BEFORE THE
UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

In the Matter of	Inv. No. 701-TA-475
CERTAIN ALUMINUM EXTRUSIONS	731-TA-1177 (Final)
FROM THE PEOPLE'S REPUBLIC	
OF CHINA	

HEARING EXHIBITS OF:

AAVID THERMALLOY, LLC

Washington, D.C.
March 29, 2011

Of Counsel:

MAYER BROWN LLP
1999 K Street, NW
Washington, DC 20006-1101

Duane W. Layton
Sydney H. Mintzer

ATTACHMENT A

WAKEFIELD SOLUTIONS
A GLOBAL LEADER IN THERMAL MANAGEMENT SOLUTIONS AND PRODUCTS FOR TECHNICAL AND INDUSTRIAL APPLICATIONS SINCE 1957

THERMAL MANAGEMENT | TECHNICAL PRODUCTS | INDUSTRIAL APPS | MACHINING SERVICES | NEWS | CONTACT US | ABOUT US

Part # or Keyword

What's New at Wakefield?

New 500 Ton Extrusion Press
Wakefield Thermovations TM
Wakefield Tooling U
Wakefield Midwest

INDUSTRIES SERVED
THERMAL MANAGEMENT
TECHNICAL PRODUCTS
INDUSTRIAL APPLICATIONS
YOUR SOLUTION
CUSTOMER SERVICE / RFQ

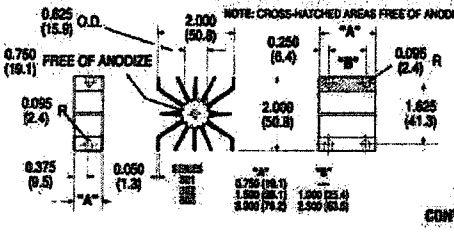
HEAT SINKS | Heat Frames | Thermal Accessories | Thermal Modeling | Inventory | MSDS

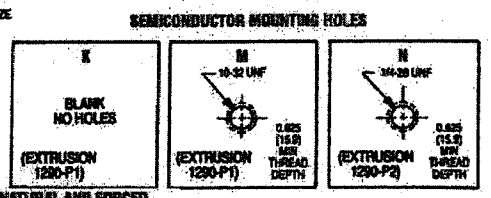
View all products

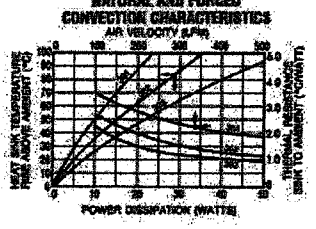
WAKEFIELD SOLUTIONS Data Sheet

Standard P/N	Outline Dimensions in. (mm)	Length "A" in. (mm)	Mounting Hole (s) Pattern and Number	Thermal Performance at Typical Load Natural Convection	Thermal Performance at Typical Load Forced Convection	Weight lbs. (grams)
301K	2.000 (50.8) x 2.000 (50.8)	0.750 (19.1)	None	70°C @ 15W	2.5°C/W @ 250 LFM	0.0580 (26.31)
301M	2.000 (50.8) x 2.000 (50.8)	0.750 (19.1)	(1) 10-32UNF, 0.625 in. thread depth	70°C @ 15W	2.5°C/W @ 250 LFM	0.0580 (26.31)
301N	2.000 (50.8) x 2.000 (50.8)	0.750 (19.1)	(1) ¼-28UNF, 0.625 in. thread depth	70°C @ 15W	2.5°C/W @ 250 LFM	0.0580 (26.31)
302M	2.000 (50.8) x 2.000 (50.8)	1.500 (38.1)	(1) 10-32UNF, 0.625 in. thread depth	50°C @ 15W	1.8°C/W @ 250 LFM	0.1330 (60.33)
302MM	2.000 (50.8) x 2.000 (50.8)	1.500 (38.1)	(2) 10-32UNF, 0.625 in. thread depth	50°C @ 15W	1.8°C/W @ 250 LFM	0.1330 (6033)
302N	2.000 (50.8) x 2.000 (50.8)	1.500 (38.1)	(1) ¼-28UNF, 0.625 in. thread depth	50°C @ 15W	1.8°C/W @ 250 LFM	0.1330 (60.33)
302NN	2.000 (50.8) x 2.000 (50.8)	1.500 (38.1)	(2) ¼-28UNF, 0.625 in. thread depth	50°C @ 15W	1.8°C/W @ 250 LFM	0.1330 (60.33)
303M	2.000 (50.8) x 2.000 (50.8)	3.000 (76.2)	(1) 10-32UNF, 0.625 in. thread depth	37°C @ 15W	1.3°C/W @ 250 LFM	0.2680 (121.56)
303MM	2.000 (50.8) x 2.000 (50.8)	3.000 (76.2)	(2) 10-32UNF, 0.625 in. thread depth	37°C @ 15W	1.3°C/W @ 250 LFM	0.2680 (121.56)
303N	2.000 (50.8) x 2.000 (50.8)	3.000 (76.2)	(1) ¼-28UNF, 0.625 in. thread depth	37°C @ 15W	1.3°C/W @ 250 LFM	0.2680 (121.56)
303NN	2.000 (50.8) x 2.000 (50.8)	3.000 (76.2)	(2) ¼-28UNF, 0.625 in. thread depth	37°C @ 15W	1.3°C/W @ 250 LFM	0.2680 (121.56)

