


# MODULAR LASER CURING SYSTEM



# Why Laser Powder Coat Curing?

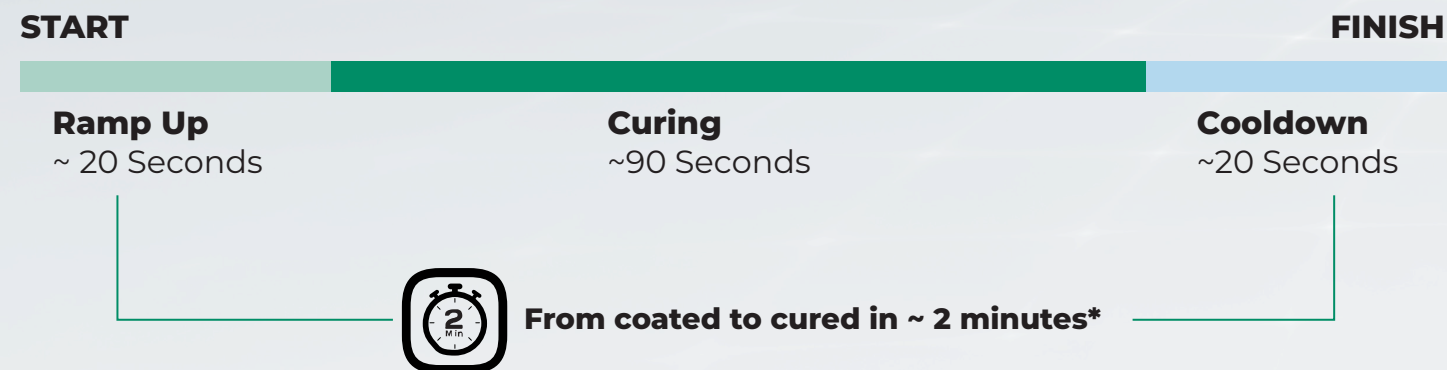
## LASER CURING VS. ALTERNATIVE METHODS

	 <b>LASER</b>	<b>Infrared Lamp</b>	<b>Convection (Electric)</b>
Process Speed	High	Moderate	Low
Oven Footprint	Small	Small	Large
Energy Cost	Low	High	High
Environmental Impact	Low	Moderate	High
Maintenance	Low	High	Moderate

## UP TO 10X FASTER THAN CONVECTION

The moment a laser oven is turned on laser energy immediately penetrates the powder surface, heating the coating in volumetric fashion.

Laser curing achieves a powder-to-liquid phase transition in seconds before rapidly completing the curing process. The high curing speed reduces unnecessary heating of the part, minimizing cooling times.



## Unmatched End-to-End Efficiency



### ULTRA-EFFICIENT LASER TECHNOLOGY

IPG laser technology provides the highest electricity to heating efficiency available.



### PRECISION ENERGY DIRECTION

Laser curing targets a controlled area, wasting no energy heating the rest of the oven.



### NO PRE-HEATING OR IDLING

Near instant starting and stopping means laser power is only on when curing is underway.

## DRAMATICALLY REDUCED SPACE REQUIREMENTS

The incredible speed of the laser curing process means that powder coated parts spend less time being cured. Faster curing times translate directly to reduced oven length requirements.

