

***“Thermal management solutions and  
aluminum extrusions since 1957”***

# Wakefield Thermal Solutions

*“Excellence in Design, Manufacturing and  
Customer Service of  
Thermal Management Products”*

*“Celebrating 50+ years”*

# Background

- Founded in 1957
- Broad range of thermal management solutions and services
- Annual Sales Volume approx. \$60 Million
- Number of Employees = 150
- Manufacturing facilities in NH & CA
- In-house extruding & fabrication capability

# Markets Served

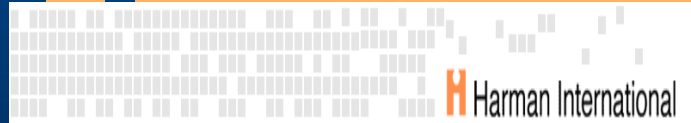
- Data Center Power / Cooling
- Industrial Drives & Controls
- Automotive Entertainment
- Pro Audio Equipment
- Communications Equipment
- Power Supplies
- Medical & Instrumentation
- Transportation
- Military / COTS

# New Growth Markets

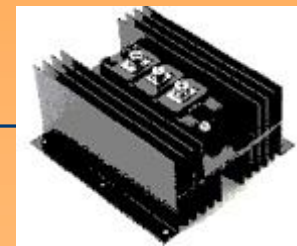
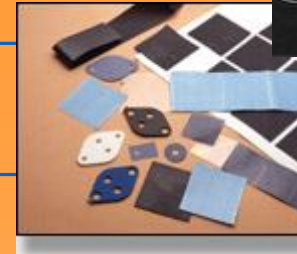
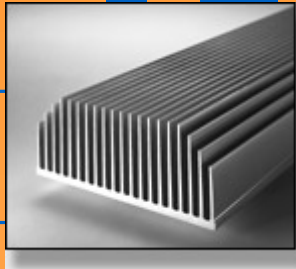
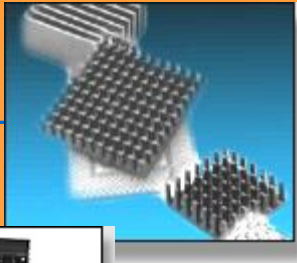
- LED Lighting
- Alternative Energy Power Conversion
  - Wind
  - Solar
- Security
- Fiber to the Home / Broadband
- Electric Vehicles



# Customers



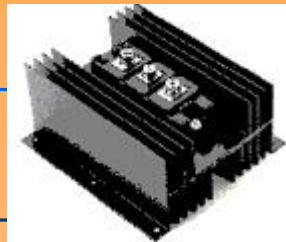
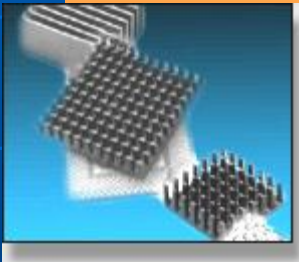
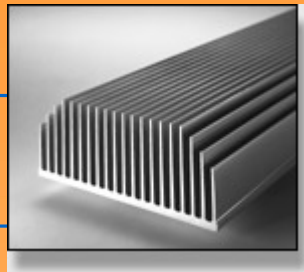
# Product Family



# Thermal Products

## ■ Extruded

- Profiles
  - Flatback/Channeled
  - Double Sided
  - Press Pack
  - Power Module
  - Forced Convection Assembly
  - Enclosure Heat Sinks
  - Misc. (Bar, Angle)
- Custom Products –Fabricated
  - Machining Processes
    - CNC-Punch-Assy.-Finishing
  - Cross Cut
    - Assembled with Clip & Tape
    - Fan Heat Sink



# Thermal Products (cont.)



- Stamped
  - Heat Sink formed from a flat stock by a press
  - Board Level
    - Fastener Device Mount
    - Spring Loaded Device Mount
    - Surface Mount
  - Standard Products
  - BGA's
  - Power Devices
- Stack Fin

# Thermal Products



- Liquid Cold Plates
- Used for High-Performance Components & Systems
  
- Miscellaneous
  - Fans
  - Deltem Heat Sinks
  - Compression Clamps

# High Performance Thermal Solutions

## ■ Bonded Fin

- Fabricated from an extruded base having slots into which straight fins are epoxy bonded



## ■ Swadged Fin

- Fabricated from an extruded base having slots which fins are mechanically inserted to base without the use of epoxy



