

水性平台2013

“电子产品先进设计概念与环保涂料论坛”

2013年11月14日，深圳



话题： Waterborne technology innovation for 3C
3C水性涂料创新技术

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水性平台会员单位代表

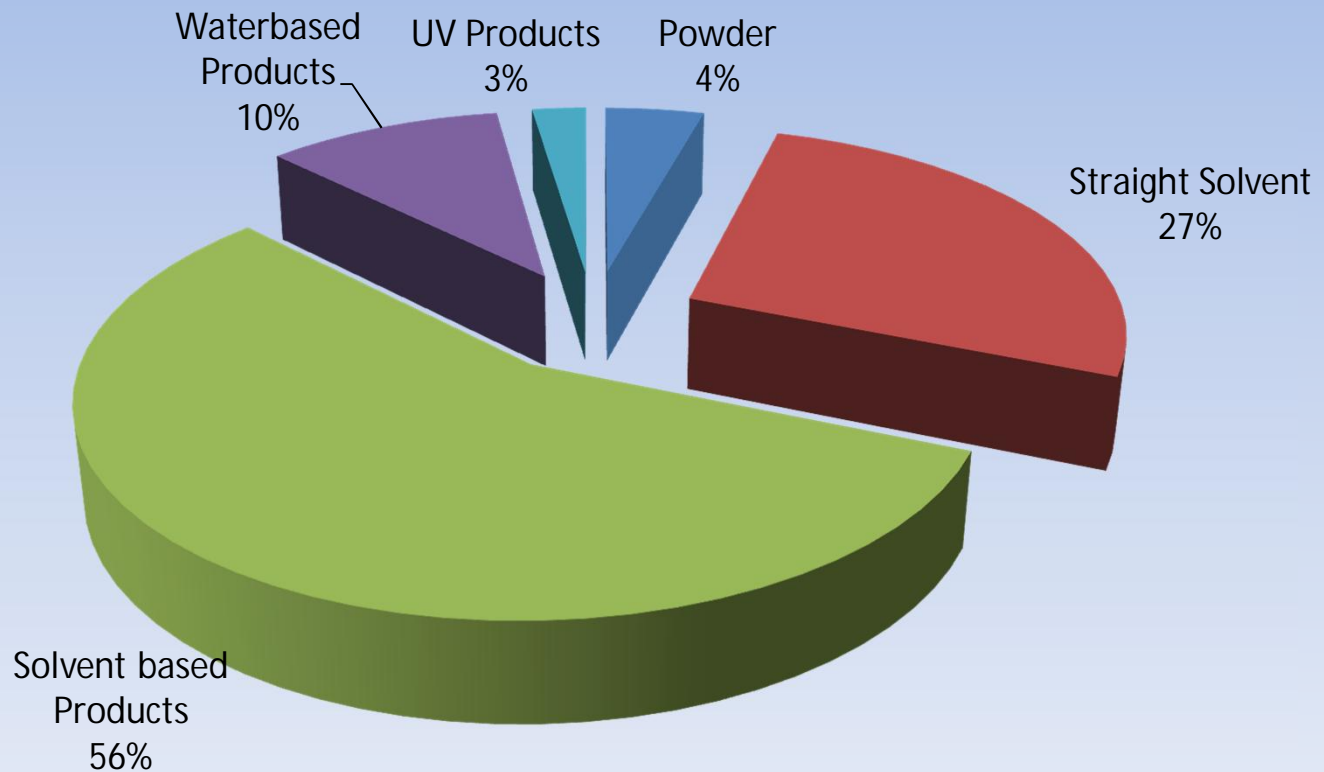


Topic

- **New technology trend**
新技术趋势
- **Application of waterborne products**
水性涂料的应用
- **Waterborne 3C products**
3C水性涂料
- **Innovation technology for 3C**
3C 技术创新
- **Questions?**
提问?

