

Polymer Dispersions
May 25th, 2007

Polymer Dispersions

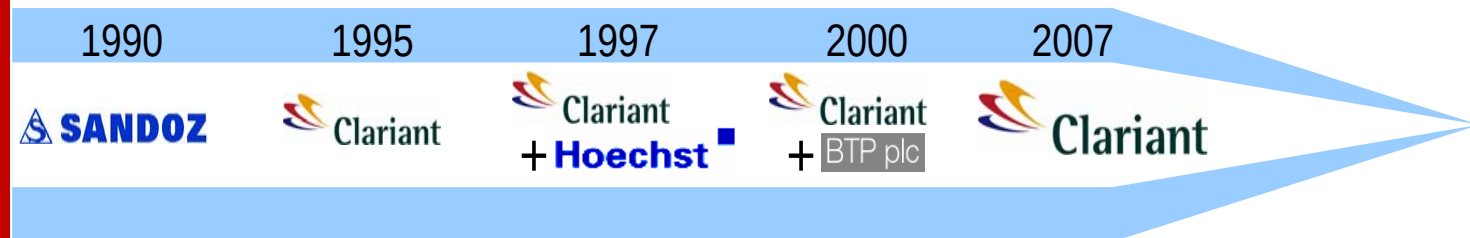
Product line



Exactly your chemistry.



History of Clariant



- IPO in the summer of 1995 out of the Sandoz Chemicals Division
- Integration of the Hoechst specialty chemicals businesses in the summer of 1997



Exactly your chemistry.

Company structure

Textile, Leather & Paper Chemicals	Pigmentes & Additives	Functional Chemicals	Life Science Chemicals	Masterbatches
Textile Industry	Coatings Industry	Detergent Industry	Pharma Industry	Resin Producers
Leather Industry	Plastics Industry	Cosmetics Industry	Agro Industry	Compounders
Paper & pulp Industry	Printing Industry	Oil and gas Industry	Manufacturers of coatings, plastics, flavor and aroma fragrances	Polymer Converters
Polymer Dispersions	Specialized Industry	Construction Industry		Manufacturers of industrial & consumer goods:
		Agro Industry		carpets, textiles, cosmetics, detergents, food packaging, toys, cars, appliances
		Metal working Industry		
		Mining Industry		

Clariant Emulsion History

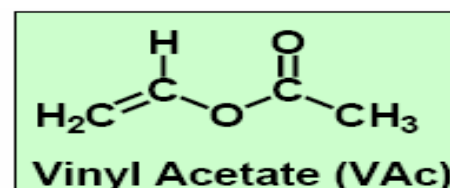
科莱恩乳液发展史

1912

赫斯特注册并开始生产乳液 **Mowilith®**

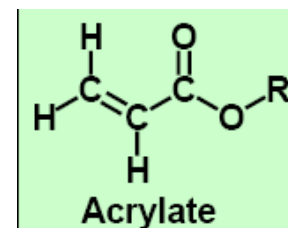
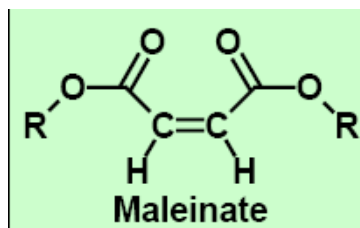
1934

赫斯特是第一个工业化生产聚醋酸乙烯乳液的公司



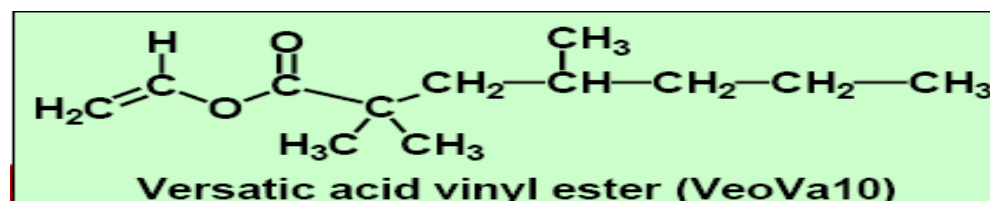
1950

赫斯特是第一个工业化生产聚醋酸乙烯分别和顺丁烯二酸酐及丙烯酸酯共聚乳液的公司



1960

赫斯特是第一个工业化生产醋叔乳液的公司





Exactly your chemistry.

Clariant Polymer Dispersions production sites in the world (19 Plants)



*3rd Party manufacturing for us

Clariant Polymer Dispersions in Asia

Some Facts and Figures

科莱恩乳液在亚洲

1965

Start selling emulsions in Asia (ex. Europe)

开始在亚洲销售Mowilith® 乳液（欧洲进口）

1973

Start producing emulsions in Asia (Indonesia)

开始在亚洲生产Mowilith®乳液（印尼）

2004

Start producing emulsions in China (leather)

开始在中国生产乳液（供皮革用）

2005

Start producing Mowilith® emulsions for Coatings in China

开始在中国生产涂料用乳液

Summary 总结

- Clariant has a long history of producing emulsions

科莱恩有悠久的乳液生产历史

- Clariant has a strong position as supplier of emulsions to the coating industry in countries where we have production capacity but not yet in China

作为涂料工业用乳液供应商，科莱恩在很多国家是涂料厂商的最佳合作伙伴。

→ Actions required for China

在中国，我们将要推广的产品会有以下部分：

Next Presentation.....

接下来的介绍是.....

- VeoVa全能型乳液

Mowilith® VeoVa universal emulsion

- 水性木器漆用乳液

Mowilith® emulsion for water-based wood coatings

- 水性防火涂料用乳液

Mowilith® emulsion for fire retardant coatings

- 弹性涂料用乳液

Mowilith® emulsion for elastomeric wall coatings

- 用于建筑领域的其他乳液

Mowilith® emulsion for construction

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Veova



Exactly your chemistry.

Mowilith DM 2468

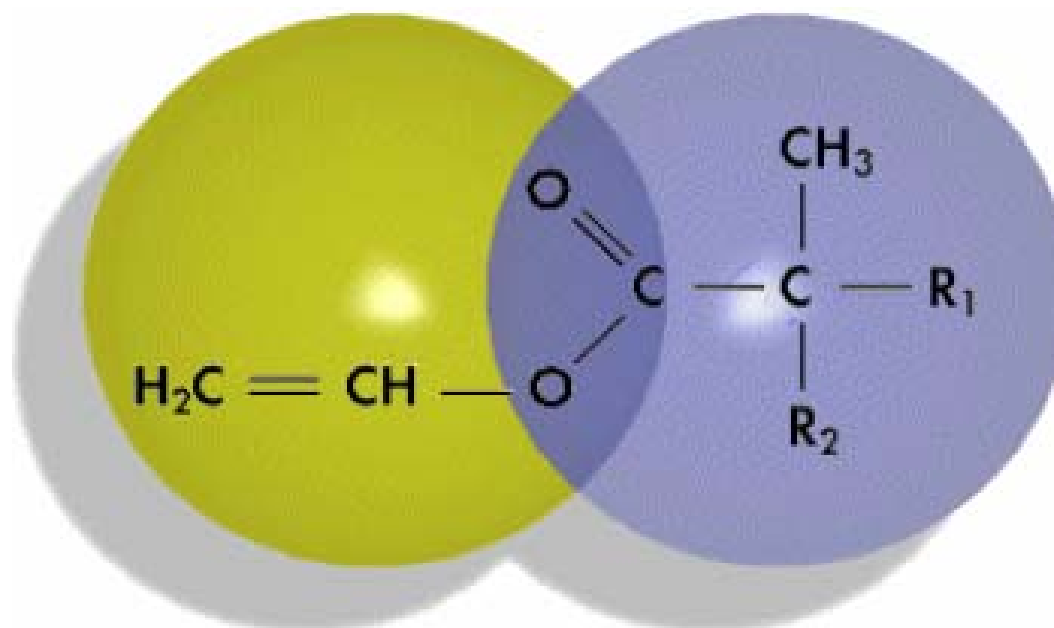
Vinyl acetate / VeoVa / acrylic acid ester copolymer Emulsion

