride, Aminosäurehydrochloride
Incidur	Glyoxal, Glutaral
Kohrsolin FF	Glutaraldehyd, Benzalkoniumchloride, Didecyldimethylammoniumchloride

As can be seen in enclosure 5, there were directly after the influence of the disinfectants no changes or only small changes of the surface of the values 0-1 to 1 on the coating surface of **Jupol Briljant**.
24 hours after the test some of the changes disappeared.
The changes can be described as "yellowing".

Comments*:

The test results refer to the samples, only. This test report may not be published (even not in parts) without the allowance of the FPL.

* The comments are an additional interpretation (opinion) beyond the test methods.

Stuttgart, 01.07.2005

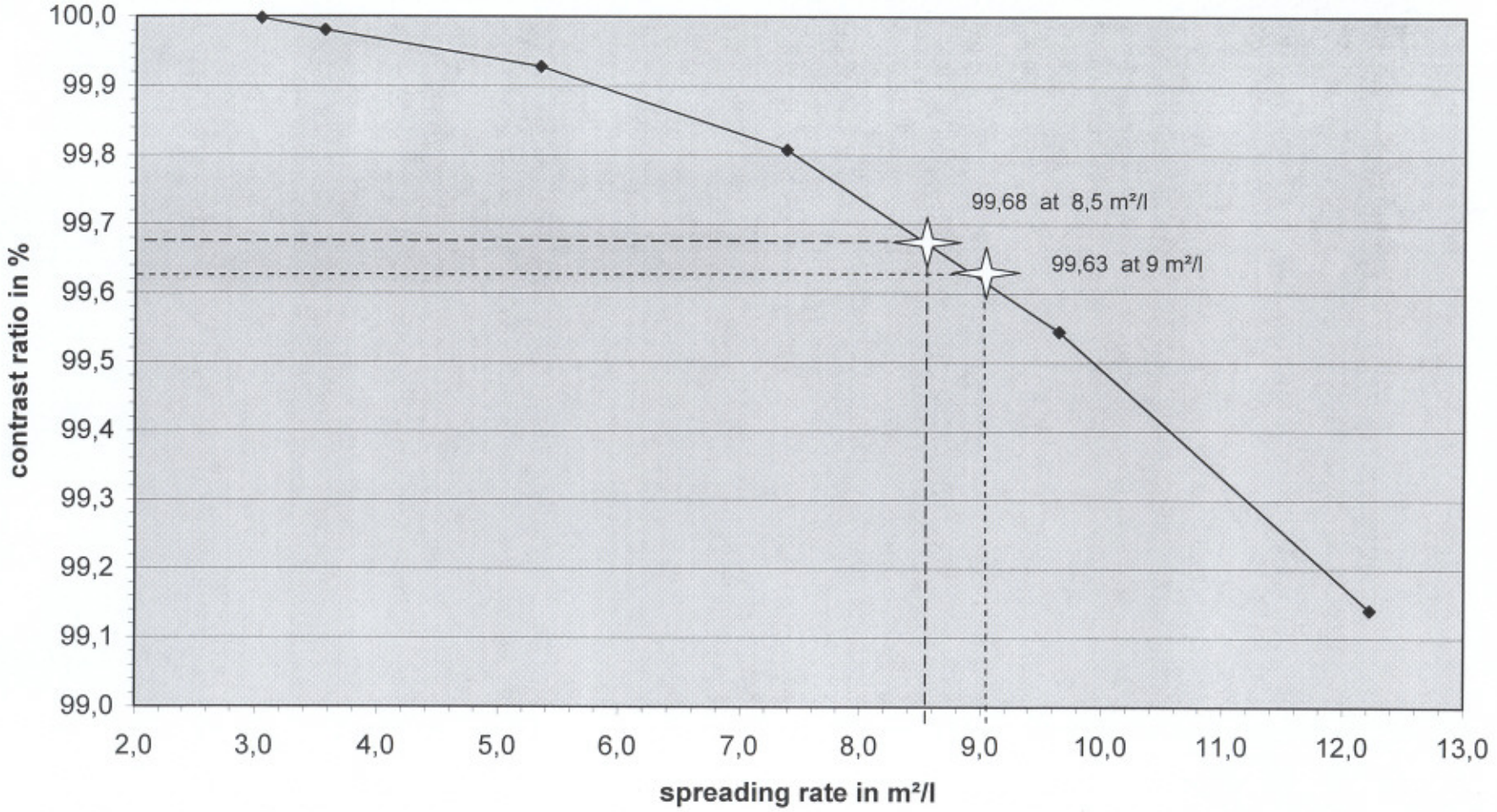
i.A. U. Gaszner

Dipl. Ing (FH) Karin Gaszner
Application technique

i. A. H. Neher-Schmitz

H. Neher-Schmitz
Tester Application technique

Jupol Briljant



contrast ratio / spreading rate

gap clearance µm	density g/cm³	material quantity on the contrast chart coated g	ml	area in cm²	l/m²	spreading rate m²/l	contrast ratio (Ys/Yw)*100	mean values Y black	Y white
100	1,55	6,15	3,97	485,08	0,08	12,23	99,14	95,65	96,48
150	1,55	7,68	4,95	477,93	0,10	9,65	99,54	96,25	96,69
200	1,55	10,04	6,48	477,93	0,14	7,38	99,81	96,68	96,87
250	1,55	11,57	7,46	399	0,19	5,35	99,93	96,90	96,97
350	1,55	20,9	13,48	479,65	0,28	3,56	99,98	96,95	96,97
400	1,55	24,47	15,79	479,65	0,33	3,04	100,00	96,94	96,94

sample No.	loss in coating mass film start m_1 (g)	loss in coating mass film end m_2 (g)	loss in mass (g)	scrub area scrub length W (mm)	scrub area scrub width S (mm)	scrub area A=(W*S) / 10^6 in m^2	loss in coating mass per unit area L= (m_1-m_2) / A in g/m^2	dried film density in g/cm^3 rnv	mean loss in film thickness L/rnv (µm)	mean value ± standard-deviation
1	24,19053	23,86699	**0,32354**	381	40	**0,0152**	**21,23**	1,81	**11,7**	**11,6**
2	23,74922	23,44597	**0,30325**	378	40	**0,0151**	**20,056**	1,81	**11,1**	±
3	24,50382	24,17407	**0,32975**	378	40	**0,0151**	**21,809**	1,81	**12**	**0,5**

