



**WAKEFIELD**  
SOLUTIONS



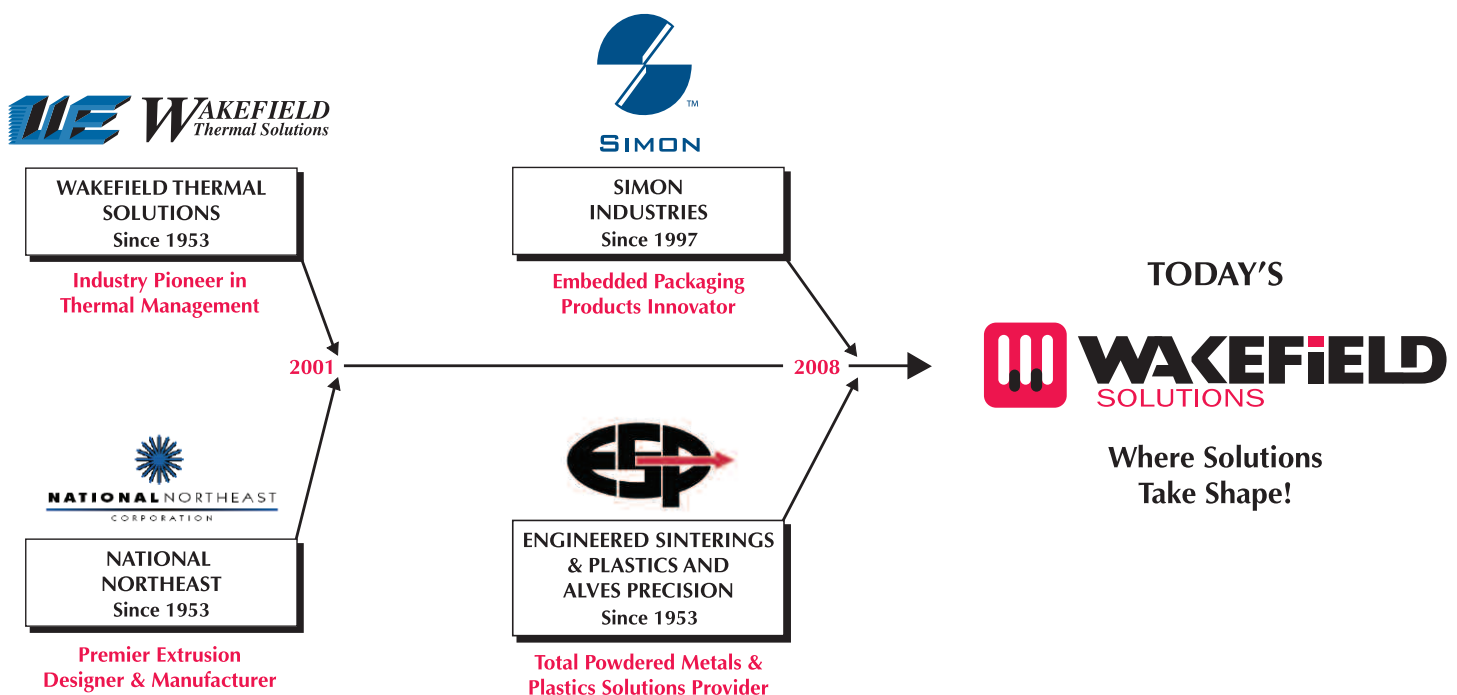
**WHERE SOLUTIONS TAKE SHAPE!**

**Please allow us to briefly introduce you to Wakefield Solutions...**

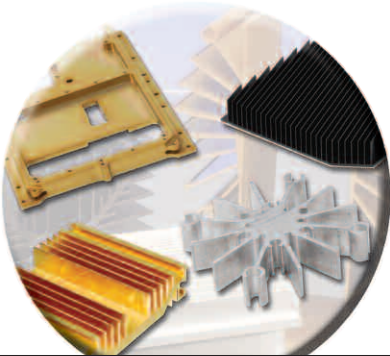
*In 2001 two premiere companies Wakefield Thermal Solutions, a leader in thermal management, and National Northeast, a precision aluminum extruder and fabricator joined forces to create a one-stop shop for our customer’s thermal management, extrusion, and fabrication needs.*

