


ELEMENTIS
SPECIALTIES

净味环保型及功能性建筑涂料
助剂最新进展与配方优化



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海名斯特殊化学
One-stop Total Solution Provider
一站式整体解决方案的伙伴

分水？热稳定性弱？

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原因：
A: PVC较高？
B: 流变助剂搭配不合理？
C: 体系低剪粘度较低？较弱的防沉性？体系对温度较敏感

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早期耐水性较弱？

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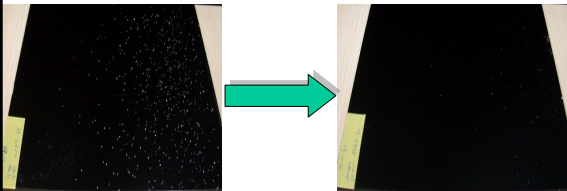


原因：
A: 乳液？流变助剂搭配不合理？
B: 表面活性剂的选择？

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抗飞溅性差？

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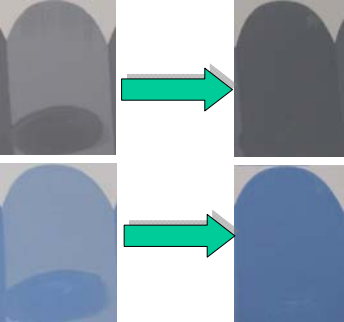


原因：
A: 流变助剂搭配不合理？

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浮色发花？展色性弱？

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原因：
基料？
A: 润湿？分散？
B: 流变助剂？
色浆？
A: 润湿剂的选择？

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RHEOLATE®
BENTONE®
THIXATROL®
NUOSPERSE®
RHEOX®
DAPRO®
TINT-AYD®

NUOSPERSE®

Wetting and Dispersing Agents /
润湿分散剂

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Dispersing and Wetting Agents

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- Dispersing agents/分散剂**
 - Dispersing agents are additives that provide optimal stability of pigment particles by **charge** and/or **steric** stabilization/通过空间位阻或电荷稳定颜填料
- Wetting agents/润湿剂**
 - Wetting agents reduce the interfacial tension and improve pigment surface wetting/降低表面张力，提高表面润湿

(Many surfactants function as both)



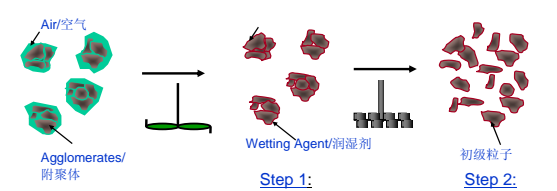
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润湿分散机理

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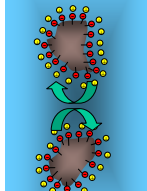
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Stabilisation/稳定机理

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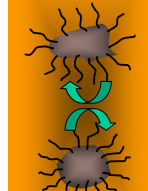
- 电荷稳定




Anionics Polymeric

Only in polar medium - like water

- 空间位阻



Nonionics Polymeric



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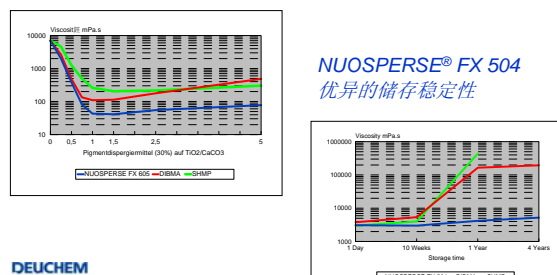
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分散剂测试- 乳胶漆

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Pigment dispersant demand curve/分散剂需求量测试 NUOSPERS® FX 605





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NUOSPERS® FX 504
优异的储存稳定性

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Stability Test at 60°C/稳定性测试

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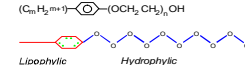
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NUOSPERS® FN 265 润湿剂

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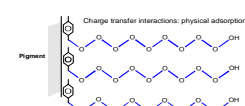
Alkyl Phenol Ethoxylate

- HLB Value = 13 - 14

$$(C_{18}H_{37}O) \text{---} \text{C}_6\text{H}_4 \text{---} (\text{OCH}_2\text{CH}_2)_n\text{OH}$$


