

Waterborne China Platform

水性平台



水性木器漆的应用及挑战

The Application and Challenges of
WB Wood Coating



Javen Yang 杨修鹏

宣伟（上海）涂料有限公司

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The Significance of Knowing the Limitation

认识水性木器漆局限性的意义



油性涂料转换为水性涂料即使对最谨慎的施工者也会有一些独特的挑战。对涂料局限性的深刻理解可以使油转水变得顺利且得到回报。为了获得正确的视角，需要全面地审核涂装操作过程。制成品从加工到包装的每一个过程均需要考虑到。



Content 目录



- 水性木器漆的应用
THE APPLICATION OF WB WOOD COATINGS

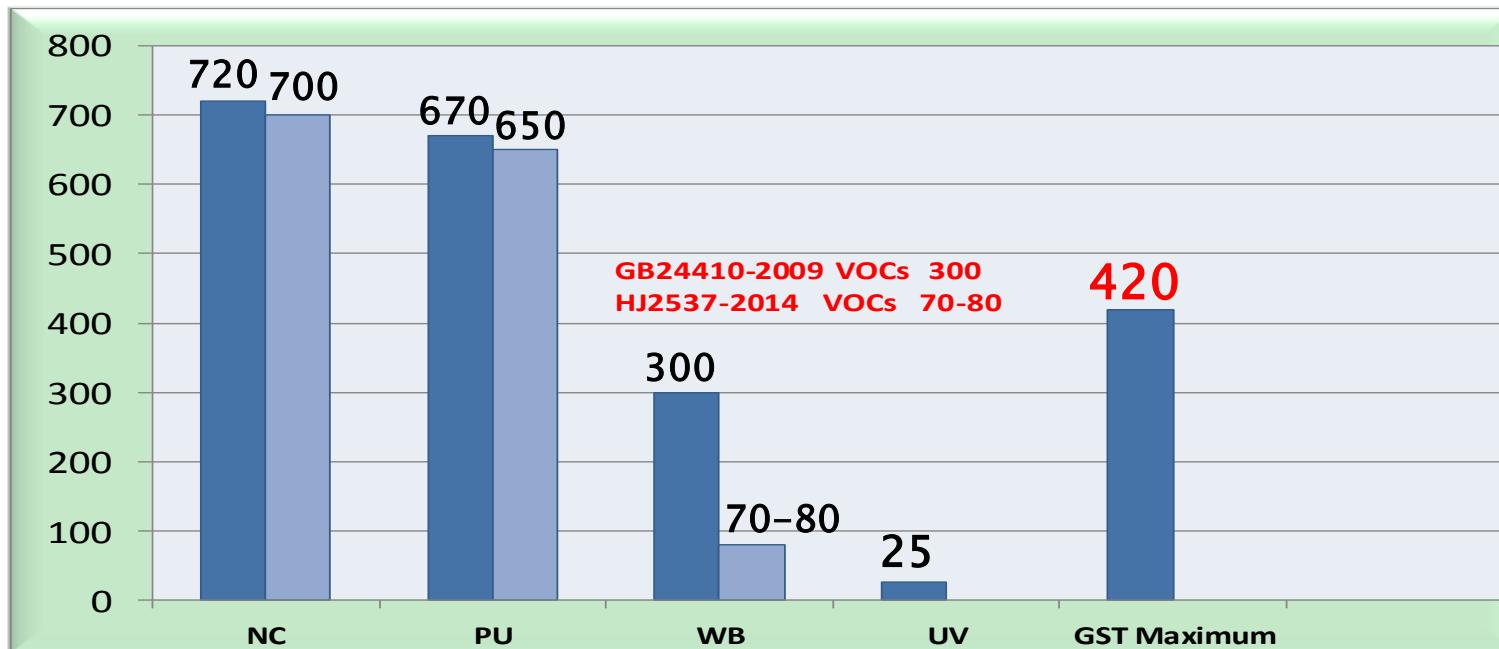
- 水性木器漆的挑战
THE CHALLENGES OF WB WOOD COATINGS

The VOCs comparison of WB and SB

水性与溶剂性木器漆VOCs含量对比



VOCs (g/L)



NC — nitrocellulose paints
UV — ultraviolet paints

PU — polyurethane paints WB — waterborne paints
GST Maximum — The maximum of consumption tax



水性木器漆的应用

THE APPLICATION OF WB WOOD COATINGS

Questions

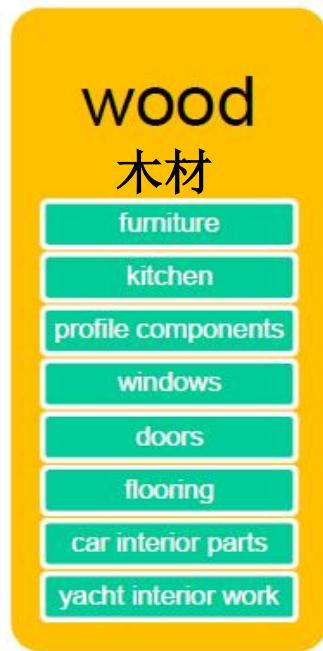
问题



- 水性漆是什么？可以用在什么基材上？价格怎么样？
- 水性漆好施工吗？需要怎样的涂装设备？设备投入高吗？
- 水性漆适合做什么风格的家具产品？
- 水性漆性能怎么样？硬度、手感、丰满度.....？
-?

