

Polymer Dispersions
May 25th, 2007

Polymer Dispersions

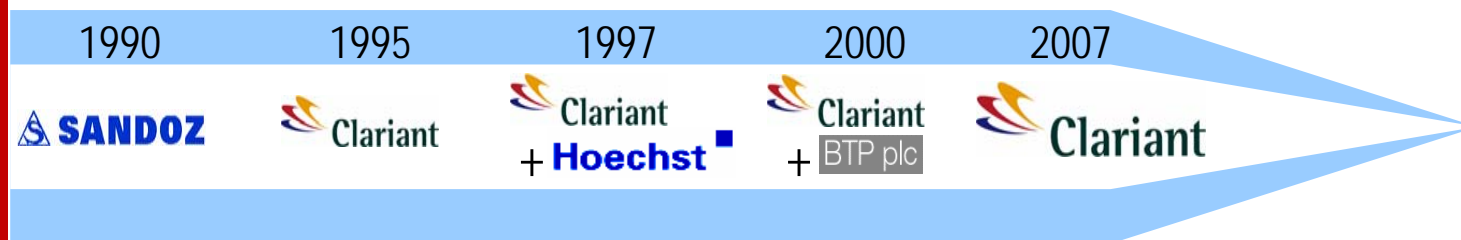
Product line



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

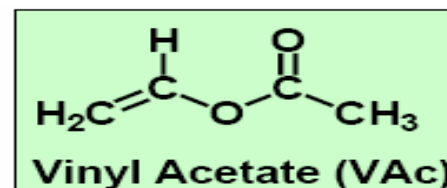
科莱恩乳液发展史

1912

赫斯特注册并开始生产乳液 **Mowilith®**

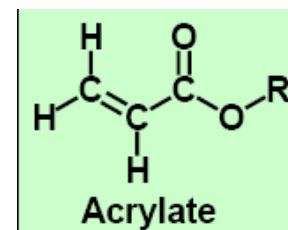
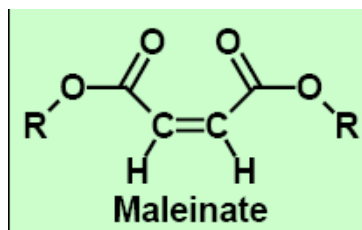
1934

赫斯特是第一个工业化生产聚醋酸乙烯乳液的公司



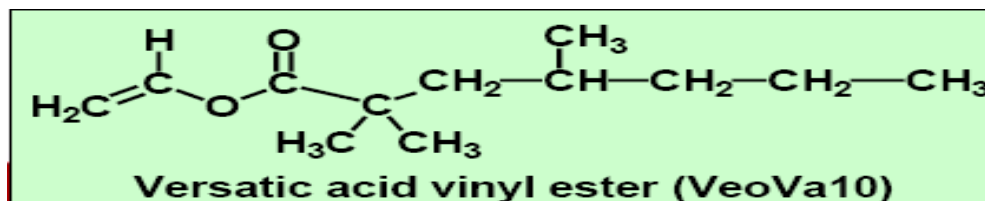
1950

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)



Polym
May 2

*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

Polymer Dispersions
May 25th, 2007

[®]Mowilith Emulsion for Wood coatings

木器塗料用乳液

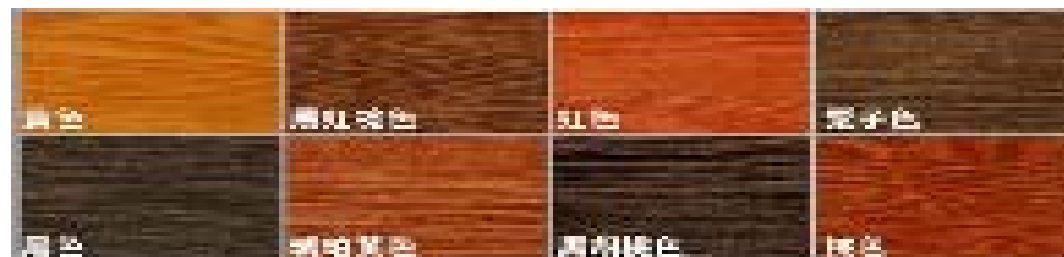


Exactly your chemistry.



Current Asian product range for wood coatings

product name	viscosity (BRF;RVT ; 27°C)- mPas	tsc (%)-	pH	Tg/MFFT (°C)	applications
Mowilith 727	500 – 1500 (2/20)	49 - 51	7.00 -8.00	28 / 25	varnish and lacquers
Mowilith 727 M	700 – 1500 (2/20)	49 - 51	7.50 -8.50	34 / 32	varnish and lacquers
Mowilith LDC 2088 S	9000 – 15000 (6/20,23oC)	49 - 51	2.80 - 3.50	27/4	2 components Sealers
Mowilith 772	4000 – 10000 (5/20,23oC)	45 - 47	8.00 – 9.00	25/12	Gloss paints, wood stains
Mowilith 777	100 – 300 (2/20,23oC)	45 - 47	8.00 – 9.00	24/15	Gloss paints, wood stains
Mowilith LDC 7766	10 – 90 (1/20)	33 - 35	8.00 – 9.00	7/0	Impregnating wood stains
Mowilith LDM 6150	3000 – 7000 (5/20,23oC)	47 - 49	8.00 – 9.00	18/18	Primers
<i>“core shell”</i>					
Mowilith LDC7154	2000 – 5000 (5/20)	46 - 48	8.00 -9.00	--- / 9	gloss paint wood stain
Mowilith LDC7064	500 - 2500 (3/20)	45 - 47	7.00-8.00	--- / 20	Parquet/furniture clear coatings