## ■ Convoluted Fin

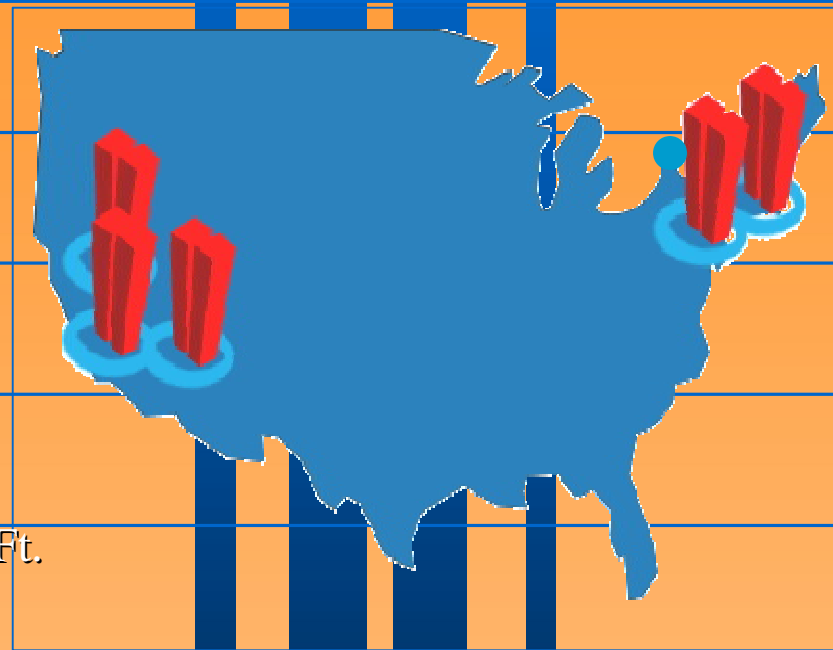
- Fin Structure Made from Sheet stock folded into Square wave shape for High Aspect Ratios
  - Stacked Layers
  - Horizontal/Vertical
  - Aluminum & Copper
  - Modular
  - Attached to Aluminum Base via epoxy bond

# Wakefield Facilities

Headquarters-Pelham, NH  
>200,000 Sq. Ft.

Wakefield West  
Paramount, CA  
62,000 Ft. Sq.

Fullerton CA, 15,000 Sq Ft.



Over 275,000  
total sq ft

# Pelham, NH-Corporate Manufacturing Capabilities

- ISO 9001:2000 Registered
- **Extrusion Presses**
  - *3000 T 11" CCD*
    - PLC Controlled with 100 T stretch & puller
    - Kevlar handling system
  - *1800 T 9" CCD*
    - PLC Controlled 45 T stretch & puller
    - Kevlar handling system
- **Fabrication**
  - 75 Multi-Axis CNC Machining Centers.
  - Punch Press
  - Debur and Wash



## Pelham, NH

- Assembly and Value Added Services
- Clamp Assembly
- Bonded Fin Assembly
- Final Inspection
- Shipping



## Pelham, NH Services

- Customer Support
- Order Fulfillment
- Distribution Channel Sales & Service
- Thermal & Design Engineering (CFD)
- New Product Review Team
- Accounting and Finance
- Executive Offices

# Wakefield West- Paramount, CA

- Fabrication
  - CNC, Punch, Cut Debur, and Wash
- Distribution & Stocking Center for Standard Products

# Fullerton, CA

- *1600 T 7" CCD*
  - Graphite handling system.
- Traditional press practices
  - Extrusion Expertise
- Close Proximity
  - Wakefield West
- Short lead times
- Direct online link with Pelham Engineering group.

# Engineering Capabilities

- Thermal/Structural Analysis
- CAD Design
  - AutoCAD 2006
  - Solids Works
- Prototype & Testing Lab
- CNC Programming
  - CAD CAM 9
  - Smart CAM
- Tooling Design & Mfg
- Thermal Performance and testing

# Customer Support

- Dedicated Sales Team
  - Applications Engineers
  - Customer Service Reps.
  - Regional Sales Managers
- Manufacturers Reps
- Distribution Partners
  - U.S. Asia, Europe
- Kan Ban Systems
- 3rd Party Warehouse
- Build to Forecast
- VMI
- EDI capability
- Safety Stock Programs

# Quality Assurance

- Precision Dimensional
- Rockwell Hardness Testing
- Automated Coordinate Measurement
  - 750mm(x) 625mm(y) 500mm(z)
  - 1500mm(x) 800mm(y) 700mm(z)

# Quality Commitment

- Wakefield Thermal Solutions, Inc. is Committed to meeting or exceeding our customer's expectations while continuously improving our product and services
- ISO 9001:2000 Registered

Thank You!