CARLISLE
FLUID TECHNOLOGIES

FINISHING EDUCATION UNIVERSITY

BGK Webinar
Session 1 – BGK Capabilities

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Jacob Fortmeyer – Global Product Manager,
Cure & Convey

CARLISLE FLUID TECHNOLOGIES

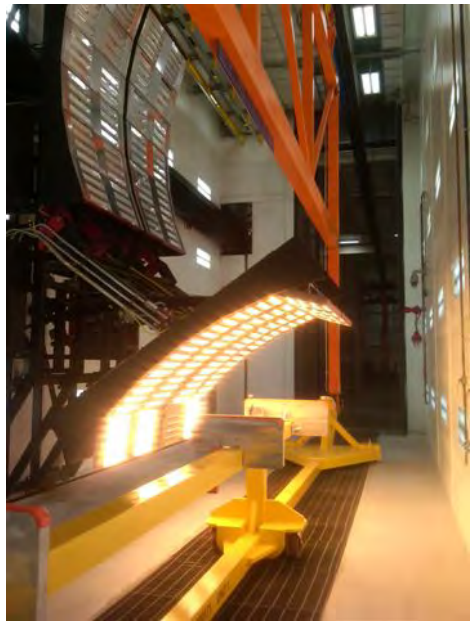
BGK Capabilities: Experts in Curing and Conveying

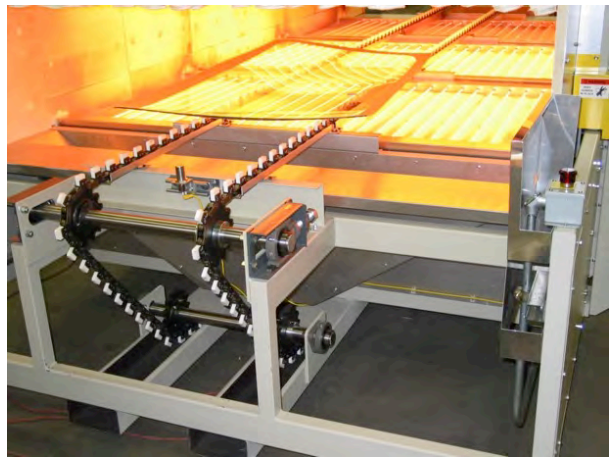
What we'll cover today:

- Curing
  - Electric IR
  - Gas Catalytic
  - Gas Convection
  - Booster Ovens
  - AutoCure portable curing
- Conveying
  - Reciprocator systems
  - Chain-On-Edge (COE)

BGK's process: Complete solutions tailored to your needs

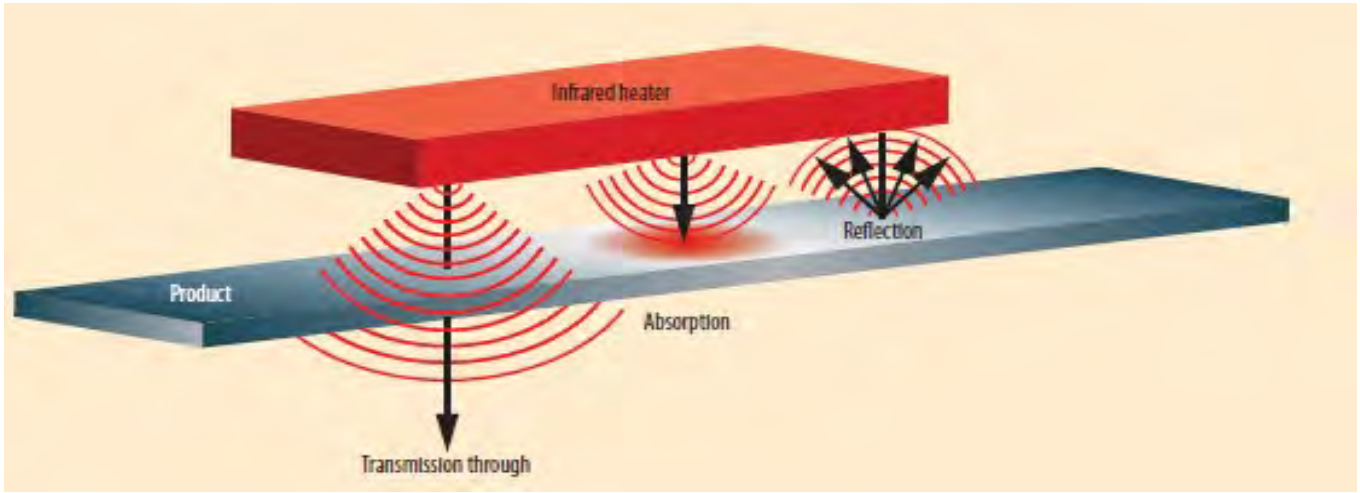
- The BGK team has decades of experience developing optimized solutions for hundreds of installations all over the globe
- Our technical sales specialists and engineers will work with you to create a complete turn-key package, or a solution that seamless integrates into the process
- We can handle jobs of any scale, from $10,000 to $1 Million+
- Equipment can be shipped anywhere in the world, we handle almost any certification





IR vs. Convection

- **In most applications, infrared heating offers numerous advantages over convection:**
  - **Infrared heating is more efficient due to the higher percentage of energy going directly into the parts**
  - **With infrared, the coating is heated at the surface and through the coating at the substrate surface**



Cure Cycle Times

- Two conditions must be met to achieve proper cure of coatings:

  1. The coating must reach the recommended cure temperature

  2. The coating must dwell at the cure temperature for the recommended time

- Shorter cycle times with equal cure properties are possible, with rapid heating from Infrared.