Water-based Solution For Different Business

水性涂装在不同领域的应用



Household- Market Segments

家用木器细分市场



Suite – furniture
套房家具



Children Furniture
儿童家具



Kitchen Cabinet
厨房橱柜



Office furniture
办公家具

Various Waterborne systems

各类水性体系



➤ Suite – Furniture 套房家具

- ✓ Waterborne 1K sealer/primer 单组份水性底漆
- ✓ Waterborne 1K topcoat 单/双组份水性面漆

➤ Children Furniture 儿童家具

- ✓ Waterborne 1K sealer/primer 单组份水性底漆
- ✓ Waterborne 1K topcoat 单组份水性面漆

➤ Office Furniture 办公家具

- ✓ Waterborne 1K Or 2K sealer/primer 单/双组份水性底漆
- ✓ Waterborne 2K topcoat 双组份水性面漆
- WBUV topcoat 水性UV面漆

Various Waterborne systems

各类水性体系



➤ Kitchen Cabinets 橱柜

- ✓ Waterborne 1K sealer/primer 单组份水性底漆
- ✓ WBUV Topcoat 水性UV面漆

➤ Wood Door 木门（衣柜）

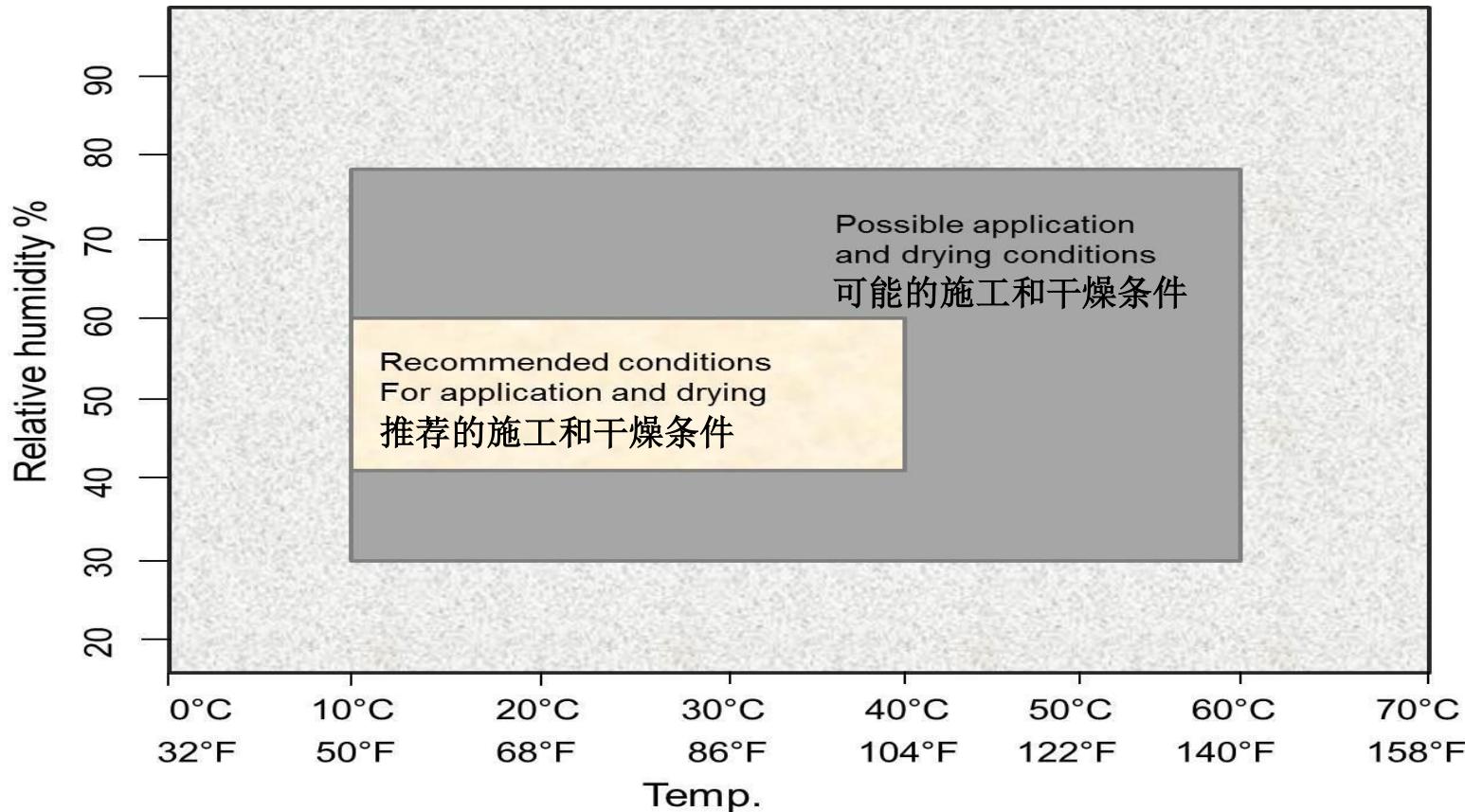
- ✓ Waterborne 1K sealer/primer 单组份水性底漆
- ✓ Waterborne 1K topcoat 单组份水性面漆

