

ABOUT US



National Office Furniture,
A Brand Unit of Kimball International, Inc.
Jasper, Indiana-based manufacturer of
high-quality office furnishings. Since
1980, National has built a reputation
for excellence with stylish furniture of
exceptional value; a dedication to
personalized service; product designs
that reflect a passion for the user's
comfort and productivity; and a
commitment to environmental
responsibility.



A business unit of
Kimball International, Inc.

**SET A GOAL THAT
TODAY MUST BE
BETTER THAN
YESTERDAY.**

GET TO KNOW US:

Torrey West, Process Engineer, Project Manager

National Office Furniture consist of 4 manufacturing locations.

- **NOF – 11th Avenue – Jasper Indiana**
- NOF – Santa Claus – Santa Claus Indiana
- NOF – Fordsville – Fordsville Kentucky
- NOF – Danville – Danville Kentucky



WHAT WE DO

- EDUCATION
- HEALTHCARE
- GOVERNMENT
- FINANCE
- DAY TO DAY
- LARGE CONTRACT

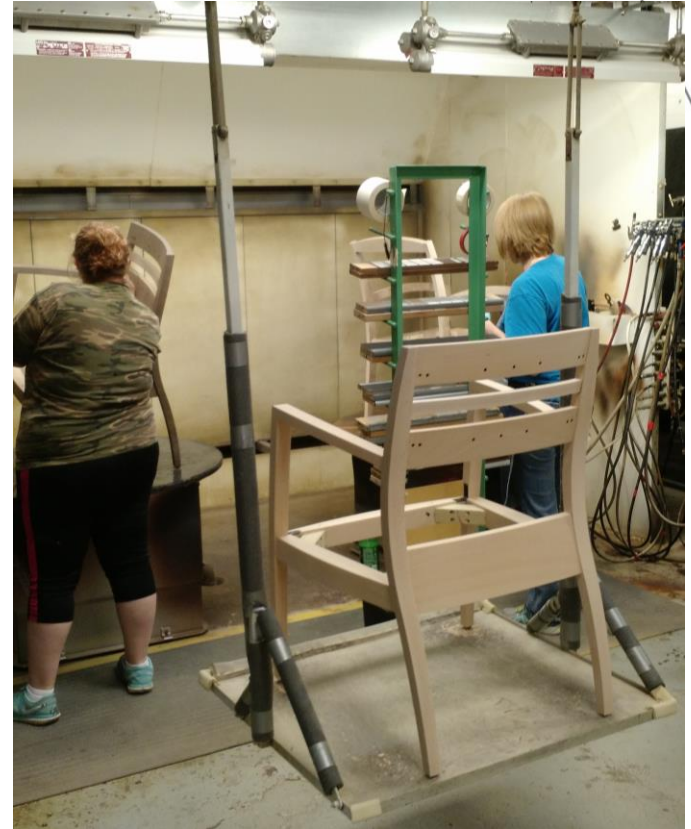
AUTOMATED FINISH LINE – ONE OF ITS KIND!

The new robotic automated finish line at 11th Ave is one of the first of its' kind in the United States. It combines multiple advanced technologies into one finishing line that is able to automate several steps of our finish process.

- 5 fully automatic robots
- RFID (radio frequency identification)
- Automatic on demand material mixing
- Halogen (short wave energy) ovens