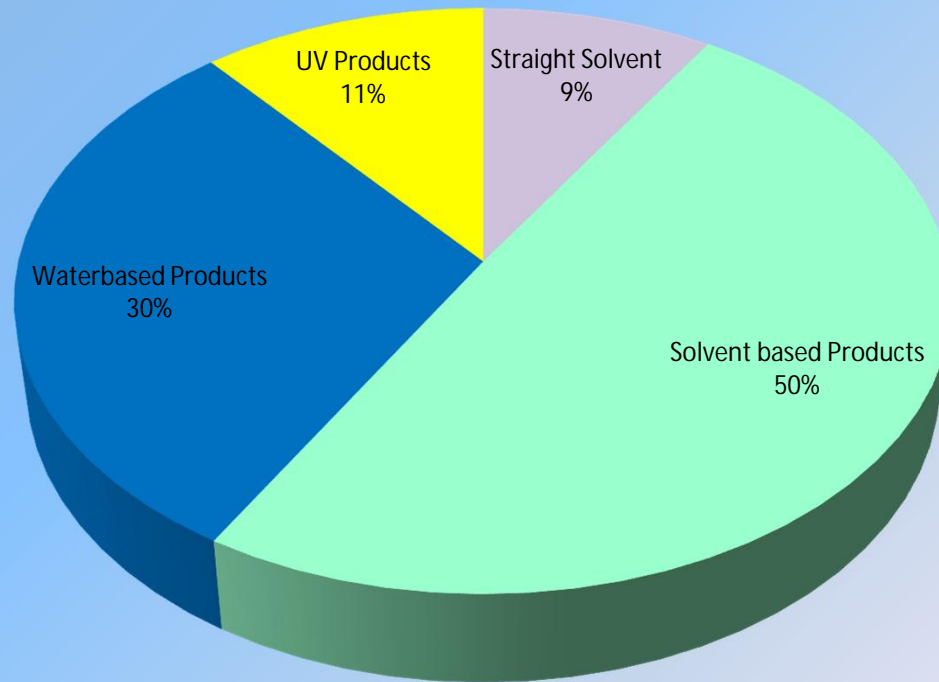
Asia Finished Goods

ASIA- 2012 FINISHED GOODS



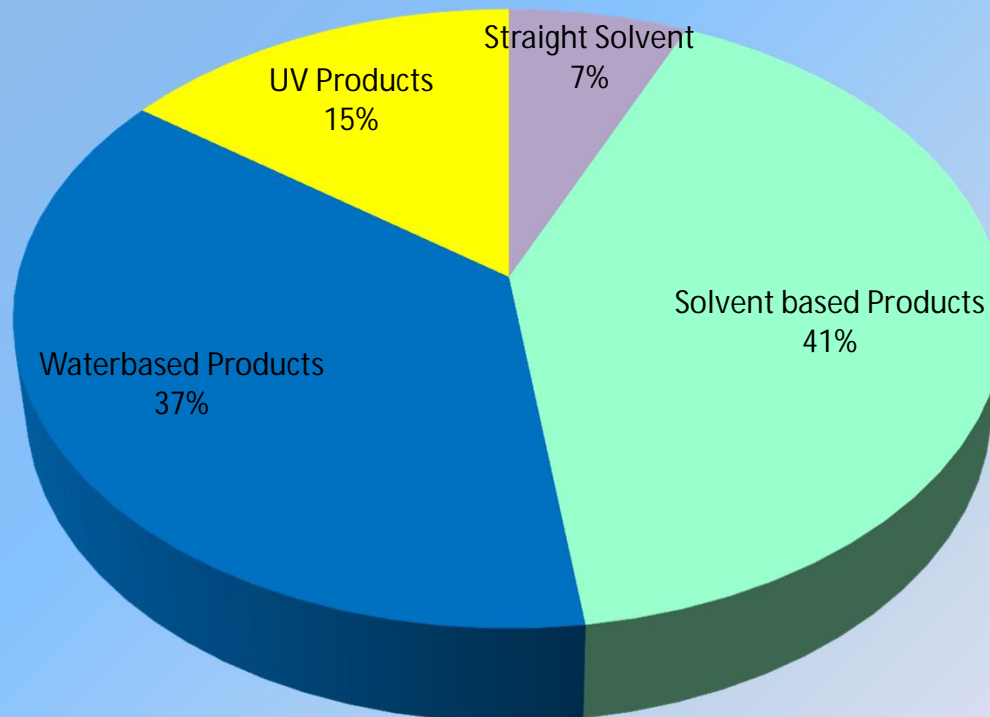
2012 Europe Finished Goods Technologies

Europe- Finished good by Technology
Jan- June 2013



2013 Europe Finished Goods Technologies

Europe- Finished good by Technology
Jan- June 2013



■ Straight Solvent ■ Solvent based Products ■ Waterbased Products ■ UV Products

Technology Trend 技术趋势

- **High Solid Solvent-borne**
高固含溶剂性涂料
- **Waterborne**
水性涂料
- **Powder**
粉末涂料
- **UV-Curable**
紫外光固化涂料

Waterborne coating Vs Solvent-borne

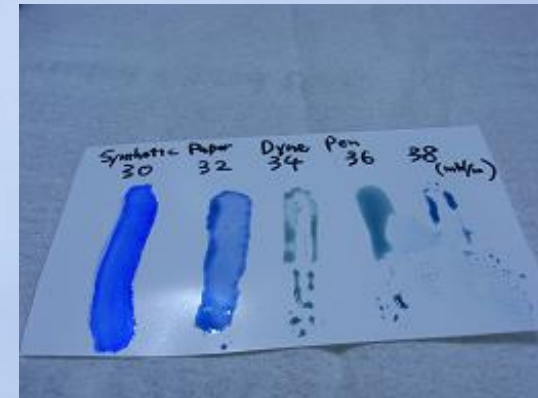
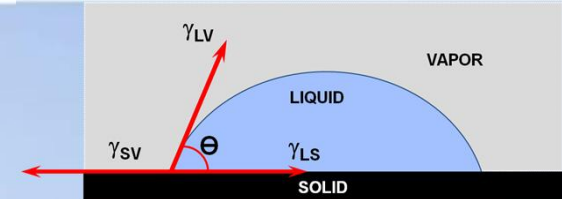
水性涂料和溶剂性涂料比较

Waterborne Coating (水性涂料)	Solvent-borne Coating (油性涂料)
<p><u>Advantage 优势:</u></p> <ul style="list-style-type: none">- Eco-friendly 环境友好- Convenient transportation 方便运输- Good adhesion on various substrate (including poor quality substrate) 在各种素材上都有良好的附着力 (包括一些质量比较差的素材)	<p><u>Advantages 优势:</u></p> <ul style="list-style-type: none">- Ease to use 易施工- Wide application 应用广泛- Shelf-life 保质期长
<p><u>Disadvantage :</u></p> <ul style="list-style-type: none">- Limited colors 颜色限制	<p><u>Disadvantages:</u></p> <ul style="list-style-type: none">- Etching substrate 易侵蚀素材- Environmental limitation 环境限制

Conversion to Waterborne: Surface Tension Comparison

溶剂型转水性表面张力的比较

- Pure liquids: 纯液体
 - Water 水 72 mN/m
 - Organic solvents 有机溶剂 25 – 40 mN/m
- Solvent borne formulations 溶剂型配方 25 – 35 mN/m
- Waterborne formulations 水性配方 50 – 72 mN/m
- Surface energy of substrates 基材表面能
 - Metals 金属 70 – 110 mN/m
 - Plastics 塑料 22 – 45 mN/m