MECHANICAL DIMENSIONS 301 SERIES 302 AND 303 SERIES



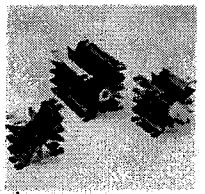




Series 301/302/303 Series 394/395/396 Series 401 & 403 Series 413/421/423 Series 431 & 433 Series 435 Ser

301K 301M 301N 302M 302MM 302N 302NN
303M 303MM 303N 303NN

Scroll For More Series



Click to enlarge

Your solution

FAQs
Case Studies
White Papers
Contact Us

Click to enlarge

© 2010 Wakefield Solutions, Inc. All rights reserved.

How to Use This Catalog

Base part number

Semiconductor device

Style description for heat sink

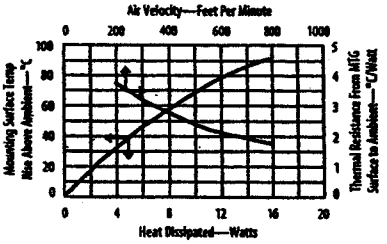
Icons indicate that a mounting kit, grease or epoxy can be used with the heat sink

TO-220 Heat Sinks

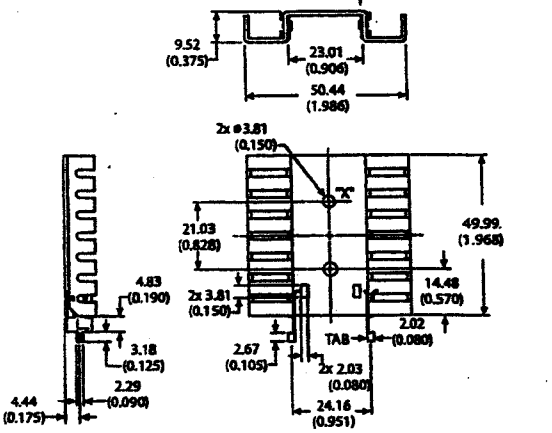
7022 **Channel style heat sink with folded back fins**

Semiconductor devices have been included in photos to assist in determining mounting position.

Thermal graphs show natural and forced convection based on black anodize finish. For information on how to use a thermal graph, please refer to page 11.



Mechanical drawing dimensions as shown are mm (inches)



Detailed description illustrates the heat sink's differentiating features.

Channel style heat sink with folded back fins for increased cooling surface area. Available with tin plated solderable tabs for easy attachment to the printed circuit card.

Material and finish information is shown for each part

Material: 1.27 (0.050) Thick Aluminum
Finish: See Table

Ordering information will specify the base heat sink with available accessories.

ORDERING INFORMATION

Part Number	Description	Finish	Dia of PCB Plated Thru Hole for Tabs
7022BG	Channel heat sink with folded back fins	Black anodize	
7022PBG	Channel heat sink with folded back fins	Pre-black anodize*	
7022B-MTG	With solderable tabs	Black anodize	2.90 (0.114)
7022PB-MTG	With solderable tabs	Pre-black anodize*	2.90 (0.114)

* Edges cut during the manufacturing process will be unfinished.
See page XX for more information

Aavid has a large selection of popular options to enhance your heat sink selection. This section will indicate the most popular options available.

POPULAR OPTIONS: 7022B-___ G

Base part no. A RoHS Compliant

Position	Code	Description	Location	Details
A	TC11-MT	Insulated device mounting clip for TO-220 and solderable tabs	Hole X	Page

For additional options see page xx

Detailed indexes are available to select additional options.

AAVID THERMALLOY
www.aavidthermalloy.com

AMERICA
USA Tel: +1 (603) 224-9988 email: info@aavid.com

EUROPE
Italy Tel: +39 051 764011 email: sales.it@aavid.com
United Kingdom Tel: +44 1793 401400 email: sales.uk@aavid.com

ASIA
Singapore Tel: +65 6362 8388 email: sales@aavid.com.sg
Taiwan Tel: +886(2) 2698-9888 email: sales@aavid.com.tw

Quick Reference

Search by part #

Check distributor part inventory

Stock Check CLICK HERE!