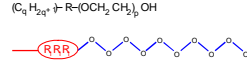
Lipophylic Hydrophilic

• π - Electrons

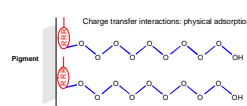


NUOSPERS FN 265


- Modified Alkyl Ethoxylate
- APE free

$$(C_{18}H_{37}) \text{---} R \text{---} (\text{OCH}_2\text{CH}_2)_n\text{OH}$$


Lipophylic Hydrophilic



• Wetting
• Steric stabilization



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NUOSPERSE® FN 265 ELEMENTIS

- 特征
 - 90% , 不含APE 非离子型润湿剂
 - 有效降低表面张力, 低起泡性能:
- 优点
 - 为疏水及亲水型颜填料提供良好的润湿, 优异的展色性能及色浆相容性
 - 提高涂料的储存稳定性
 - 降低消泡剂的用量
 - NO-VOC



competitor / NUOSPERSE® FN 265 / Nonyphenol 10EO

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良好的低温稳定性 ELEMENTIS



Competitor NUOSPERSE FN 265 Competitor NUOSPERSE FN 265 Competitor NUOSPERSE FN 265

75 °F / 23 °C 60 °F / 16 °C 40 °F / 4 °C

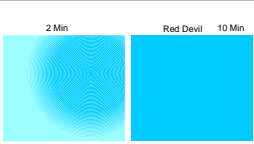
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Wetting problem / 润湿问题
Colour Development Test: Dispersion paint. ELEMENTIS

问题: 2 Min Red Devil 10 Min



解决方案: Add 0.5% NUOSPERSE FN 265

2 Min Red Devil 10 Min




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怎样解决色浆相容性问题 ELEMENTIS

- Selecting a *nonionic* additive with the proper HLB to improve wetting (additive should have similar HLB to the paint system) /选择非离子表面活性剂提高基料润湿
- Selecting the proper, mostly *anionic*, hydrophilic surfactant for universal colorants and more hydrophobic *anionic* surfactant for non-polar colorants to improve dispersion/选择阴离子型表面活性剂, 提高展色性能



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水性体系用流变助剂 ELEMENTIS

- RHEOLATE®
- BENTONE®
- THIXATROL®
- NUOSPERSE®
- RHEOX®
- DAPRO®
- TINT-AYD®

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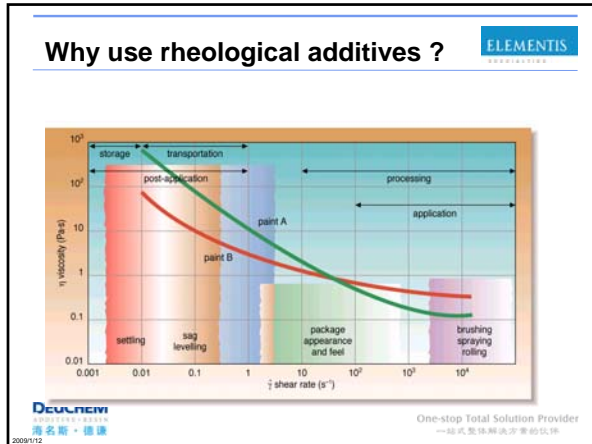
Why use rheological additives ? ELEMENTIS

- Sag – control/抗流挂
- Anti – settling/防沉
- Spatter – resistance/抗飞溅
- Easy application/易添加
- Levelling...../流平