Mowilith LDC 2088 S

■ Characteristics:

An aqueous vinyl acetate dispersion with reactive groups. an isocyanate as crosslinker
on tannin-rich timber no discoloration is observed.

带活性基团的醋酸乙烯聚合物乳液，可与异氰酸酯交联，即使在富含丹宁的木材上也不会使面漆变色。

■ Recommended Use

2 components sealers, undercoats

以异氰酸酯为固化剂，配成水性 双组分封闭剂、底漆

Mowilith LDM 6150

■ Characteristics:

A plasticizer-free aqueous dispersion based on acrylic acid esters and styrene, Good barrier properties against coloured stains because of the migration of nicotine and tar from substrates that may cause a discolouration of the topcoat.

不含增塑剂的苯丙乳液,具有优良的阻隔性能,能防止因基材中含有尼古丁、焦油等而引起的面漆变色

■ Recommended Uses

Primers for wood, chip wood panels

木材、胶合板用封闭底漆,尤其适用于旧底材

Mowilith LDC 7766

■ Characteristics:

A plasticizer-free aqueous dispersion based on methacrylic acid ester and styrene

不含增塑剂的苯丙乳液

■ Recommended Uses

Penetration primer, impregnating wood stains

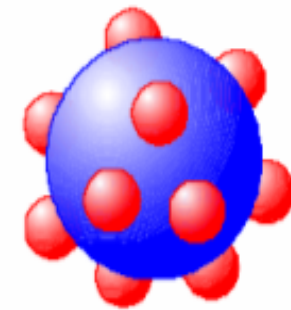
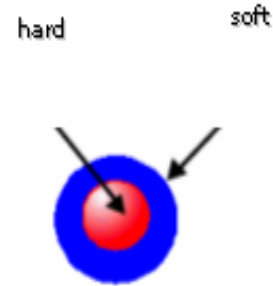
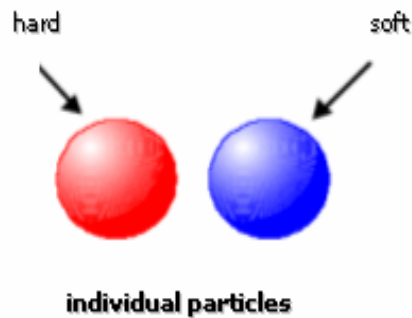
渗透底漆、木材着色剂



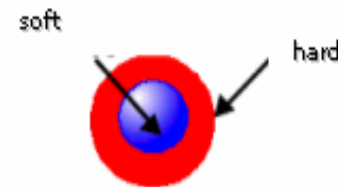
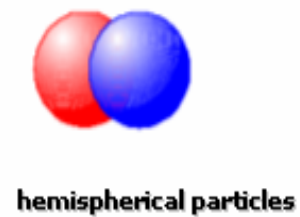
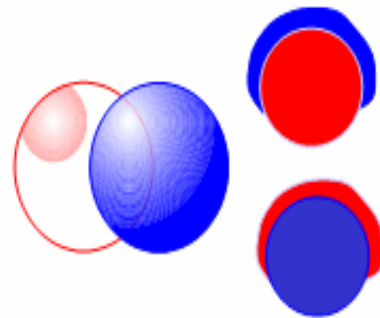
Mowilith LDC 7154

- APEO free “core shell” dispersions
不含“APEO”的核壳乳液
- good exterior durability 户外耐久性好
- good blocking resistance (self crosslinking by drying)
好的抗粘着性（干燥后自交联）
- good gloss properties (good wet adhesion)
高光泽(好的湿附着力)
- medium chemical resistance 中等耐化学性
- medium scratch resistance 中等耐擦性
- low solvent demand 助溶剂用量极少
- assisting rheological properties for spraying application
具有很好的流变性能
- transparent clear film 漆膜清澈透明
- good water resistance 耐水性能好