- Using infrared, with some coatings, “total cure” can be achieved in as little as 20 seconds

Infrared Advantages

- **IR Response Time**
  - **Shorter Heat Up Times**
  - **“Idle Mode” - No Overheating**

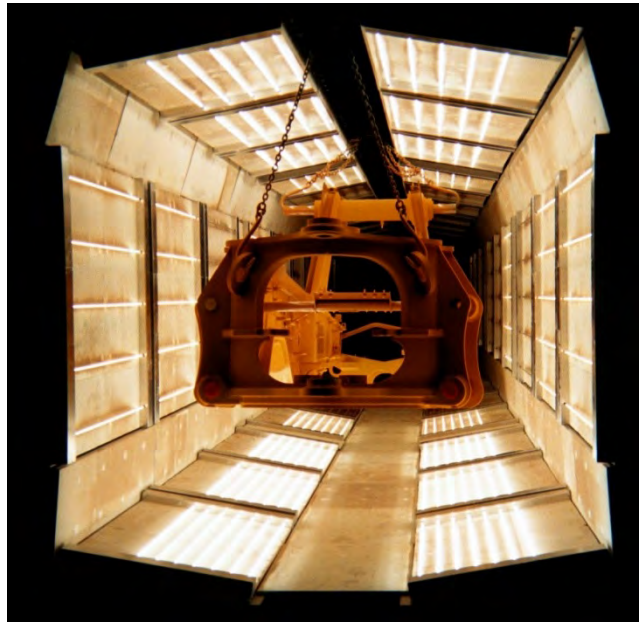
- **Coatings Reach Cure Temperature Quickly**
- **Final Average Part Temperature Reduced**
- **Energy Requirements for Part Cooling Reduced**

Infrared Advantages

- **Direct Heat Transfer**
  - **Heating Substrate Only - Not Surrounding Air**
    Though "line of sight" is a consideration it is not a limiting factor
  - **Low Exhaust Air Requirements (Permitting)**
  - **Think Part Temperature - Not Oven Temperature**

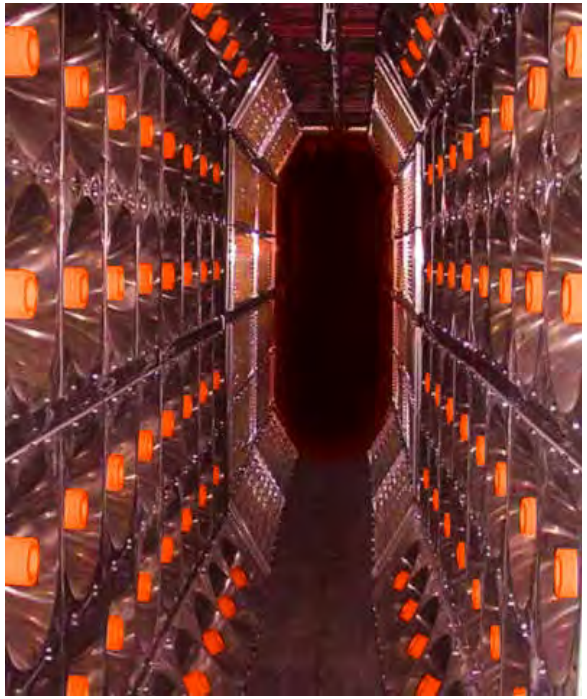
Infrared Advantages

- **Zone Control Available**
  - **Automatic Oven Profiling**
    - **Match Heat Profile to Individual Parts**
  - **Dedicated Part Heating Recipes**
    - **Parts, Color, Speed, & Temperature**
    - **Documented and Stored in Controller**



ELECTRIC Long Wave INFRARED OVENS (Ceramic Cone)

- Low intensity heating
- Lower cost initial investment
- More effective on wet paints (water or solvent)
- Good on heat sensitive substrates
- Long lasting cone (element buried into ceramic)