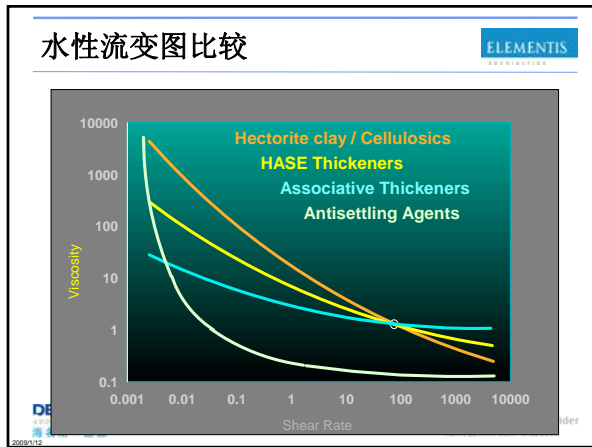
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- ### 水性流变助剂分类
- 纤维素类 (HEC)
 - 锂蒙脱石/蒙脱石类 (Clay based)
 - 丙烯酸碱溶胀型 (ASE)
 - 疏水改性丙烯酸碱溶胀型 (HASE)
 - 聚氨酯缔合型 (PEUPU)
 - 聚醚聚氨酯类缔合型 (PEPO)
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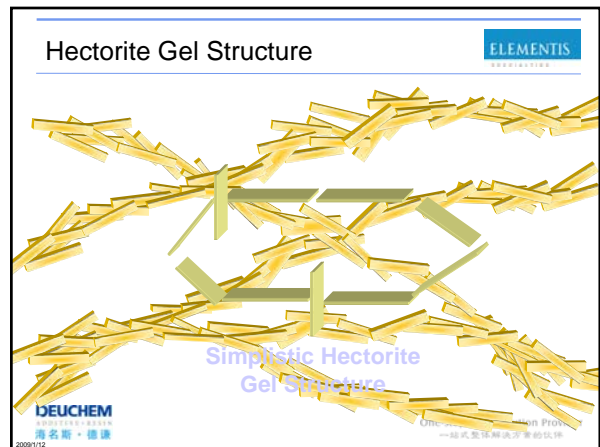


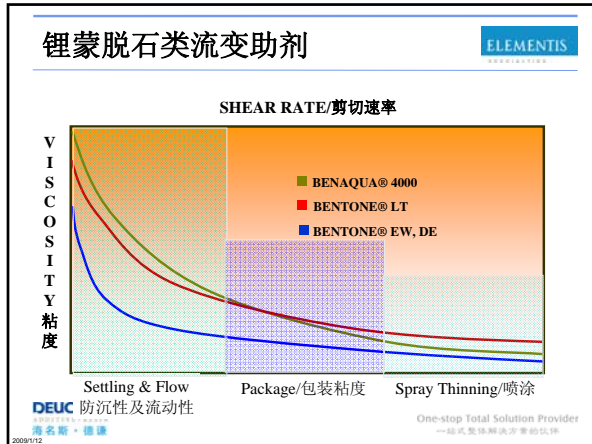
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BENTONE®
THIXATROL®
NUOSPERSER®
RHEOX®
DAPRO®
TINT-AYD®

BENTONE®
Hectorite Clay Based Thickener
/ 锂蒙脱石增稠剂

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- ### BENTONE Clay Thickeners
- Key Properties/主要性能
- ✓ high low shear viscosity/较高的低剪粘度
 - ✓ good sag-resistance/优秀的抗流挂性
 - ✓ good scrub-resistance//优异的耐洗刷性
 - ✓ efficient suspension control/极佳的悬浮性
 - ✓ fast water release/快速释放水分
 - ✓ Improve syneresis 改善分水
 - ✓ Reducing viscosity change with change in temperature .
降低涂料由于温度引起的粘度变化
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锂蒙脱石类流变助剂

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BENTONE® DE

- 超易分散型锂蒙脱石
- 可制备更高固含的预凝胶 (10-14%)
- 对铝粉和珠光粉提供优异的悬浮性；同时具有极佳的定向排列性能
- 优异的抗分水性
- 对光泽的影响更小

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锂蒙脱石类流变助剂

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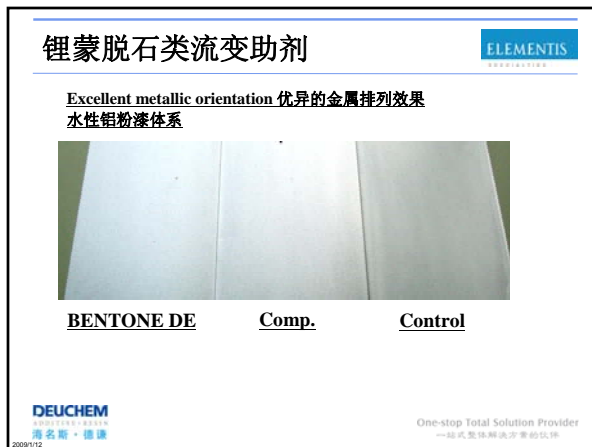
Ease of Dispersion/易分散性

| | BENTONE® EW | BENTONE® DE |
|---------------------|-------------|-------------|
| Milling Time (mins) | 4% pregel | 14% pregel |
| 2 | 65 μm | 12 μm |
| 5 | 65 μm | 12 μm |
| 20 | 50 μm | 12 μm |
| 40 | 30 μm | 12 μm |
| 60 | 25 μm | 12 μm |