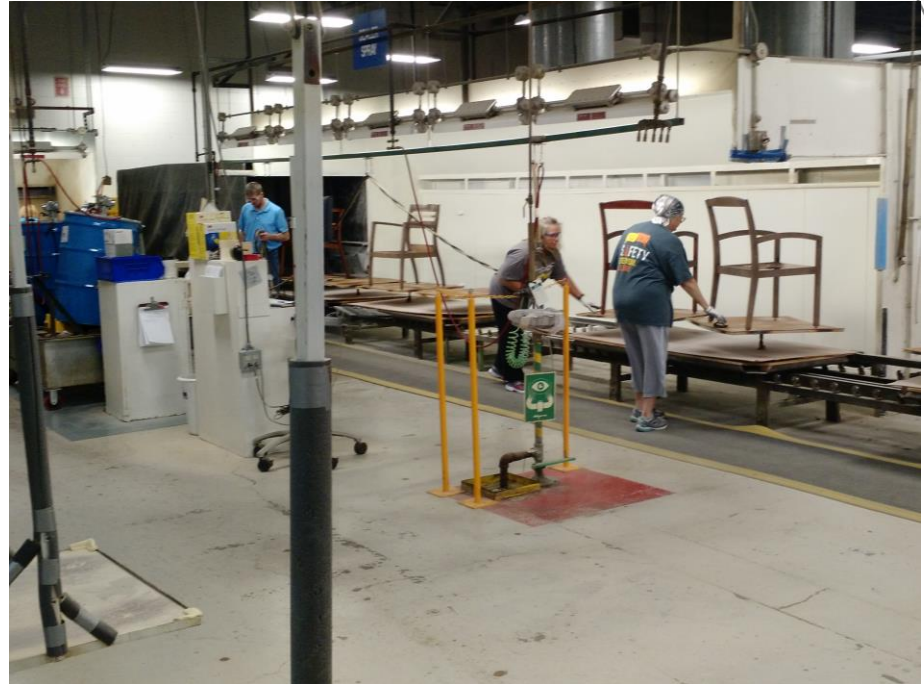
MANUAL COLOR APPLICATION

- Chairs moved to manual color spray
- Color and style identified by operator
- Color selected and sprayed
- Chair moved back to conveyance



MANUAL CLEAR APPLICATION

- Chair removed from one conveyor and placed onto finish line
- Sealer and top coat applied (open face booths)
- Open air (ambient) flash
- Convection heat ovens



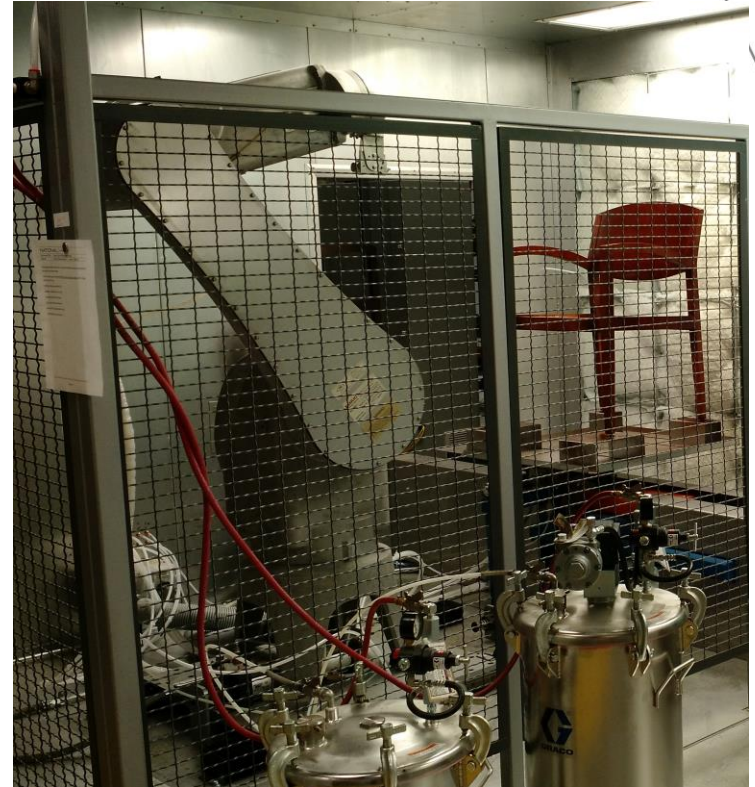
ELECTRIC / STEAM FINISH CURING

- Open air (ambient) flash
- Convection heat ovens
- High risk of airborne contaminates



