

Waterborne China Platform

水性平台



水性涂料在3C工业中的 新产品和新技术

宣伟（上海）涂料有限公司

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CONTENT 内容

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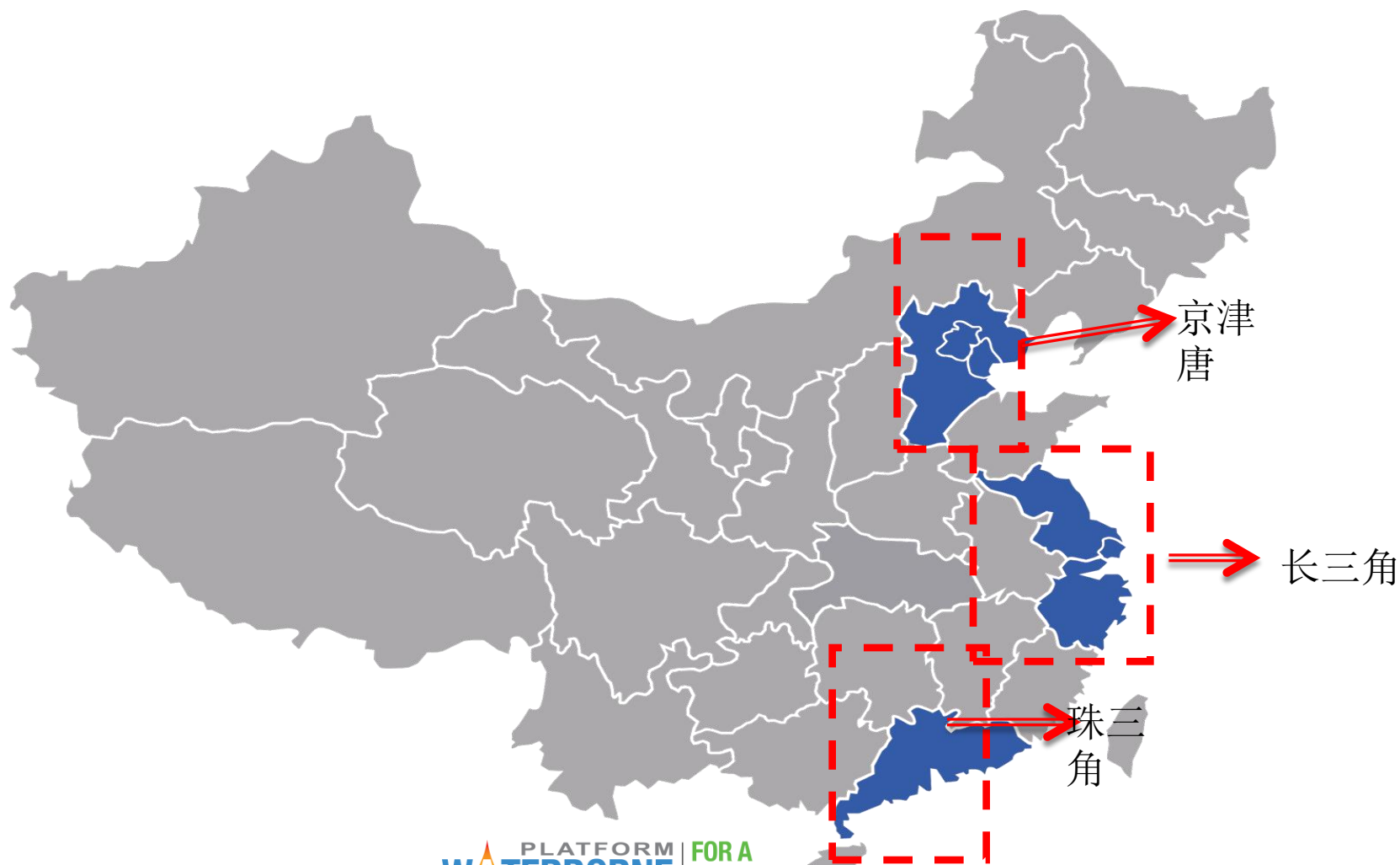
- **China Legislations for environment protection**
中国环境保护法规
- **Waterborne products Series**
水性产品系列介绍
- **Innovation Technology for 3C**
3C涂料的新技术

NATIONAL LEGISLATIONS 国家法律法规



Effective Date	Legislation	法律法规名称
Sep 12, 2013	Air Pollutants Prevention Action Plan	大气污染防治行动计划
Jan 01, 2015	Environmental Protection Law	环保法
Jan 01, 2016	Air Pollution Prevention Law	大气污染防治法
Feb 01, 2015	Consumption Tax for Coating	涂料消费税
June 10, 2015	Environmental Protection Tax (draft)	环境保护税（意见征求意见稿）
Oct 01, 2015	VOC Emission Charge	挥发性有机物排污收费
June 25, 2015	Environmental Protection Pioneer Embodiment Plan	环保“领跑者”制度实施方案
Aug 01, 2016	National Hazardous Waste List	《国家危险废物名录》（新修订）
July 13, 2016	VOC Reduction Action Plan for Key Industries	重点行业挥发性有机物削减行动计划

