

# Powder. Perfected.



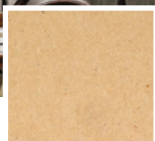
PPG ENVIROCRON<sup>®</sup> HeatSense  
powder coatings for heat-sensitive substrates



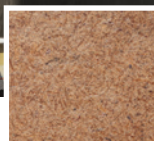
We protect and beautify the world<sup>®</sup>



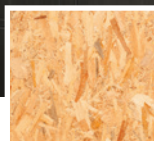
Hardwood (HW)



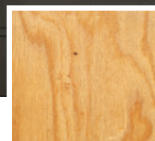
Medium-Density Fiberboard (MDF)



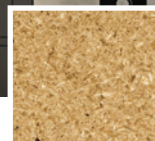
High-Density Fiberboard (HDF)



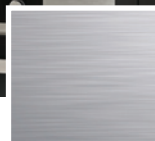
Oriented Strand Board (OSB)



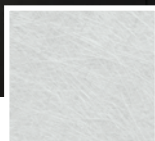
Plywood



Particle Board



Metal



Fiberglass

## Advanced technology brings the power of powder to wood, wood-composite substrates and metals

Powder coatings have long been renowned for their toughness and durability when used over thinner metals, but the technology has worked less reliably over wood and wood composites. Low conductivity, warping, variations in moisture content and inconsistencies in substrate quality have all made it difficult for wood coaters to adopt powder.

Dense and oversized metal items such as kettle bells or construction counterweights have been problematic to powder coat as well, as it is often difficult to bring them up to a uniform temperature.

We're solving these challenges with our low-bake *Envirocron* HeatSense powder coating technology for heat-sensitive wood, wood-composites and metals. These coatings, coupled with a strictly regimented application and curing process, overcome the traditional barriers to using powder on these substrates.

The result is a tough, durable coating that delivers clear advantages over competing finishing technologies in aesthetics and functionality.

### Suggested markets

Office furniture and equipment

Building products

General industrial

### Suggested end uses

Office furniture

Cabinetry and casework

Building and construction

Store fixtures and point-of-purchase (POP) displays

Heat-sensitive and oversized metals

### Unique benefits



Sealed edges provide durable protection from heat, moisture, physical impacts and UV light



Cost-effective, compact, low-waste, high-output, automated application technology



Delivers aesthetics and functionality: solids, textures, antimicrobial\*-protected films



Available in a wide range of custom colors, glosses and textures



No edge-banding allows for application on curved and straight parts; may reduce labor costs

\* Antimicrobial is limited to the treated surface to provide mold and mildew resistance on the paint film and to inhibit the growth of stain and odor-causing bacteria that may affect the surface of the coating. The use of these products does not protect users of any such treated article or others against food-borne or disease-causing bacteria, viruses, germs or other disease-causing organisms.





## The performance benefits of low-cure powder by end use



### Office furniture

- No edge banding creates more design freedom
- No edge banding can reduce labor cost
- Hardness and scratch resistance
- Sealed edges improve moisture resistance



### Cabinetry and casework

- Compact, single-coat process versus multi-coat liquid process
- Fully encapsulated and seamless, offering moisture and chemical resistance
- Design flexibility (e.g., one-piece shaker door)
- Small, custom-color batches



### Building and construction

- Exceptional durability and appearance
- Factory-applied, water-resistant barrier on OSB sheathing
- Prefinished, factory-applied coating for engineered wood siding
- Factory-applied primer for plywood



### Store fixtures and point-of-purchase (POP) displays

- Freedom of design with custom colors, finishes and textures
- Hardness and scratch resistance
- Seamless coverage aids in ease of cleaning
- PPG SILVERSAN™ antimicrobial\*-protected coating in public places



### Heat-sensitive and oversized metals

- Protects metals that have traditionally been too dense/large to powder coat
- Exceptional durability and appearance
- Freedom of design with custom colors, finishes and textures
- PPG SilverSan antimicrobial\*-protected coating

