



## SHOWCASE PROJECT: FORD MOTOR COMPANY: TRUCK EXPEDITION AND NAVIGATOR PAINT SHOP

### SOLUTION OVERVIEW

In 2014, the Ford Motor Company commenced construction on a second paint shop to boost vehicle production capacity and increase energy efficiency at their Kentucky Truck Plant (KTP) located in Louisville, Kentucky (Photo 1). Ford manufactures F-series Ford Super Duty trucks at the Kentucky plant. They also manufacture the Ford Expedition and Lincoln Navigator SUVs. This additional production began in January 2009. The new paint shop will be taking the SUVs out of the existing paint shop to provide them with a premium paint job and release capacity for additional Super Duty trucks in the existing paint shop. This will boost vehicle production by approximately 15 percent total volume at the KTP facility.

By design, the new paint facility reduces the amount of energy required to apply paint finish by an estimated 27 percent compared with traditional process employed in the existing paint shop. The existing paint shop consumed approximately 860 kWh/vehicle.

Ford's new paint facility provides upscale utility vehicles with a higher quality paint finish, focusing exclusively on the Expedition and Navigator SUV models. The additional paint system releases capacity in the existing paint shop for additional full-size truck production. The combined capacity of the two paint shops feeds the existing final assembly process at the plant which operates at an accelerated line speed to accommodate the increased volume.

Construction of the paint shop began early in 2014 with full production starting in April 2016.

### SECTOR TYPE

Industrial

### LOCATION

Louisville, Kentucky

### PROJECT SIZE

308,600 Square Feet

### FINANCIAL OVERVIEW

\$200,000,000

## **SOLUTIONS**

Numerous new technologies are incorporated in the new paint shop, making it a state-of-the-art paint facility.

These new technologies include:

- Single Booth/Single oven three wet painting and curing process
- Ro-Dip e-coat processing
- Zirconium based body pre-treatment instead of traditional phosphate washing
- Compressed air usage reduction strategies including utilizing blowers for blow-off and using electric motor drives for mixers and pumps
- Maximizing booth air cascading and re-circulation strategies
- Sophisticated Building Management Controls to cascade ventilation air through the different paint area zones
- LED lighting for the whole facility
- All ovens are optimized for minimal air flow, eliminating radiant zones and using direct drive blowers
- Abatement is accomplished using VOC concentrators and highly efficient Regenerative Thermal Oxidizers. This approach will allow energy efficiencies to be exploited despite the relatively low production volume of the new facility.

## **OTHER BENEFITS**

The new facility's dry booth paint system provides myriad benefits. In addition to saving energy, dry booth paint particulate scrubbing does not need any water or chemicals. Also, conventional systems use wet scrubbers, which cause significant humidity in the exhaust air and thus make it difficult to reuse waste heat in the exhaust air. In contrast, the dry booth reduces the amount of air supply and fans needed; less air is brought in from outside and 80 percent of the air used can be easily recirculated. The new system also employs a "RO-Dip e-coat" method to coat automotive bodies, which requires less floor space, resulting in a building with a much smaller physical footprint.

## Annual Energy Use

Baseline(2015)  
860 KWh/vehicle

Expected(2016)  
625 KWh/vehicle

### Energy Savings

27%

## Annual Energy Cost

Baseline(2015)  
1

Expected(2016)  
.73

### Cost Savings

27%



New Paint Shop Concept Under Construction