醋叔丙三元共聚乳液

a “universal” binder with superior weathering stability

新型耐候型通用乳液

Structure and characteristics of VeoVa's

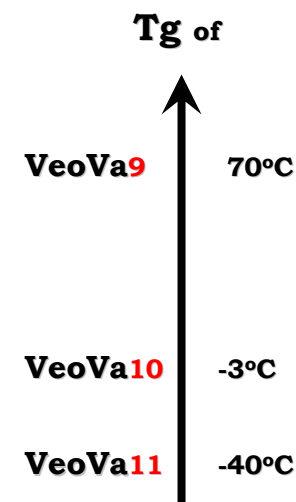
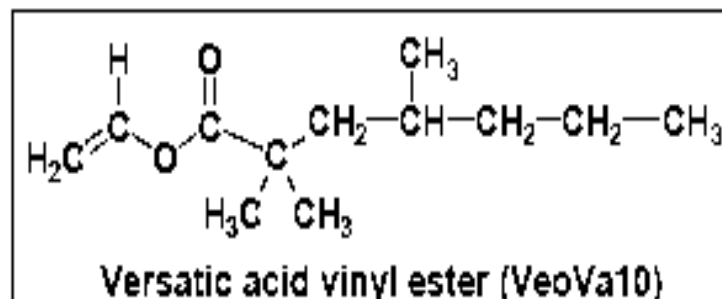


VeoVa = Vinyl Ester of Versatic Acid

叔碳酸乙烯酯

Structure and characteristics of VeoVa's

- similar reactivity to vinyl acetate 与醋酸乙烯相似的活性
- hydrophobic (low surface tension) 憎水性（低表面张力）
- can be co-polymerized with other monomers (ethylene, acrylics and methacrylics)
能够与其他单体共聚（如乙烯，丙烯酸酯，甲基丙烯酸酯）
- UV resistant 好的抗紫外性能
- hydrolytically stable 抗水解性
- non hazardous (low HSE = health safety and environmental risk) 无危害性



Why use VeoVa ?

为什么要用VeoVa单体呢？

-improved saponification resistance due to a homogeneous distribution of VeoVa molecules along the polymer chain (homogeneous distribution = most effective sterical protection of VAc ester groups)

由于**VeoVa**单体在聚合物链中的均匀分布（可有效保护醋酸乙烯基团），提高了乳液抗皂化性能

-copolymerization of **VeoVa 10** ($T_g = -3^{\circ}\text{C}$) decreases T_g and MFFT of the polymer

与**VeoVa 10** ($T_g = -3^{\circ}\text{C}$) 共聚可降低共聚物的 **T_g** 和**MFFT**

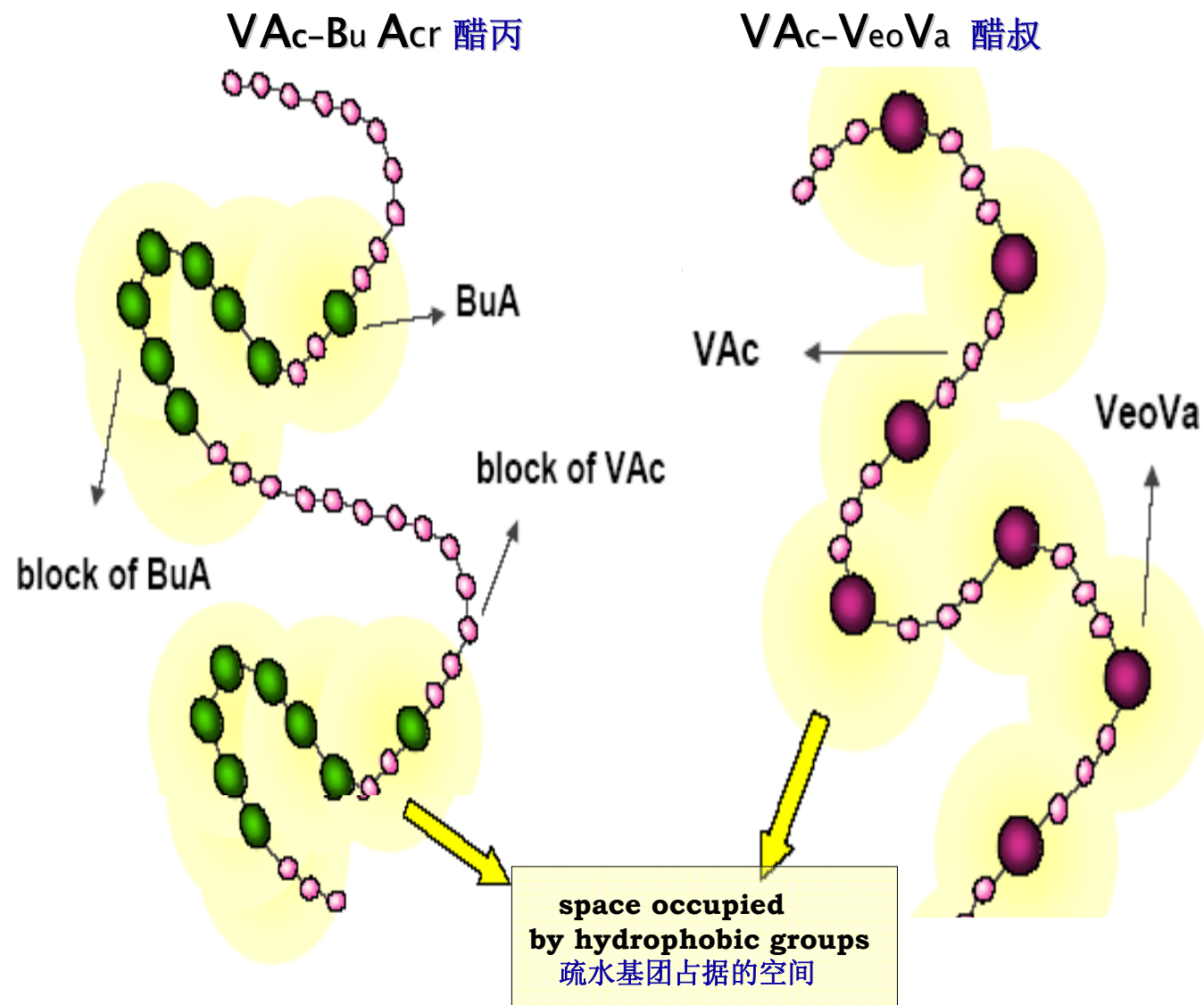
-improved (decreased) water up take 降低了吸水率