PUBLISHED REGION 法规颁布区域



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 PRODUCTS SERIES

水性产品系列介绍

WATERBORNE SPECIALTY PRODUCTS CATEGORY

水性特种产品种类

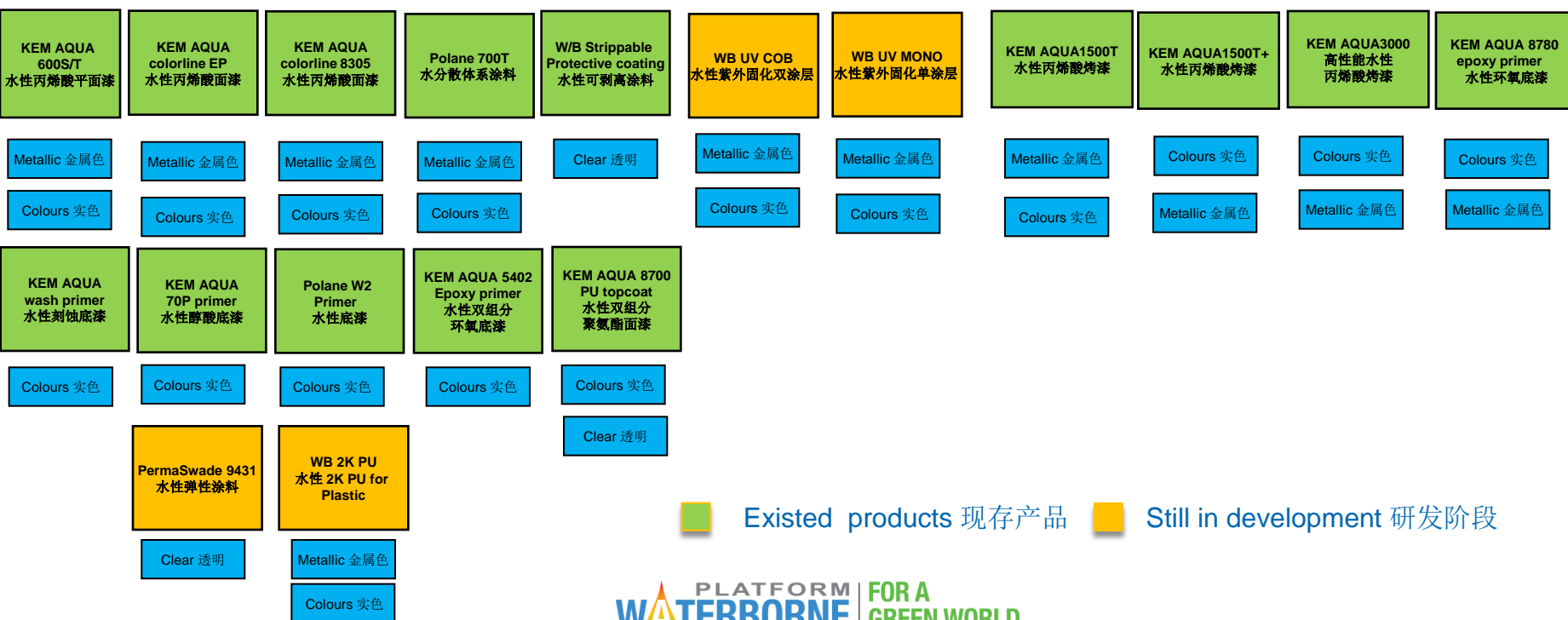


Waterborne specialty paint in SW 宣伟水性特种产品

Low temperature bake or air dry 低温烤漆或自干

UV curing 紫外光固化

High temperature baking 高温烤漆



Existed products 现存产品



Still in development 研发阶段

LOW BAKING(AIR DRY) WB SPECIALTY COATING

低温烤漆(自干) 水性特种涂料



KEM AQUA® 600T Water Reducible Enamel 水性丙烯酸面漆

latex, water reducible coating
developed for the electronic business
machine market. This product can be
used as a smooth or texture coating on
treated metal and structural foam
plastics.

含丙烯酸乳液的单组分涂料，用于电子商
业机器市场，可涂敷在表面处理过的金属及
结构塑料件上，可产生平面或纹理效果。

KEM Aqua color line EP 水性丙烯酸面漆

is a one component coating
designed to meet the
performance and application
requirements of the Consumer
Electronics Market for
decorative plastics finishes

是一种单组分、低光、挥发性有机物
VOC含量不高于 2.3磅/加仑丙烯酸
乳胶型水稀释性表面漆，用于电子
机械喷涂。本品可在处理过的金属、
建筑泡沫塑料、木质表面喷涂，得
到非常光滑的、无桔皮起皱现象的
表层。

Kem Aqua® colorline 8305 水性丙烯酸面漆

a one component coating designed
to meet the performance and
application requirements of the
Consumer Electronics Market for
decorative plastics finishes. should
match silver color.

是一种单组分、满足电子产品性能要
求的水性表面喷涂漆，适合做金属色。

Gloss increasing 光泽递增

KEM AQUA® COLORLINE 8305

水性丙烯酸系列 特点/优势/获益



特点Feature

- ◆多种颜色可供选，且遮盖力优异
Diverse colour availability with improved hiding power where topcoats are used
- ◆自然干或低温烘干均可,避免黄斑
Faster drying in low temperature air dry or force dry, avoid blushing
- ◆容易操作，能够使用不同的喷涂设备
Easy to handle, can be applied using a variety of spray equipment
- ◆优异的铅笔硬度(F-H)和耐磨性
Qualified Pencil hardness(F-H) and abrasion resistance
- ◆能过通过化学品测试,能耐受不同的溶剂和化学的, Ability to pass critical chemical testing and good resistance to various solvents and chemicals

优势Advantage

- ◆避免基材在高温干燥过程中的变形
Avoid substrate deform in high temperature drying
- ◆能在PC/ABS/PC+ABS上涂
Can be coated on PC/ABS/PC+ABS
- ◆良好的触变性，平滑度和渗透性提高,优异的铝粉分散和定向作用，产生更华丽和耀眼的外观
Improved rheology giving optimised penetration, flow levelling. Excellent dispersion and directional array effects of aluminum Flake, result in grand & brilliant cosmetic appearance
- ◆优异的抗性
Excellent resistance performance