Application – Environmental Conditions

应用-环境条件

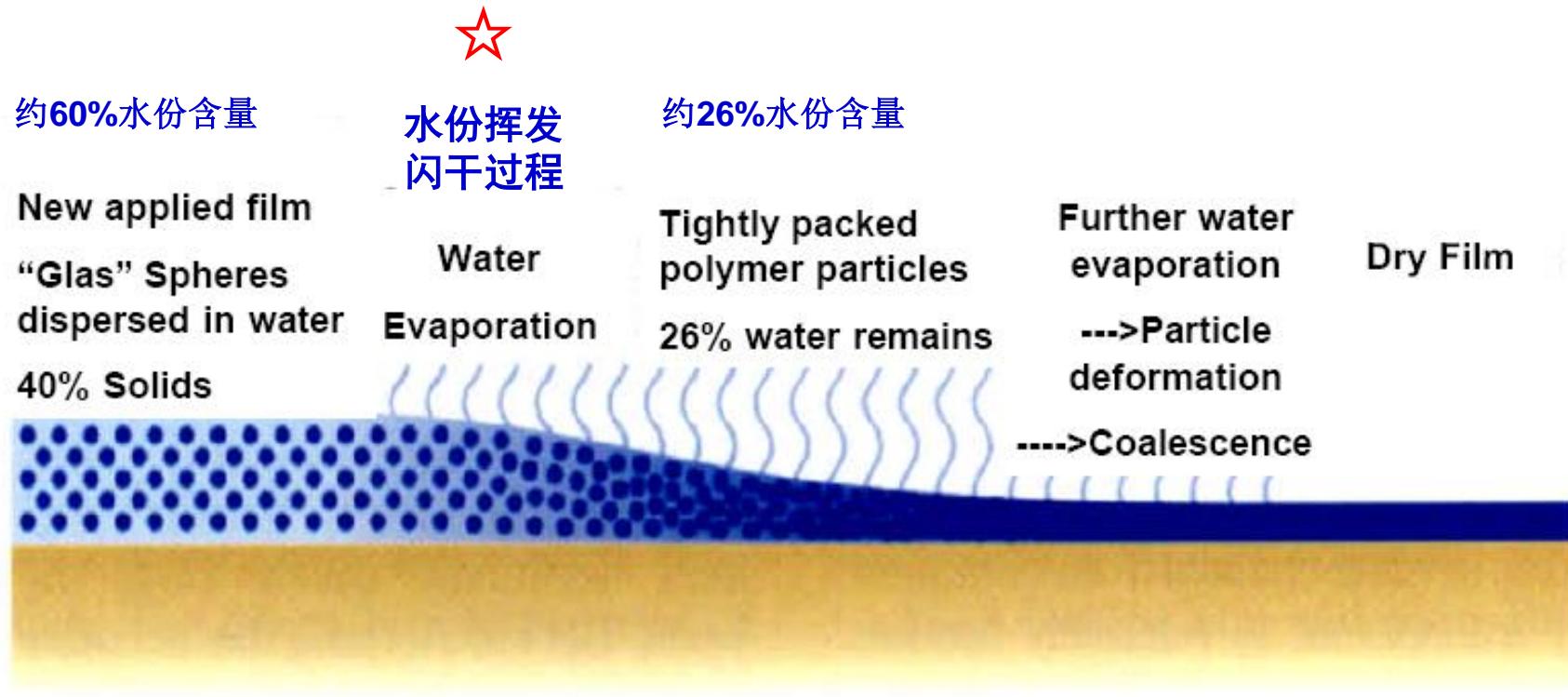


Application window for water-borne paints (Containing water and small amount of co-solvent) 水性涂料施工窗口（包含水和少量溶剂）