-very good outdoor resistance ; improved UV resistance
非常好的户外持久性，提高抗紫外性能

-smell is more pleasant (less odour) than Styrene Acrylic
气味比苯丙乳液要宜人

Different morphologies of copolymers

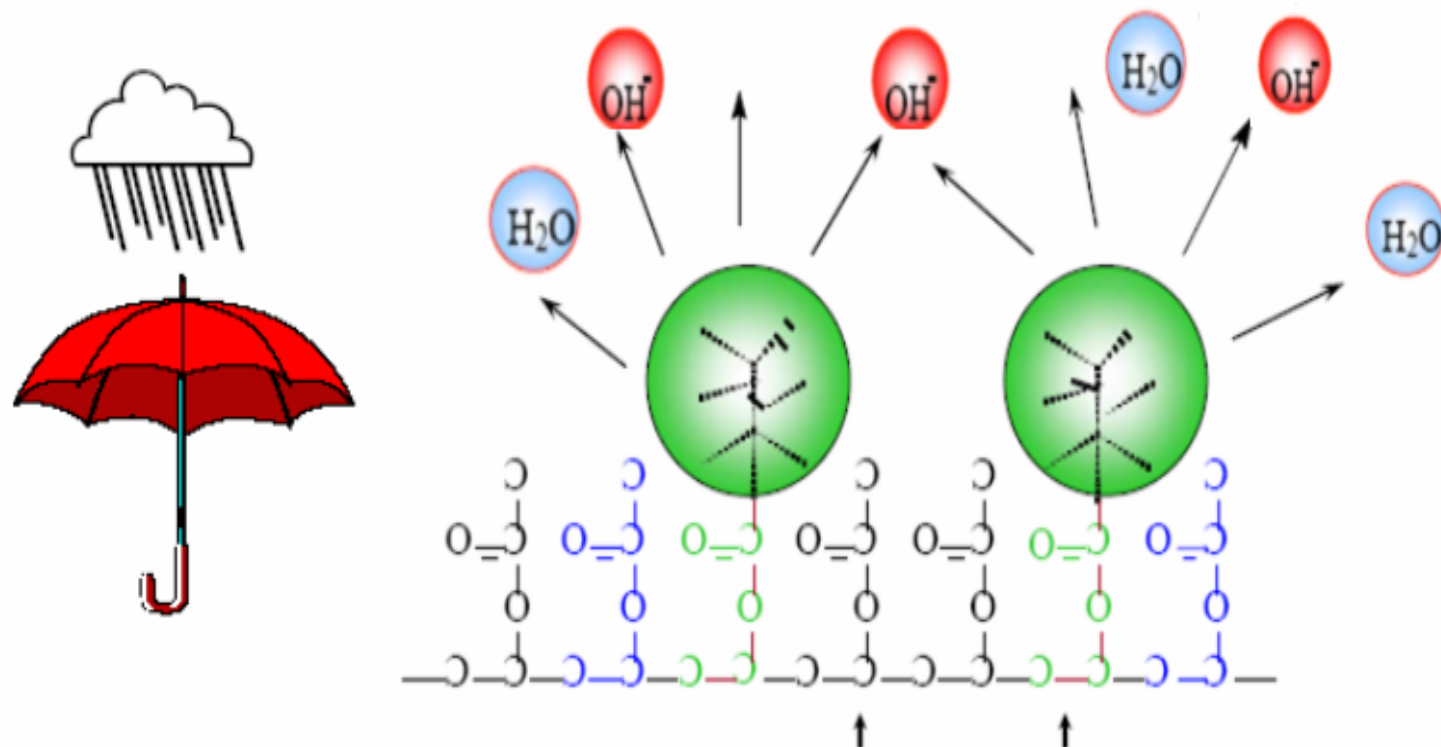
共聚物不同形态学



the "umbrella" effect of Veova-monomers

叔碳酸单体“伞状保护效应”

random co-polymer
... -Veova10 - Vinyl Acetate - ...



Veova 10 单体有憎水性并且能够随机分布在聚合物链中，可以使聚合物链免于水解和并具有良好的耐碱性和耐候性，Veova乳液还有低的表面张力，提高了耐水性。

versatility of VeoVa monomers

VeoVa 单体的多功能性

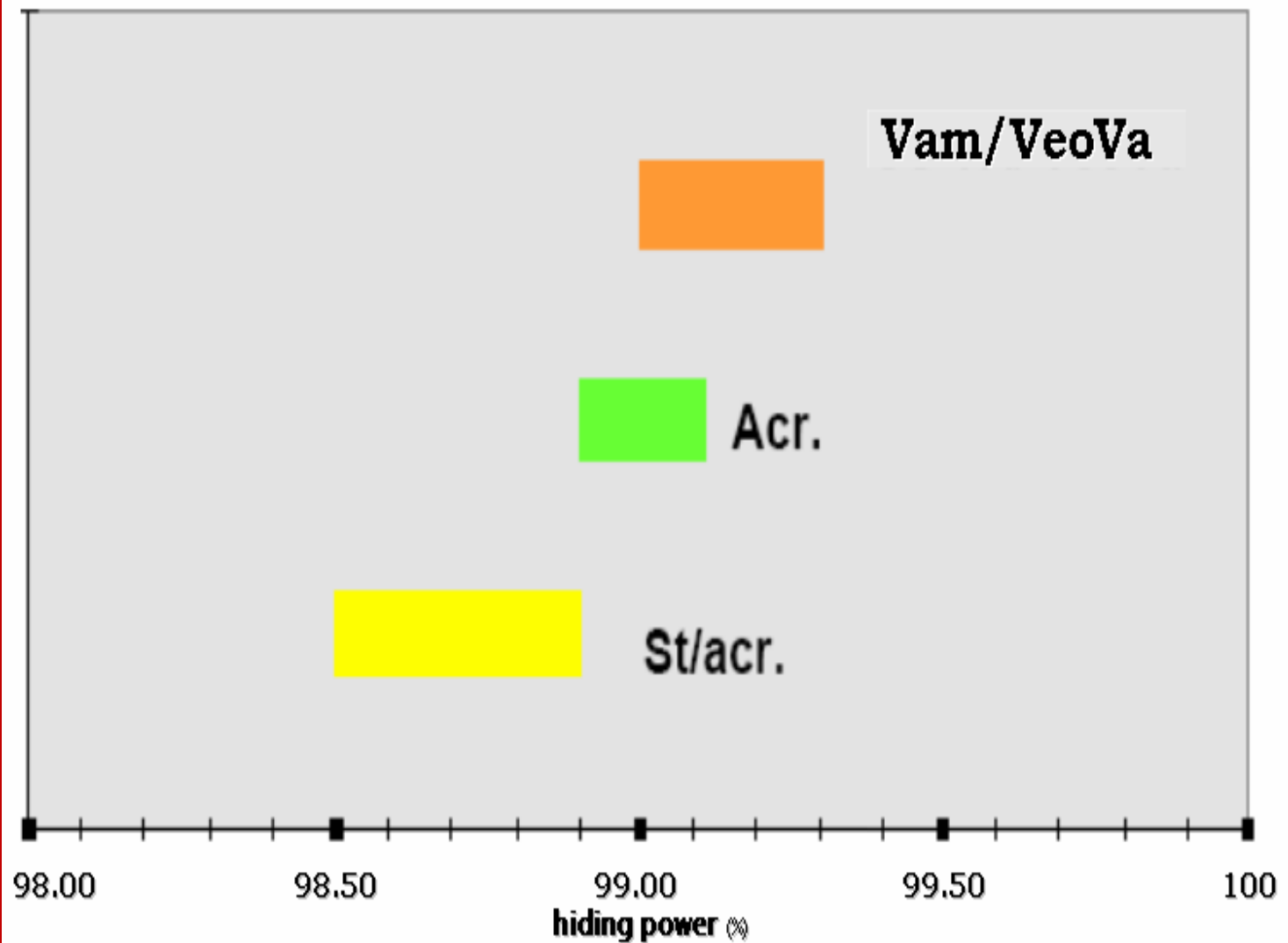
VeoVa is mainly used as comonomer to produce latex via (radical) emulsion polymerization

VeoVa 通常用作共聚单体通过自由基乳液聚合生产乳液

Applications 应用领域:

- architectural paints 建筑涂料
- industrial paints 工业涂料
- concrete additives 混凝土添加剂
- plasters 灰泥
- adhesives 粘合剂
- textiles 纺织

ASTM - hiding power (PVC of 80%) 遮盖力



⇒ **better hiding power**, can be used to save cost (less TiO_2) in **high PVC-paints**

好的遮盖力意味着在高PVC涂料中可以减少 TiO_2 的用量而降低成本

不同乳液的对比率比较(GB)

涂 料 类 型				对 比 率 (GB)			
TSC (W/V)%	Binder%	PVC %	TiO2%	Mowilith DM 2468	C6 (苯丙)	C8 (苯丙)	C1 (纯丙)
55/35	30	40	20	0.935	0.915	/	0.931
56/36	16	71	9	0.913	0.875	0.88	/
53/32	8	85	3.5	0.857	0.837	0.849	/



Exactly your chemistry.

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C1(AA) Mowilith 2468 C6(SA)