*In 2008, Wakefield Solutions made strategic acquisitions to create an even stronger competency portfolio. Wakefield acquired Engineered Sintering & Plastics and Simon Industries to enhance and compliment its already existing design and manufacturing capabilities. By adding Engineered Sintering and Plastics, a powdered metal and thermoset injection molder, manufacturer, as well as Simon Industries, a leader in the embedded packaging products market, we have created a more comprehensive product array. This will ultimately create convenience for our customers that no one else in the industry can equal.*

*Our goal at Wakefield Solutions is to create a “total” solution for our current and future customers. From our expertise in design engineering to our comprehensive manufacturing capabilities, let Wakefield be your solutions partner.*



# WAKEFIELD SOLUTIONS CAPABILITIES



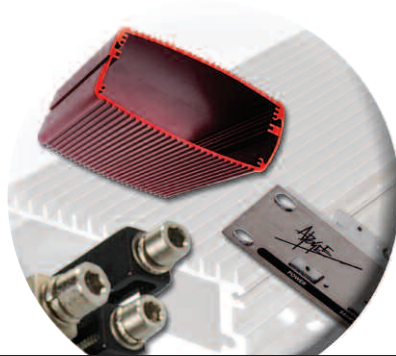
## THERMAL MANAGEMENT

Heat Sinks

Heat Frames

Thermal Modeling

Thermal Accessories



## TECHNICAL PRODUCTS

Wedgelocks

Front Panels

Enclosures

Electronic Packaging Accessories



## INDUSTRIAL APPLICATIONS

Aluminum Extrusion/Fabrication

Powered Metal/Forgings

Thermoset/Thermoplastics

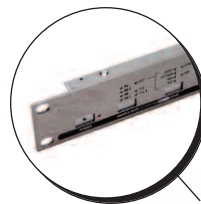
Universal Joints



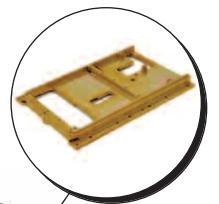
Forged Powdered Metal Options



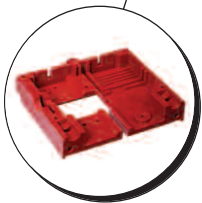
Zero Backlash Universal Joints



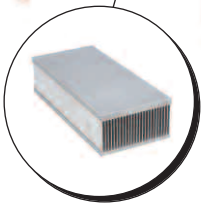
Custom Front Panel Solutions



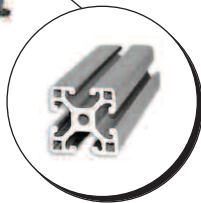
Thermal Management Heat Frames



Custom Thermoset Plastics



Engineered Thermal Solutions



Aesthetic Functional Extrusions



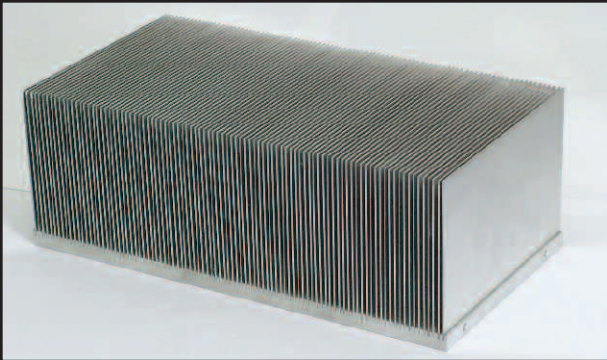
Extruded Enclosure Systems



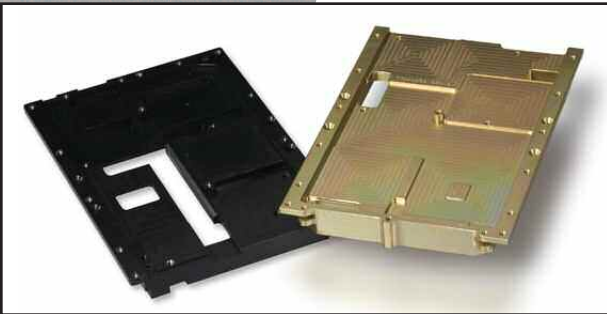
Board/Module Retention Systems

# WAKEFIELD SOLUTIONS

## THERMAL MANAGEMENT



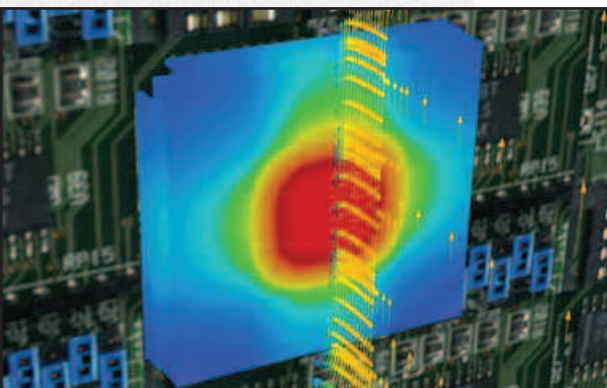
Heat sinks that are cost effectively customized to your system needs.



Fully verified board level modular heat transfer management solutions.