Products

Browse Products

-By Device-

-By Product Line-

-Attachment Methods-

-Interface Materials-

-Accessories-

Useful Links

- Building a Part #
- Catalog Request
- Directions
- Find Distributor
- Find Sales Associate
- How to Order?
- MSDS Safety Sheets
- Part # Cross Ref
- Quote Request
- RoHS Initiative
- Sample Request

Part Number: PF434G

Plug in style heat sink with solderable tab horizontal mount.
For use with TO-220/TO-262 packages.

Order this part through an Authorized Distributor

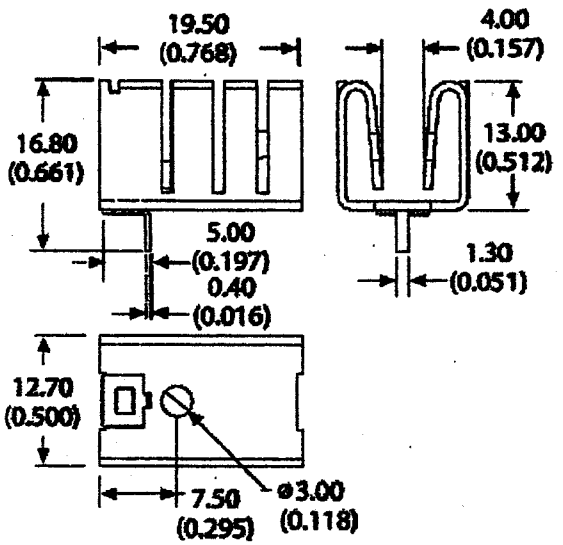
Order Now

Product Information

This non-electronic component is functionally unaffected by the normal soldering or reflow processes used for semiconductor circuits. The heat resistance time or heat resistance temperature is not applicable for the component.

Part #	Finish	RoHS
PF434G	Pre-Black Anodize	RoHS ✓ Compliant

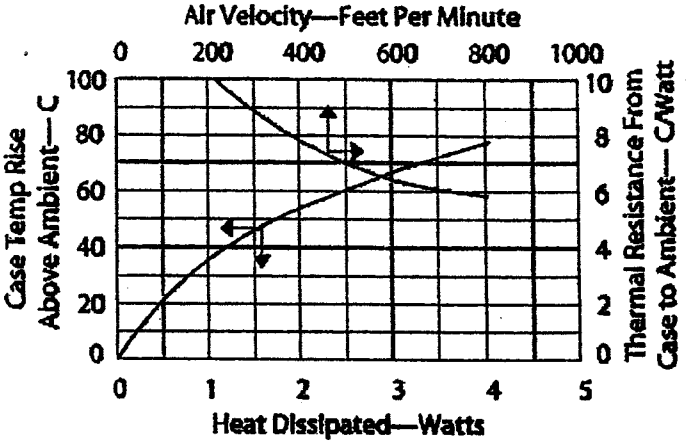
Mechanical Outline Drawing



4

Thermal Curve

Thermal Resistance	20.30



Thermal resistance value is based on a 75°C rise in natural convection

Not Exactly what you need?

We offer several options for those applications which require a more unique solution. For slight modifications of this part or other attachment options, finishes, and interface materials, contact your sales associate. Challenge us with your thermal requirements - we can design custom solutions.

www.Aavid.com • Sitemap • Disclaimer Statement • ©2010 Aavid Thermalloy, LLC
Aavid Thermalloy • Aavid Solar • Aavid Data Center Cooling • Applied Thermal Technologies

Standard Products

- Homepage
- Passive BGA Heatsinks
- Fansinks
- DC/DC Converter Heatsinks
- Small Round Pin Heatsinks
- Push Pin Heatsinks
- Accessories
- Attachment Options

Shopping Cart

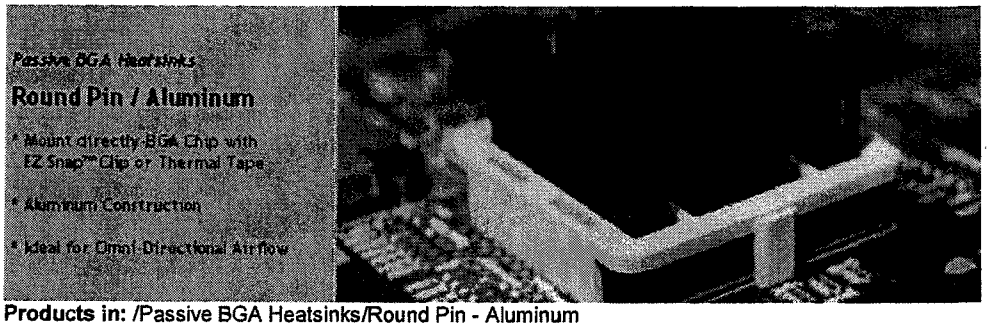
YOUR CART IS EMPTY.