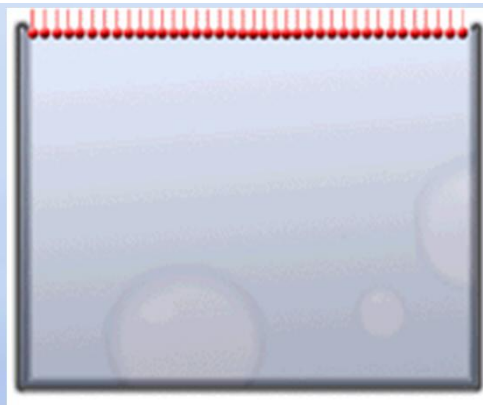
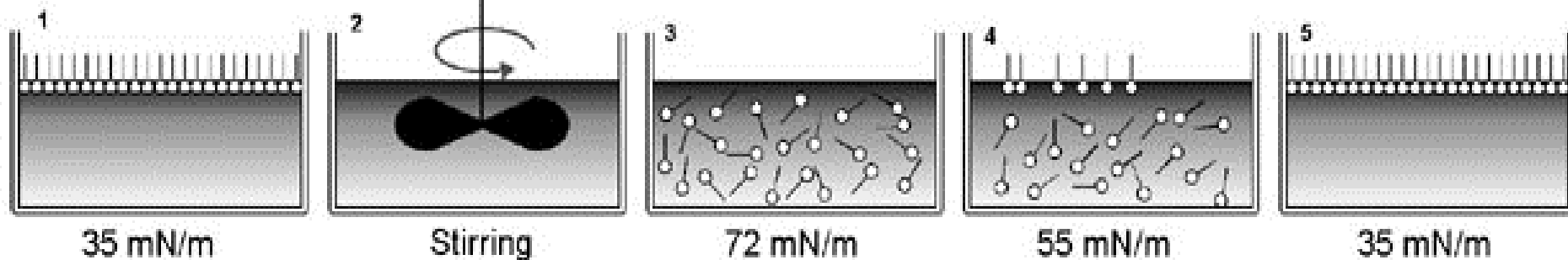


Substrate surface Energy
基材表面能 ~30 mN/m

- Requires surfactant(s) to lower the surface tension of waterborne systems for wetting, especially on low energy surfaces (e.g., plastics, oil contamination) 为了实现良好的润湿,需要使用表面活性剂降低水性体系的表面张力,特别是低表面能基材(如塑料,油污染表面)