获益Benefit

- ◆适合多种基材的施工要求
Suitable to application to different substrates.
- ◆少量投资在溶剂型涂装设备零件更换。与溶剂型涂料相比，减少废弃物处理费用
Little cost increase for transfer the equipment of SB to WB for components alteration. Reduce expense to waste treatment
- ◆通过多项电子消费品OEM测试要求，延长使用时间
Pass the qualified testing for electronic consumer /house hold appliance with desirable service time

KEM AQUA COLORLINE 8305



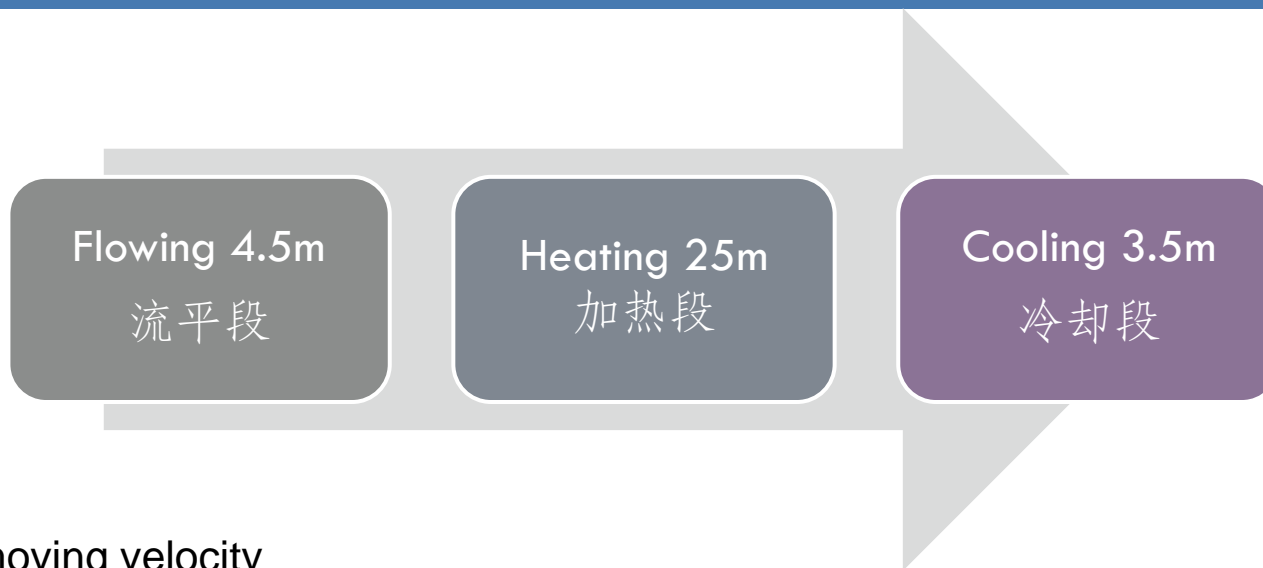
Low-cure, water reducible clear base system

低温,水性透明涂料体系

- Low-cure technology is ideal for a wide variety of plastic substrates
- 低温干燥技术广泛用于不同的塑料基材
- Available in a wide variety of custom metallic and pigmented colors
能过广泛地应用于定制的金属和实色漆
- Excellent flow and film appearance
优异的流动和漆膜外观
- Designed for easy recoatability 容易重涂
- Mar and alcohol resistant 耐磨损和耐醇
- Abrasion and chemical resistant 耐磨耗和耐化学品



APPLICATION 应用

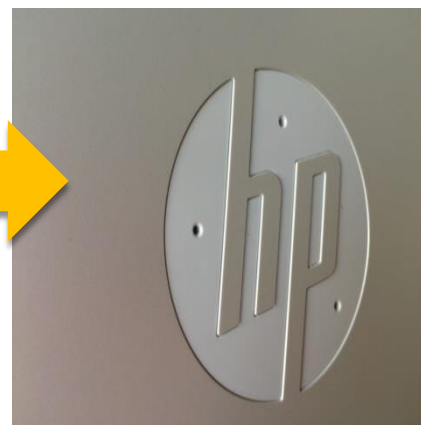


- ◆ Belt moving velocity
皮带传送速度 1.5m-2.5m/min
- ◆ Substrate temperature 基材温度
60°C 10min
65 °C 10min