Dispermat 40mm @ 3000rpm

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锂蒙脱石类流变助剂

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BENAQUA® 4000 –

聚合物改性锂蒙脱石

- ✓ 优异的剪切稀化性能与雾化性能
- ✓ 出色的低剪粘度与抗流挂性能
- ✓ 适合于复层涂料、腻子、瓷砖粘结剂、真石漆、内墙质感涂料

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锂/蒙脱石类流变助剂

BENAQUA 4000 - Sag resistance

Original Reference Material

BLANK

Reference Material with 0.07% BENAQUA 4000 added to % of original (Other same)

BENAQUA 4000 0.07%

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锂/蒙脱石类流变助剂

BENAQUA 4000 / RHEOLATE 150

| Application by | 5 |
|----------------|-------|
| Rotary Spoon | 5 |
| Spindle # | 5 |
| 6 rpm | 51196 |
| 12 rpm | 34030 |
| 30 rpm | 20660 |
| 60 rpm | 13960 |
| T.I | 3.67 |

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Alkali Swellable Acrylic Thickeners / 丙烯酸碱溶胀型流变助剂

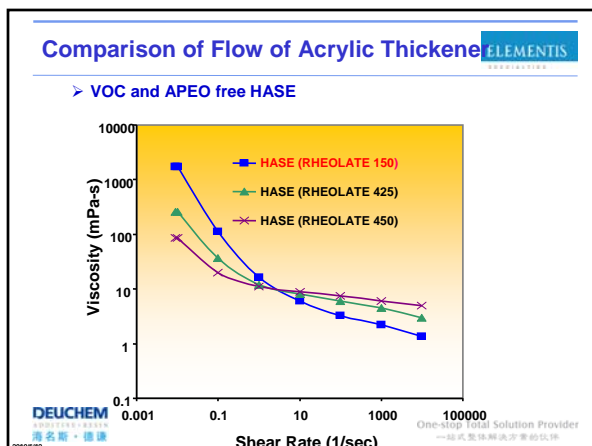
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HASE Thickening Mechanism

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RHEOLATE 150

PHYSICAL PROPERTIES/物理性能

| | |
|---------------------------|--------------------------|
| Composition/组成 | Acrylic emulsion / 丙烯酸乳液 |
| Appearance/外观 | Milky white/奶白色 |
| Non-volatile content/不挥发份 | 28.5-31.5% |
| Solvent/溶剂组成 | Water/水 |

APE Free, VOC Free

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RHEOLATE 150

KEY PROPERTIES/主要性能

- Excellent dilutability/优异的稳定性
- To provide high viscosity in low shear rate./提供低剪切粘度
- Efficient develops package viscosity/有效包装粘度
- Reduces spattering during roller application/抗飞溅
- Provides excellent sag and anti-settling resistance/抗流挂与防沉
- Liquid form and low viscosity - easy incorporated/易添加
- APEO (alkyl phenol ethoxylate) free and solvent free./不含APEO 和溶剂
- Good compatibility with generally water borne resin /同水性树脂有良好的相容性
- Reduces syneresis./抗分水