possible structures of latex particles **hard** or and **soft** polymer



„strawberry” morphology



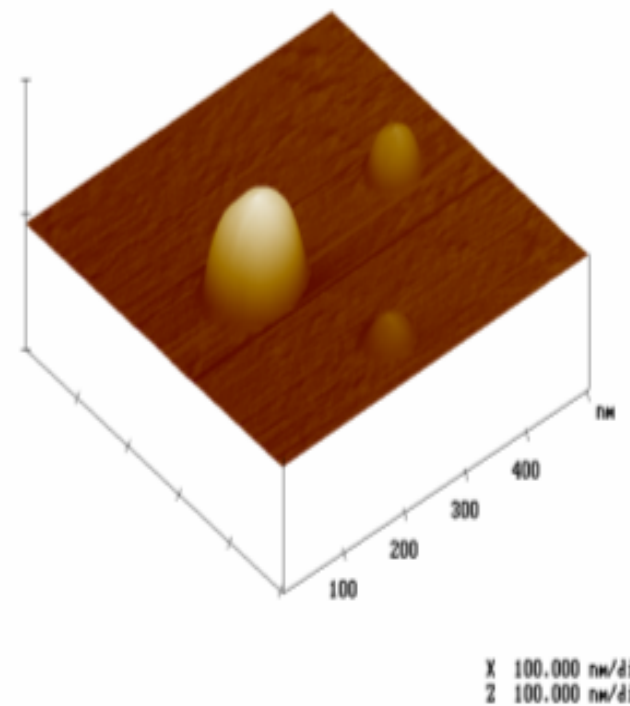
inverse core shell



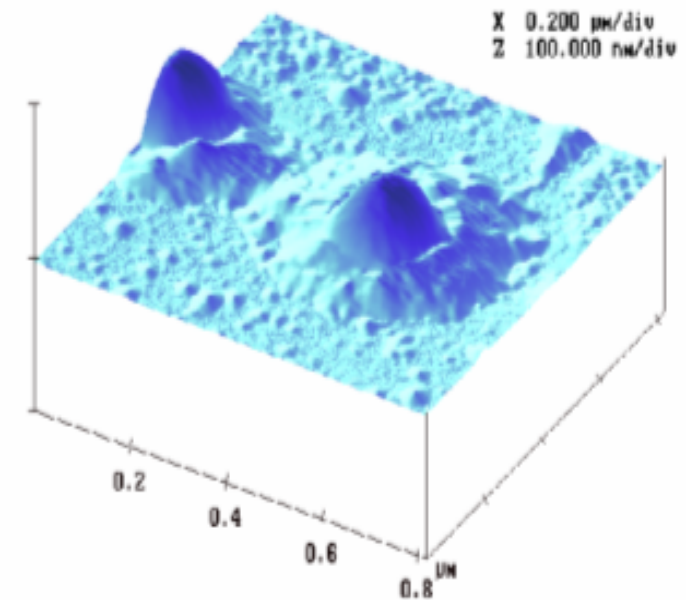
软/硬聚合物乳液颗粒的不同结构

AFM-pictures of single latex particles with **homogeneous (left)** and **„core shell“ (right)** morphology