FOCUS MARKET 关注市场



CASE REFERENCE 案例-HP



F83SP4018

F83SP4035



CASE REFERENCE 案例-HP

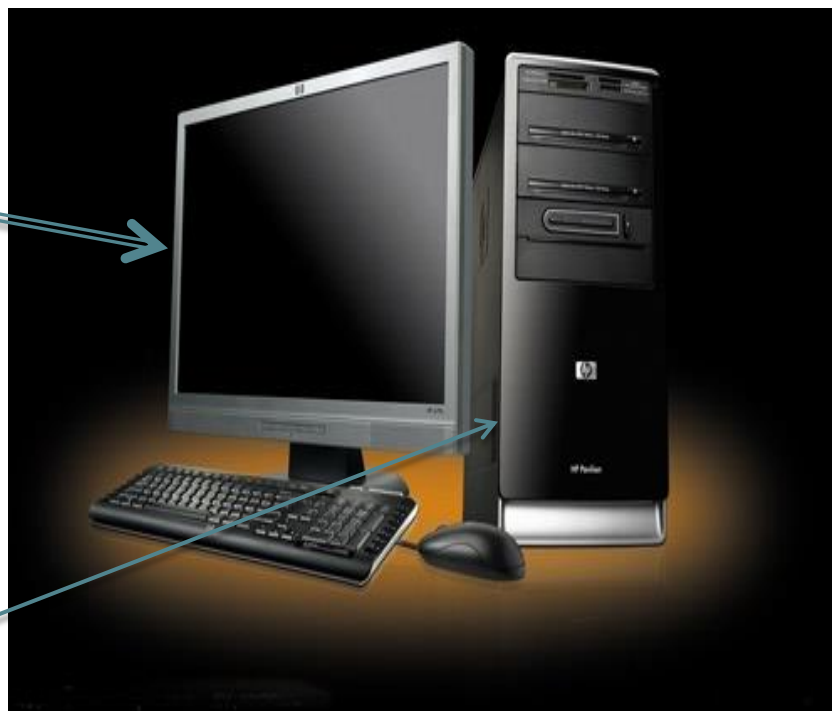


HP desktop and all-in-one machine

惠普台式机及一体机

Frames of Monitor 监视器外框

Face panel 机箱面板



KEM AQUA® W/B STRIPPABLE PROTECTIVE COATING 水性可剥离涂料



Application

Dilute with 0-10% water

0-10%的水稀释

Air dry by 2-4hs 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

30-40 um(Recommended)

推荐膜厚 30-40微米



POLANE ® 700T W/B REDUCIBLE水分散



Features 特点

- 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.耐溶剂和化学品性好
- Performance similar to solvent based polyurethanes in these market
性能媲美溶剂型聚氨酯涂料

应用市场/ Market Segment
Business machine/Electronics



KEM AQUA® W/B BAKING ENAMEL 水性烤漆



Kem Aqua1500T W/B Baking Enamel 水性丙烯酸烤漆

is a one component, water reducible, thermoset baking enamel for the electronic enclosure and general metal market. This product can be used as a smooth or texture coating.

单组分水性热固性烤漆作为电器柜和一般金属用途。能产生平面或纹理效果

KEM Aqua 1500T+ W/B Baking Enamel 水性丙烯酸烤漆

is a one component, water reducible, thermoset baking enamel for the electronic enclosure and general metal market. This product can be used as a smooth or texture coating.

单组分水性热固性烤漆作为电器柜和一般金属用途。能产生平面或纹理效果

KEM AQUA® W/B BAKING ENAMEL 水性烤漆



KEM Aqua 3000 W/B Baking Enamel

高性能水性丙烯酸烤漆

is a one component, water reducible, thermoset baking enamel for the consumer electronic and general metal market. This product can be used as a outdoor coating.

单组分水性热固性烤漆作为消费电子和一般工业用途。能作为室外用途。

Kem Aqua Epoxy 8780 Baking Enamel

高性能水性环氧烤漆

Is one component, water reducible thermoset baking enamels for general finish market. , it provides superior performance properties in these markets.

单组分水性热固性烤漆,可作为一般工业市场使用,能过提供出众的性能。

KEM AQUA® W/B BAKING ENAMEL-FABS

水性烤漆-特征/优势/获益



特点 Feature

- ◆ 能在镁/铝合金上涂
Can be coated on Mg/Al
- ◆ 优异的铅笔硬度(3H)
Excellent pencil hardness(3H)
- ◆ 能通过200次RCA测试
Pass 200 times RCA test
- ◆ 能过通过化学品测试, 能耐受不同的溶剂和化学品,
Ability to pass critical chemical testing and good resistance to various solvents and chemicals

优势 Advantage

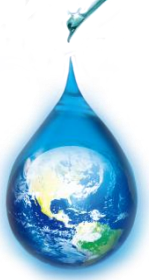
- ◆ 可在多种金属基材上覆涂
Various metal substrates can be painted with WB baking coating
- ◆ 优异的耐化学品性, 可应用于易受侵蚀情况
Can be applicationed in moderately corrosion occasion Excellent chemical resistance
- ◆ 磨耗损失降到最低, 边角的磨损降到最低
Extremely little loss under severe abrasion, especially for sharp edge

获益 Benefit

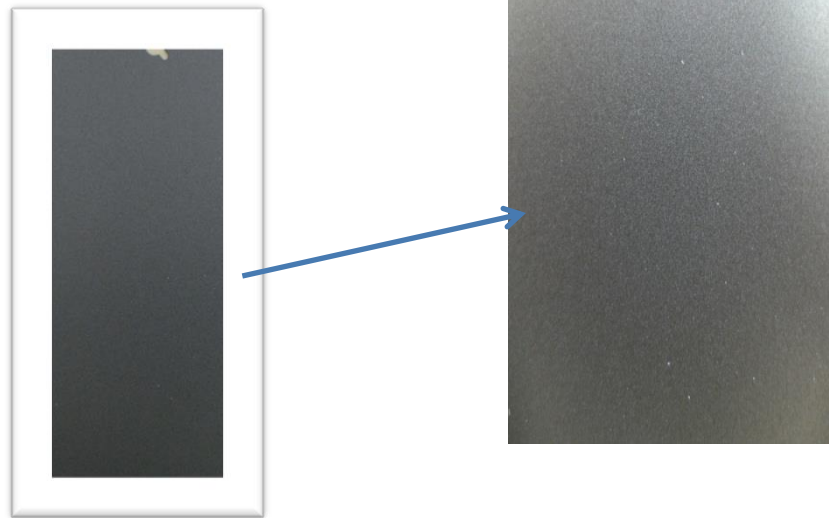
- ◆ 优异的耐化学品性能, 拓宽了使用领域
Excellent chemical resistance extend the application fields subjected to chemical.
- ◆ RCA 测试及铅笔硬度符合手机, 笔记本, 电脑等的测试要求
Remarkable hardness is qualified by specification of notebook ,cell phone.
- ◆ 与同等性能的溶剂型烤漆有成本优势
Cost competitive versus to high quality solvent based alkyd baking enamel