30% Binder

No TiO_2

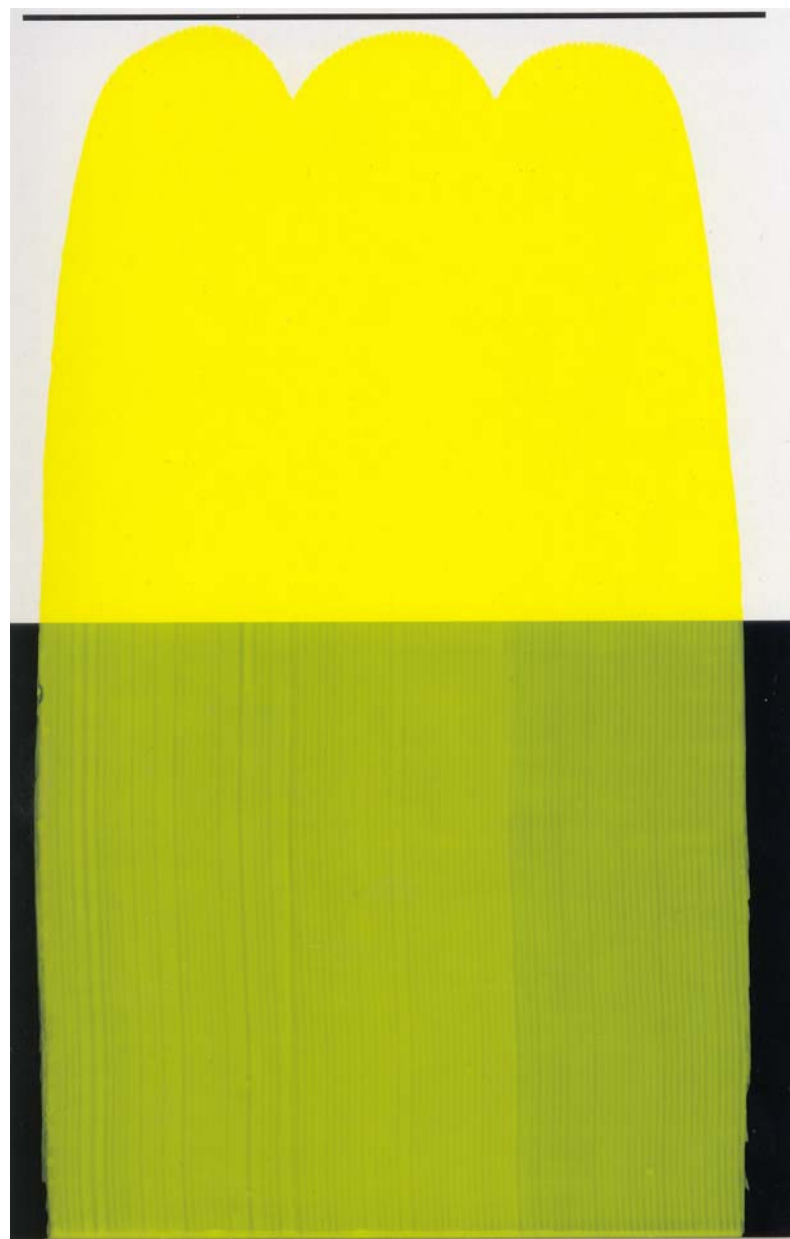
3% Red
paste

120umWFT



Exactly your chemistry.

Polymer Dispersions
May 25th, 2007



C1(AA)

Mowilith 2468

C6(SA)

30% Binder

No TiO_2

3% paste

120umWFT



Exactly your chemistry.

Polymer Dispersions
May 25th, 2007



C1(AA)

Mowilith 2468

C6(SA)

30% Binder

No TiO_2

3% paste

120umWFT



Exactly your chemistry.

Polymer Dispersions
May 25th, 2007



C1(AA)

Mowilith 2468

C6(SA)

30% Binder

No TiO_2

5% red Iron
Oxide paste

120um WFT



Exactly your chemistry.

Polymer Dispersions
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Mowilith 2468 C6(1.1) C6(1)

C6产品即使增
加10%的色浆，
也不能达到
LDM 2468的展
色效果



Exactly your chemistry.

Polymer Dispersions
May 25th, 2007

Mowilith DM 2468 的应用比较

Products

	1-1	1-2	1-3	2-1	2-2	2-3
Water	222	232	242	222	232	237
Natrosol HBR	3	3	3	3	3	3
Mowiplus XW 330	6.5	6.5	6.5	7	7	7
Ammonia	2	2	2	2	2	2
Diethyleneglycol	10	10	10	15	15	15
Foamstar A-12	2	2	2	2.5	2.5	2.5
Kronos 2190	50	50	40	15	15	10
Satintone 5HB	22.68	22.68	22.68	22.68	22.68	22.68
Omyacarb 2	300	300	300	-	-	-
Omyacarb 5	250	250	250	550	550	550
S/A 5018	100	-	-	150	-	-
Mowilith DM 2468	-	90	90	-	140	140
Nipacide CFX-3	1.5	1.5	1.5	1.5	1.5	1.5
Texanol	5	5	5	5	5	5
DBP	-	-	-	5	5	5
Pine Oil	0.5	0.5	0.5	0.5	0.5	0.5
Colanyl Blue A-2R	-	-	-	17	17	17
TOTAL	975.18	975.18	975.18	1018.18	1018.18	1018.18

Test Results

Scrub 7 days (cycles)	440	440	445	2900	3000	2950
Contrast ratio	97.23	97.34	97.23	97.90	98.25	97.90
DELTA L	-0.44	-0.10	-0.10	0.26	0.13	0.15
(168hrs) a	0.07	0.04	0.02	-2.06	-1.74	-1.05
b	0.21	0.06	0.11	4.31	1.95	1.73
Stormer Visco (KU)	110.8	111.1	109.1	115.2	116.2	114.8
Storage stab. Week 3	111.1	111.3	109.6	115.7	116.6	114.9



Exactly your chemistry.

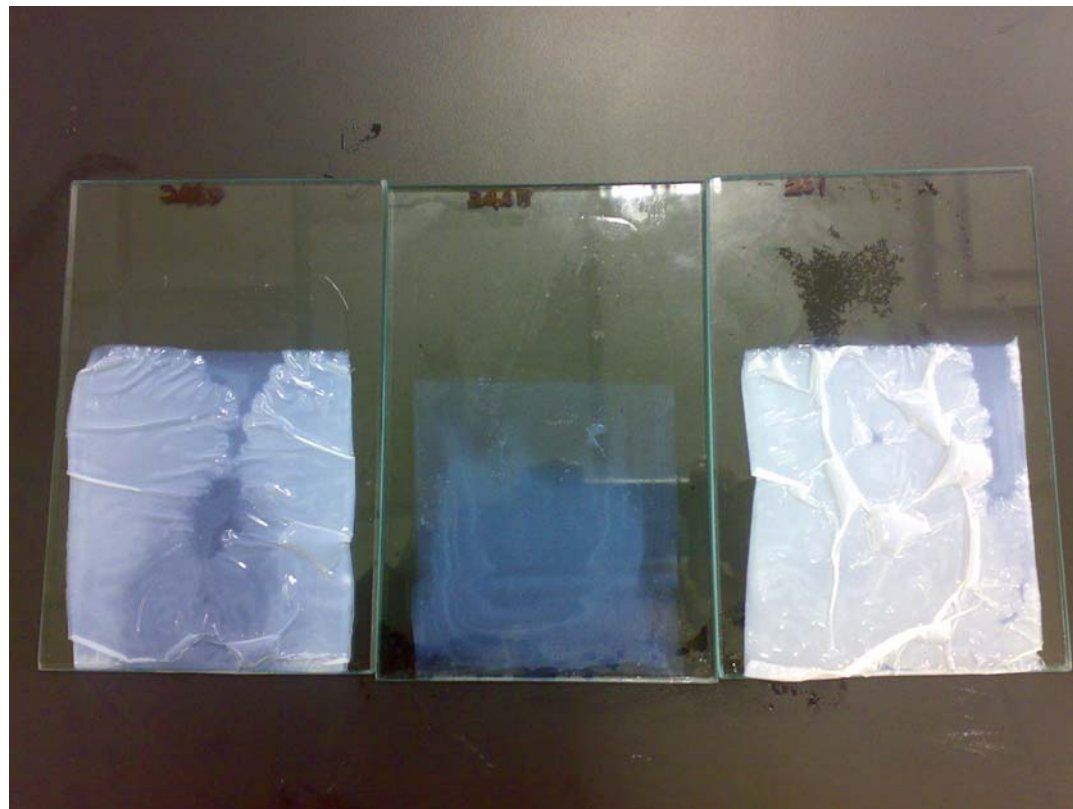
Mowilith DM 2468 的应用比较

Water	273	273	273
Tylose H10000P2	5	5	5
NH3.H2O	1	1	1
Mowiplus XW 330	4	4	4
Dispelair CF 1501	2	2	2
CC(1000Mesh)	250	250	250
Talc (1000Mesh)	75	75	75
Dispelair CF 1501	1	1	1
Nipacide BIT 20	2	2	2
PG	20	20	20
Texanol	17	17	17
C6(S/A)	350	0	0
C1(AA)	0	350	0
Mowilith DM 2468	0	0	350
Colanyl Red FGR 130	45	24.1	21.9
Colanyl Red Oxide B130	5	3	3
Colanyl Blue A2R100	0	0.001	0.001
Total	1050	1027.101	1024.901

Polymer Dispersions
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大约可节省成本1.60/kg

Good water resistance 优良的耐水性



C6(苯丙)

Mowilith DM 2468

C1(纯丙)

outdoor durability 户外耐久性

10 years exposure on fiber cement (40% PVC paint)