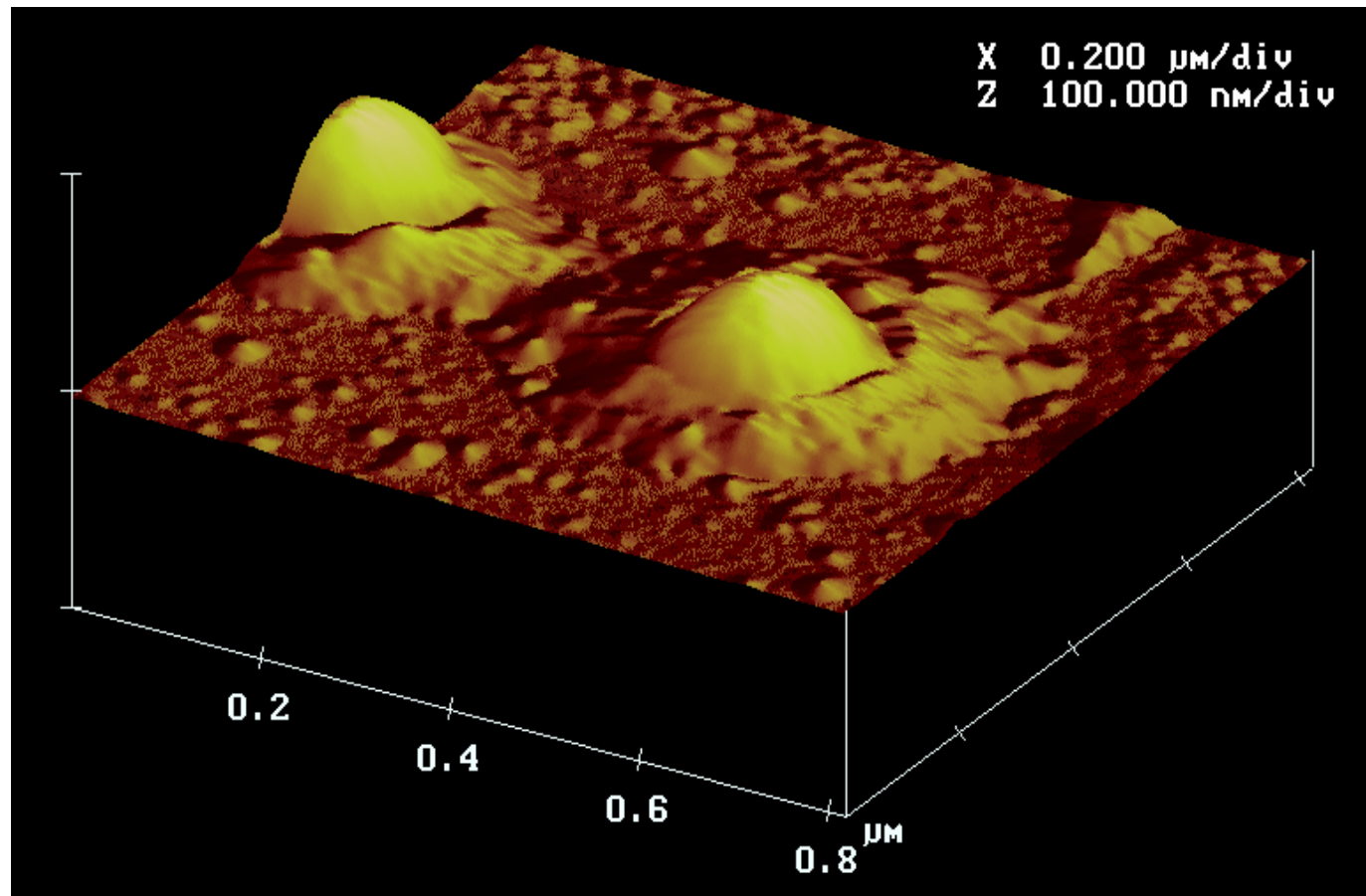
单个的普通（左）和核壳（右）乳胶粒子的显微照片



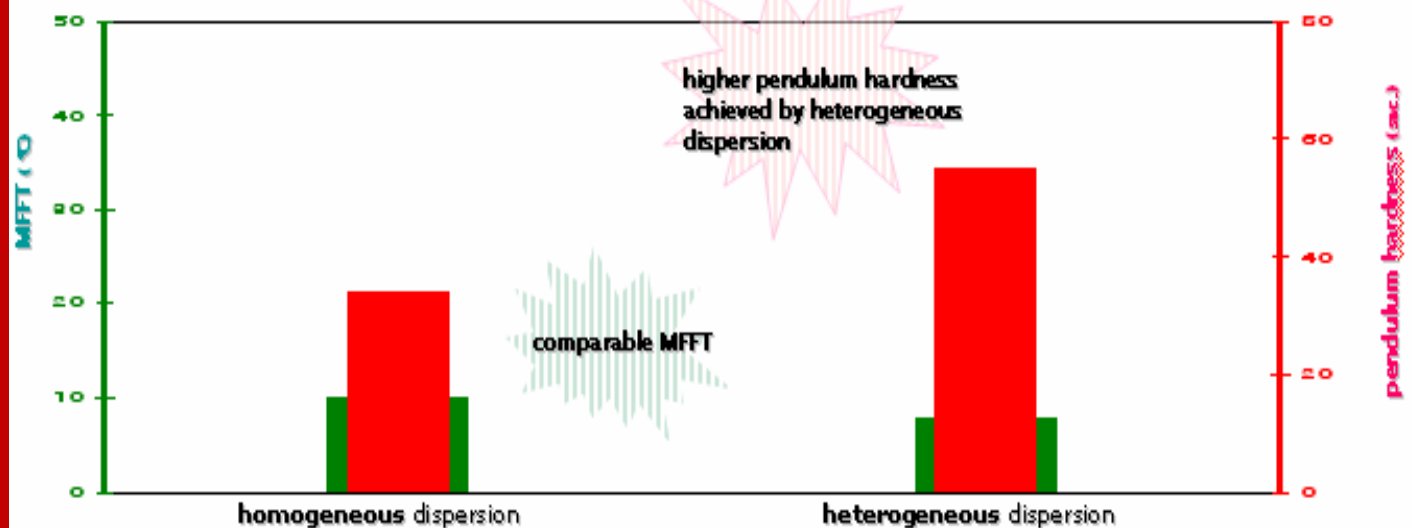
KRBMFT 59 Latex



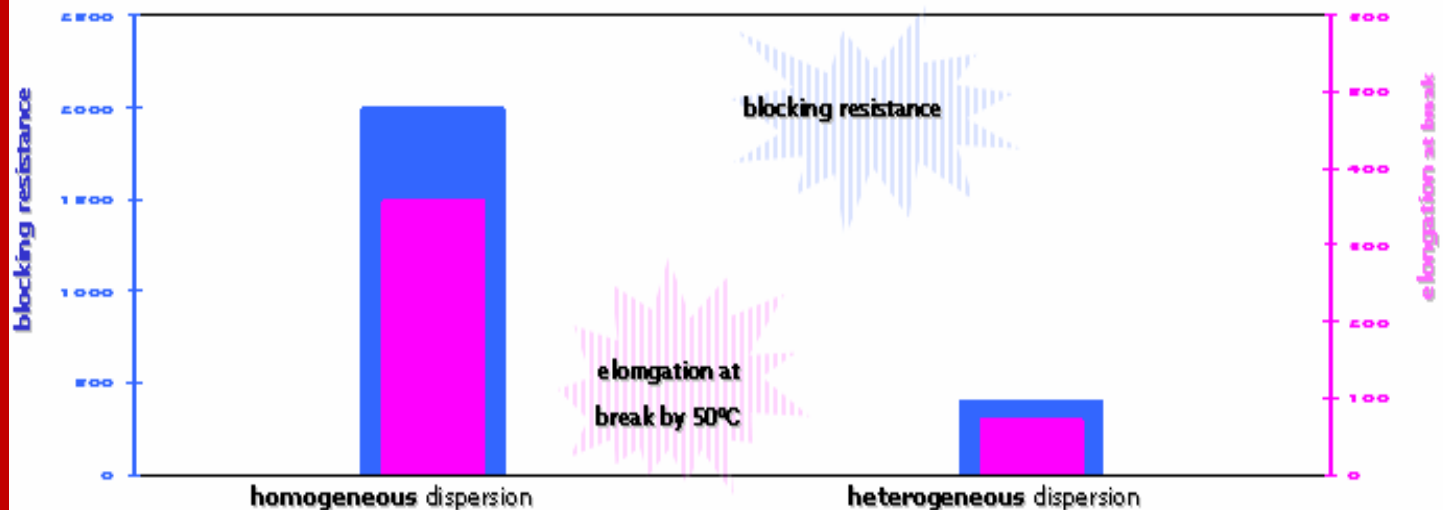
AFM-picture of single latex particles with core shell morphology



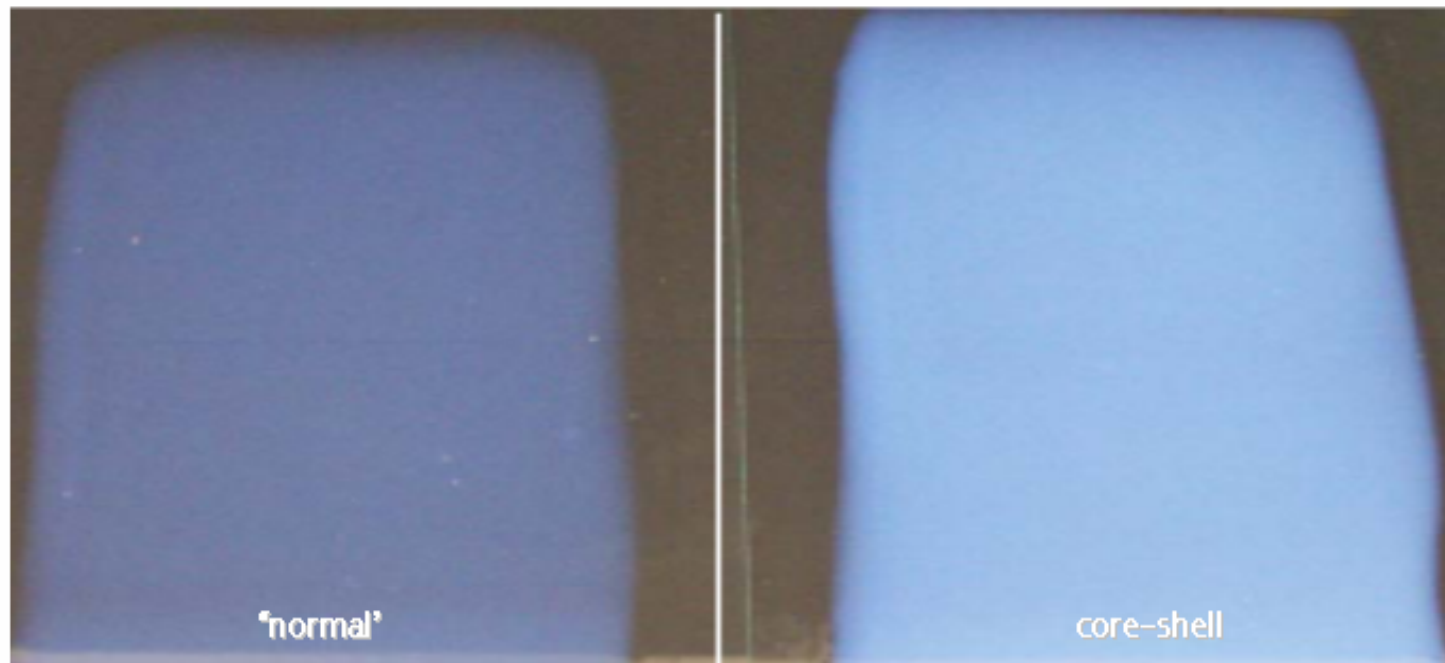
MFFT and pendulum hardness 最低成膜温度和摆杆硬度



blocking resistance and elongation 抗粘着性和延伸率



influence on drying behaviour 干燥性能



advantages of core-shell emulsions

- exhibit a much more uniform drying behavior
- remain opaque for a longer time during drying
- give very clear polymer film with a high gloss

核壳结构乳液优点

- 干燥均匀一致
- 干燥过程中开放时间长
- 光泽高，透明度好

*important where open time and high gloss ; good touch-up ,
glossy paints ...etc. are required*





Exactly your chemistry.