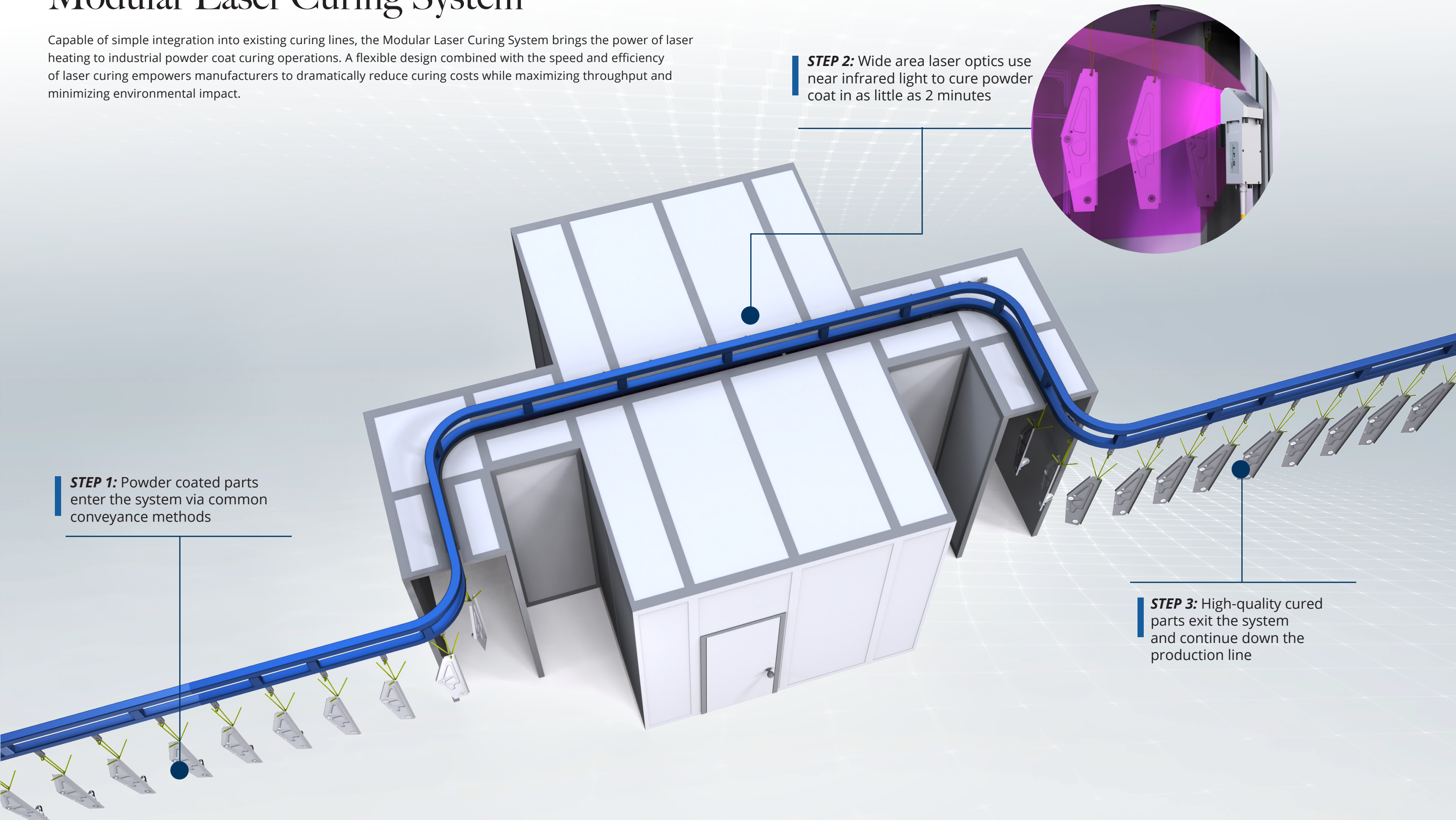
As a result, laser ovens match the productivity of a convection oven while requiring as little as 10% of the floorspace.



\*Lab test results using ACT panels. Consult your coating manufacturer for product specific information.

# Modular Laser Curing System

Capable of simple integration into existing curing lines, the Modular Laser Curing System brings the power of laser heating to industrial powder coat curing operations. A flexible design combined with the speed and efficiency of laser curing empowers manufacturers to dramatically reduce curing costs while maximizing throughput and minimizing environmental impact.



