

DRYING & DRIVING SUSTAINABILITY IN THE AUTOMOTIVE INDUSTRY

The automotive industry doesn't need to paint cars green to make its thermal operations more sustainable.

INTRODUCTION

Car paint is more than a preference or expression of personal style. Neutral, bold, matte or metallic, colors and finishes affect the value of the car.

Paint has protective purposes, too; it can keep critical components — the metal body of an automobile, for example, and what's underneath — safe from abuse like scratches, rust, moisture and other damaging elements that come from putting kilometers on city streets or rural roads. But most importantly, car paint (how it's dried, in particular) affects the current and future sustainability of the automotive industry.



CHANGE HOW PAINT IS DRIED TO HELP CHANGE THE WORLD

Before rubber meets the road – but after design, engineering and stamping – cars are painted. Then, the paint must be dried.

There's more to this thermal automotive process than meets the eye; drying car paint is complex, often unnoticed and unconsidered, but should be, especially because the automotive industry must meet growing production demands amid stringent sustainability regulations.

India's overall sustainability includes a one-billion metric ton in projected carbon emissions by 2030 and net-zero emissions by 2070.¹

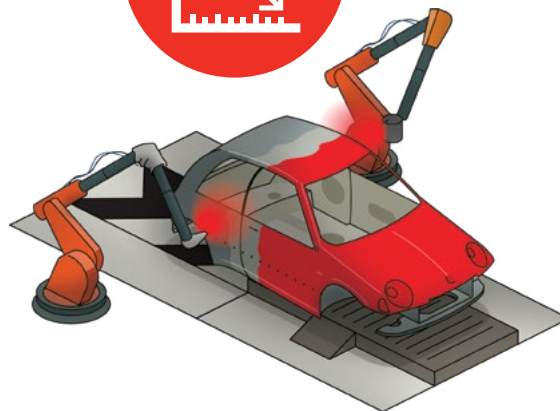
However, because car painting currently uses an average of 50-70% of a car manufacturing plant's total energy costs and emits over 65% of a plant's total CO₂ emissions, India's essential sustainability goals remain distant in a sector that can make an effective, planet-first impact.^{2,3}

INDIA'S DRIVE TO SUSTAINABILITY

GOALS

**1 BILLION
METRIC TON
REDUCTION**
IN CARBON EMISSIONS BY 2030

NET-ZERO
CARBON EMISSIONS BY 2070¹



CHALLENGES

**50-70%
ENERGY
COSTS**
FROM CAR PAINTING

**EMITS
+65%**
PLANT'S TOTAL
CO₂ EMISSIONS

HELPING PAINT SHOP SYSTEMS REDUCE EMISSIONS

Changing how the car-painting process is performed by improving its efficiency at the equipment level can help. Automotive painting relies on industrial equipment that cures and dries each layer (e-coat, primary, base color/clear coat). Enhancing the thermal drying equipment that often runs nonstop is an approach many automotive manufacturers adopt to reduce emissions, improve energy efficiency and protect the quality of their products without disrupting their processes.

Honeywell Thermal Solutions has the equipment, technology and expertise to elevate the sustainability, reliability and performance of automotive paint-drying equipment for sector-wide improvements.

Automotive paint-drying systems need to be energy efficient and deliver clean, safe, evenly distributed heat for paint drying while minimizing emissions. And that's what the thermal solutions in our comprehensive portfolio help drying systems do, including the following:

THEMAL SOLUTIONS IN OUR COMPREHENSIVE AUTOMOTIVE PAINT-DRYING SYSTEMS PORTFOLIO



HEAT EXCHANGERS

Our heat exchanger offerings include solutions for low- and high-temperature drying applications that can effectively capture and reuse waste heat from equipment, as well as lower energy costs by effectively controlling process air temperatures. They also include solutions for indirect air heaters, that are commonly used for the final drying process of the base/clear coat, like our Exothermics RHT heat exchanger.



NP-LE AIRFLO® LINE BURNER

For automotive, this line burner is used primarily in spray booth air heaters and make-up air units. It helps provide fresh air heating at a thermal high turndown with low NO_x and CO levels that meet regulatory requirements for ventilated workspaces.