ITEMS IN CART: 0
TOTAL: $0.00
View Shopping Cart

Featured Product

HS2142DB

Round Pin - Aluminum



Products in: /Passive BGA Heatsinks/Round Pin - Aluminum

CLICK A COLUMN HEADING BELOW FOR SORTING RESULTS		DIMENSIONS (MM)			THERMAL RESISTANCE THETA-SA (°C/W)		
PART NO. / SERIES	SIZE / FITS CHIP	WIDTH	LENGTH	HEIGHT	200 LFM	400 LFM	600 LFM
HS2133DB	21	21	21	7.1	14.8	9.6	7.9
HS2101DB	21	21	21	12.2	8.6	5.9	4.8
HS2087DB	21	21	21	7.6	13.2	9.1	7.5
HS2088DB	21	21	21	12.7	8.3	5.7	4.7
HS2134DB	23	23	23	7.1	11.6	7.9	6.5
HS2135DB	23	23	23	12.2	7.4	5.1	4.3
HS2099DB	23	23	23	7.6	11.0	7.5	6.2
HS2100DB	23	23	23	12.7	7.2	4.9	4.1
HS2124DB	25	25	25	7.1	10.7	7.2	5.8
HS2102DB	25	25	25	12.2	6.7	4.5	3.7
HS2077DB	25	25	25	7.6	10.3	6.9	5.7
HS2078DB	25	25	25	12.7	6.5	4.4	3.6
HS2136DB	27	27	27	7.1	9.6	6.4	5.2
HS2137DB	27	27	27	12.2	6.0	4.1	3.5
HS2085DB	27	27	27	7.6	9.2	6.2	5.0
HS2086DB	27	27	27	12.7	5.9	4.0	3.4
HS2144DB	32.5	32.5	32.5	7.1	7.0	4.6	3.7
HS2145DB	32.5	32.5	32.5	12.2	4.5	3.0	2.5
HS2142DB	32.5	32.5	32.5	7.6	6.6	4.4	3.5
HS2143DB	32.5	32.5	32.5	12.7	4.4	2.9	2.4
HS2132DB	35	35	35	7.1	6.4	4.8	3.3
HS2103DB	35	35	35	12.2	3.9	2.6	2.1
HS2089DB	35	35	35	7.6	6.1	4.0	3.2
HS2090DB	35	35	35	12.7	3.7	2.4	1.9
HS2138DB	37.5	37.5	37.5	7.1	5.9	3.8	3.0
HS2139DB	37.5	37.5	37.5	12.2	4.0	2.6	2.1
HS2091DB	37.5	37.5	37.5	7.6	5.6	3.6	2.9
HS2092DB	37.5	37.5	37.5	12.7	3.8	2.5	2.0
HS2140DB	40	40	40	7.1	5.7	3.5	2.8
HS2141DB	40	40	40	12.2	3.4	2.2	1.8
HS2081DB	40	40	40	7.6	5.1	3.3	2.7
HS2080DB	40	40	40	12.7	3.3	2.1	1.7
HS2167DB	42.5	42.5	42.5	7.1	4.9	3.7	2.5
HS2168DB	42.5	42.5	42.5	12.2	3.2	2.1	1.7

HS2166DB	42.5	42.5	42.5	7.6	4.7	3.0	2.4
HS2168DB	42.5	42.5	42.5	12.7	3.1	2.0	1.8
HS2129DB	45	45	45	7.1	4.4	2.8	2.2
HS2125DB	45	45	45	12.2	2.9	1.9	1.5
HS2093DB	45	45	45	7.6	4.2	2.7	2.1
HS2094DB	45	45	45	12.7	2.8	1.8	1.5

2160 Walsh Avenue Santa Clara, California 95050-2512 United States
Telephone: 1.800.689.2802 Fax: 408.988.0683
© 2007 Radian Heatsinks. A division of Intricast Co, Inc. All rights reserved worldwide.