**STEP 1:** Powder coated parts enter the system via common conveyance methods

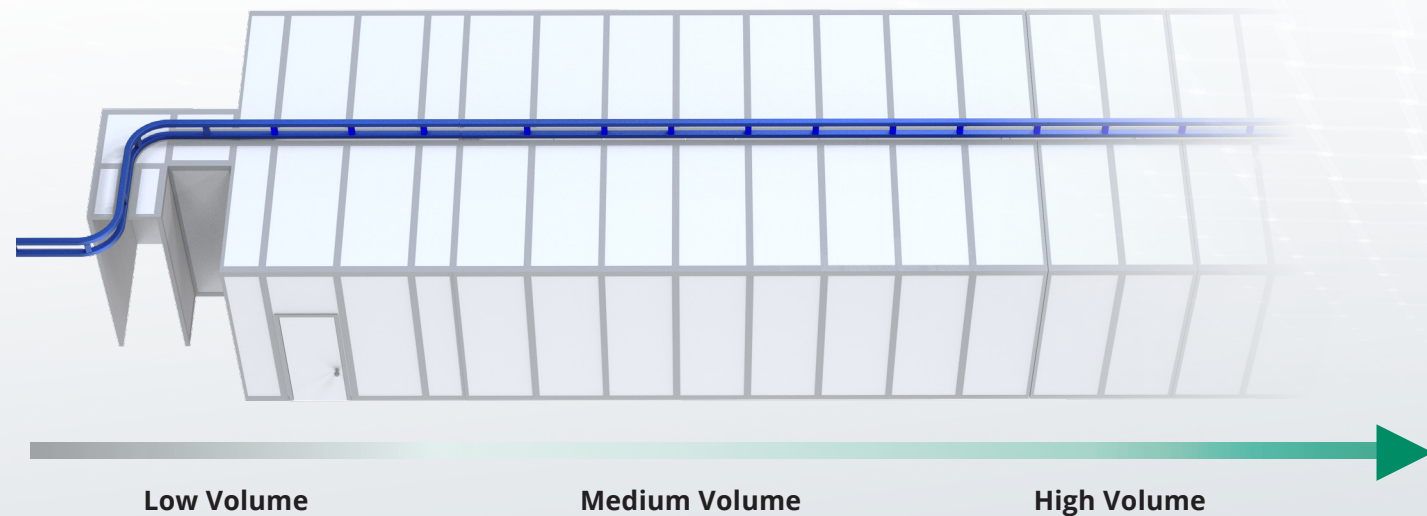
**STEP 2:** Wide area laser optics use near infrared light to cure powder coat in as little as 2 minutes

**STEP 3:** High-quality cured parts exit the system and continue down the production line

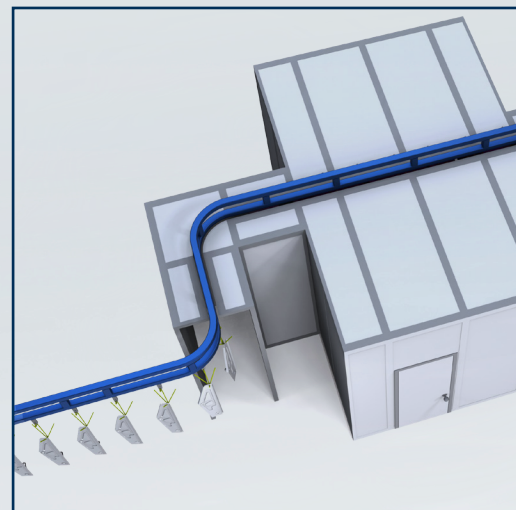
# Modular, Flexible & Scalable

## RIGHT-SIZED FOR YOUR OPERATION

From 8 feet to 100, a modular cell design means the length of your laser oven always matches your exact space and throughput requirements, even as your operation grows.

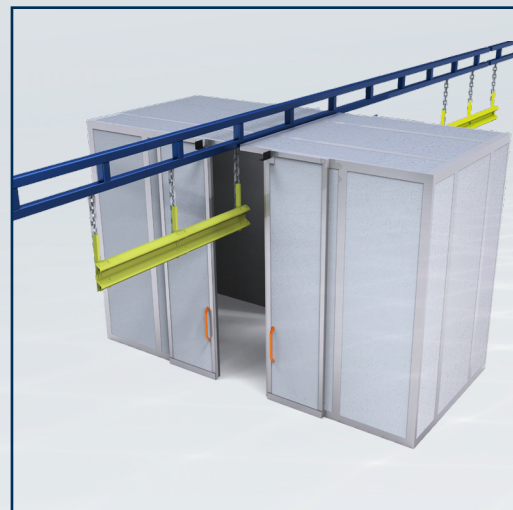


## SEAMLESS INTEGRATION WITH COMMON CONVEYORS



### CONTINUOUS

A laser safe “light labyrinth” option traps laser light, allowing for continuous conveyance.