sample No.	measure-ment No.	A [cm²]	p_a 100%-wert	T [°C]	r.F. [%]	p [Pa]	p1 [Pa]	p2 [Pa]	δL [g/(m*h*Pa)]	l [g/h]	i [g/(m²*h)]	d Pr [g/(m²*h*Pa)]	sd [m]	Mean-value measurement No. 5 - 9	Standard-deviation measurement No. 5 - 9
	1														
1	2	61	2863	23,3	50,1	99000	2663	1434	7,20E-04	0,04979	8,163	6,65E-03	0,1083		
	3	61	2794	22,9	51,1	98500	2598	1428	7,23E-04	0,05000	8,197	7,00E-03	0,1032		
	4	61	2744	22,6	51,3	97500	2552	1408	7,29E-04	0,04942	8,101	7,08E-03	0,1030		
	5	61	2727	22,5	48,6	96500	2536	1325	7,37E-04	0,04847	7,946	6,56E-03	0,1123	0,1077	0,004
	6	61	2761	22,7	53,1	96500	2568	1466	7,37E-04	0,04808	7,883	7,16E-03	0,1030		
	7	61	2845	23,2	54,1	97500	2646	1539	7,31E-04	0,04688	7,684	6,94E-03	0,1052		
	8	61	2794	22,9	50,9	98000	2598	1422	7,26E-04	0,04792	7,855	6,68E-03	0,1088		
	9	61	2863	23,3	52,4	98000	2663	1500	7,27E-04	0,04721	7,739	6,66E-03	0,1092		
	1														
2	2	61	2863	23,3	50,1	99000	2663	1434	7,20E-04	0,05338	8,752	7,13E-03	0,1010		
	3	61	2794	22,9	51,1	98500	2598	1428	7,23E-04	0,05063	8,299	7,09E-03	0,1019		
	4	61	2744	22,6	51,3	97500	2552	1408	7,29E-04	0,05088	8,340	7,29E-03	0,1001		
	5	61	2727	22,5	48,6	96500	2536	1325	7,37E-04	0,04918	8,062	6,66E-03	0,1106	0,1061	0,004
	6	61	2761	22,7	53,1	96500	2568	1466	7,37E-04	0,04871	7,985	7,25E-03	0,1017		
	7	61	2845	23,2	54,1	97500	2646	1539	7,31E-04	0,04767	7,814	7,06E-03	0,1035		
	8	61	2794	22,9	50,9	98000	2598	1422	7,26E-04	0,04857	7,963	6,77E-03	0,1073		
	9	61	2863	23,3	52,4	98000	2663	1500	7,27E-04	0,04800	7,869	6,77E-03	0,1074		
	1														
3	2	61	2863	23,3	50,1	99000	2663	1434	7,20E-04	0,04938	8,096	6,59E-03	0,1092		
	3	61	2794	22,9	51,1	98500	2598	1428	7,23E-04	0,04942	8,101	6,92E-03	0,1044		
	4	61	2744	22,6	51,3	97500	2552	1408	7,29E-04	0,04950	8,115	7,09E-03	0,1029		
	5	61	2727	22,5	48,6	96500	2536	1325	7,37E-04	0,04796	7,862	6,49E-03	0,1135	0,1089	0,004
	6	61	2761	22,7	53,1	96500	2568	1466	7,37E-04	0,04746	7,780	7,06E-03	0,1044		
	7	61	2845	23,2	54,1	97500	2646	1539	7,31E-04	0,04650	7,623	6,89E-03	0,1061		
	8	61	2794	22,9	50,9	98000	2598	1422	7,26E-04	0,04735	7,762	6,60E-03	0,1101		