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RHEOLATE 150

Application: 75%PVC 内墙涂料 -100KU

**RHEOLATE 150 :
RHEOLATE 278=1:1**

System 2: 75% PVC interior wall paint system based on styrene acrylic emulsion
Initial Stomter viscosity: 100KU

| Results | RHEOLATE® 150 | HEC 30000 | HEC 25000 | RHEOLATE® 150/RHEOLATE® 278 | RHEOLATE® 150/RHEOLATE® 278 | HEC 30000/RHEOLATE® 278 | HEC 25000/RHEOLATE® 278 |
|---|---------------|------------|------------|-----------------------------|-----------------------------|-------------------------|-------------------------|
| Loading Time | 1:15 | 0:40 | 0:47 | 0:57:22 | 0:57:22 | 0:57:22 | 1:05:18 |
| Stomter viscosity KU | 115.8 | 109.8 | 109.1 | 109.1 | 109.1 | 109.4 | 109 |
| Breakdown viscosity CPS @ 10 rpm, 150 rpm | 20000/4000 | 30000/3000 | 20000/4470 | 18000/3000 | 19000/3700 | 6040/2200 | 3040/2004 |
| SD viscosity P | 0.89 | 1.32 | 1.19 | 0.92 | 1.11 | 0.94 | 1.06 |
| Leveling property | ○ | ✗ | ✗ | ○ | ○ | ○ | ○ |
| Flow Property | ○ | ✗ | ✗ | ○ | ○ | ○ | ○ |
| Color development | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Storage stability, aging test (two weeks) | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Spatter resistance | ○ | ✗ | ✗ | ○ | ○ | ○ | ○ |
| Syneresis resistance | ○ | ✗ | ✗ | ○ | ○ | ○ | ○ |

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RHEOLATE 150

Application: 40%PVC 外墙涂料体系 -100KU

System 3: 40%PVC Exterior Wall Paint system based on pure acrylic emulsion
Initial Stomter viscosity: 100 KU

| Results | RHEOLATE® 150 | RHEOLATE® 150/RHEOLATE® 278 | HEC 30000/RHEOLATE® 278 | HEC 25000/RHEOLATE® 278 |
|---|---------------|-----------------------------|-------------------------|-------------------------|
| Loading Time | 0:22/0:26 | 0:40/0:4 | 0:1/0:32 | 0:1/0:29 |
| Stomter viscosity KU | 110.3 | 116.6 | 112.6 | 115.9 |
| Breakdown viscosity CPS @ 10 rpm, 150 rpm | 9160/3404 | 15020/4980 | 14440/4630 | 16720/4620 |
| SD viscosity P | 0.865 | 1.1 | 0.875 | 0.922 |
| Leveling property | ○ | ○ | + | + |
| Flow Property | ○ | ○ | + | + |
| Color development | ○ | ○ | ○ | ○ |
| Storage stability, aging test (two weeks) | ○ | ○ | ○ | ○ |
| Syneresis resistance | ○ | ○ | + | + |

**RHEOLATE 150 :
RHEOLATE 278=1:1**

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RHEOLATE 150

Comparison of dilution stability in 75% PVC Styrene Acrylic Interior Wall Paint based on 998A

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RHEOLATE 150 Versus HEC

75% PVC emulsion system

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RHEOLATE 150 Versus HEC

75% PVC BATF RS-998A 苯丙乳液内墙涂料中
Spatter Resistance Test/抗飞溅测试

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RHEOLATE 150

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Storage stability test/储存稳定性 (50°C after 7 days)

RHEOLATE 150 HEC 1 HEC 2 HEC 3

Reduced syneresis/降低分水

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RHEOLATE 150 Versus HEC

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75% PVC emulsion system, Leveling Test

RHEOLATE 150 HEC 2

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Formula 2: 40%PVC Exterior Wall Paint

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Stormer Viscosity@KU in 40%PVC exterior wall paint system

| | R-150/R278 | R-150/R-212 | R-425/R-278 | HEC2/R-278 | HEC3/R-278 | HEC5/R-278 |
|-----------------------|------------|-------------|-------------|------------|------------|------------|
| Initial@25°C | ~110 | ~130 | ~110 | ~110 | ~110 | ~110 |
| Stormer viscosity, KU | 0.22 | 0.45 | 0.2 | 0.1 | 0.1 | 0.1 |
| RHEOLATE 278 or 212 | 0.26 | 0.4 | 0.26 | 0.32 | 0.29 | 0.31 |

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Formula 2: 40%PVC Exterior Wall Paint

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Chart 2: Brookfield Viscosity, CPs

Brookfield Viscosity@CPs, overnight, in 40% PVC exterior wall paint system

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Formula 3: Flexible Texture Coatings