OVENPACK LE BURNER

This is an industrial burner with high thermal turndown for direct and indirect air heating in paint curing and other oven applications. It burns any clean fuel gas, operates on low gas supply pressures and provides clean combustion with low NO_x and CO levels.



KINEDIZER® STAGED LE BURNER

Used in thermal oxidizers to help eliminate volatile organic compounds, this burner has a high thermal turndown to reach and maintain operating temperatures, produces less than 20 ppm NO_x at 3% O₂, and adheres to emissions regulations such as SCAQMD 1147.



BURNER CONTROL UNITS

Select from compact, simplified or all-in-one modular solutions to manage burners in automotive paint-drying systems. Our burner control units include the 7800 SERIES, which controls automatically fired burners with unlimited capacity, and the SLATE™ Combustion Management System, which features the revolutionary integration of configurable safety and programmable logic. All burner control units can be customized to monitor and adjust temperatures, pressures and flows for optimal, energy-efficient drying.

We can also utilize hydrogen to help reduce or even eliminate carbon emissions depending on the carbon intensity of the hydrogen and its percentage of the fuel used in paint-drying equipment. We have burners and all the necessary controls to support the various applications across an automotive plant's paint shop.

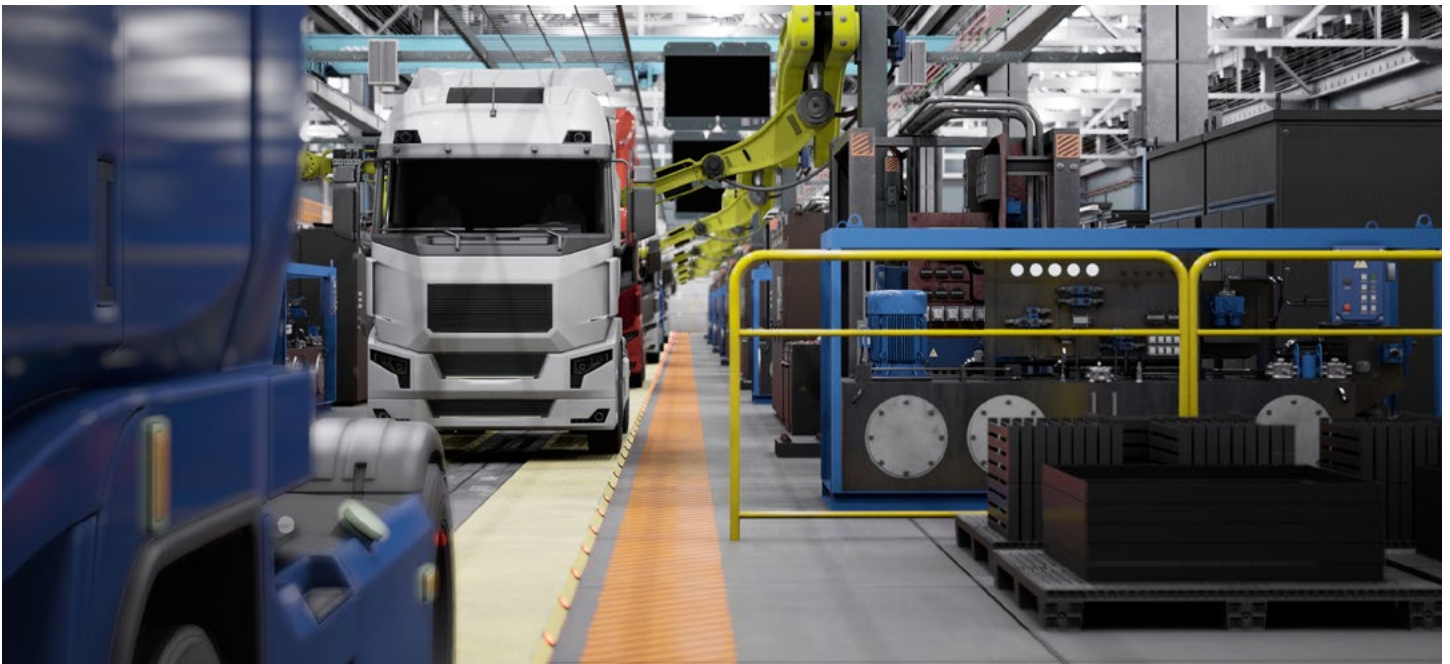
A TRUCKLOAD OF EFFICIENCY AND SUSTAINABILITY

The following is an example of how our thermal solutions enhanced the efficiency, sustainability and operability of the paint-drying process at a major U.S. automotive manufacturing plant.