	9	61	2863	23,3	52,4	98000	2663	1500	7,27E-04	0,04658	7,637	6,57E-03	0,1107		
	1														
4	2	61	2863	23,3	50,1	99000	2663	1434	7,20E-04	0,051	8,306	6,76E-03	0,1064		
	3	61	2794	22,9	51,1	98500	2598	1428	7,23E-04	0,051	8,354	7,14E-03	0,1013		
	4	61	2744	22,6	51,3	97500	2552	1408	7,29E-04	0,051	8,402	7,34E-03	0,0993		
	5	61	2727	22,5	48,6	96500	2536	1325	7,37E-04	0,049	8,092	6,68E-03	0,1102	0,1058	0,004
	6	61	2761	22,7	53,1	96500	2568	1466	7,37E-04	0,049	8,094	7,35E-03	0,1003		
	7	61	2845	23,2	54,1	97500	2646	1539	7,31E-04	0,048	7,835	7,08E-03	0,103		
	8	61	2794	22,9	50,9	98000	2598	1422	7,26E-04	0,04829	7,916	6,73E-03	0,1079		
	9	61	2863	23,3	52,4	98000	2663	1500	7,27E-04	0,04808	7,883	6,78E-03	0,1072		

sd-values mean values of coated glass frits	sd-values mean values of uncoated glass frits	sd-values mean values of the coating	sd mean value [m]	Standard-deviation
0,1077	0,063	0,0447		
0,1061	0,063	0,0431	0,0441	0,00146
0,1089	0,063	0,0459		
0,1058	0,063	0,0428		

Resistance of a "latex paint" against 4 disinfectants at room temperature - assessment immediately and 24 hours after the test

a) assessment according to EN ISO 4628-1:2003(D)

Kennwert	Intensität der Veränderung
0	no visible change
1	very small visible change
2	small visible change
3	medium, distinctly visible change
4	strong visible change
5	very strong visible change

disinfectant	sample	Jupol Briljant value	
Assessment after [h]		at once	24
Hexaquart S	a	0	0
1% solution	b	0	0
1h test period	c	0	0
Surfanios	a	0	0
0,25% solution	b	0	0
4h test period	c	0	0
Incidur	a	1**	0-1*
0,5% solution	b	0-1*	0
4h test period	c	0-1*	0
Incidur	a	0-1*	0
0,75% solution	b	0-1*	0
1h test period	c	0-1*	0
Incidur	a	1**	0-1*
3% solution	b	1**	0-1*
1h test period	c	1**	0-1*
Kohrsolin FF	a	0-1*	0-1*
0,75% solution	b	0-1*	0
1h test period	c	0-1*	0
Kohrsolin FF	a	0	0
1% solution	b	0	0
0,5h test period	c	0	0
Kohrsolin FF	a	0	0
3% solution	b	0	0
0,5h test period	c	0	0

* artificial illumination
** artificial illumination and daylight
annotation: the changes are yellowing