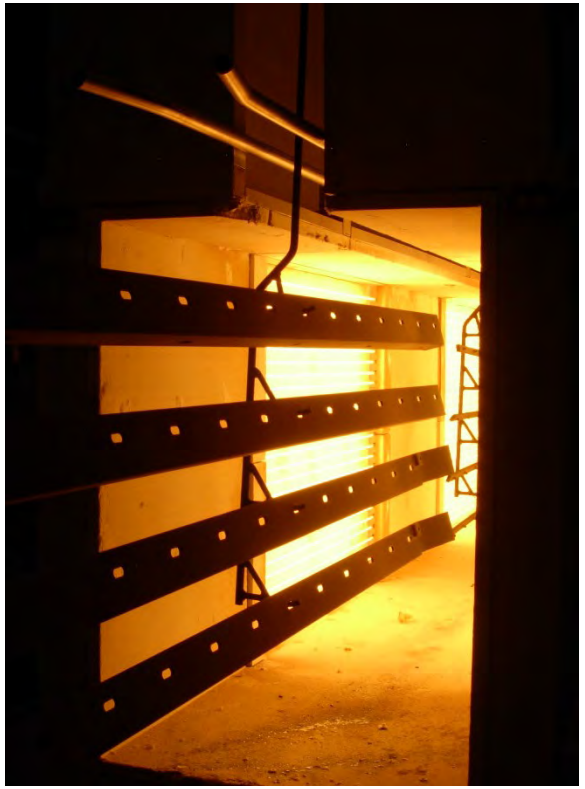


ELECTRIC Medium Wave INFRARED OVENS (Coil)

- Interior and exterior plastic components
- Automotive industry
- Wood cabinets
- Heat sensitive components
- High Solids
- Powder

Electric Short Wave Electric INFRARED ovens

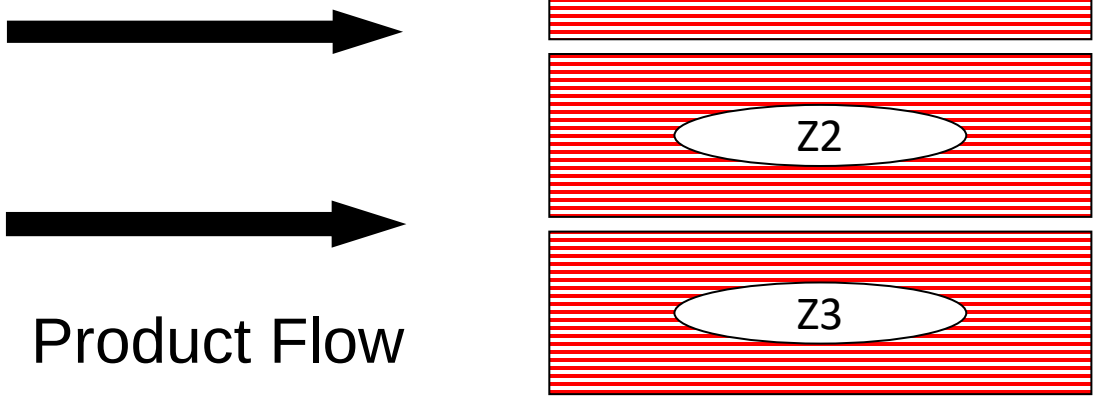
- Self cleaning oven – low maintenance
- Zoning control
- Closed loop product temperature control
- Instant On/Off
- No heat up times
- “Idle Mode” - no overheating
- Small footprint
- Shortest cure times
- BGK expertise and extensive installed base
- Controls capabilities
- Premium emitters and support