Importance of Dynamic Surface Tension

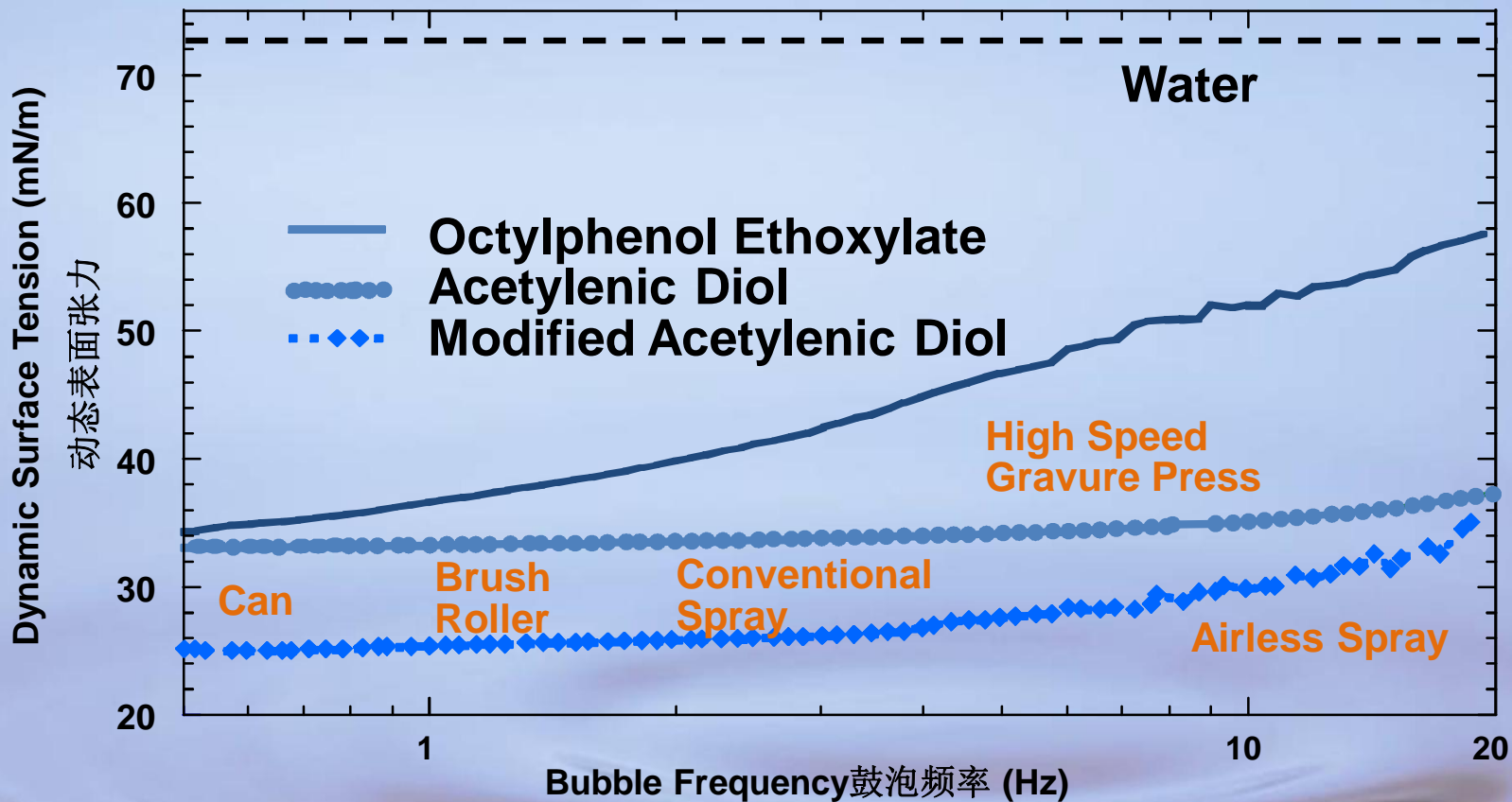
动态表面张力的重要性



Source: www.kruss.info/techniques/bubble_pressure_e.html

- Many industrial processes apply coatings at high speeds, creating large surface areas very quickly. 许多工业过程中涂料是在高速下施工的。非常快地产生了大量新的表面。