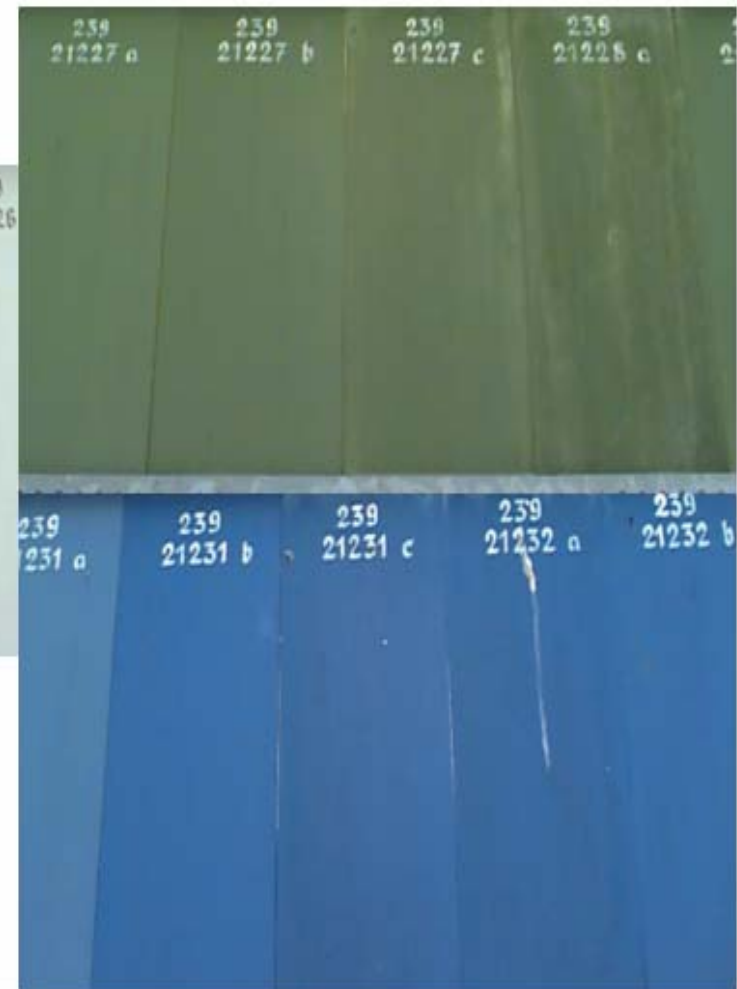
*VeoVa 10 (copolymer and terpolymer) systems are **non-yellowing** ; **non-chalking**; had **a low dirt pickup** and exhibited **a very good alkaline resistance** 叔碳酸乙酸酯（二元及三元共聚物）类涂料具有耐黄变、无粉化、耐沾污等优良特性，并且表现出很好的耐碱特性。

exterior-/deep shade paints 外墙深色漆

Mowilith DM2468 gives exterior paints and deep shade paints a high weather resistance, hue stability as well as a very low chalking and dirt pick up.

以Mowilith DM2468 制备的外墙深色漆具有户外耐久性、保色长，且耐粉化和耐脏污性好。

-after 4 years outdoor weathering-
(exposed at an angle of 45°, facing south)



emulsions based on: (from left to right)

- styrene / acrylic
- Mowilith DM2468
- vinyl acetate / VeoVa
- vinyl acetate / VeoVa
- vinyl acetate / VeoVa



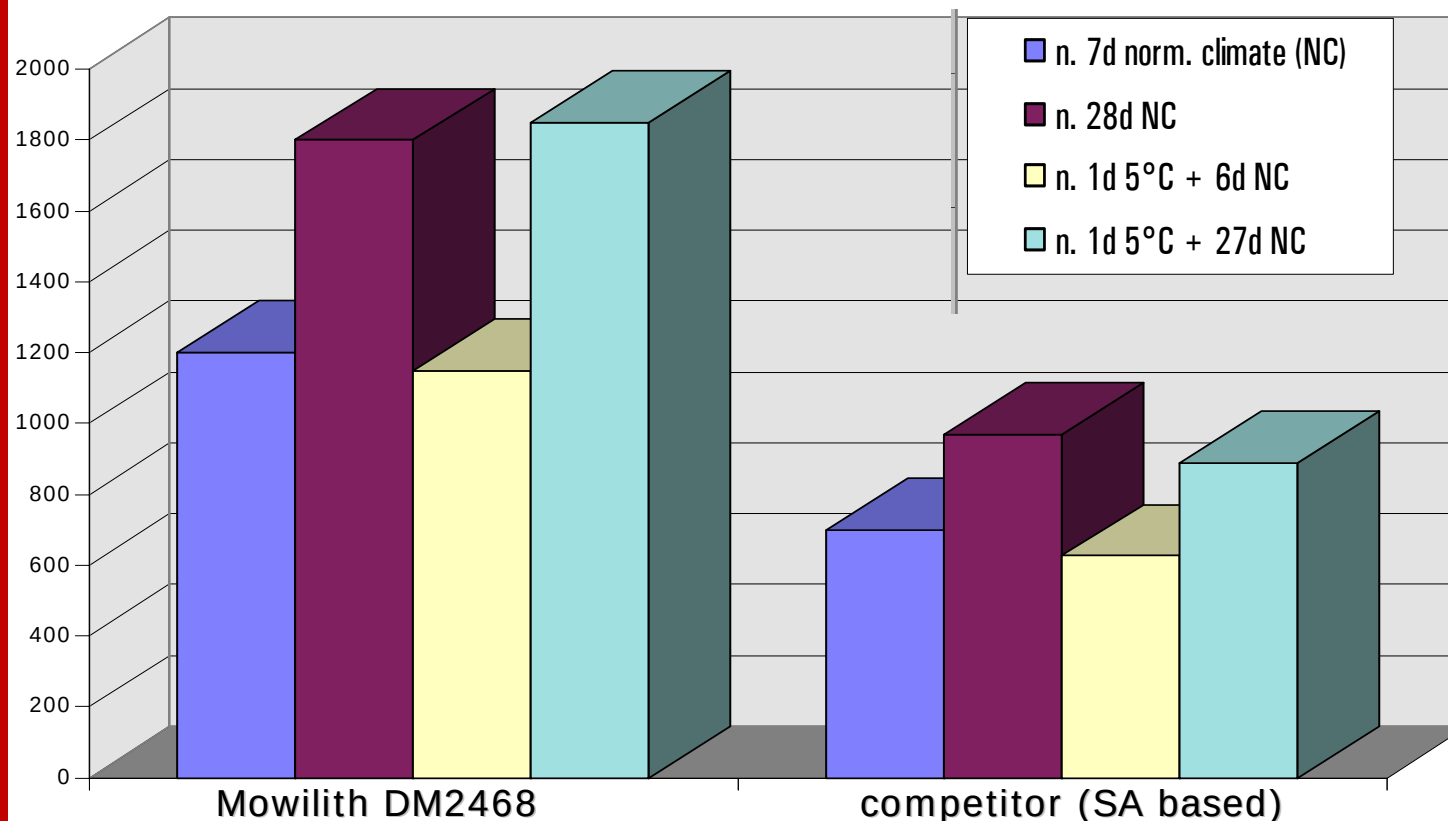
Exactly your chemistry.

high PVC interior paints 高PVC内墙涂料

the very high pigment binding power of Mowilith DM2468 results in an excellent scrub resistance within the different formulations tested even under critical conditions like drying at 5°C.