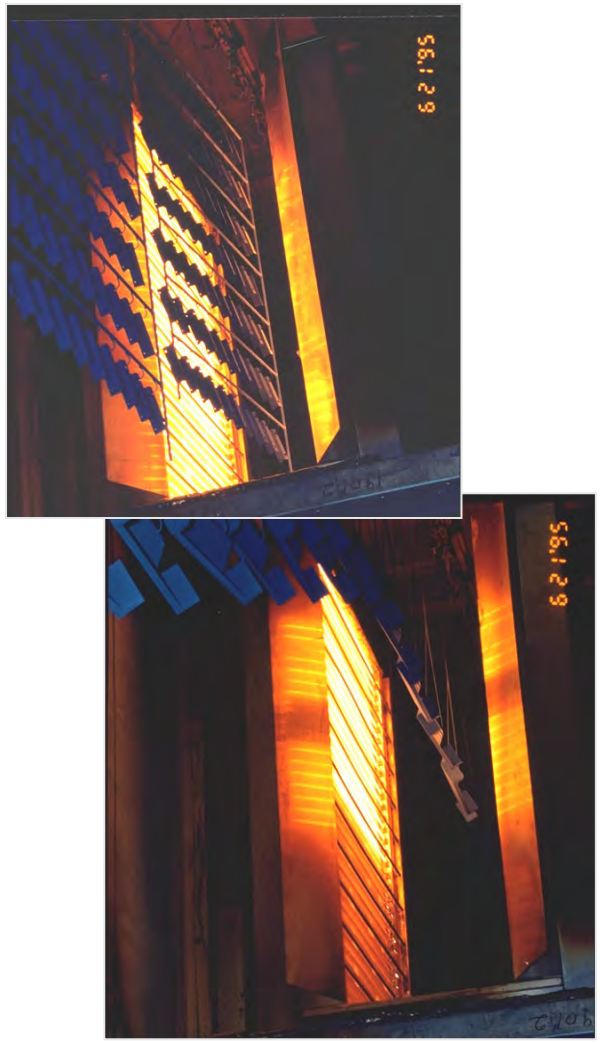


Zone Control

Vertical Zoning

- Varying Vertical Loading



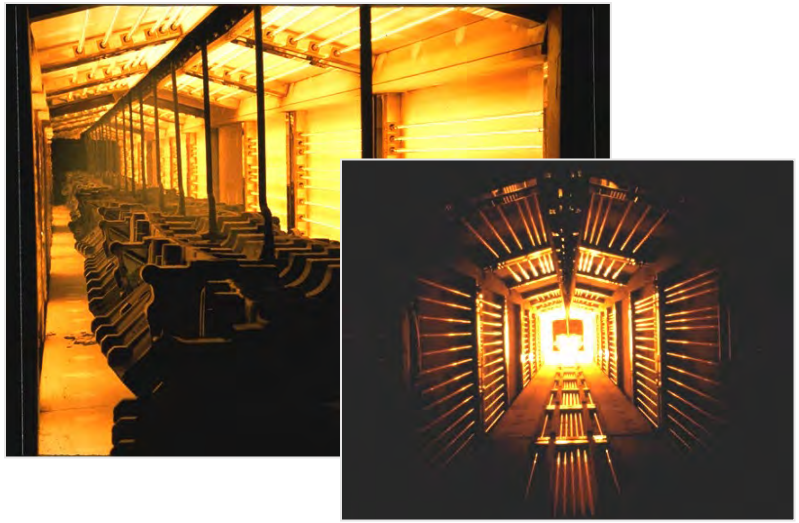


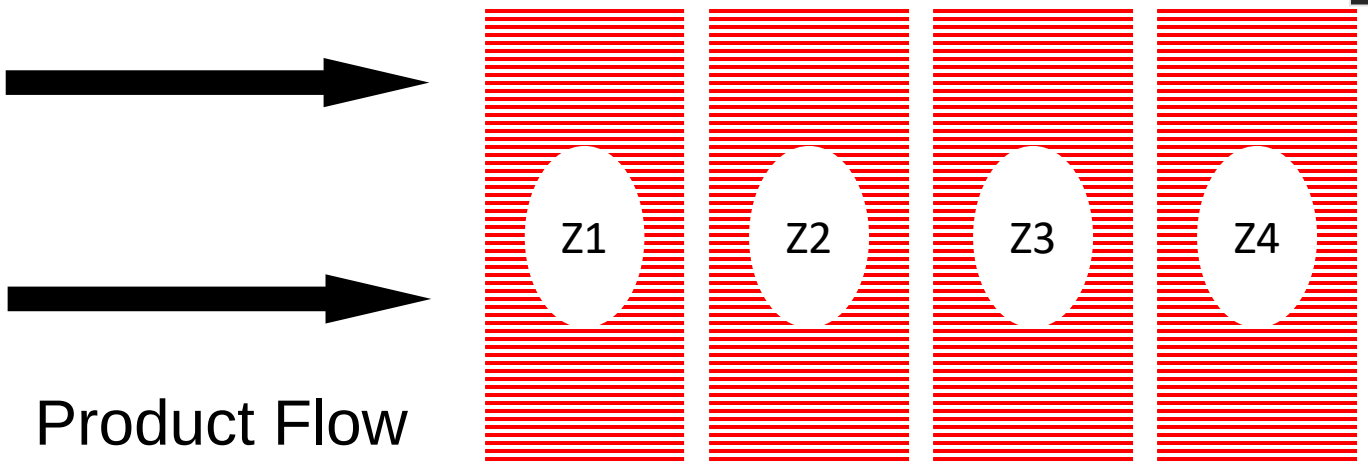
Zone Control

Longitudinal / Horizontal Zoning

(direction of travel)