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	Envirocron HeatSense Powder Coating	Melamine	High-Pressure Laminate	Solventborne Liquid Coating
<b>Sustainability</b>	Low VOCs Low CO <sub>2</sub> Low waste	High VOCs Moderate CO <sub>2</sub> High waste	High VOCs Moderate CO <sub>2</sub> High waste	Highest VOCs Highest CO <sub>2</sub> High waste
<b>Labor</b>	Low	High	High	High
<b>Durability</b>	Excellent	Good	Good	Good
<b>Moisture resistance</b>	Excellent	Poor	Poor	Good
<b>Design flexibility</b>	Custom colors, textures, antimicrobial*-protected surface options	Limited due to edge banding	Limited due to edge banding	Thousands of solid colors, antimicrobial*-protected surface options

## Overall, powder outperforms competing technologies

Powder coatings outperform solventborne liquid coatings, high-pressure laminates and melamine across several key metrics, the most important of which is in the realm of sustainability. Powder's VOCs and carbon footprint are considerably lower, boosted by the fact that powder can be reclaimed and resprayed.

Performance is another factor. Powder provides better durability than all competing technologies as well, but does so in fewer coats. Because powder

fully encapsulates the substrate, it provides better moisture resistance than laminate or melamine, which are banded and leave openings at corners.

Finally, in addition to custom color matching, powder offers finishing capabilities that are not available to all competing technologies, including textures, veins, metallics and antimicrobial\*-protected surface options.

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## The curing and application process

Once applied to a pre-heated substrate, this powder breakthrough allows for fast curing at low temperatures through convection, infrared (IR) and/or combination convection/IR ovens.

### Step 1: Preheat the substrate

- Temperature range 150-250° F (66-121° C)
- Substrate dimensions and type dictate conditions

### Step 2: Powder application

- Standard powder spray guns
- Film thickness of 4 mils (100 μ) or more – enough to form a continuous film
- Film thickness uniformity has to be controlled

### Step 3: Powder cure

- Temperature range 250-350° F (121-177° C)
- Dwell time 5-10 minutes
- Substrate dimensions and type dictate conditions

## Start-up investment\*

### \$250K

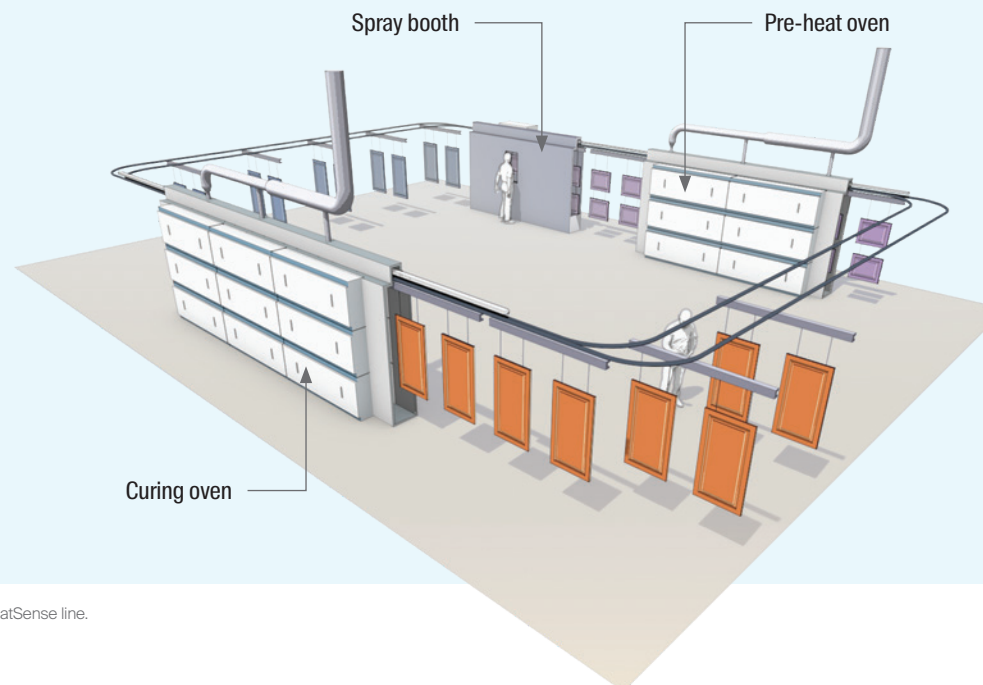
- Manual spray, continuous line
- 200 – 300 parts per hour

### \$1.2M

- Automated spray with reclaim, continuous line
- 750 – 1,000 parts per hour

### \$2.0M

- Automated spray with reclaim, continuous line
- 2,000 – 3,000 parts per hour



\* Approximate figures represent typical equipment cost for a PPG Envirocron HeatSense line. Contact a PPG representative for more information or a detailed quote.