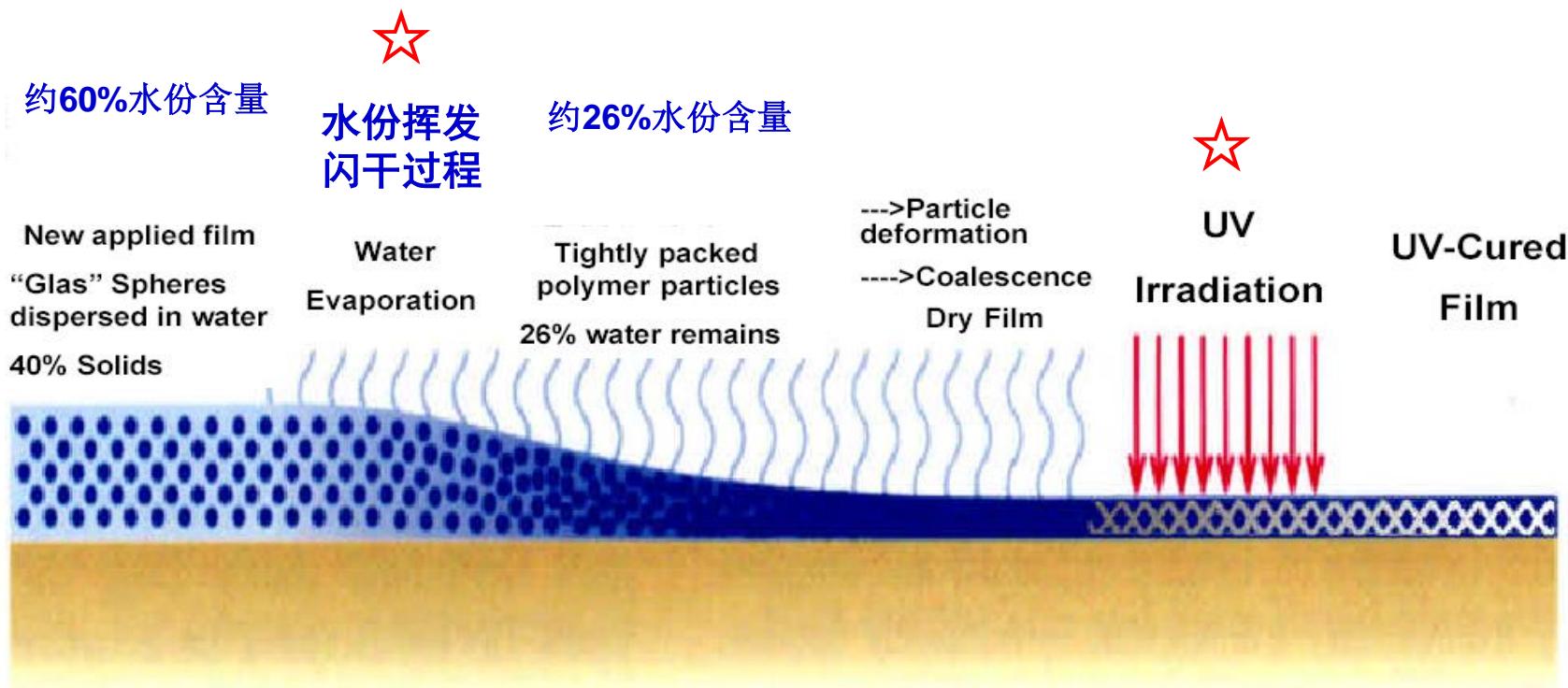
Drying of waterborne products

水性产品干燥过程



Drying and curing waterborne UV

水性UV干燥和固化过程



The 4 Steps of drying waterborne paint

水性漆干燥的4个阶段



Draft 示意图	Step 阶段	Reaction 状态反应	Phase 过程	Water content, % 含水率	Temperature 温度	Time 时间 (分钟)
	I. Application Wet 湿	Creating a covering film 创建涂膜	Evaporate 蒸发	60-65	Room temperature 15-35°C	2-3
	II. Activation Dividing of solids and water 区分固体和水	Water-film on top Solid state on wood 水膜固含量最高	Evaporate 蒸发	30-35	Settle point because of evaporation 15-35°C	15-35
	III. Drying Creating of capillaries 创建毛细管	Deformation of solids 固态变形	Diffusion 扩散	20-25	Heating 加热 45-50°C	>30
	IV. Curing Coalescence 交联	Coalition of solids 固态交联	Diffusion 扩散	≈ 0	Heating 加热 45-50°C	

Application – Environmental Conditions

应用-环境条件



- **Flash off times are critical to water base products.**
闪干时间对水性产品至关重要
- **Air movement plays a vital role in this process.**
空气流动在闪干过程中起着关键作用
- **Common issues due to poor flash off include the following**
由于闪干不良造成的问题如下：
 - Mud cracking 开裂
 - Blistering 起泡
 - Inconsistent gloss 光泽度不一致

Application – Environmental Conditions

应用-环境条件



- **Humidity level is a contributing factor in water base product cure response.**

湿度高低在水性涂料的干燥中起重要的作用

- ✓ **Low Humidity 低湿度**

Can cause the applied coating to dry to quickly. 会导致快速干燥。

Can also reduce the amount of flow-out of the applied film.

减少水从涂膜中的流出量

- ✓ **High humidity 高湿度**

Can slow the rate of evaporation of the water from the applied film.

会减慢水从漆膜中的挥发速率

Can cause runs or sags.