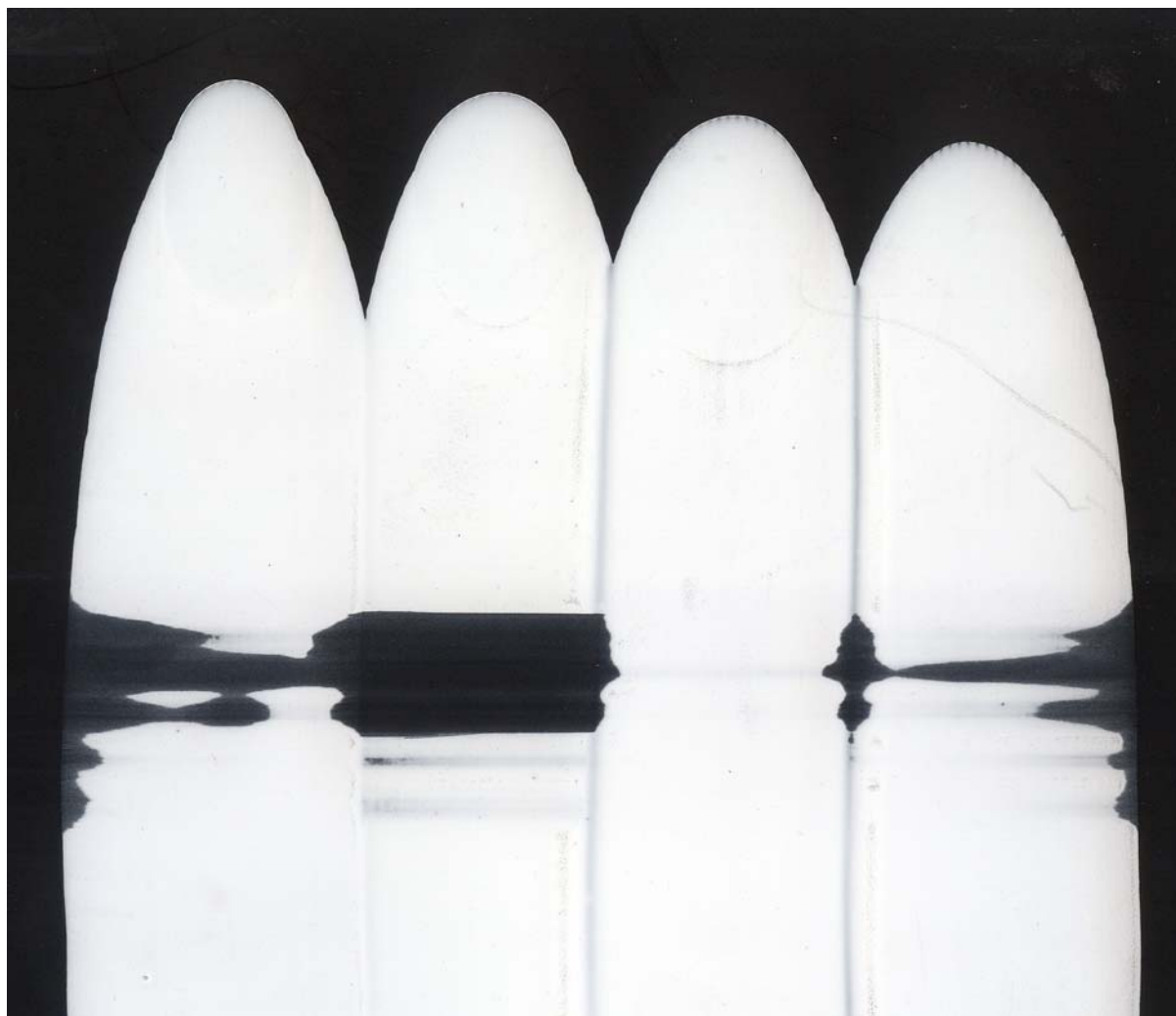
Mowilith DM 2468 极强的颜料结合力使得它在不同配方下测试都具有出色的耐擦洗能力，即使在5°C 干燥这种苛刻的条件下也是如此。

scrub cycles acc. to DIN53778 (BC 8% ; PVC ca.85%)





Exactly your chemistry.



C6(SA) C9(VaVV) Mowilith 2468 C8(SA)

8%Binder 120umWFT 2000Cycles

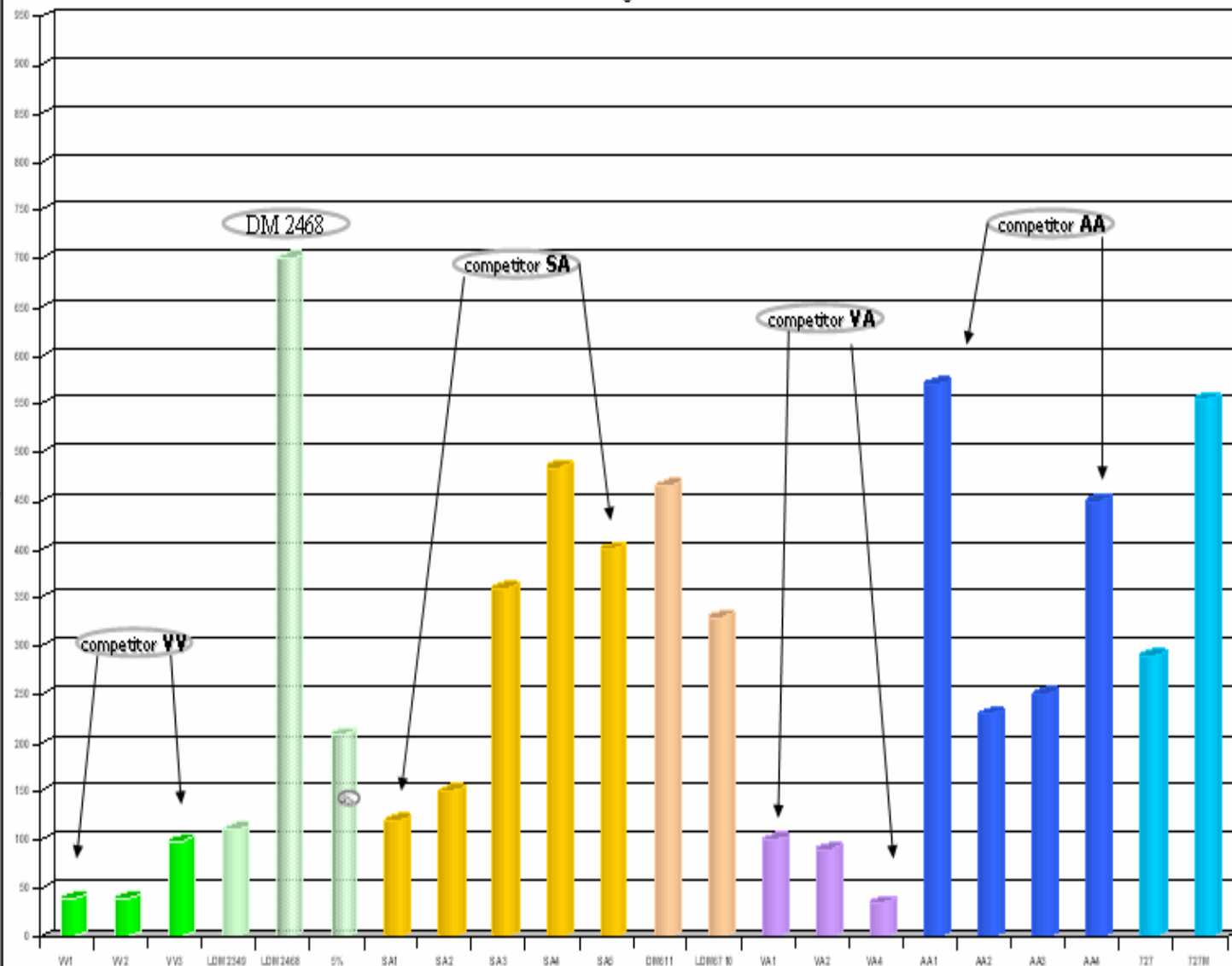


Exactly your chemistry.

comparison scrub-cycles acc. to **DIN 53778**

VV vs SA vs VA vs AA

(BC of 8%; PVC of ca.85%)



"high" PVC-paint 高PVC 涂料参考配方

mill base

	%
1. water	32.21
2. Tylose HS 30000 YP2 (HEC-thickener)	0.49
<i>-Tylose is slowly added under continuous stirring -</i>	
3. Mowiplus XW330 (dispersing-wetting agent)	0.64
4. Byk 037 (defoamer)	0.06
5. Nipacide CFX3 (biocide)	0.15
<i>-the ingredients are added accordingly-</i>	
6. Kronos 2044 (titaniumdioxidet)	9.61
7. talc	3.35
8. clay	3.35
9. Omyacarb 5 GD (calciumcarbonaate)	47.82
<i>-pigment and fillers are added accordingly under continued slow stirring-</i>	
 <i>-after complete addition , the mixture is dispersed at high rotational speed [doughnut effect] ; for approx. 20 minutes its to form a homogeneous mill base than cool it down to RT-</i>	
10. Ammonia	0.20
11..Dowanol DPM (solvent)	2.12

	100.00

Paint - formulation :