Liquid cold plates designed to customer specifications.



Thermal modeling support positions Wakefield as a virtual extension of your own design team.

Since the founding of Wakefield Engineering in 1957, Wakefield has continuously supported design and manufacture of thermal management products. With the enhancements of Wakefield Solutions capabilities today we are able to offer an even more comprehensive array of thermal management solutions to our customers. Some of our thermal management products & services include:

### HEAT SINKS

#### Extruded

- Over 5,000 Standard Shapes & Custom Fabrication

#### Cold Plates & Heat Pipes

#### Assembled

- Bonded Fin, Swage Fin, Folded Fin, Stacked Fin

#### Heat Frames

- CNC precision-machined precisely to match the topography of electronics being ruggedized. When combined with thermal-interface material, conduction-cooled Heatframes increase a board's operating temperature range, as well as its resistance to shock and vibration.

#### Board Level & BGA

- Thermal catalogue offering standard products, and thermal accessories through worldwide.

#### Thermal Accessories

- Precision Clamps & Spring Assemblies
- Thermally Conductive Grease, Pads and Tape

#### Thermal Modeling

- Leaders in Thermal Management Engineering since 1957
- Comprehensive Thermal Analysis
- Thermal Engineering Team
- Thermal Lab Testing
- Thermal Performance Verification
- Heat Transfer Simulation
- Employing the latest CFD & CAD design

**A comprehensive array of products to facilitate a "systems" approach to thermal management.**

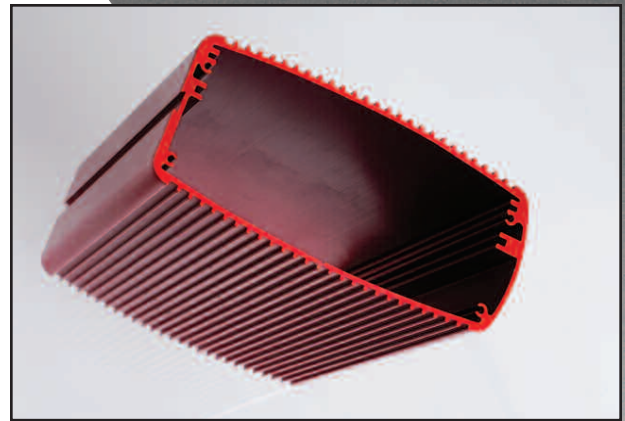
[www.wakefield.com](http://www.wakefield.com)



# WAKEFIELD SOLUTIONS TECHNICAL PRODUCTS

## ENCLOSURES

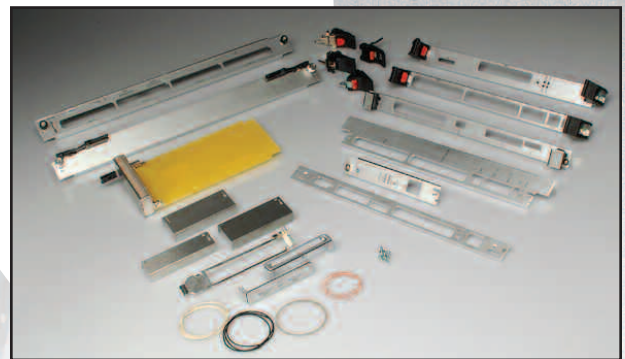
- Wakefield offers custom aluminum enclosure support on a complete assembly and piece part basis.
- Complete extruded aluminum enclosures with integral PCB guides, internal component mounting provisions, front panels/end plates, etc.
- Complimented by customized fabrication and assembling services.