可能会引起流挂

WB Coatings Handling Basics

水性涂料操作基础



- **Sensitive to shear (stirring, pumping)**
对剪切敏感（振荡器、分散盘）
- **Sensitive to temperature**
对温度敏感
- **Sensitive to pH (generally stable in alkaline pH ~ 7.5-8.5)**
对PH值敏感
- **Sensitive to freeze-thaw cycles**
对冻融循环敏感
- **Sensitive to immediate surroundings**
对周围环境敏感
- **Spray equipment**
喷涂设备（油、水分离）

Surface Preparation

基材处理



- No dirt, oils or grease on surface of substrate
基材表面不能有污垢、油或油脂
- Handling the wood parts be kept to a minimum
处理木材部分保持到最低限度
- Barrier of substrate
基材隔离
- Round edge of furniture design
圆边的家具设计

Surface Preparation- Sanding

表面处理-砂光



➤ Bare wood Sanding 原木砂光

- ✓ Hardwood max 180-240 grit 硬木最大180-240目
- ✓ Softwood and oily wood max 180 grit
软木和油性木材最大180目

➤ Basecoat Sanding 底漆砂光

- ✓ Between 320-400 grit 320-400目之间
- ✓ Zinc Stearate—provide excellent de-dusting or clogging & increase efficiency
硬脂酸锌—提供优异的除尘或防堵塞，以提高效益

Application Methods

应用方式



- Dipping 浸涂
 - Flow coat 流涂
 - Curtain coater 淋涂
 - HVLP 高流量低气压
 - Air mix 混气
 - Conventional Spray 传统喷涂
 - Roller coater 轧涂
 - Electrostatic 静电喷涂
- } **Outdoor Products**
户外产品
- } **Manual or Auto**
手工或自动

How The Finishing Can Influence Drying? 喷涂方式对干燥的影响



Air Gun

- By spraying with a lot of air (air gun), pressured air takes a lot of water out of the spray mist. So layer of paint falls more dry on the workpiece. Therefore there must less water be withdrawn in the drying process.
- 有气喷涂中的气体能够带走水气，所以在基材表明的涂层更干燥，因此在干燥过程中回收的水气会减少。



Air Mix Gun

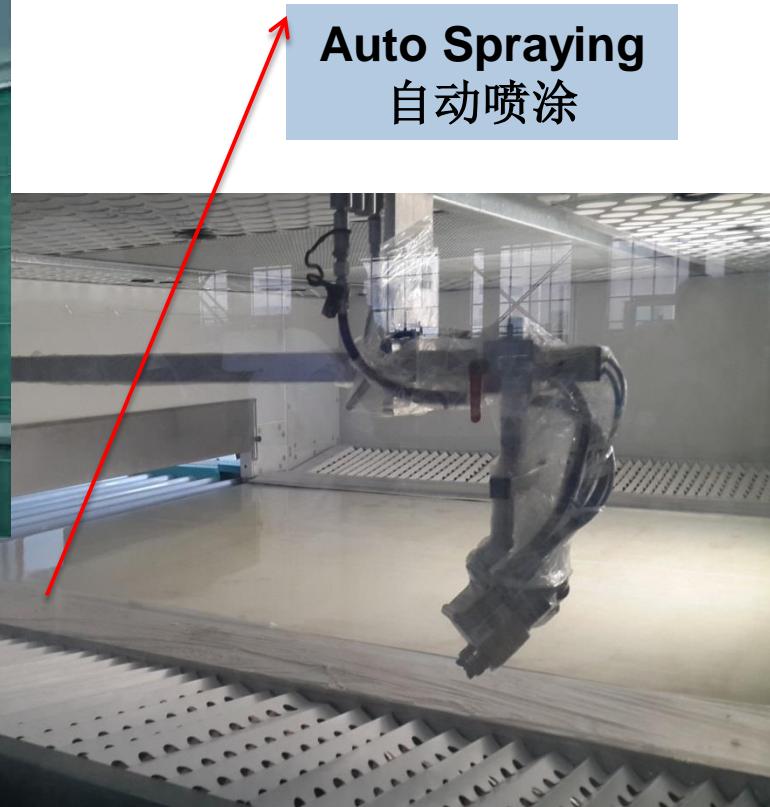
- With an Air mix gun to combine the benefits of the airless with those of an air atomization gun.
空气混合式具备比无气喷涂雾化好的优点。

Dry-type Spraying

干式喷涂



Manul Spraying
人工喷涂



Auto Spraying
自动喷涂

Dry-type Spraying can reduce water pollution.
干式喷涂能减少水污染。

Common equipment used in the cure process

常用干燥固化设备



- **Fans 风扇**
- **Ovens 烘箱（烘道）**
- **IR Ovens 远红外烘箱（烘道）**
- **OIR 冷红外辅助干燥**
- **Dehumidifiers 除湿机**
- **UV Cure Equipment 紫外光固化机 （WBUV）**