KEM AQUA® W/B BAKING ENAMEL-SAMPLE

水性烤漆样板



KEM Aqua 1500T



FOCUS MARKET 关注市场



Electronic business machine 商业设备

- Printer 打印复印
- Fax 传真机
- Telephone 电话
- POS machine POS机
- Projector 投影仪



Consumer electronics 电子消费品

- TV set 电视
- Notebook and desktop 笔记本/台式电脑
- Tablet 写字板



Medical equipment 医疗设备

- PET-CT
- Radiography 造影机
- Computed tomography 计算机断层扫描
- Ultrasound 超声设备



Electronic cabinetry and Enclosure 电子机柜

- Switchboard 交换机
- Concentrator 集线器
- Server chassis 服务机箱
- networking accessories 网络配件



Exterior appliance 室外设施

- Outdoor furniture 室外家具
- Lighting 灯具

CASE AND REFERENCE 案例



Cisco

- Exchange machine

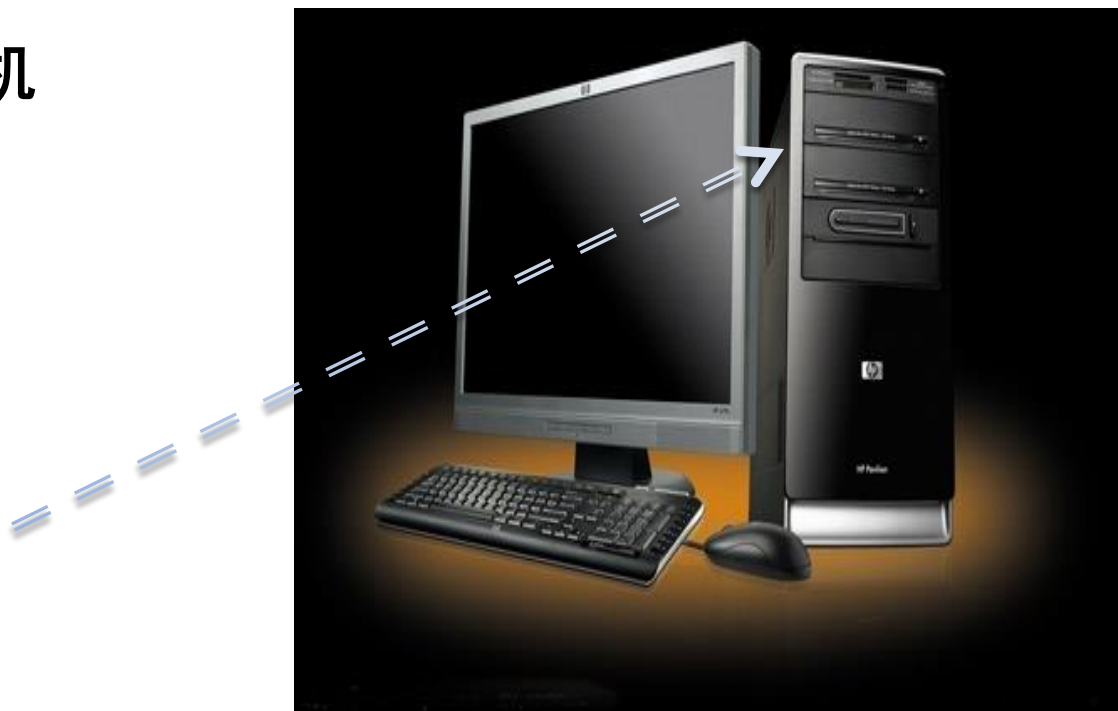


CASE AND REFERENCE 案例



HP desktop and all-in-one machine

惠普台式机及一体机



Back panel 机箱背板

CASE AND REFERENCE 案例



Agilent

- Radiography造影机



SW COATING PRODUCT ON PLASTIC

宣伟涂料塑料件在上的体系



Substrate Type	Primer			Basecoat			Topcoat / Clear			Application
	Tech	Code	Baking	Tech.	Code	Baking	Tech.	Code	Baking	
PC+ABS / PC/ABS	NA	NA	NA	ACRYLIC LACQUER EP	L61	50-60°C 10-20Mins	2K PU Clearcoat	Polane 8300 F63*****	60-70°C 30Mins	Computers, Appliances, Accessory for Mobile and computers
				KA 600	F83	60-80°C 20-30min	2k WB PU		70-80°C 30-60Mins	
				ACRYLIC LACQUER EP	L61	50-60°C 10-20Mins	PermaSwade 9421	F63CP7036	60-80°C 30-60Mins	
				KA 600	F83	60-80°C 20-30min	PermaSwade 9431		70-80°C 30-60Mins	
				ACRYLIC LACQUER EP	L61	50-60°C 10-20Mins	Permaclear ® UV 9400	V86CP0116	800-1200 mJ/cm2	
				KA600	F83	60-80°C 20-30min	WB COB UV		800-1400 mJ/cm2	
							2K PU Monocoat	Polane 8300 F63*****	60-70°C 30Mins	
							2k WB PU		70-80°C 30-60Mins	