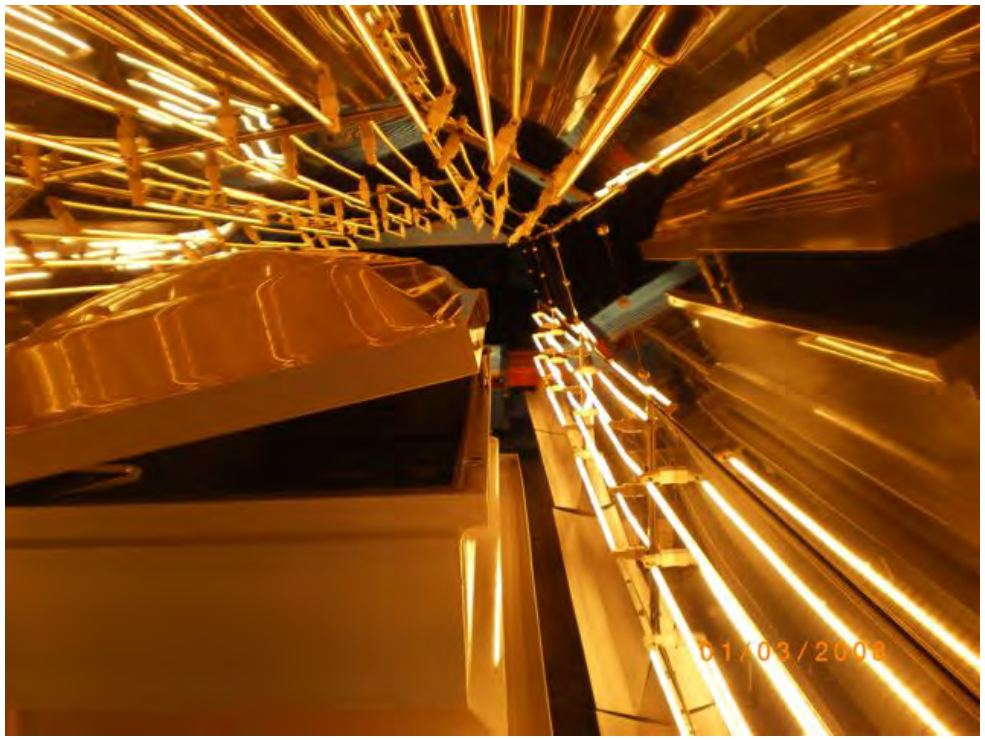
- Adjustable Heating Curves



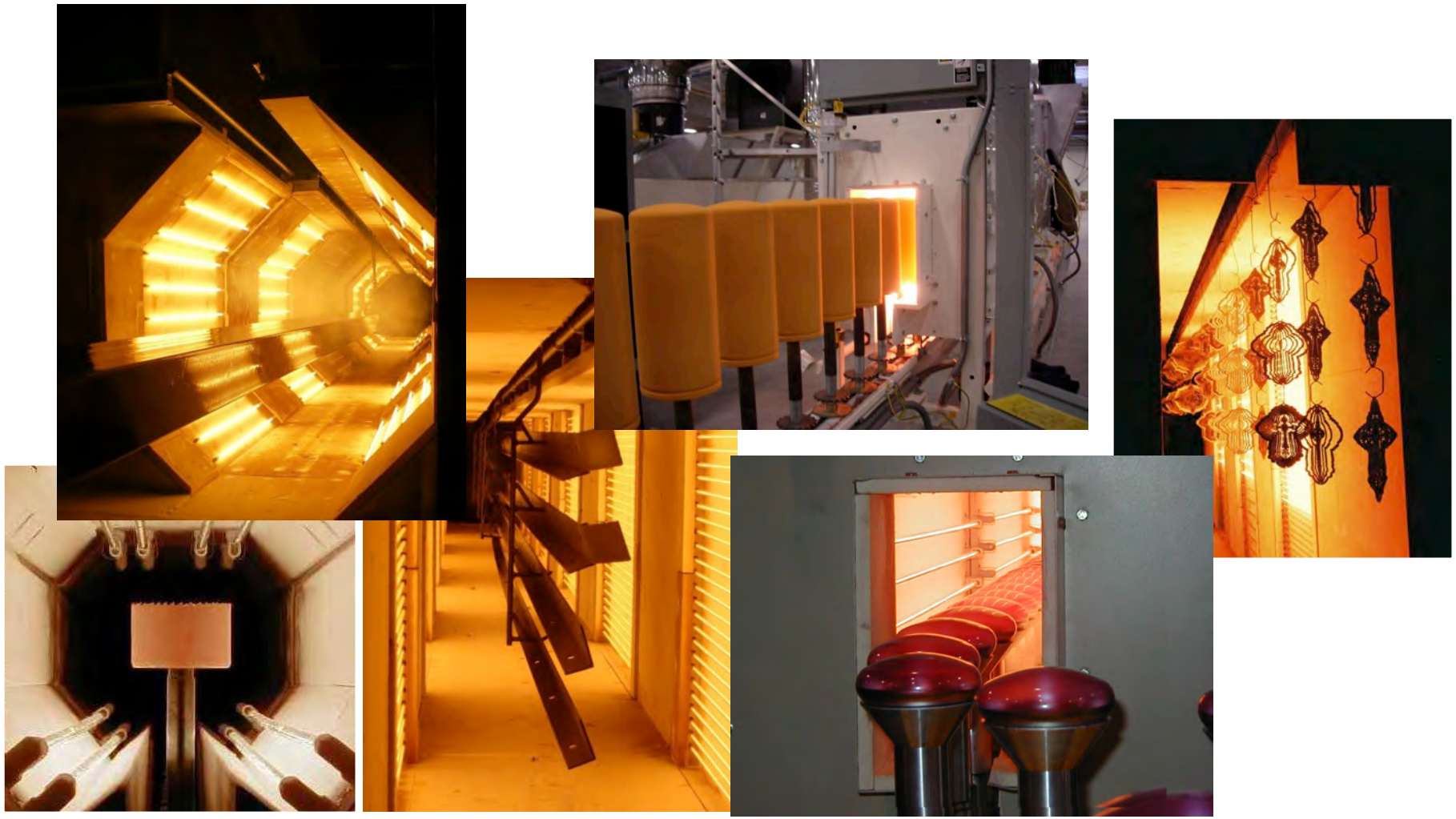


BGK Oven Design

Metal Reflector Infrared Oven for Liquid Cure on Plastic Outboard Motor Housings & Caskets