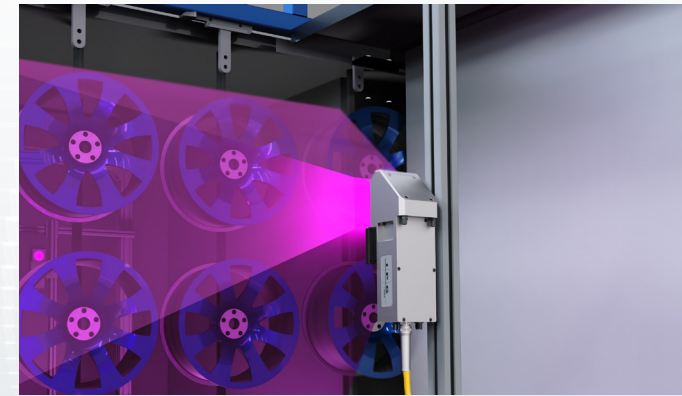


### STOP-AND-GO

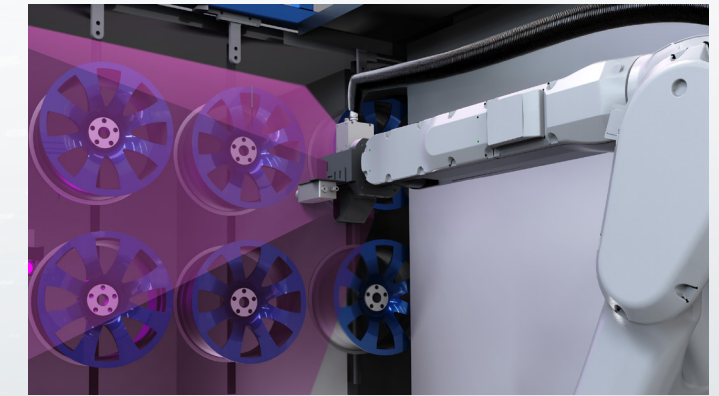
Choose between automatic or manual doors for a light-tight enclosure that integrates with stop-and-go conveyance.

## OPTIMIZED BEAM DELIVERY FOR ANY PART MIX

From manually adjustable optics to 3-axis and robotic options, the Modular Laser Curing System delivers consistent curing quality no matter your part mix or part complexity.



XYZ OPTICS



ROBOTIC OPTICS

## UNPRECEDENTED TEMPERATURE MONITORING & CONTROL

The Modular Laser Curing System can be equipped with a variety of internal temperature sensors. Not possible with traditional convective curing methods, in-situ temperature measurement and adjustment enables the curing process to be more precise than ever.

### IR THERMAL SENSOR

Ideal for most full-production curing processes, small spot thermal sensing delivers data to system software for precise control over process temperatures.

### FLIR THERMAL CAMERA

Providing a full view of the entire part, a precision thermal camera provides detailed data & enhances the temperature control loop.

### HIGH-PRECISION PYROMETER

By collecting high-resolution data, an internal pyrometer sensor enables in-house R&D and process development.

# MODULAR LASER CURING SYSTEM SPECIFICATIONS

SYSTEM CHARACTERISTICS	
Modular Cell Dimensions	<b>Length:</b> Minimum: 2.4 m Maximum: Unlimited (Increments of 1.2 m) <b>Height:</b> up to 5 m <b>Depth:</b> Customer Part Dependent
Laser Safety	<b>Class I Laser Enclosure</b> Laser Safe "Light Labyrinth" or Manual or Automatic Doors
Enclosure Walls	Heat Resistant Aluminum Panels
Conveyor Compatibility	<b>Conveyor Types:</b> Overhead Rail & All Common Conveyors <b>Conveyance Style:</b> Continuous & Stop-and-Start
Fume Extraction	Ready for Integration with Facility Fume Extraction
LASER & BEAM DELIVERY	
Laser Source	IPG DLS or DLS-ECO Series Laser (from 4.5 kW to 100 kW)
Beam Delivery Optics	IPG DLS Wide Area Projection Head
Heating Area (per Laser Source)	Minimum: 200 x 200 mm Maximum: 1800 x 4000 mm
Projection Head Mounting Options	Fixed Manually Adjustable (XYZ) Pneumatic (XYZ) Servo (XYZ) Robotic (6-Axis)
Cooling	IPG Laser Chiller
CONTROL & MONITORING	
Software	IPG DLS/HMI Controller Software
Operator Interface	Monitor with Keyboard & Mouse
Temperature Control Options	Infrared Temperature Sensor FLIR Thermal Camera Precision Pyrometer Sensor
Internal Monitoring	Imaging Camera with CCTV
Safety	Optional Human Detection Safety Radar
GENERAL CHARACTERISTICS	
Facility Requirements	<b>Power:</b> 400-480VAC, 68A, 3PH, 50/60Hz <b>Temperature:</b> 0 °C to 43 °C <b>Relative Humidity:</b> <75%, No Dew or Frost <b>Air:</b> Filtered Moisture-free Compressed Air, 550 kPA minimum

## TALK TO A LASER CURING EXPERT



Considering a laser powder coat curing solution? Getting started is easy. Whether you want us to coat and cure a sample part or to just learn more about how laser curing can revolutionize your powder coat operation, an IPG laser expert is ready to help.

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