SW COATING PRODUCT ON PLASTIC

宣伟涂料在塑料件上的体系



Substrate Type	Primer			Basecoat			Topcoat / Clear			Application
	Tech.	Code	Baking	Tech.	Code	Baking	Tech.	Code	Baking	
GF+Nylon	2k PU Clear Primer	Polane 82XX P60CP0 0006	60-70°C 30Mins	ACRYLIC LACQUER EP	L61	50-60°C 10-20Mins	2K PU Clearcoat	Polane 8300 F63*****	60-70°C 30Mins	Accessory
				KA 600	F83	60-80°C 20-30min	2k WB PU		70-80°C 30-60Mins	
				ACRYLIC LACQUER EP	L61	50-60°C 10-20Mins	PermaSwade 9421	F63CP7036	60-80°C 30-60Mins	
				KA 600	F83	60-80°C 20-30min	PermaSwade 9431		70-80°C 30-60Mins	
				ACRYLIC LACQUER EP	L61	50-60°C 10-20Mins	Permaclear® UV 9400	V86CP0116	800-1200 mj/cm2	
				KA600	F83	60-80°C 20-30min	WB COB UV		800-1400 mj/cm2	
				NA			2K PU Monocoat	Polane 8300 F63*****	60-70°C 30Mins	
				NA			2k WB PU		70-80°C 30-60Mins	

SW COATING PRODUCT ON METAL

宣伟涂料在金属件上的体系



Substrate Type	Prime			Topcoat			Application
	Tech	Code	Baking	Tech	Code	Baking	
Mg Alloy Al Alloy Stainless steel	Acrylic Baking Enamel	F73*****	140-180°C 15-30Mins	2k PU	Polane 8300 F63***** Or PermaSwade 9421	60-70°C 30Mins	Electronics, Notebook, mobile phone, e-book, handheld device
				Acrylic Baking Enamel	F73*****	140-180°C 15-30Mins	
				Permaclad 2400	H67*****	160-180°C 30Mins	
	Hybrid	HBS*****	180-200°C 10-15min	2k PU	Polane 8300 F63***** Or PermaSwade 9421	60-70°C 30Mins	
				Acrylic Baking Enamel	F73*****	140-180°C 15-30Mins	
				Permaclad 2400	H67*****	160-180°C 30Mins	
Stainless Steel	KA epoxy primer 8780		160°C 30Mins	WB high baking	KA1500T KA3000	160°C 30Mins	handheld device
	NA			UV Clearcoat	V86VG0007	800-1200 mj/cm2	
	KA epoxy primer 8780		160°C 30Mins	WB Mono UV			



INNOVATION TECHNOLOGY FOR 3C

3C涂料的新技术

INNOVATION TECHNOLOGY

涂料的新技术

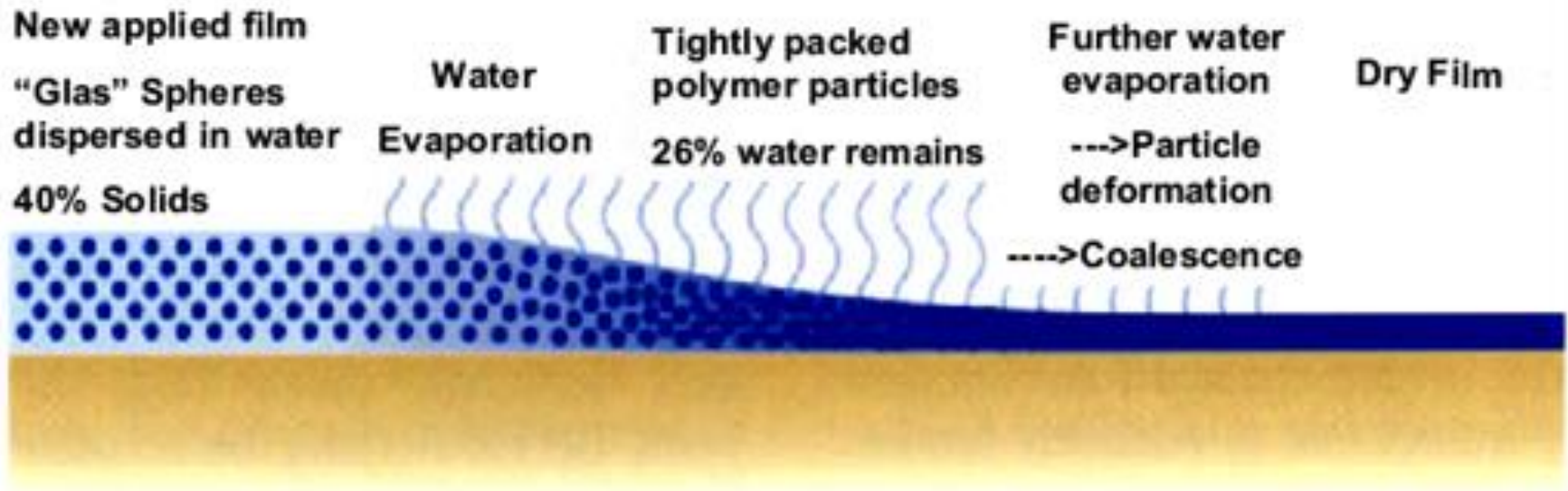


- *WB Soft-feel coating* 水性柔感涂料
- *W/B Mono-UV clear* 水性单涂层光固化清漆
- *W/B COB-UV clear* 水性双涂层光固化清漆
- *2K W/B Acrylic Series 2K* 水性丙烯酸系列