BGK Full Cure Infrared Ovens

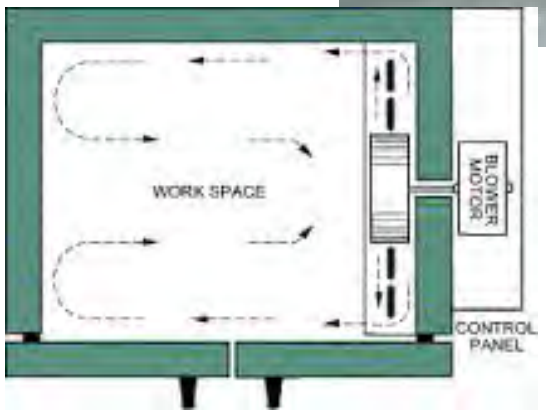


Gas Catalytic Infrared Ovens

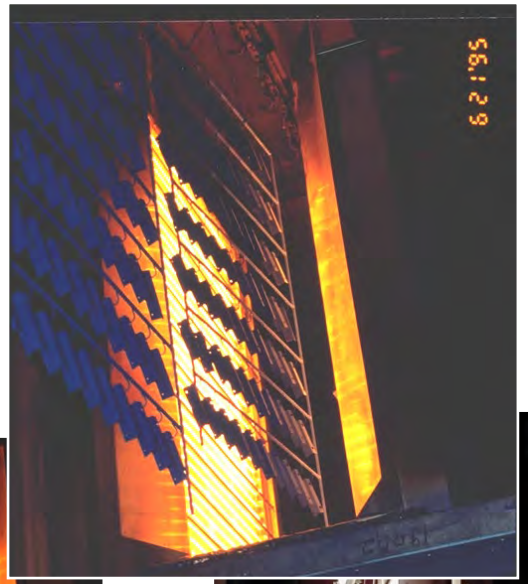
- Good for heat sensitive substrates
- Locations where electricity is at a premium
- Wood market
- Explosion proof for hazardous locations
- Low air flow requirement – cleaner than gas convection
- Low operating temperature
- Approvals (XP Series) – CE (Europe), CSA (Canada) & FM (US)

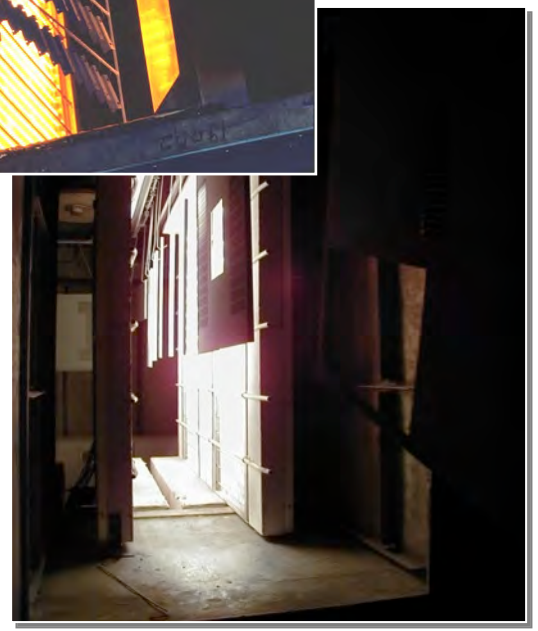
Gas Fired Convection Ovens

Markets
- Powder or liquid Coatings
- General industrial
- Restricted budgets
- Geographic areas where electricity is at a premium
- Not particularly suited to heat sensitive substrates



BGK Booster Ovens





AutoCure: Flexible, portable curing solutions

- Optimized for rapid, accurate, and consistent spot repairs
- Full range of configurations to fit your process
- Include temperature control technology and laser-sighting to ensure consistent curing