ATTACHMENT B

Sales Information

- How to order?
- Find Sales Rep
- Find Distributor
- Global Locations
- Sample Request
- Quote Request
- Catalog Request
- Building a part #
- Part # Cross Ref

Authorized Distributors

Serving California

Hardware Specialty
1951 Plaza Real
Oceanside, CA 92056
Tel: 760-643-0722
Fax: 760-643-0749
Email: oceanside@hardwarespecialty.com
Web Site: www.hardwarespecialty.com

Serving California

Digi-Key
701 Brooks Ave.
South
Thief River Falls, MN 56701
Tel: 1-800-344-4539
Fax: (218)-681-3380
Web Site: www.digikey.com

Serving California

Mouser Electronics Inc.
1000 N. Main Street
Mansfield, TX 76063
Tel: (800) 346-6873
Fax: (817) 804-3899
Email: sales@mouser.com
Web Site: www.mouser.com/aavid

Serving California

Richardson Electronics
780 Montague Expressway
Suite 102/103
San Jose, CA 95131
Tel: 1-800-737-6937
Fax:
Email: rfpd@rell.com
Web Site: www.rell.com

Bisco Industries
7801 N Lamar Blvd
Suite B-170
Austin, TX 78752
Tel: (512) 448-4550
Fax: (512) 448-4862
Email: info@biscoind.com
Web Site: www.biscoind.com

Serving Texas - Austin

Heilind Electronics
1826 Kramer Lane
Suite A
Austin, TX 78758
Tel: (800) 400-7041
Fax: (512) 339-2328
Email: heilindatx@heilind.com
Web Site: www.heilind.com

Serving Texas - Austin

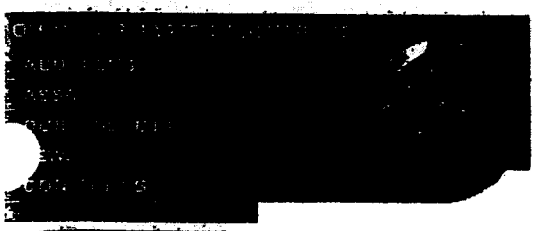
Future Electronics
Greystone Plaza
7200 North Mopac
Austin, TX 78731
Tel: (512) 502-0991
Fax: (512) 502-0740
Contact: www.FutureElectronics.com/ContactUs
Web Site: www.futureelectronics.com

Serving Texas - Austin

Norvell Electronics
7800 N. Mopac
Ste. 120
Austin, TX 78759
Tel: (800)-893-0593
Fax: (512) 343-9602
Email: austin@norvell.com
Web Site: www.norvell.com

Serving Texas - Brownsville

Allied Electronics
3505 Boca Chica Blvd
Ste 260
Brownsville, TX 78521-4063
Tel: 956-548-1129



Eastern Metal Supply

View a product from our online catalog

EMS Credit Application

PDF Downloads:
> Credit Application
> Credit Card Form
> EMS Info Sheet

Using the Online Product Catalog: You must have Adobe Acrobat Reader to view PDF files.

Click here to download the free Adobe Acrobat Reader.

Products are broken up into categories and sub-categories. To find what you are looking for, click on a sub-category to display a PDF of that particular product line.

Example: Looking for Rod Holders?

Click on or Scroll to the "Anodized Marine Extrusions & Accessories" Category. Then select "Rod Holders" from the sub-category listing to display the Rod Holders PDF file.

See something you need?

Send an e-mail to the EMS nearst you for quotes, availability, pricing, and more.

Click on the approprate branch below to generate an e-mail:

EMS Florida

services Florida & the Caribbean

EMS North Carolina

services the Southeastern,

OUR PRODUCTS

Click on a product category or scroll down to see all categories:

Standard Extrusions & Sheet Products
D.O.T./Highway Products
Boat Trailers & Boat Lifts
Handrail Extrusions
Castings
Fence & Wall
Signage
Awning Shapes
Architectural Products
Hurricane Protection Systems
Dock, Ramp & Gangway; Seawall Shapes
Anodized Marine Extrusions & Accessories
Window Treatment Extrusions
Miscellaneous Shapes

Standard Extrusions & Sheet Products

Bar & Rod • Sheet & Plate • Alodine Sheet • Angle • Channel • Square Tube • Rectangular Tube • Round Tube • Serrated & Fluted Tube • Zees & Tees • Pipe • I-Beams • Painted Shapes

[Back to Top]

D.O.T./Highway Products

Round Tube • Misc. D.O.T./Highway Products • Alodine Sheet Products

[Back to Top]

Boat Trailers & Boat Lifts

I-Beams • Components • Boat Lift Extrusions & Accessories • Lil' Bertha™ Aluminum Boat Trailer • Plywood Trailer Components