Drying Room

干燥室



Need Ventilation and Humidity Control
需要有通风设备和湿度控制

IR Drying System with Fans

带有风扇的红外干燥通道



- Fast heat transmission
热传导快
- Shortest Drying Times
干燥时间短

- Reduce Risk of Surface Damage
减少涂装表面损伤
- Good temperature stability
温度稳定性好

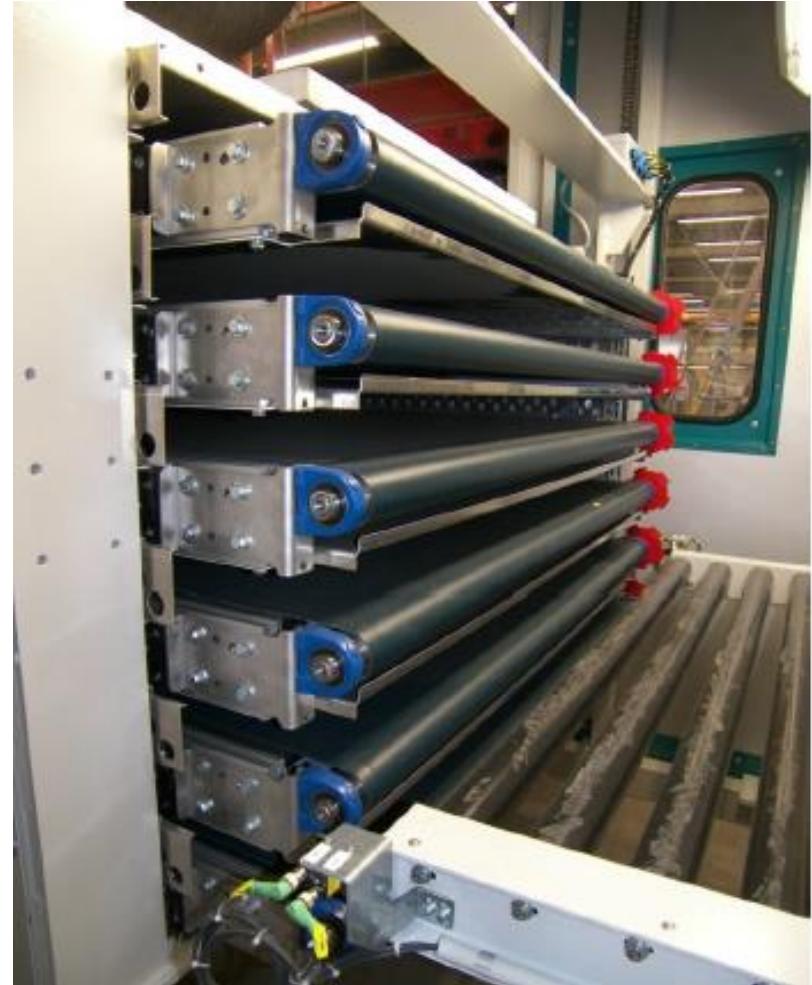


Drying Collecting Tower

集中干燥塔



- Suit for Panel Furniture
适合板式家具
- Space-Saving 节省空间
- Energy-effective 能量效率高



Sanding Methods

打磨方式



Manul Sanding
人工打磨



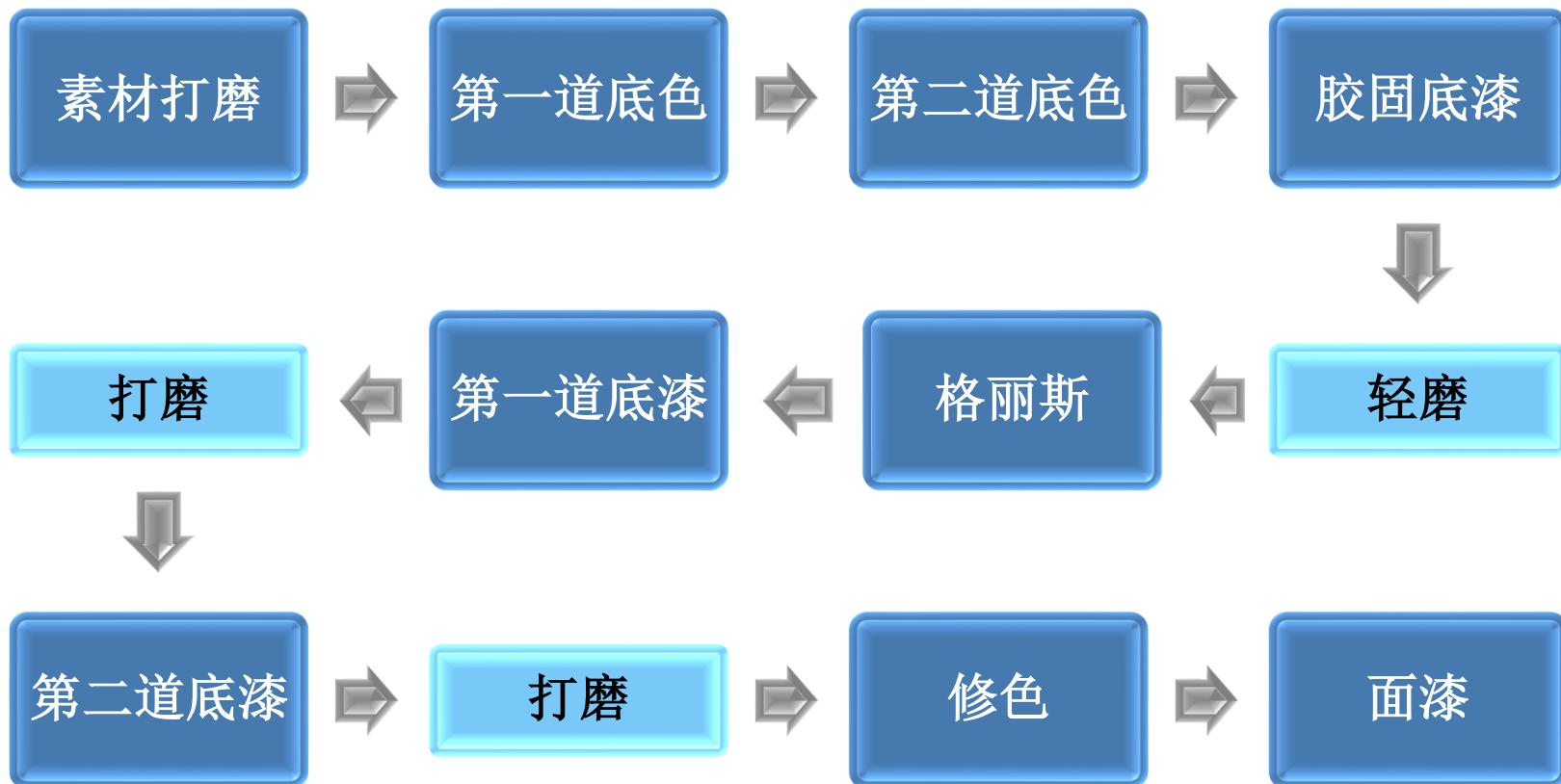
Sanding machine
机械打磨

- **High Efficient 高效**
- **Save Labor Costs 省人工**
- **Suit for Panel Furniture
适合板式家具**