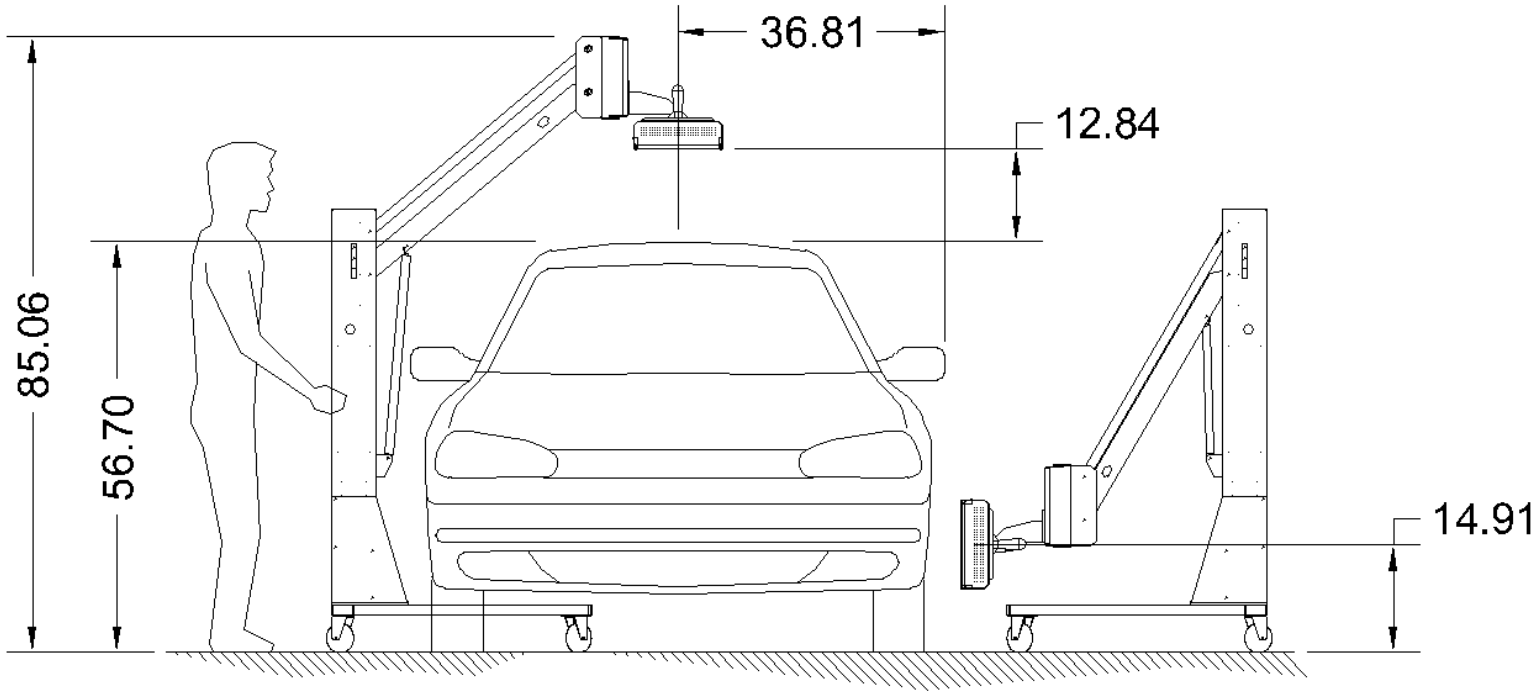
AutoCure 3000 – Sill Heater

- Post & Sill Spot Repairs
- Temperature Control Technology and Laser-Sighting

AutoCure 5000 – Portable Heater

- Spot Repairs
- Variety of Sizes
- Temperature Control Technology and Laser-Sighting

AutoCure 5000 – Car Model

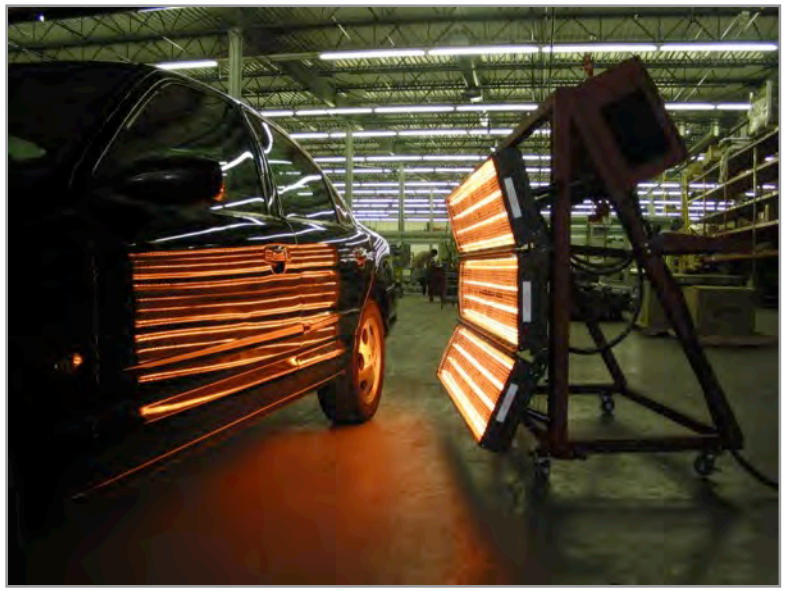


AutoCure 5000 II
Car Model

AutoCure 6000 – Overhead

- Spot Repairs
- Engineered for Mounting on an XY Overhead Gantry
- Variety of Sizes
- Temperature Control Technology and Laser-Sighting

AutoCure 8000 – Panel Heater



- Complete Panel Sections
- Two Standard Sizes
- Temperature Control Technology and Laser-Sighting

Chain-On-Edge (COE): Reliable motion for any process

Chain-On-Edge (COE)

- Spindle Master II
- Spindle Pro
- Spindle Boss
- Spindle King

Spindle Master II

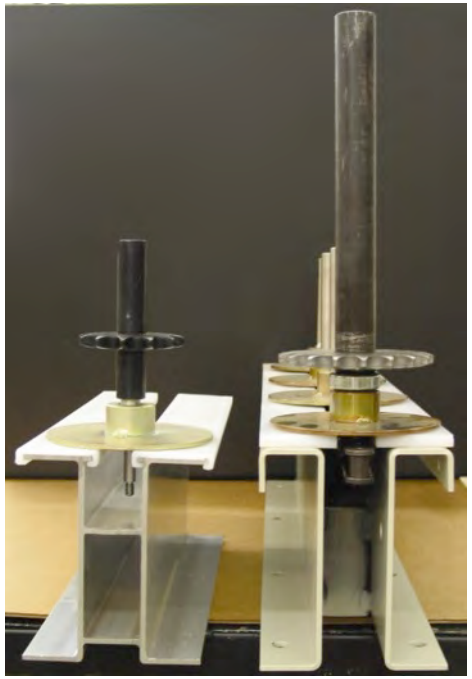
Spindle Master II
With SlimLine Reciprocator
And Infrared Oven
For Steering Spline Shafts
Infrared Oven