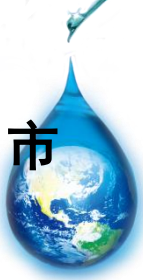
以上产品在实验室阶段

DRYING OF WATERBORNE SOFT FEEL PRODUCTS

水性弹性漆的干燥及成膜机理



SHERWIN WILLIAMS WB SF PRODUCTS (READY FOR COMMERCIALIZATION) 宣伟水性弹性漆产品 - 将上市



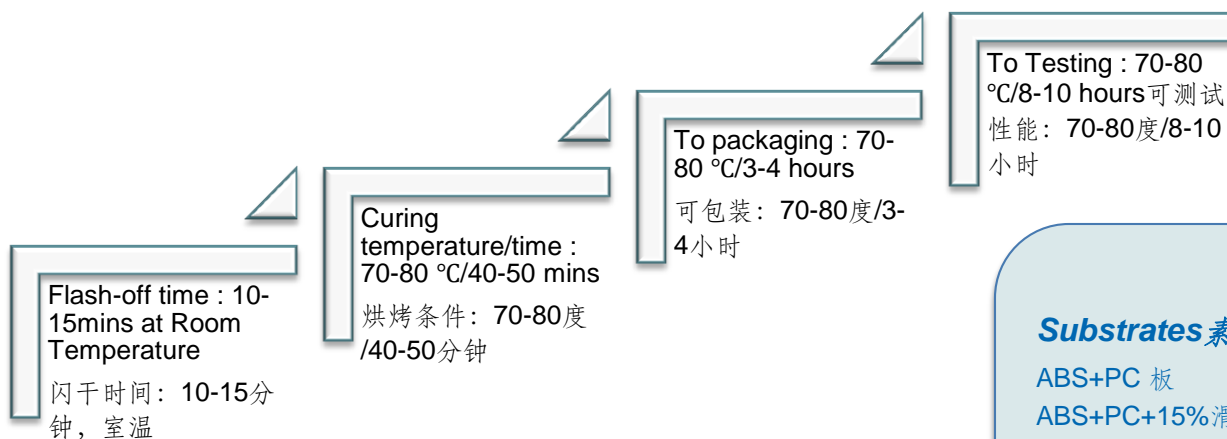
- Permawade 9431

Waterborne Soft Feel – Silky (AP3272F63)

Waterborne Soft Feel – Velvety (AP5184F63)

APPLICATION OF WB SF

水性弹性涂料的应用



Substrates 素材

ABS+PC 板

ABS+PC panel

ABS+PC+15%滑石粉

ABS+PC+15% talc

PC+30% 玻纤

PC+30% GF

DFT膜厚:

40-60微米

Pot-Life可使用时间:

2-3 hours (RT:20 °C, RH 50%)

PERFORMANCE OF WATERBORNE SOFT FEEL

水性弹性涂料的性能



SN	Test Item		Test Methods	Test Results	
				WB SF	SB SF
				Basecoat + AP3272F63	Basecoat + AP2204F63
1	Solvent Resistance		Taber linear abrasion, Alcohol 70% Distance: 50 mm ,Weight 1kg, 50cycles	Pass	Pass
2	Ultra-Violet Light		Refer to ASTM G154,96hrs	1.59	0.24
3	Pencil Hardness		ASTM D 3363 Standard Test Method , loading: 750g	>H	>H
4	Cross cut tape adhesion		Cutting Guide - at least 6 space teeth at 1.0mm and 2.0mm,Tape 3M-600	5B	5B
5	Taber abrasion & RCA	Taber Abrasion	Abrasion wheels – CS-10, load 1,000-gram	>1500	>1300
		RCA	Norman Abrasion Wear Tester (7-IBB-647) load 175g	>500	>500
6	Thickness		Topcoat for Plastic Metal: 40-60 μm Base coat as applicable for metal	45-55	50-60
7	Temprature-hum idity chamber	Surface	Set the temperature at constant 60°C and the Relative Humidity to 95%.	Pass	Pass
		Adhesion	Run the test 96 hours (4 days)	5B	5B
8	Thermal shock humidity test	Surface	1 cycle: Room temp→-40°C in 5min, -40°C dwell 1hr, Raise to 60°C in 10min dwell 1hr, Decrease to room temp in 5min, total 48cycles	no change	no change
		Adhesion		5B	4B

PERFORMANCE OF WATERBORNE SOFT FEEL

水性弹性涂料的性能



Chemical resistance		WB SF	SB SF
		Basecoat + AP3272F63	Basecoat + AP2204F63
<p>1. For all chemical : Apply test materials to the surface finish for a minimum of one (1) hour contact at room temperature</p> <p>2. At least 2ml (2cc) of each liquid test material applies to surface finish</p> <p>3. The surface finish shall show no permanent staining or visible marring when cleaned with running tap water</p> <p>4. Clean with a soap solution if staining is visible</p> <p>5. Clean with Isopropyl Alcohol if staining is still visible without visible surface marring</p>	1. Lipstick (Red)	marring	marring
	2. Coffee (Nestle 3 in 1) 60°C	marring	marring
	3. Yellow Mustard	marring	marring
	4. Water Soluble Ink	marring	marring
	5. Wax Pencil (Black)	No marring	No marring
	6. Red Wine - no preference	marring	marring
	7. Beer - Heineken	No marring	No marring
	8. Regular Coca-Cola	No marring	No marring
	9. Sunscreen - Coppertone, SPF 15	No marring	No marring
	10. Lotion - Nivea	No marring	No marring
	11. Artificial Sweat PH4.7	No marring	No marring
	12. Artificial Sweat PH8.7	No marring	No marring

WB UV INTRODUCTION 水性UV介绍



INTRODUCTION介绍



- What are Waterborne-UV?什么是水性UV涂料?

A waterborne product that is crosslinkable with UV- light. Waterborne-UV are available both as clear lacquer and pigmented coating它是一种能够通过光引发交联反应的水性涂料, 可以是透明的, 也可以是有色的.mainly as topcoats. 主要用作面漆.