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RHEOLATE 150 & BENAQUA 4000

Application by
foaming
Roller (1-poor, 8-
good)

| | |
|----------------|-------|
| Spindle, # | 5 |
| 0 rpm | 51160 |
| 12 rpm | 34630 |
| 30 rpm | 20660 |
| 60 rpm | 13060 |
| T ₁ | 0.67 |

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RHEOLATE 150 VS ASE

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Stormer viscosity, KU, in 75% PVC interior wall paint system

较少的添加量
优异储存稳定性

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RHEOLATE® HASE thickeners

RHEOLATE 425

- 30% active matter 30% 疏水改性丙烯酸碱溶胀型增稠剂
- APE and VOC Free 环保型, 不含 APE 和VOC,
- Low odor 低气味
- To provide excellent Stormer KU viscosity and ICI viscosity build. 提供良好的Stormer 粘度及ICI 粘度
- Reduces spattering during roller application 优异的抗飞溅性能
- Provides good balance of sag control and leveling 在抗流挂与流平之间保持良好的平衡
- Excellent color development. 优异的展色性
- Reduces syneresis. 降低分水现象
- Recommended for medium PVC emulsion paint system 适用于中PVC建筑涂料

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一站式整体解决方案的伙伴

RHEOLATE® 425

Early Blistering Resistance Test
早期耐水起泡性测试

HASE HEC

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一站式整体解决方案的伙伴

RHEOLATE® 425

Better Leveling
最佳的流平性-

抗分水-更优异的热储存稳定性
(2周后, 50度热储)

RHEOLATE 425 HEC HEC RHEOLATE 425

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RHEOLATE® 425

Spatter Resistance 优异的抗飞溅性能

HEC RHEOLATE 425

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RHEOLATE® 425

Flow 动态曲线-

HEC RHEOLATE 425

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RHEOLATE® 425

45% PVC NO-VOC 内墙涂料体系

Stormer viscosity, KU in 45% PVC NO-VOC Interior Wall Paint System

| Product | Stormer viscosity, KU |
|----------------|-----------------------|
| RHEOLATE 425 | ~100 |
| RHEOLATE 425 | ~100 |
| RHEOLATE 425 | ~100 |
| Competitor 1 | ~100 |
| Competitor 2 | ~100 |
| De-urtho WFT16 | ~100 |

EcoVAE™ 1608
Loading: 0.75%wt

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RHEOLATE® 425 ELEMENTIS

45% PVC NO-VOC 内墙涂料体系
Color Development 展色性比较-碳黑色浆

RHEOLATE 425 取得最佳的展色性能 色浆添加量: 2%wt

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RHEOLATE® 425 ELEMENTIS

45% PVC NO-VOC 内墙涂料体系
Color Development 展色性比较-铁红色浆

RHEOLATE 425 取得最佳的展色性 色浆添加量: 5%wt

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Polyurethane Associative Thickeners /PEUPU缔合型增稠剂 ELEMENTIS

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环保型PEUPU缔合型流变助剂 ELEMENTIS

不含 APE
不含 VOC
不含锡

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环保型PEUPU缔合型流变助剂 ELEMENTIS

不含APE, VOC 和锡

- RHEOLATE® 644** - 25%固含, 提供较高剪切粘度
- RHEOLATE® 678** - 25%固含, 提供中高剪切粘度
- RHEOLATE® 655** - 20%固含, 提供中剪切粘度
- RHEOLATE® 666** - 20%固含, 提供中低剪切粘度, 适合于喷涂体系
- RHEOLATE® 212** - 20%, 提供牛顿型流动状态 / 高剪切粘度

聚氨酯缔合型增稠剂

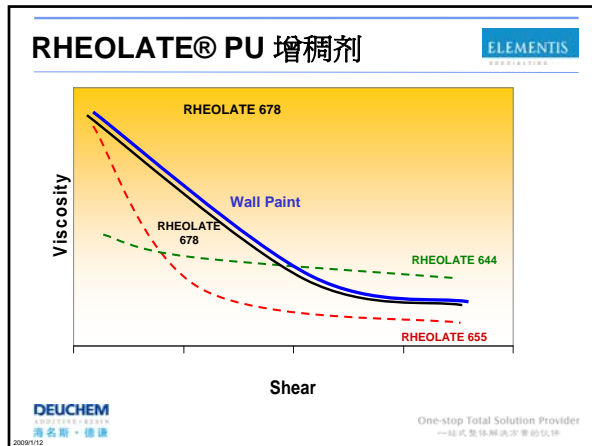
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环保型PEUPU缔合型流变助剂 ELEMENTIS