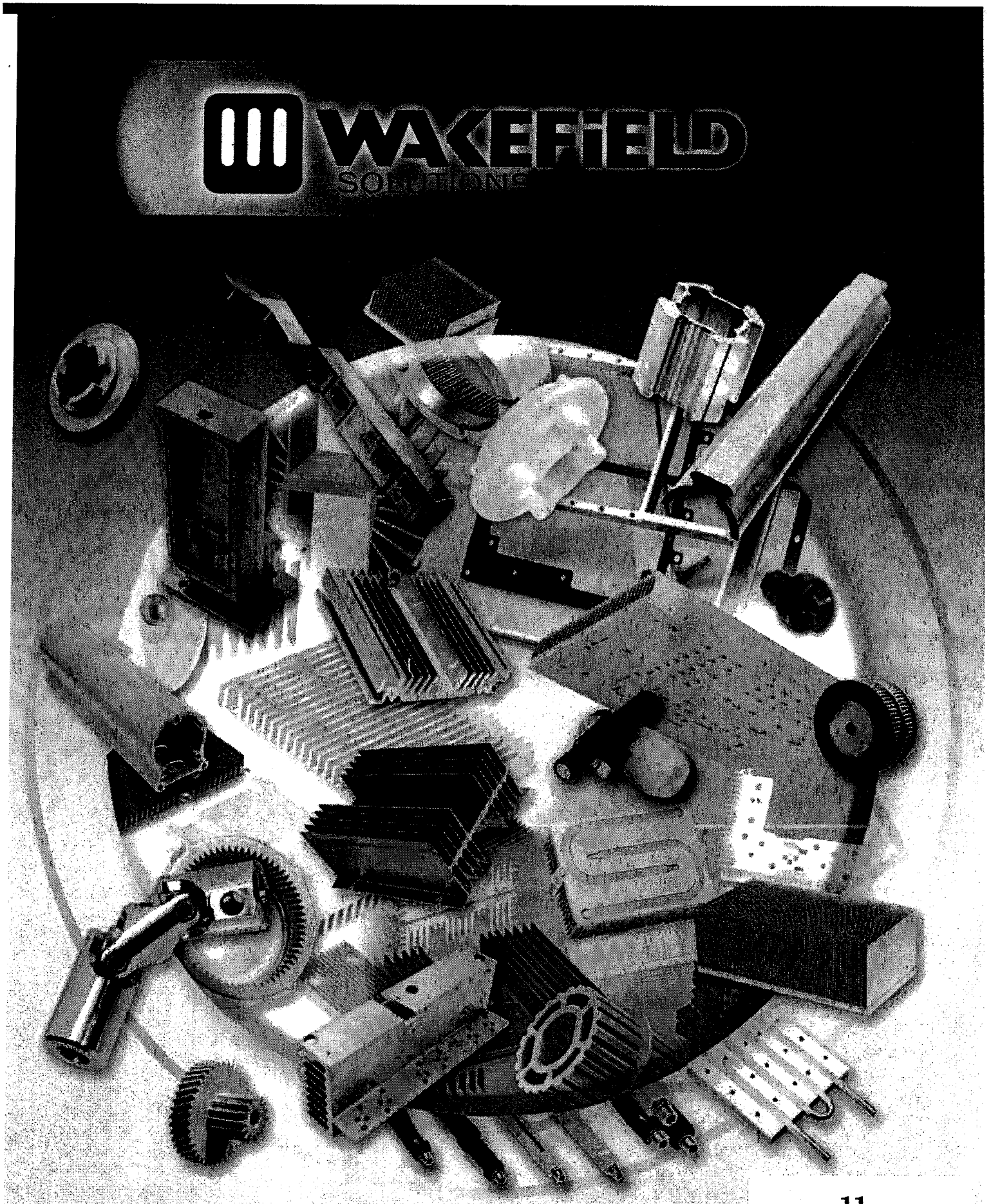
[Back to Top]

Handrail Extrusions

Mechanical Railing • Welded Railing • Welded Dixie Caps • Railing Channel & Cover Plates; Pipe Brackets • Glass Railing • Miscellaneous Railing • Square Tube Posts & Pickets

[Back to Top]