On wood after 10 years exposure

在木材上的10年曝晒测试情况



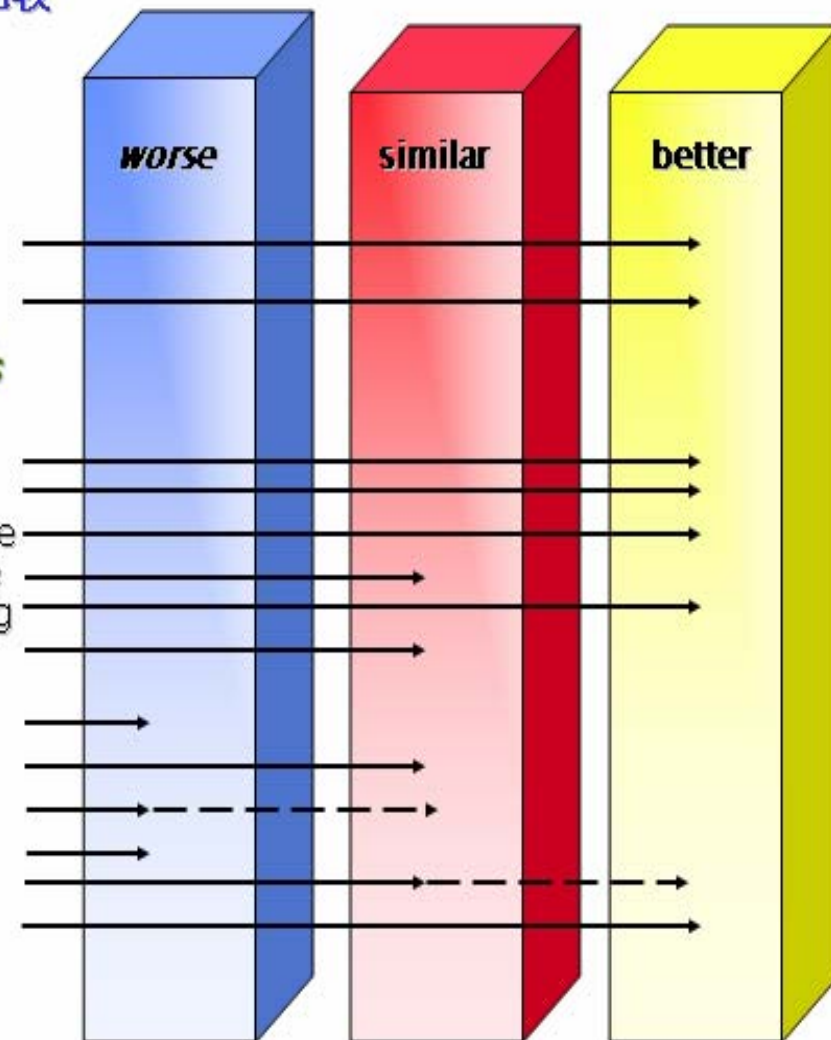
comparison of performance of an acrylate dispersion with alkyd resins
 丙烯酸乳液与醇酸树脂性能比较