Enclosure systems that are aesthetic, structurally enhanced and configured with customer specific mounting options.

## FRONT PANELS

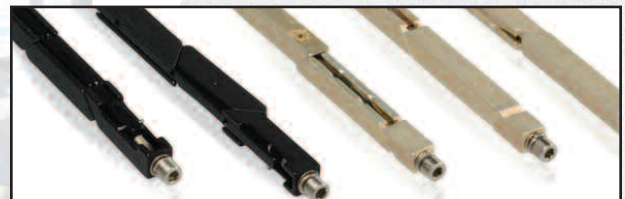
- Face plates fully assembled to customer specifications support includes: machining, silkscreening, painting, overlays, hot swap switches, and shielding provisions, etc.
- High speed milling facilitates production of customized designs quickly and efficiently. Handles can be provided to address a myriad of bus architectures and compatibility with existing aesthetic/ brand compatibility requirements.



Front Panels customized to your specific need with the finishes, features and functional flexibility to address any application.

## WEDGELOCKS

- The Wedglock series of retainers offer the highest locking force available for cold wall applications. They provide a high shock/vibration environment and thermal efficiency solution.



Board and plug-in unit mounting retention systems ideally suited to the most challenging environments.

# WAKEFIELD SOLUTIONS INDUSTRIAL APPLICATIONS



Over 30 million pounds extruded a year!



Production of "net shapes" to minimize secondary machining.



"Zero backlash" repairable universal joints.

## ALUMINUM EXTRUSIONS AND FABRICATIONS

- 3,000 ton press 12" Circumscribing Circle Diameter (CCD)
- 1,800 ton press 9" CCD
- Kevlar handling system
- Post Extrusion Fabricating Service
- 100+ CNC machines
- 25 punch presses
- 5 CNC cut off machines
- 5 turning centers
- Welding, assembly, debur & wash

## POWDERED METALS

- 85+ powder compacting presses ranging from 2 to 740 tons.
- Products ranging from a few grams to 15 pounds with surface area of up to 18 square inches.
- Value added capabilities leveraging Wakefield's array of CNCs, turning centers, etc.

## UNIVERSAL JOINTS

### Blue Block Universal Joints

- Built better and costs less...Split block design makes the difference.

### Solid Block Universal Joints

- Standard pin and block type...High grade alloy steel.

### Hex Block Universal Joints

- An inexpensive riveted joint...Designed for low torque.

### Needle Bearing Block Universal Joints

- The only repairable needle bearing joints on the market.

### "Double" Block Universal Joints

- Connects two blue block, hex block or solid block joints.

### Repair Kits and Boots

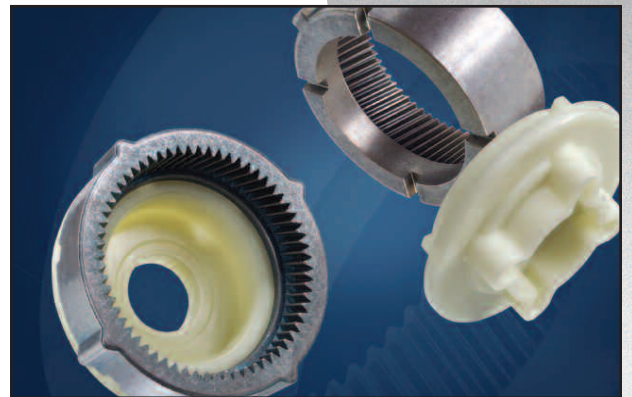
- On-site repair kits can repair any size blue block u-joint.

## PLASTICS

- Capable of addressing a wide range of thermoset and thermoplastic parts — custom molded from a diverse array of commercially available resins.
- Includes glass filled and heat resistant materials.
- 22 presses ranging from 22 ton clamp @ 1.5 oz. up to 650 ton clamp @ 60 oz.
- Thermoset applications supported by, we offer 16 compression transfer presses of 25 to 300 ton clamp pressure and 8 inline injection presses from 75 ton @ 3 oz. to 300 ton @ 52 oz.



Array of thermoset/thermoplastic options.



Combining powdered metal and plastic capabilities.





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[www.wakefield.com](http://www.wakefield.com)

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