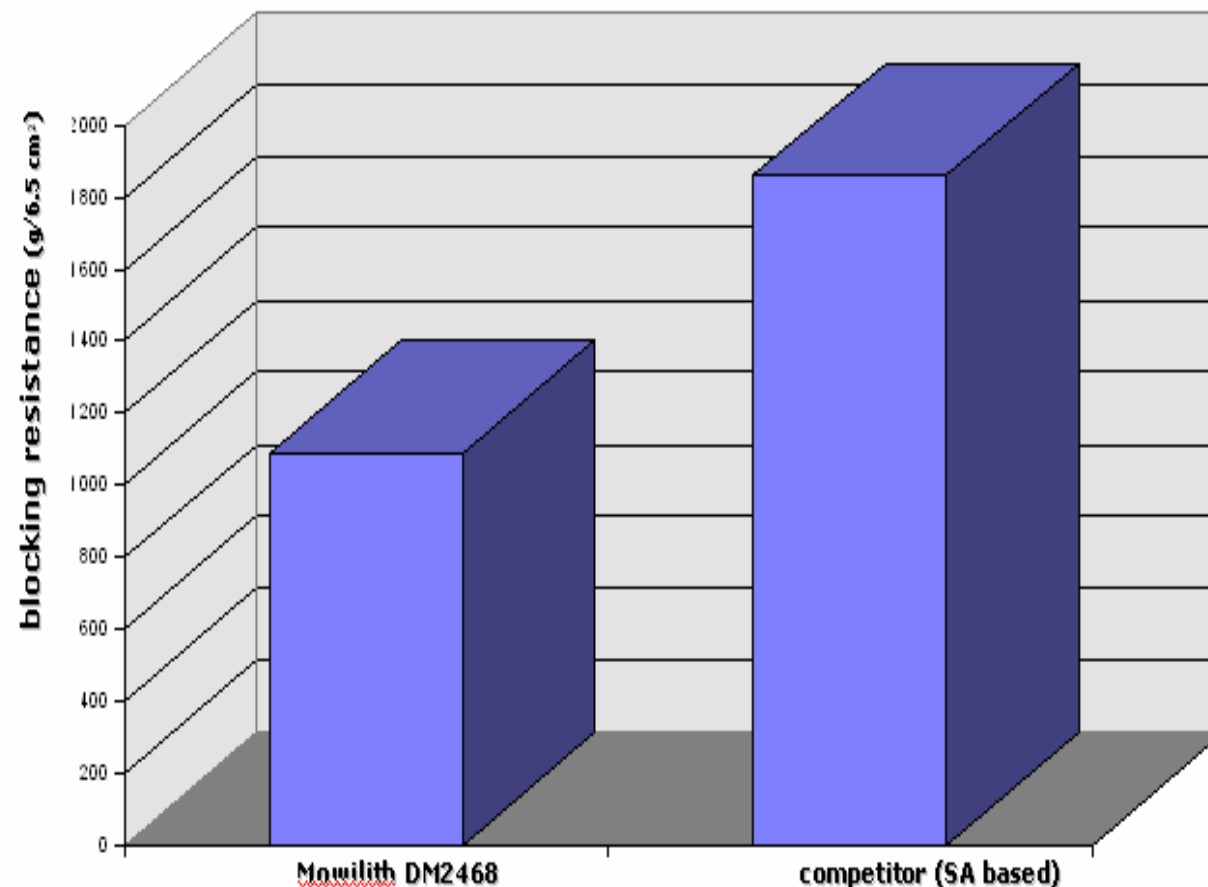
1. mill base	92.00
(PVC ca.85%) 2. Mowilith DM2468	8.00

semi matt-/semi gloss paints

Mowilith DM 2468 has an excellent compatibility in with associative acrylic and polyurethane thickeners. Due to its high Tg of 18°C the blocking resistance of medium PVC paints is low.

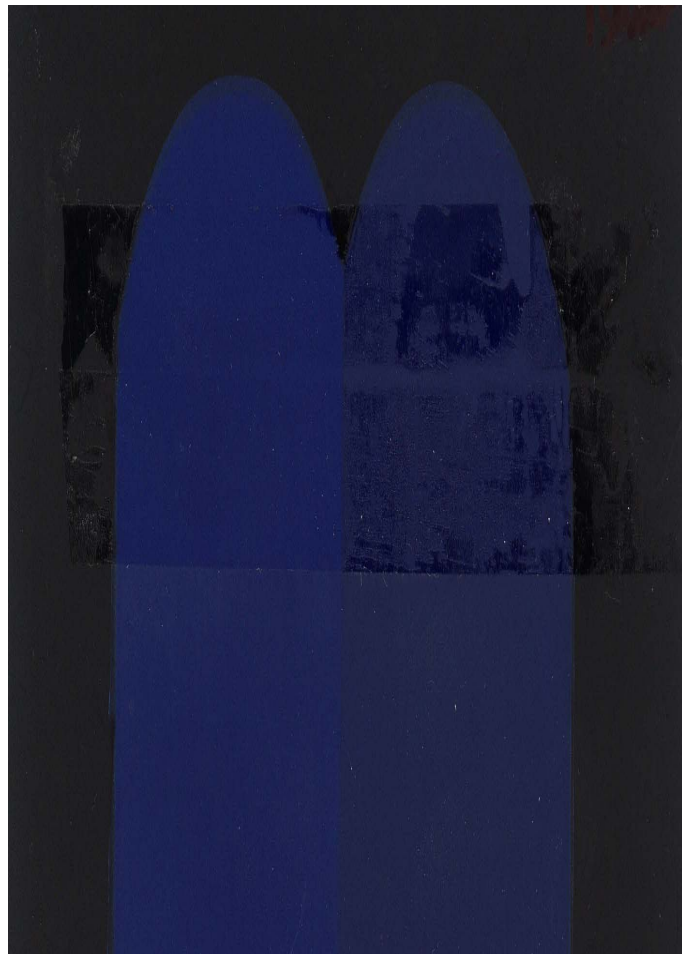
blocking resistance (BC 46% ; PVC ca.33%) 抗粘着性测试

-test condition: 2 h / 2 kg / 23°C ; rH 50 %-





Exactly your chemistry.



Mowilith 2468 C6(SA)



Mowilith 2468 C1(AA)

GUIDANCE FORMULA "semi" Gloss-paint

半光涂料参考配方 (recipe on Lab. scale)

		%
1.	Water	16.40
2.	Tylose HS 30.000 YP2 (HEC thickener)	0.15
3.	Mowiplus PDA 40S (dispersing agent)	0.40
4.	Byk – 037 (defoamer)	0.20
5.	Nipacide CFX3 (biocide)	0.20
6.	Kronos 2190 (titaniumdioxide)	20.00
7.	Omyacarb extra CL (calciumcarbonate)	15.00
8.	Ammonia (pH-adjustment)	0.15
9.	Mowilith DM2468	46.00
10.	water	0.75
11.	Denka UH420 (PU-thickener)	0.75

		100.00

resin bound plasters 树脂基砂浆

resin bound plasters based on Mowilith DM2468 have an excellent workability, high outdoor durability and low dirt pick up.

基于Mowilith DM2468的灰泥具有出色的施工性、户外耐久性和耐脏污性。

-after 3 years outdoor weathering- (exposed at an angle of 90°, facing south)



brush rendering

based on:

a.) Mowilith DM21

b.) Mowilith DM2468

plaster

based on:

a.) Mowilith DM21

b.) Mowilith DM2468

GUIDANCE FORMULA

"textured" paint

艺术立体涂料参考配方 (recipe on Lab. scale)

(white - "fine")

		%
1. Water		10.05
2. Mowiplus XW 330	(dispersing- + wetting agent)	0.30
3. Tylose MH 300 G4	(HEC-thickener)	0.35
4. Mowilith DM2468		13.00
5. Ammoniac (25% sol)	(pH=adjustment)	0.10
6. SHMP 10% SOL	(dispersing agent)	0.30
7. BYK 037	(defoamer)	0.10
8. Nipacide BIT	(biocide)	0.20
9. Kronos 2160	(titanium dioxide)	4.00
10. Calcilit (0.1-0,5)	(calcium carbonate)	40.00
11. Calcilit (0.5-1,0)	(calcium carbonate)	22.00
12. Calcilit (1.5-2.0)	(calcium carbonate)	8.30
13. BCA	(coalescing agent)	0.50
14. White spirit	(solvent)	0.80