exterior durability

- chalking 粉化
- hardening 硬化

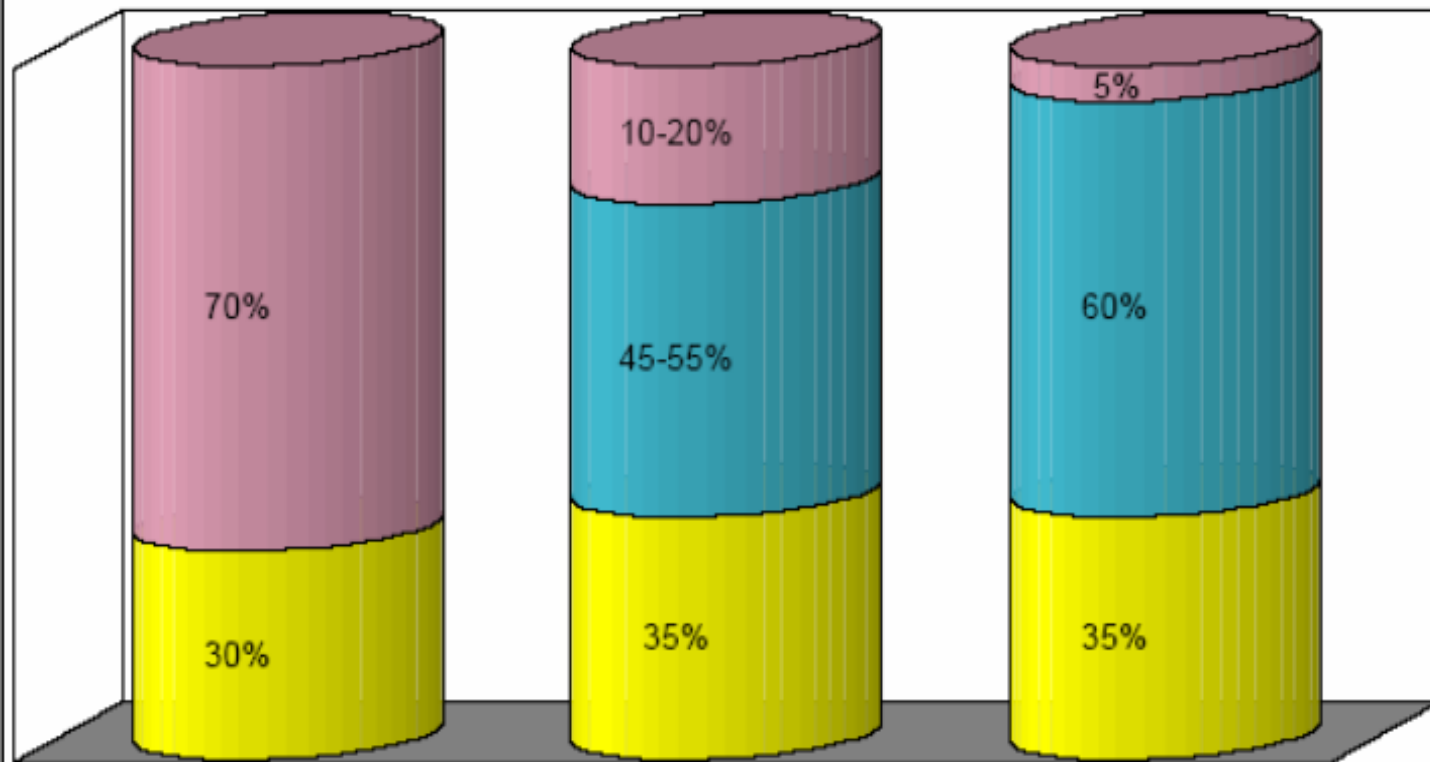
application properties

- odour 气味
- yellowing 黄变
- short term blocking resistance
- long term blocking resistance
- scratch resistance - beginning
- long term scratch resistance
- open time (wet edge)
- wet adhesion 湿附着力
- initial gloss 起始光泽
- sanding
- chemical resistance
- problem with cobalt



common comparison of **VOC** levels of furniture varnishes NC- vs water based- varnishes

■ solids content ■ water content ■ solvent content



NC varnish

water based varnish
homogeneous dispersions

water based varnish
heterogeneous dispersions

"clear" -VARNISH 清漆参考配方

(recipe on Lab scale)

			%
1. Mowilith LDC 7154	)	premix	75.50
2. Water	)		6.60
3. Water			1.00
4. Nipacide CFX3	(biocide)	)	0.20
5. 1,2-Propandiol	(solvent)	)	1.00
6. AMP 95	(pH stabilizer)	) premix	0.20
7. Mowiplus XW 330	(dispersing- + wetting- agent)	)	0.50
8. Texanol	(coalescing agent)	)	1.00
9. BYK 037	(defoamer)	)	0.20
10. Water		)	3.60
11. Denka UH 420	(PU-thickener)	) premix	0.30
12. Methoxybutanol	(solvent)	)	2.50
13. Aquacer 535	(wax emulsion)		1.50
14. Water	(viscosity adjustment)		5.90

			100.00

-this varnish can be tinted by adding Colanyl or Hostafine pigment dispersions (ex Clariant)

"gloss" paint 高光漆

(recipe on Lab scale)

		%
I> pigment pasta		
water		7.30
Mowiplus PDA40S	(dispersing agent)	1.20
AMP 95	(pH-stabilizer)	0.20
BYK 028	(defoamer)	0.10
Nipacide CFX3	(biocide)	0.20
ammonia		0.60
Propylene Glycol	(solvent)	8.50
Kronos 2300	(titanium dioxide)	25.00
II> let down		
Mowilith LDC 7154		50.00
add as a mixture		
Texanol	(coalescing agent)	1.50
BYK 028	(defoamer)	0.10
Denka UH 420	(PU-thickener)	0.50
add as a mixture		
Mowilith LDM7002	(acrylic thickener)	2.30
Water		2.50

		100.00

 before adding the pigment pasta into the dispersion check pH-value and adjust if necessary with ammonia to 8.50-9.00

▶▶ pH of the paint should be 8.50 – 9.00

"corrosion protection" primer 防腐底漆

(recipe on Lab scale)

I> pigment pasta

		%
water		6.80
Ser Ad FA 179	(dispersing agent)	0.15
Borchigel L75N (10%)	(thickener)	4.40
Surfinol SE-F	(dispersing- + wetting agent)	0.30
AMP-95	(wetting agent)	0.15
Mergal K 9N	(biocide)	0.20
Additol VXW4973	(defoamer)	0.30
<i>-premix-</i>		
Heucophos ZP10	(corrosion protection pigment)	6.40
Bayferrox 130M	(Fe-oxide red)	5.50
Micro talc AT extra		6.40
Millicarb	(calcium carbonate)	4.00

-pigments and fillers are added under continued slow stirring in the above mentioned sequence-

==> after complete addition the mixture is dispersed at high rotational speed (doughnut effect) for 20 min. to form the pigment pasta ,then cooled down to RT-

II> let down

Mowilith LDC 7154		47.45
Texanol	(coalescing agent)	2.00
Water		15.95

-premix-



add the pigment pasta under slow stirring into premix II
adjust pH with ammonia (12%) to pH 9.00