## Envirocron HeatSense powder coating technologies

The *Envirocron* HeatSense family of coatings offer formulations for a wide variety of end uses and substrates. The hard, fully encapsulated surface helps to protect your products from chips, scratches, chemicals, heat and water – all while delivering aesthetic and functional options not available with competing technologies.

Product Characteristics	Interior	Exterior
<b>Recommended Substrates</b>	Medium- and high-density fiberboard, hardwood, plywood, fiberglass, steel	Plywood, oriented strand board, steel, composite concrete board, wood siding
<b>Colors Options</b>	Custom	Custom
<b>Gloss</b> ASTM D523 @ 60°	5 – 80	5 – 80
<b>Texture Options</b>	Smooth and texture	Smooth and texture
<b>Specialty</b>	Optional antimicrobial*-protected	Optional mold and mildew resistance
<b>Oven Type</b>	Convection, IR or Combo	Convection, IR or Combo

Performance Properties†		
<b>Dry Film Thickness</b> ASTM D4138	4.0 – 7.0 mils	4.0 – 7.0 mils
<b>Pencil Hardness</b> ASTM D3363	H – 2H minimum	H minimum
<b>Solvent Resistance</b> PCI #8	No effect	Slight mar
<b>Boiling Water Resistance</b> NEMA LD 3-2005 -3.5	No effect	No effect
<b>Detergent/Water Resistance</b> KCMA 9.5	No swelling or edge cracking	No swelling or edge cracking



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† Proper selection of substrate, powder, film thickness and curing process is critical to achieving a quality coated part.



## PPG: WE PROTECT AND BEAUTIFY THE WORLD™



### A trusted global coatings leader

Operations in 70+ countries, with 100+ manufacturing facilities and 47,000 employees



### Renowned color expertise

Trend-setting palettes for home, auto and industry paired with unrivaled color matching



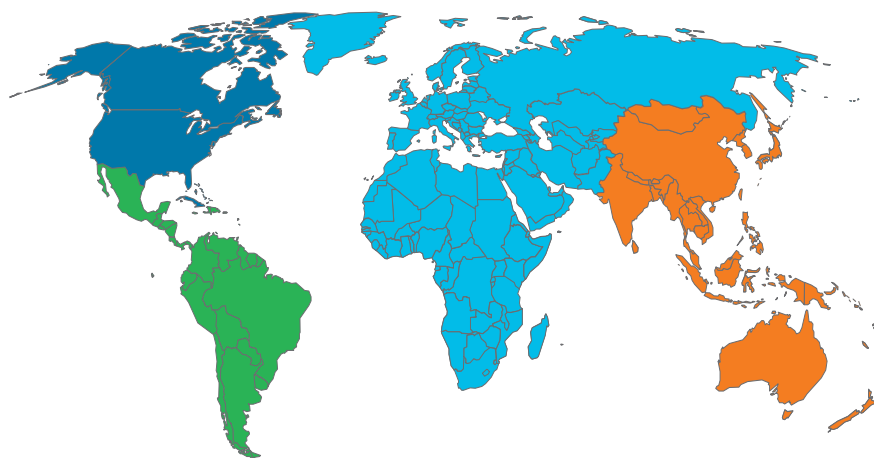
### Commitment to sustainability

Over 35% of annual sales from sustainably advantaged products and processes



### Dedication to innovation

3,500+ technical employees and \$464 MM average annual R&D investment



### Industrial coatings from PPG

- World-class technical services and training
- Help meeting specific, coatings-related environmental mandates
- Assistance setting up new equipment and identifying areas where your processes may be streamlined
- Troubleshooting production issues
- SECURE LAUNCH EXCELLENCE™ accelerated custom product formulation and color development process

To learn more about PPG coatings, please visit us online at [ppgindustrialcoatings.com](http://ppgindustrialcoatings.com), or contact one of the international sales offices listed below.

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