- For uniform substrate wetting, surfactants have to migrate rapidly to new liquid – solid interfaces 为了得到均匀的基材润湿，表面活性剂要迅速地扩散到新的液/固表面

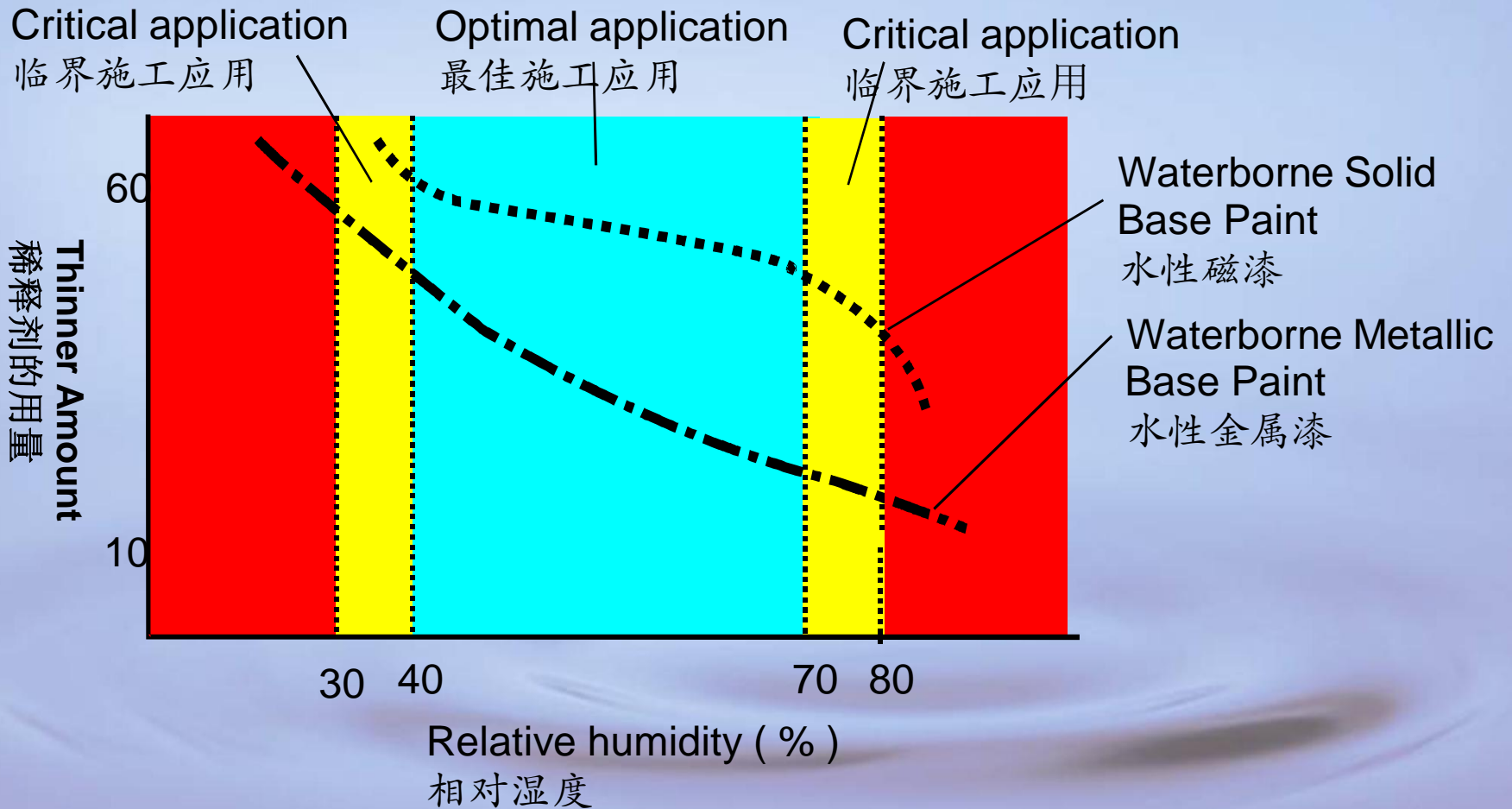
DST Comparison for Several Surfactants (0.1% Aq. Solution) 几种表面活性剂动态表面 张力比较(0.1%的水溶液)