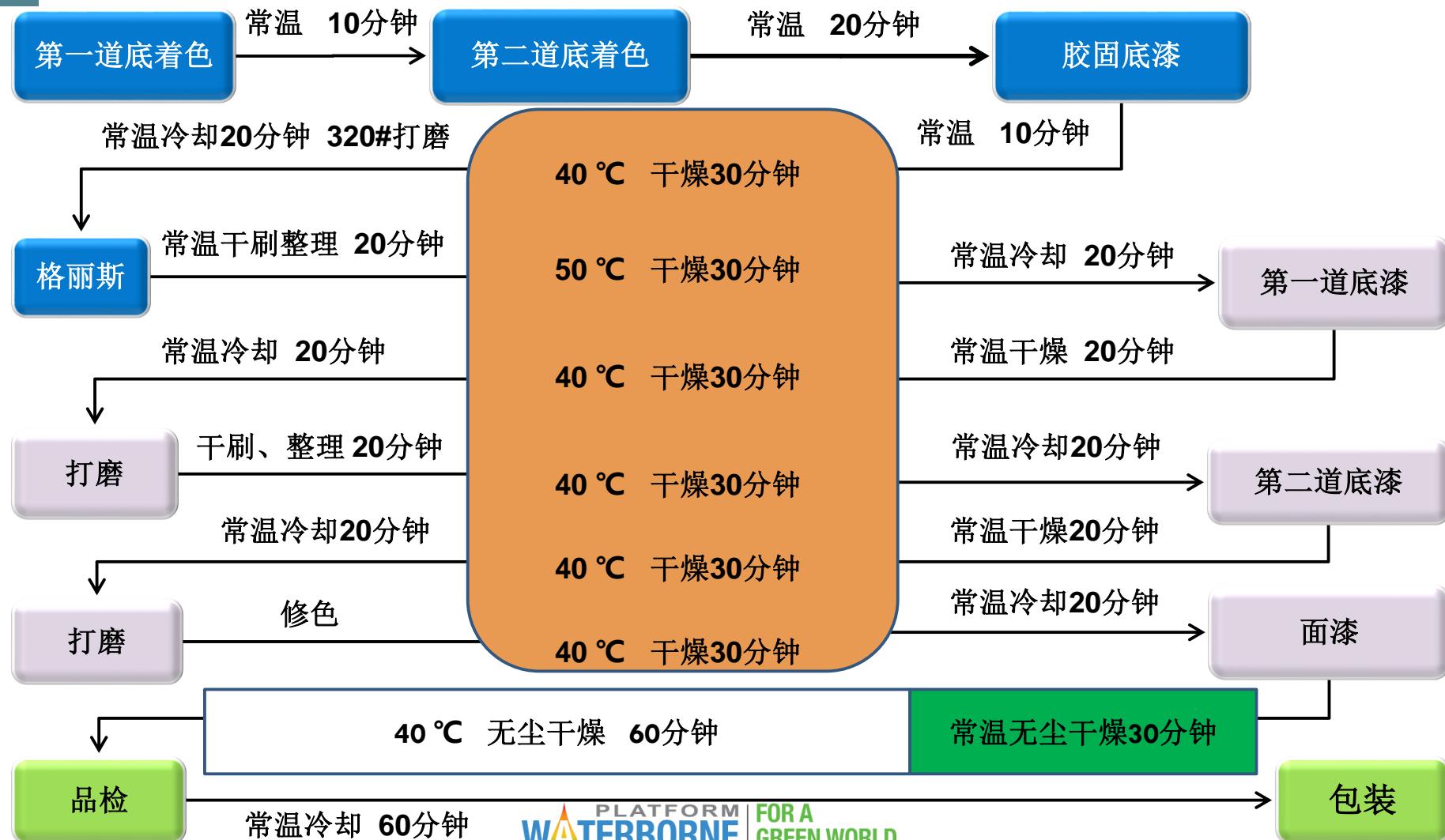
Basic Application process

基本涂装工艺流程



WB application in field

水性漆现场涂装生产线



Internal Application Case

室内应用实例



Internal Application Case

室内应用实例



Internal Application Case

室内应用实例



Interior Application Case

室内应用实例



Exterior W/B solution

户外水性涂装方案



SHERWIN-WILLIAMS ITALY
Società a Responsabilità Limitata
Via del Fiffo 12
I - 40065 - Pianoro (BO)

We hereby certify the conformity of the coating system
SAYERLACK
impregnating stain AM0546/xx*
+
top coat AZ21xx/xx**
(MINIMUM WET FILM THICKNESS 200 MICRON)
to the EN 927-2 performance specification and
to the additional requirements of the
CATAS QUALITY AWARD PLUS
COATING SYSTEM FOR EXTERIOR WOOD
(*STABLE PRODUCTS)
THE USE OF THE WORD **PLUS** INDICATES THAT THE CERTIFIED
COATING SYSTEM SATISFIES THE NATURAL WEATHERING TEST
REQUIREMENTS FOR AN EXPOSURE TIME TWICE AS LONG AS THAT
REQUIRED BY EN 927-3 (2 YEARS).
We are pleased to declare that the production of the above mentioned
coating system is supervised by CATAS having obtained the

CATAS QUALITY AWARD

* IMPREGNATING STAIN COLOURS
SA AMERICAN WALNUT BB BROWN WALNUT F2 WALNUT FA MEDIUM WALNUT
* TOP COAT SHADES
BY TEAR Y3 LIGHT WALNUT F2 WALNUT M5 DARK WALNUT

FROM July 1st 2010
TO June 30th 2014

dr. Antonio Giorio
Chief Executive

CATAS www.catas.com

Exterior W/B solution

户外水性涂装方案



Exterior W/B solution