ATTACHMENT C



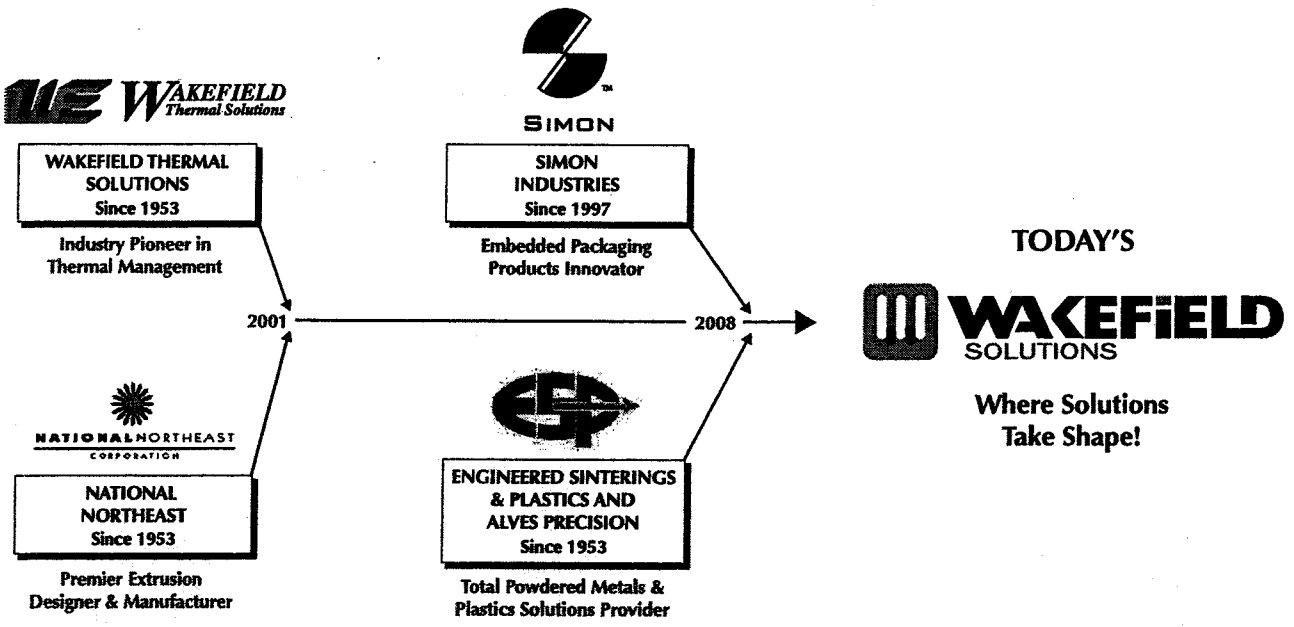
WHERE SOLUTIONS TAKE SHAPE!

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

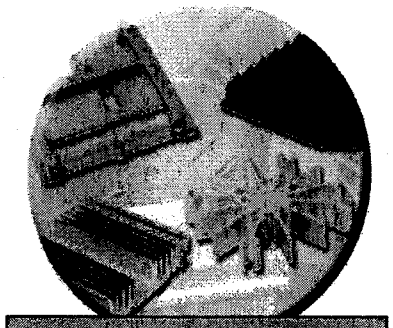
In 2001 two premiere companies Wakefield Thermal Solutions, a leader in thermal management, and National Northeast, a precision aluminum extruder and fabricator joined forces to create a one-stop shop for our customer's thermal management, extrusion, and fabrication needs.

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.

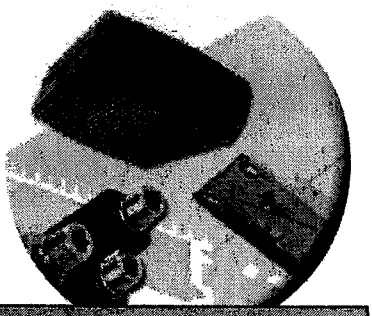


WAKEFIELD SOLUTIONS CAPABILITIES



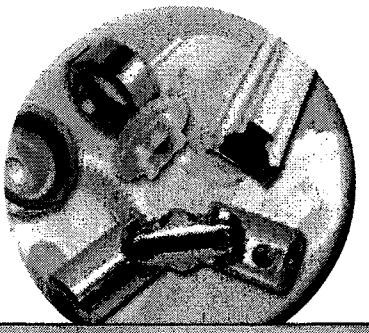
THERMAL MANAGEMENT

- Heat Sinks
- Heat Frames
- Thermal Modeling
- Thermal Accessories



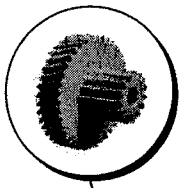
TECHNICAL PRODUCTS

- Wedgelocks
- Front Panels
- Enclosures
- Electronic Packaging Accessories

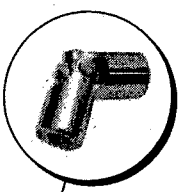


INDUSTRIAL APPLICATIONS

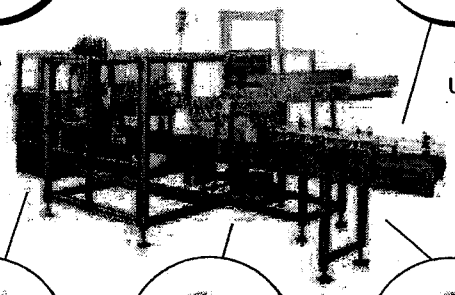
- Aluminum Extrusion/Fabrication
- Powered Metal/Forgings
- Thermoset/Thermoplastics
- Universal Joints