施工条件对选择合适的动态表面张力非常关键

Waterborne Application 水性涂料应用

Effect of Humidity 湿度影响



Waterborne Application 水性涂料应用

Proper Handling-Continue 正确应用方式

- **Use stainless steel or plastic containers & lines.**
用不锈钢或塑料材质做为容器和流水线
- **Require bigger pumps and larger hoses to accommodate more thixotropic waterborne coating**
由于水性涂料的触变性需要较大功率的泵和更粗的输送管
- **Humidity Control. At least good air movement**
湿度控制，至少要有良好的空气流动
- **Apply at room temperature higher than 15C.**
使用时，建议室温大于15摄氏度

Kem Aqua® W/B Acrylic Series 水性丙烯酸系列

应用市场/ Market Segment Desktop/Notebook /Keyboard

	Kem Aqua ® 600S/T	Kem Aqua ® Colorline EP
Substrate	PC /ABS/PC+ABS	PC/ABS/HIPS
Dry to Touch/Handle	60-80°C* 10-20mins/ 60-80°C*	
Pencil Hardness	F-H	F-H
Gloss /60	20-70	20-80
Exterior durability	Good	Good
Key Features	Fast dry / Metallic Compatibility /Chemical resistance	



Polane® 700T W/B Reducible水分散体系涂料

应用市场/ Market Segment

Business machine/Electronics

Features

- One component ,2.3 lb/gal VOC
单组份, 2.3磅/加仑 (275g/L)的
VOC
- PUD/Acrylic 聚氨酯改性的丙烯酸
体系
- Smooth/Texture effect 平面/橘纹
效果
- Good solvent and chemical
resistance. 好的耐溶剂和化学品
性
- Performance similar to solvent
based polyurethanes in these
markets 媲美与溶剂型涂料的性能