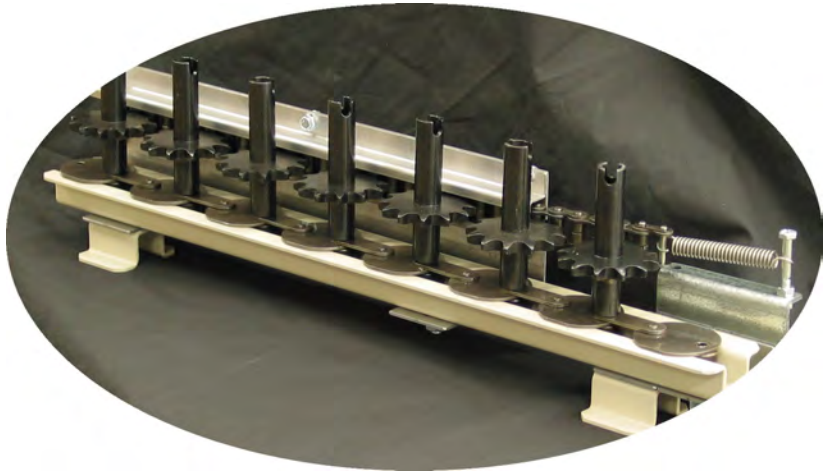
Spindle Master II

Spindle Master II Standard Style #3

Spindle Pro

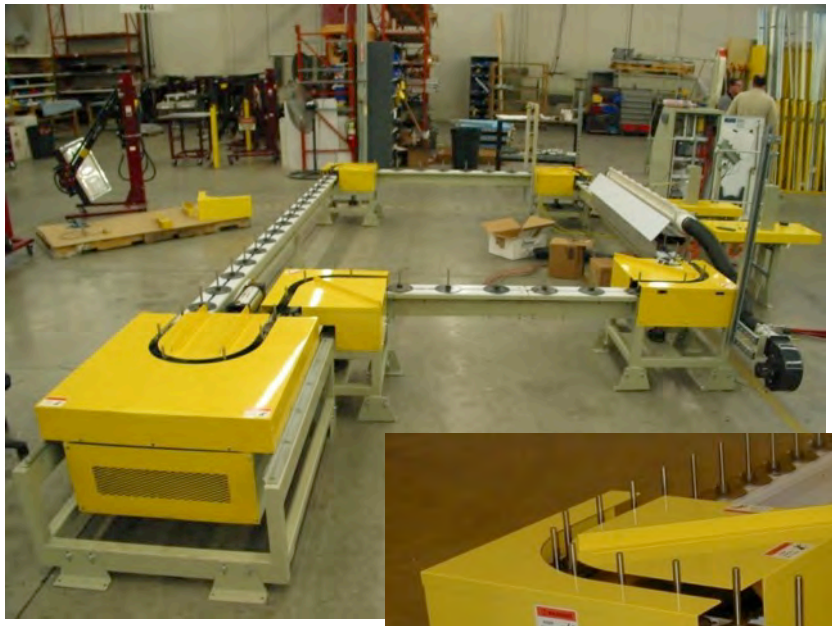
- Sheet metal Corners
- Aluminum or Binks Track
- 8” Sprockets
- 30 fpm, small parts





Spindle Boss

- Tube Frame
- Steel Track
- 18” Sprockets
- 60 fpm, large parts/high volume



Spindle King

- Designed for Heavy and Large Parts
- Custom Engineered Product
- 3” Pitch Chain

Reciprocators: Automating your coating process

R1500 Base Unit w/VFD:

- Base Unit
- Includes Nema 1 VFD

PLC Control Package:

- A-B PLC and OIT
- Pulse Package
  - o Home Sensor
  - o Pulse Prox
  - o Conveyor Signal Prox
- Standard Software
  - o Speed control
  - o (2) spray on/off signals
  - o Duration timer

Horizontal Reciprocator

Sensor Array to determine
Sheet Steel Size

Top & Bottom Horizontal Reciprocators
Rust Preventative on Sheet Steel

The Brands You Trust

BGK™ products deliver precision-engineered curing capabilities for a full range of coatings including liquid, powder, wax, UV and adhesives.

Binks® products boast innovative spray gun and air cap design along with industry leading pumps and controls.

DeVilbiss® products include low pressure manual and automatic spray guns and related spraying accessories. *DeVilbiss* products are widely acclaimed for ergonomics and innovative spray gun design.

Hosco® products deliver smooth bore, “cavity free” stainless steel fittings and accessories designed for use in paint circulating and application finishing systems.

ms® products include powder coating systems and equipment. ms is recognized throughout the world for quality, efficiency and durability.

Ransburg® manual and automatic electrostatic finishing products offer spray finishing solutions to industrial and automobile manufacturing markets.

BGK A CARLISLE BRAND

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DEVILBISS A CARLISLE BRAND

HOSCO A CARLISLE BRAND

ms A CARLISLE BRAND

Ransburg A CARLISLE BRAND

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Thank you!