From start to finish, this automotive plant produces more than 200,000 trucks each year. Part of its assembly line includes paint dryers that rely on indirect-fired heaters. Wanting to switch from indirect-fired to direct-fired heaters for greater energy savings, it partnered with Honeywell Thermal Solutions to help design and drive this pilot project.

Alongside the plant and its original equipment manufacturer, Honeywell Thermal Solutions redesigned one of its many drying systems with a new Maxon APX[®] burner and a new fuel train with Kromschröder components, the SLATE combustion management system, a SMARTLINK[®] DS Intelligent Control Actuator and Thermal IQ[™]. This burner-fuel train-controls combination enhanced the drying system's existing combustion control and its overall efficiencies — when measured, there were zero traces of carbon monoxide and lower explosive limit gases. With real-time data from Thermal IQ in particular, the plant noticed its temperatures, pressures and flows with this new system were more consistent, leading to more effective drying across all different paint types.

The success of the solutions in this drying system — energy savings, efficiency gains, greater control, increased visibility — encouraged the plant to scale them across more than 30 drying systems, which lowered emission levels and improved the plant's overall sustainability without affecting its production levels.



PUTTING SUSTAINABILITY FIRST WHILE PROTECTING METALS

Honeywell Thermal Solutions can help car plants in India and worldwide overcome barriers to better sustainability by tailoring new solutions and comprehensive services to existing drying equipment. It goes a step further than sustainability when prescribing and implementing solutions, considering finished product quality, too.

Industry-leading heat exchangers, burners, controls and more help protect the metal body of the car as paint is dried through precise temperatures and even heat application. These characteristics are critical; an improperly dried finish can lead to poor quality such as color variations or premature failure of the finish, exposing the metal body of the vehicle to the elements.



ADDING VALUE TO OTHER PAINT-RELATED PROCESSES

Car manufacturers can revamp other car paint-related processes with Honeywell Thermal Solutions for more sustainability and efficiency gains. The solutions in Honeywell's extensive portfolio enhance drying equipment, as well as paint booths and thermal paint incinerators.



PAINT BOOTHS

Honeywell Thermal Solutions helps provide clean, reliable, evenly distributed heat as paint is sprayed onto automobiles for enhanced application. Recommended solutions for equipment like roof-mounted Air Supply House units used in paint booths are raw-gas line burners, like the Maxon NP-RG AIRFLO® industrial burner and Maxon NP-LE AIRLFO natural gas burner. Honeywell Thermal Solutions also provides fuel delivery, electronic control devices and complete valve trains for paint systems.

THERMAL PAINT INCINERATORS

The fumes and volatile organic compounds from car paint must be destroyed before air used and captured from the painting process can be exhausted into the atmosphere. Thermal incinerators, also known as thermal oxidizers, are used for this part of the painting process. Honeywell Thermal Solutions provides complete combustion systems for thermal incinerators, including the Maxon Kinedizer® LE burner, which provides low NO_x emissions with very little excess air, the Staged Kinedizer® LE burner and the Maxon Kinemax® burner. Heat exchangers can also be integrated into thermal oxidizers to increase efficiency and reduce fuel costs.

CONCLUSION

Automotive paint-drying processes in India, in addition to other paint-related processes, are pivotal to worldwide sustainability efforts because of how small changes at the equipment level can save energy, reduce emissions and raise overall plant efficiency while protecting product quality and production levels. Honeywell Thermal Solutions makes these changes easy.



REFERENCES

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For more information

<https://process.honeywell.com/us/en/industries/manufacturing/automotive>

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THE
FUTURE
IS
WHAT
WE
MAKE IT

Honeywell