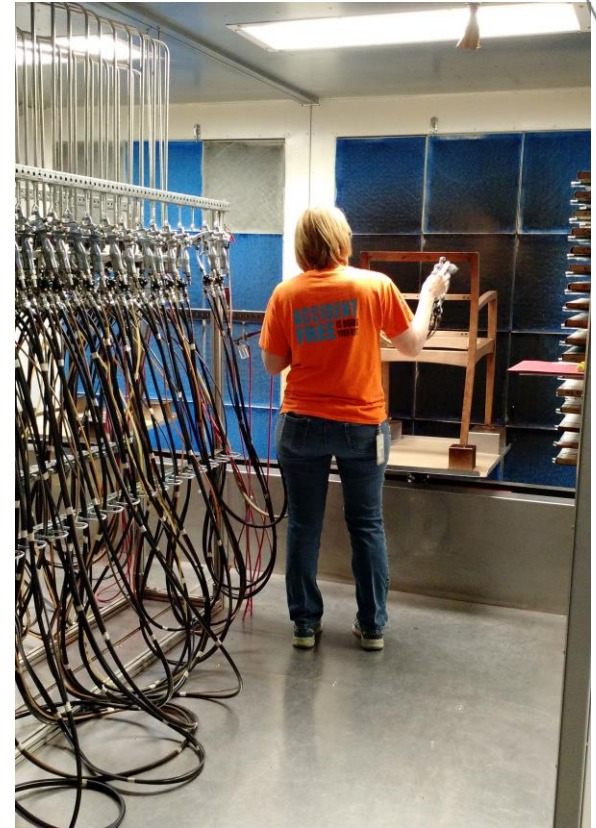
ROBOTIC COLOR APPLICATION

- RFID label already attached to chair in assembly operation
- Chair loaded onto custom carriers
- RFID label scanned prior to entry into robotic spray area
- Model and color selected
- Chair rotated and color applied
- Chair indexes to final color step



MANUAL COLOR APPLICATION

- Identify color
- Apply final color step
- Check final color to calibrated color panel
- Operator signals to the line chair is complete
- Chair continues to next operation



ROBOTIC CLEAR APPLICATION

- Booths sealed (not open face)
- Supply air double filtered
- Chair model identified upon entry into booth (RFID label)
- Chair rotated and clear material applied



FINISH FLASH

- Chair indexes through flash tunnel
- Air pulled from ovens through tunnel into spray booths
- Tunnels lightly heated to assist solvent flash



OVENS HALOGEN

Benefits of Halogen Oven curing

- Quick startup
- Faster cure times
- Reduced heat soak
- Chairs cool to touch quickly
- On demand operation
 - Only operates when product present
 - Turns off once target temp is met
 - Reduction in electricity usage vs. conventional convection ovens



EFFICIENCY GAINS

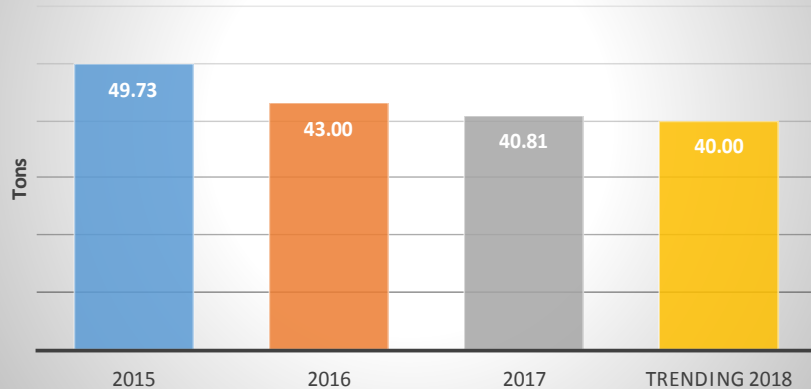
- 67% capacity improvement in chairs/hour using less floor space
- Improved cycle time 65% from start to finish.
- Five high efficiency variable speed booth stacks
- AMU demand reduced 55%
- Conveyor powered by a single 1.5 hp variable speed motor
- Improved sprayed material utilization
 - Potential reduction of approximately 6500 gallons per year