户外水性涂装方案



花园家具、甲板、廊道(柚木、大绿柄桑、栎木)



Exterior W/B solution

户外水性涂装方案



户外门窗、凉亭(橡木、胡桃木、柚木)



★ 端头及V字接头





水性木器漆的挑战

THE CHALLENGES OF WB WOOD COATINGS

Challenge from SB to WB – Application process

油转水的挑战-应用过程



- Change handling basics 改变操作基础（操作习惯）
- Surface preparation – moisture control of substrates, sanding, part cleanliness, staining
表面处理准备：底材含水率控制 → 砂光 → 清理 → 底着色
- Application 应用
 - ✓ Environmental conditions 环境状况
 - ✓ spray equipment 喷涂设备
 - ✓ fluid handling 液体的处理

Challenges from SB to WB – Appearance

油转水的挑战—外观



- Solvent borne-look surface 跟油性涂料一样的外观
- Clarity of topcoats 面漆清晰度
- High gloss 90+ sheen 高光90
- Matt gloss 0 sheen 0分光
- Wood warming effect 暖木效应
- Film Build 膜厚
- Appearance 表面
- Waterborne cause grain raising & rough surface
水性涂料导致木毛竖起&粗糙表面

Customized Products and Application Methods

定制化产品及工艺



- Different environment: temperature、humidity、air flowing
不同的施工环境：温度、湿度、空气流动
- Different substrate: softwood、hardwood
不同的底材：软木、硬木
- Different produce line: ground line、spraying room、drying room
不同的生产线：地盘线、喷房、干燥房
- Different product: suite-furniture、office-furniture、wooden door
不同的产品：套房家具、办公家具、木门

Customized Products and Application Methods

定制化产品及工艺



**Perfect Result = Customized Products +
Dependable Application Methods**

理想的涂装效果 = 定制化产品 + 可靠的涂装工艺

We need the blue sky and white clouds
我们需要这样的蓝天和白云



水性引领绿色生活
平台造就环保产业