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RHEOLATE® PU 增稠剂

PEUPU(聚氨酯型缔合型)

RHEOLATE® 212
RHEOLATE® 644
RHEOLATE® 678
RHEOLATE® 655
RHEOLATE® 666

更佳亲水
更高 ICI 粘度
对中剪切粘度影响更小

更佳疏水
更佳的剪切稀化
更有效地提高中剪切粘度

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NO-VOC 内墙涂料体系

推荐于NO-VOC净味型涂料中——

- RHEOLATE® 212
提供牛顿性流体，同时提供最佳的展色性能
- RHEOLATE® 644
获得良好的斯托默粘度与ICI粘度，优异的展色性能
- RHEOLATE® 678
在较低的添加量时，获得较高的斯托默粘度和较高的ICI粘度，同时提供优异的展色性能

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RHEOLATE®
BENTONE®
THIXATROL®
NUOSPERS®
RHEOX®
DAPRO®
TINT-AYD®

DAPRO® DF 7000 系列消泡剂

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DAPRO® DF 7000 系列

采取独特的生产技术

使活性疏水基
稳定地分散在
矿物油载体中

稳定性
高效性
批次稳定性

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DAPRO® DF 7000 系列

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超稳定型, 不含 APE及VOC

DAPRO DF 7010

- > 矿物油/蜡/有机硅
- > 各种 PVC 系统
- > 优异的稳定型
- > 极佳的消泡抑泡性
- > 良好的成本效益
- > 较少的漆膜缺陷

DAPRO DF 7015

- ✓ 矿物油/蜡/有机硅
- ✓ 中、低 PVC 系统
- ✓ 优异的稳定型
- ✓ 极佳的消泡抑泡性
- ✓ 乳化型, 易分散, 适合后添加
- ✓ 适合于色浆、研磨浆系统, 优异的耐热稳定性

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DAPRO DF7000系列评估

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鼓泡法-PA237纯丙乳液体系
---消泡剂添加量: 0.3%

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DAPRO® DF 7000 系列

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Loading: 0.3%wt

Defoaming test, in 30% PVC latex paint system based on 296D

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一站式整体解决方案的伙伴

DAPRO® DF 7000 系列

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Loading: 0.3%wt

Defoaming test, in 75% PVC Latex Paint system Based on BATF 998A

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一站式整体解决方案的伙伴

DAPRO® DF 7000 系列

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弹性拉毛体系的抑泡效果

DAPRO DF 7010

CONTROL

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一站式整体解决方案的伙伴

50% PVC NO-VOC内墙涂料体系

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DAPRO DF 7000 series defoamers in low voc 50% PVC interior wall paint system .0.3% by wt - Celvolit 1608-Celanese

DAPRO DF 7010 最佳的储存稳定性

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一站式整体解决方案的伙伴

50% PVC NO-VOC内墙涂料体系 ELEMENTIS

Blank DAPRO DF 7015 DAPRO DF 7010

DAPRO DF 7005 Defom W-092 Competitor 6

2009/1/12

Summary/小结 ELEMENTIS

NUOSPERSE FN 265 -环保型非离子型润湿剂
NUOSPERSE FX605 -环保型聚丙烯酸钠盐分散剂
DAPRO DF 7010/7015 -超稳定型消泡剂
RHEOLATE 212/644/678 -环保型聚氨酯缩合型增稠剂
RHEOLATE 150/425 -环保型丙烯酸碱溶胀型增稠剂
BENAQUA 4000 -改性锂蒙脱石, 适合于厚浆型涂料
BENTONE DE -易分散型锂蒙脱石, 适合于水性金属涂料

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一站式整体解决方案提供商

2009/1/12

ELEMENTIS

Thank You !!

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