100.00

*tropical /humidity test



poor

good

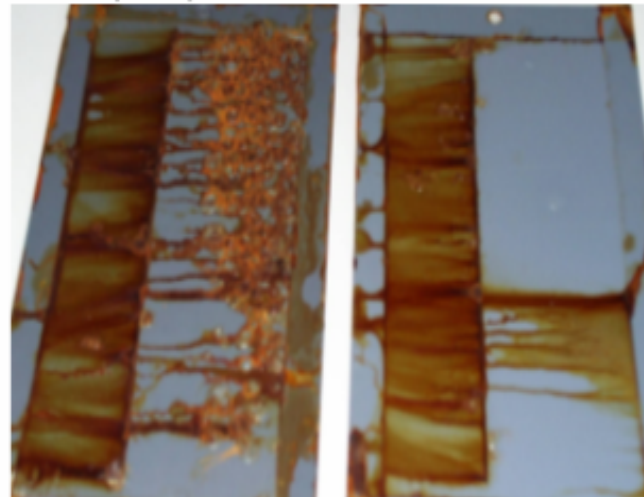


good

poor

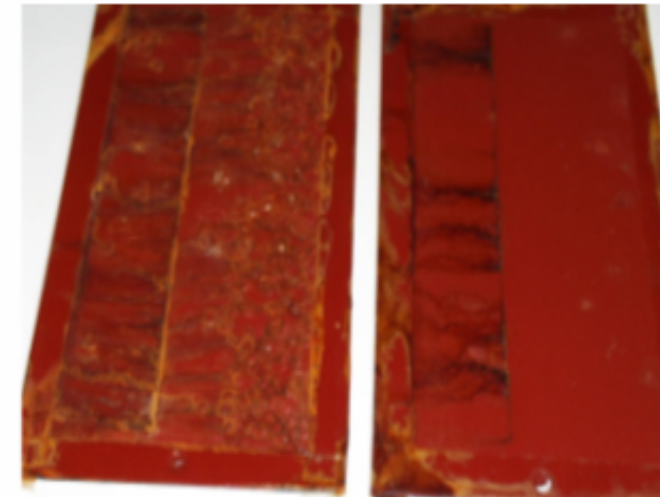
protection-

*salt-spray test



poor

good



poor

good

-protection-

Various application of Mowilith LDM 7154 其他各种应用



Nylon plastic 尼龙制品



Zinc 镀锌板

Adhesion on Alkyd paint substrate 在旧醇酸漆上的附着力比较

Adhesion test :
after 8 hrs drying in oven 60 °C



M. LDM 7154

The image shows a white substrate with a grid of yellow lines. The lines are clearly visible and well-defined, indicating good adhesion of the paint to the substrate.



Compet. 3

The image shows a white substrate with a grid of yellow lines. The lines are very faint and blurry, indicating poor adhesion of the paint to the substrate.



Compet. 2

The image shows a white substrate with a grid of yellow lines. The lines are very faint and blurry, indicating poor adhesion of the paint to the substrate.

Mowilith LDC 7064

- “core shell” dispersions 核壳乳液

■ application fields 应用领域

- especially suitable for the production of clear varnishes as well as pigmented coatings and enamels for industrial coatings (interior use).

水性工业漆的清漆、色漆、磁漆

- also be recommended to formulate clear coatings for wood (parquet and furniture) with good scratch resistance and good anti-blocking properties .

水晶地板漆、家具漆

- compatible with polyurethane emulsions increased flexibility and adhesion of the polymer film .

与聚氨酯乳液拼用可提高柔韧性和附着力

Clear varnish for wood, interior use

Ingredients		w.
Mowilith LDC 7064	premix	745
water		61
water	premix	10
Mergal k 10N(preservative)		2
Propandiol		10
AMP 95		2
Byk 348		5
Texanol		10
Agitan 295(defoamer)(Munzing Chemie GmbH)		2
Water	premix	36
Tafigel PUR 40(PU thickener)		3
Methoxybutanol		25
Aquacer 535(wax)(BYK)		30
water(to achieve viscosity)		59

1000

This varnish can be tinted by adding Colanyl pigmentdispersions(Clariant Chemical Ltd)

product profile of different dispersions in wood varnishes

dispersions type	solvent content	elasticity	blocking resistance	pendulum hardness / scratch resistance	sanding properties	chemical resistance
homogeneous MFFT ≤ 70°C	rel. high (> 10%)	-	++	++	+ / -	-
homogeneous MFFT ≥ 10°C	low	++	-	-	-	-
homogeneous MFFT ≤ 10°C	low (< 5%)	+	+	+	-	-
Mowilith LDM 7064	low (< 5%)	+ / -	++	++ / ++	+ (-)	+
NC-Varnish	very high	-	++	++ / ++	+	+ (-)

Mowilith LDM7064 will give low solvent containing furniture varnishes (clear varnishes) with good chemical-, scratch- and block resistance)



Exactly your chemistry.



Mowilith LDC 7064 透明度好，不使木材变色。



Exactly your chemistry.



*Exactly
Your
Chemistry*

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