		100.00

GUIDANCE FORMULA Plasters

灰浆等厚浆型涂料参考配方

(recipe on Lab. scale) (white - "fine")

		%
1. Water		10.05
2. Mowiplus XW 330	(dispersing + wetting agent)	0.30
3. Tylose MH 300 G4	(HEC-thickener)	0.35
4. Mowilith DM2468		13.00
5. Ammoniac (25% sol)	(pH=adjustment)	0.10
6. SHMP 10% SOL	(dispersing agent)	0.30
7. BYK 037	(defoamer)	0.10
8. Nipacide BIT	(biocide)	0.20
9. Kronos 2160	(titanium dioxide)	4.00
10. Calcilit (0.1-0,5)	(calcium carbonate)	40.00
11. Calcilit (0.5-1,0)	(calcium carbonate)	22.00
12. Calcilit (1.5-2.0)	(calcium carbonate)	8.30
13. BCA	(coalescing agent)	0.50
14. White spirits	(solvent)	0.80

		100.00

the right **EMULSIONS/DISPERSIONS** is

based on :

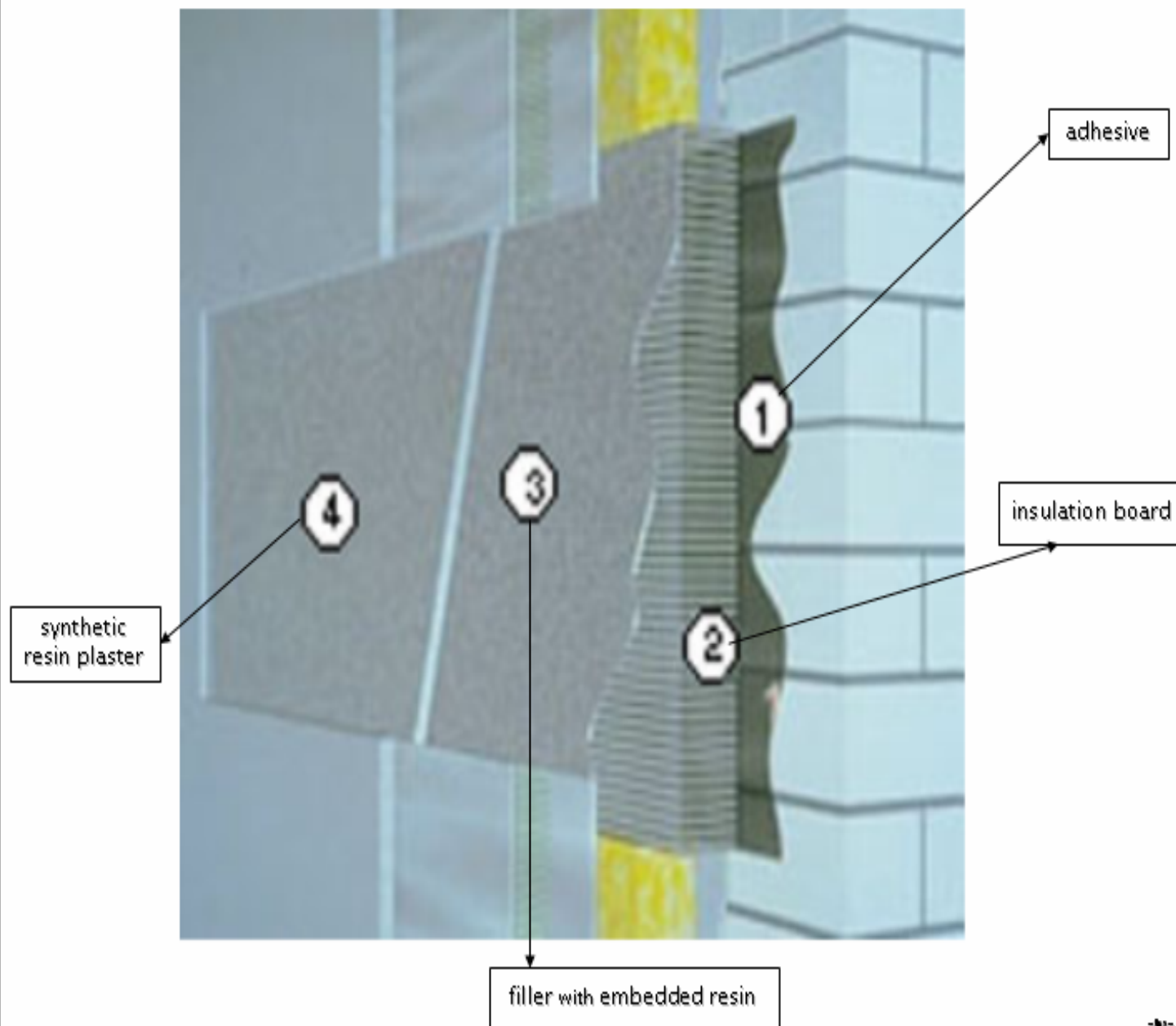


Mowilith DM2468

FOR

EIFS (= **E**xterior **I**nsulating and **F**inish **S**ystems)

Mowilith DM2468用于外保温系统中



thermal insulation systems

Mowilith DM2468 fulfils the requirements for this application field:

- compatibility with cement
- high cohesion and adhesion forces to build up the adhesion layer
- very good behaviour in the fire propagation test according DIN 4102 B1 similar to vinyl acetate / ethylene / vinyl chlorid emulsions
- excellent results in the cyclic water uptake / water release test of thermal insulation systems formulated with Mowilith DM2468



Division TLP - Polymer Dispersions

在外保温系统中，DM 2468

完全能满足下列要求：

--与水泥的兼容性好

--胶结层的粘结力和强度高

--火焰传播试验按DIN 4102 B 1方法与氯醋乳液相似。

--耐水吸收/释放试验效果良好



Sequence of a fire chamber experiment under DIN 4102

1. support with prepared test specimens and thermocouples.
2. the test specimens are exposed for 10 minutes to the flames of a methane gasburner mounted in the shape of a ring.
3. test specimen after testing. The measured variables are smoke temperatures and remaining lengths.

thermal insulation systems based on **Mowilith DM2468**;
 shows excellent results in the cyclic water uptake / water release test.
 therefore the test panels are exposed in a cyclic climate change over 25 day
 (one day = one cycle) like it is described in the test scheme.

基于DM 2468的外保温系统经过25个循环的
 耐水吸收/释放试验后，显示出优良的性能。

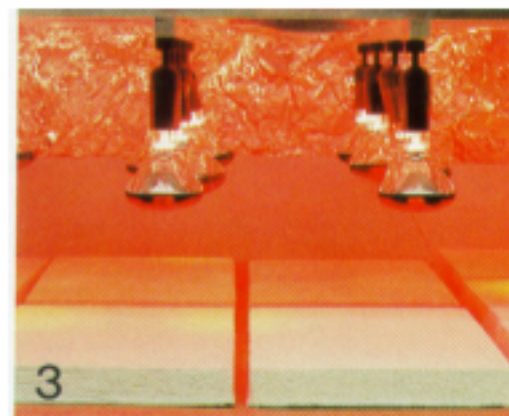
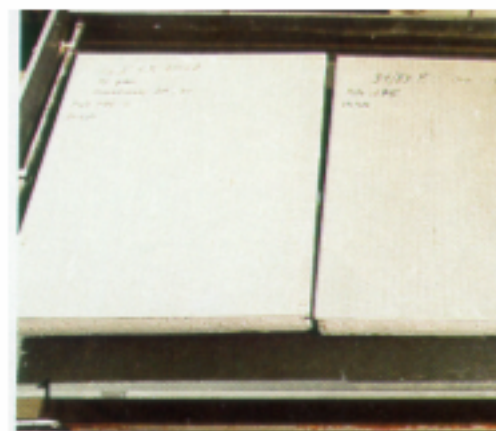
实验方法如下：

test scheme for one cycle:

1. 6-hour storage under water.
2. 15-hour cold exposure at -20°C .
3. 3-hour irradiation with infrared lamps at a constant surface temperature of 70°C .
4. test specimen after testing.
it is free of cracks and blisters

一个循环的试验是：1) 浸在水中6小时；2)
 在 -20°C 气温下保持15小时；3) 用红外灯照
 射保持表面温度 70°C 共3小时；4) 观察样板

无开裂、起泡等不良影响





Exactly your chemistry.



*Exactly
Your
Chemistry*

Polymer Dispersions
May 25th, 2007