ENVIRONMENTAL IMPACT IMPROVEMENT

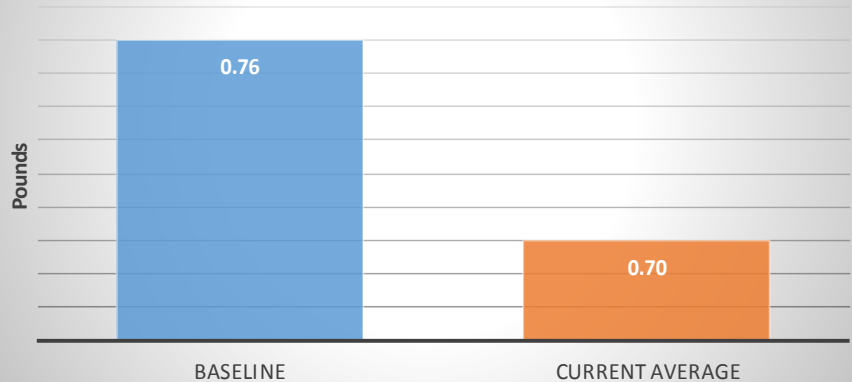
VOC Emissions Reduced by:

- 19.6% Absolute
- 7.9% Normalized per Wood Unit Produced.

**VOC Emissions
Tons per Year - Absolute**

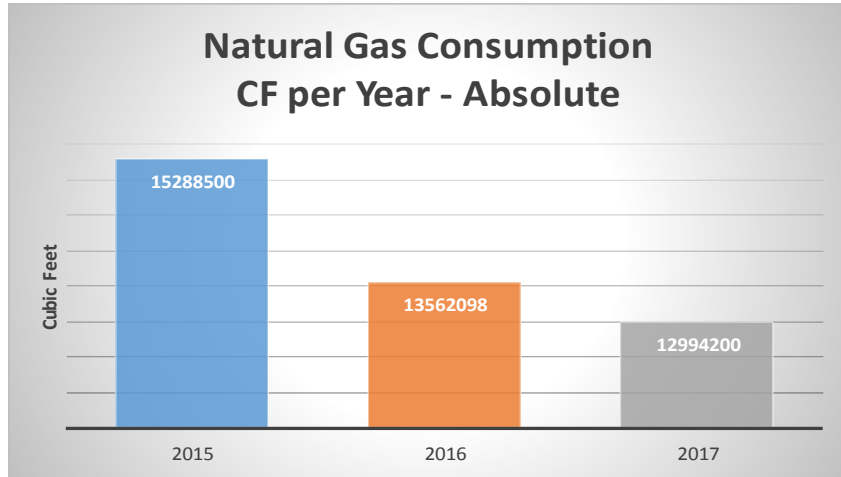


**VOC Emissions
Per Unit Produced**

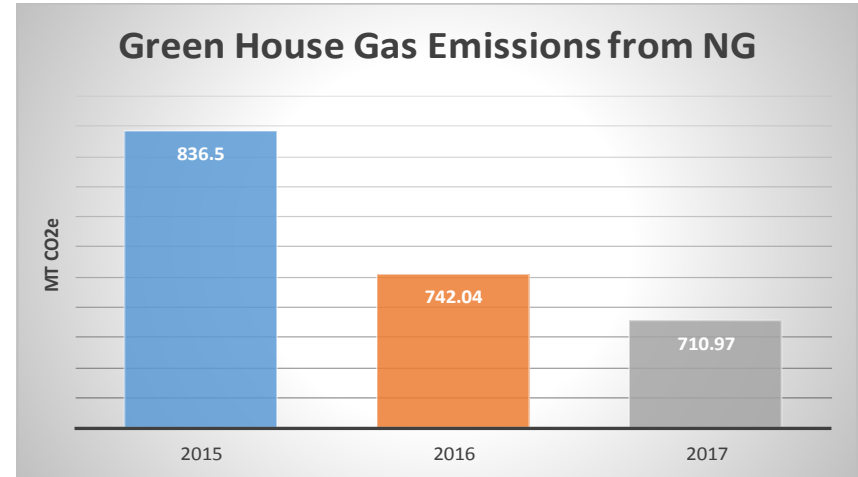


ENVIRONMENTAL IMPACT IMPROVEMENT

➤ 15% Reduction in Natural Gas Consumption



➤ 15% Reduction in Green House Gas Emissions



SUMMARY

- Automated color and clear material application
 - Consistent and repeatable application of materials
 - Reductions in cycle time and material usage
 - Reduced product throughput time
- RFID technology used throughout the processes
- Halogen ovens cure products in less time
- Sealed booths and flash tunnels reduce airborne contaminants
- Mix on demand system reduces material usage and waste
- Reduced energy consumption due to more efficient design

QUESTIONS / ANSWERS