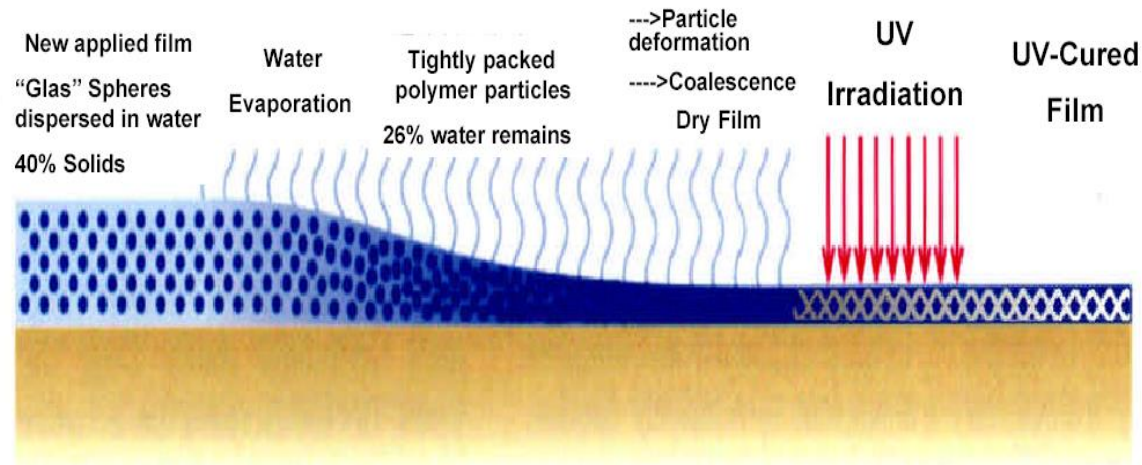
- Waterborne-UV is a high-end product. 水性UV涂料是高端涂料产品.

DRYING AND CURING OF WATERBORNE-UV PRODUCTS

水性UV涂料的干燥及成膜机理



Waterborne UV dispersions Film Forming



SYSTEMS INCLUDING WATERBORNE-UV 水性UV涂装系统



Waterborne-MONO UV 水性单涂层UV涂装体系 V88系列

- High performance Mono 高性能单涂
- Economy Mono 经济型单涂

Waterborne/Waterborne-UV 水性KA 600/ KA EP和水性UV涂装体系V88系列

- Waterborne primer 1 or 2 times 水性底漆1-2道
- Waterborne-UV topcoat 1 or 2 times 水性UV面漆1-2道
- Common system 通用体系



WB MONO UV INTRODUCTION单涂水性UV介绍



☐ Product REX Number

产品编号

☐ Product Description

产品描述

☐ Substrate Compatibility

基材兼容

☐ Specific Gravity 比重

☐ Solids Content 固体含量

☐ VOC

☐ Pot Life 使用寿命

☐ Shelf Life

☐ V86SP6001

☐ Water borne Mono UV

☐ ABS/ABS+PC

☐ 1.0-1.05

☐ 32+/-1%

☐ <100g/L

☐ N/A

☐ 6 moths, unopened

WB MONO UV PERFORMANCE 单涂层水性UV特性



Mono coat 单涂层	Good adhesion and pencil hardness 良好的附着力和铅笔硬度
Excellent RCA 优异的RCA	Easy to cure 容易固化
Better effect of silver , pearl and color 更好的银色，珍珠色和实色效果	Good chemical resistance 优良的耐化学性
Good appearance & workability 良好的外观和重涂性	Suitable for Notebook and Desktop(AIO) 适合笔记本和台式机

WB MONO UV PAINTING SCHEDULE

水性单涂层涂装工艺



Item	Condition
Dilution	Paint : DI Water=100:5-15%(Weight)
Spray Viscosity	20-40sec (NK-2 Cup@25°C)
Gun diameter	1.5-2.5 mmØ
Spraying pressure	3-5 kgf/cm ²
Spraying Distance	15-35cm
Flash time	R.T.2-5mins
Curing	50-60°C × 15-20mins/1200-1600mJ/CM ²
DFT	12-18um

COMPARISON BETWEEN DIFFERENT PRODUCT TYPES 不同类型的涂料性能对比



Category 种类	WB-UV 水性UV	Waterborne 自干型水性	SB-UV 溶剂型UV	100% UV 无溶剂UV
Environmental impact 对环境的影响	++	+	-	+
Usage time 生产效率	++	+	++	++
Investment cost* 投资成本	0	+	0	-
Cost per square meter 单位面积涂装成本	-	+	+	0
Line speed 生产线速度	+	0	+	++
Chemical resistance 漆膜表面抗性	++	0	++	++
Stackability 可快速码堆性	++	-	++	++
*From solventborne line参照传统的溶剂型涂料				

WB MONO UV TEST RESULT

单涂水性UV测试性能



WB Mono UV performance in different curing schedule 在不同固化条件下的性能

Curing schedule	Color data	Gloss	Adhesion	RCA	Hardness	Appearance
2mins+15mins @50°C	ΔL :0.09 Δa :0.07 Δb :0.08	5.2-5.5%	5B	300-400 Cycle	H	OK
5mins+20mins @50°C	ΔL :-0.19 Δa :0.08 Δb :-0.03	5.8-6.0%	5B	300-400 Cycle	H	OK
10mins+20mins @50°C	ΔL :-0.08 Δa :0.09 Δb :0.05	5.5-5.6%	5B	300-400 Cycle	H	OK

❖UV Curing: 1500mJ/CM²,DFT:14-16um

2K W/B ACRYLIC SERIES双组分水性 PU



- Eco-friendly, low VOC 环境友好, 低VOC
- Pencil Hardness 铅笔硬度 \geq HB
- Good adhesion 优异的附着力
- Environment test 环境测试, 65C温度, 85%湿度下存放12小时, 样品无变色和黑斑等现象
- Excellent chemical resistance 优异的耐化学品性和耐磨性
 - ✓ 负荷 200g, 75%酒精摩擦, 10000次无露底
 - ✓ 汗渍测试, 温度55度, 乳液 40ml, 盐 80g, 测试时间48小时无露底

水性引领绿色生活
平台造就环保产业