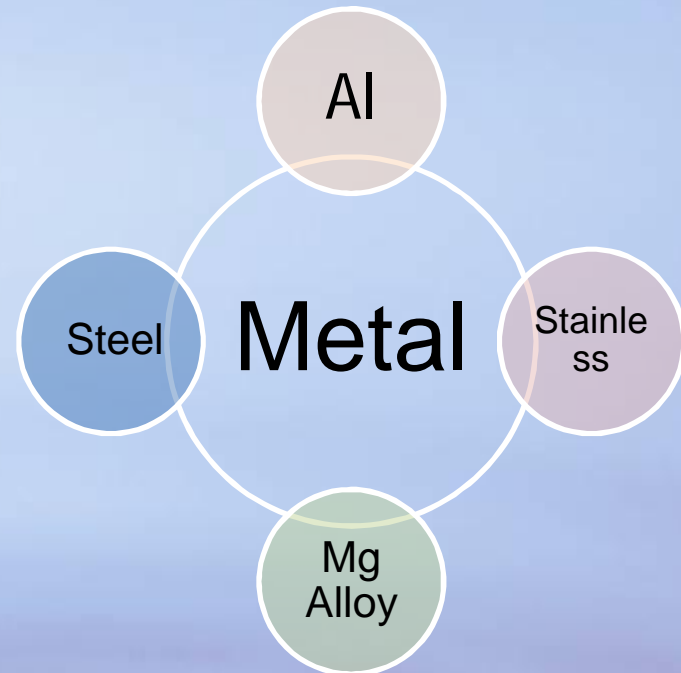


Kem Aqua® 1500T W/B Baking Enamel

应用市场/ Market Segment

General Electronics metal

- ✓ VOC of less than 2.0 lb/gal less water
含少量水时VOC 低于240g/L
- ✓ Mono bake of basecoat and texture system 单涂成烤漆纹理体系
- ✓ Excellent adhesion and mar resistance 优异的附着力和耐刮伤性
- ✓ High Quality 高品质
- ✓ Free of lead and chromate hazards 不含重金属



应用市场/ Market Segment Notebook

- Eco-friendly ,low VOC 环境友好, 低VOC
- Pencil Hardness (>H) 铅笔硬度>H
- Good adhesion on Mg/Al metal
在镁铝合金上有优异的附着力
- Excellent Taber /RCA resistance
(RCA/175g pass 200times)
优异的耐磨性能 (纸带耐磨超过200次)
- Excellent chemical resistance
(Motor oil/ Lemon juice/Ethanol etc)
优异的耐化学品性 (机油/柠檬汁/酒精等)

*Equivalent
Performance
VS Solvent-
borne baking
coating !*



Innovation Technology for 3C

3C涂料的创新技术

- WB Soft-feel coating 水性柔感涂料
- W/B Nano-UV clear 纳米水性紫外光固化清漆
- Easy to clean UV clear 易擦洗光固化清漆
- W/B PP primer 水性 PP 底漆
- W/B Strippable Protective coating 水性可剥离涂料
- UV Soft-feel coating 光固化柔感涂料
- Powder soft-feel coating 粉末柔感涂料



Waterborne Soft-feel 水性柔感涂料

Typical Features

- ✓ VOC less than 230g/l
- ✓ Velvety/Silky/Rubbery feel
- ✓ Low gloss



Performance (Parts specification for Desktop)

Items	Results
Voc (g/l)	230
Gloss(20° /60°)	0.4/3.0
Mar Resistance (by nail)	No mar effect
Chemical /Stain Resistance(30 Minutes Spot Test)	
Lipstick	No visual surface change
Ketchup	No visual surface change
Pledge	No visual surface change
Hand cream	No visual surface change
70% IPA	No visual surface change
Taber Abrasion Resistance (CS-17/1000cycles/500g) Weight Loss - mg	3mg
Thermal Cycle Resistance (High 65C ,90%RH 4hrs/Low - 20C uncontrolled RF4hrs / 3days)	Pass (Adhesion no reduction)

Waterborne Nano-UV Clear 纳米水性紫外光固化清漆



Waterborne Strippable Protective Coating

水性可剥离涂料

Application 应用:

- Dilute with 0-10% water
0-10%的水稀释
- Air dry by 2-4hrs or cure by 50-70°C /
20-30 minutes
2-4小时可自干或50-70°C烘烤20-30分钟

Film Thickness:

干膜膜厚:

- 30-40 um(Recommended)
推荐膜厚 30-40微米



Vigorously working towards EPEAT approval on the current Kem Aqua system.

正致力于Kem Aqua 体系的EPEAT的批准

Meet ROHS II specifications.

符合ROHS II

Low voc and low HAPS.

低VOC和低HAPS



Questions ?
Thank you !

Waterborne China Platform

水性平台（中国）