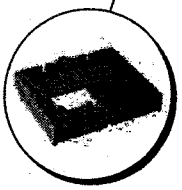


Forged Powdered Metal Options

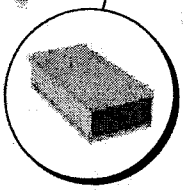


Zero Backlash Universal Joints

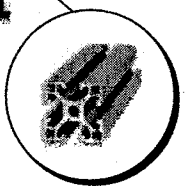




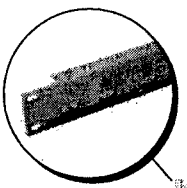
Custom Thermoset Plastics



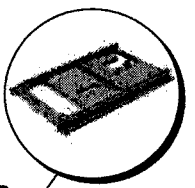
Engineered Thermal Solutions



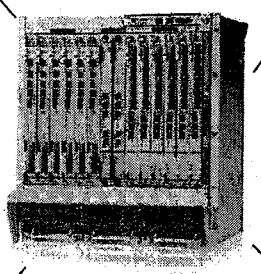
Aesthetic Functional Extrusions

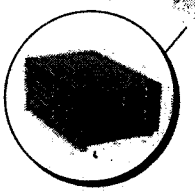


Custom Front Panel Solutions

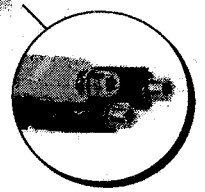


Thermal Management Heat Frames



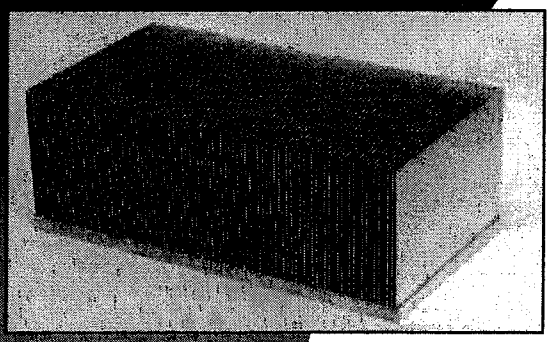


Extruded Enclosure Systems

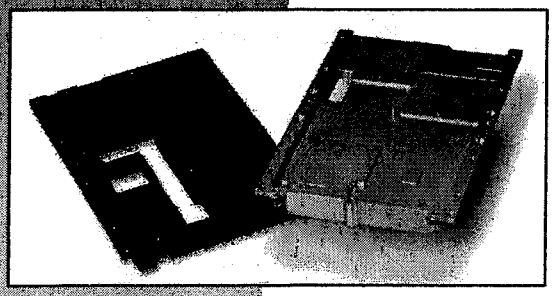


Board/Module Retention Systems

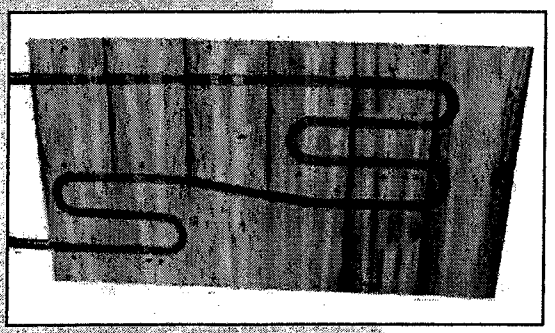
WAKEFIELD SOLUTIONS
THERMAL MANAGEMENT



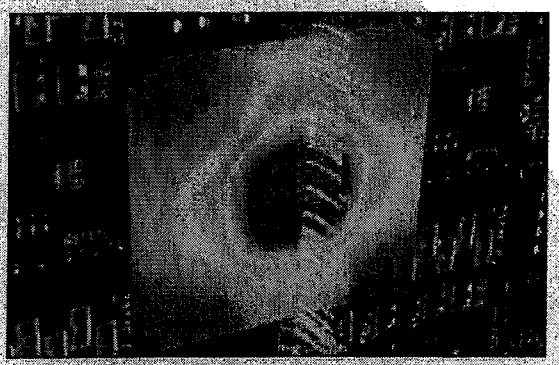
Heat sinks that are cost effectively customized to your system needs.



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.

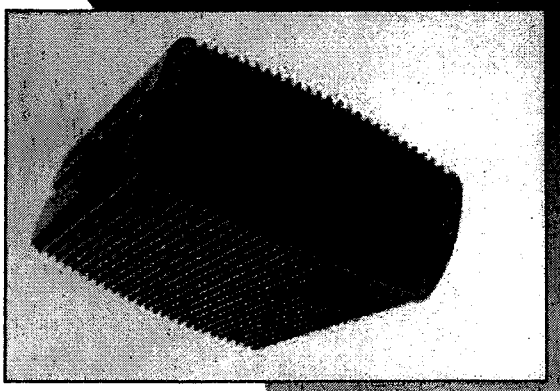
www.wakefield.com

WAKEFIELD SOLUTIONS

WAKEFIELD SOLUTIONS
TECHNICAL PRODUCTS

ENCLOSURES

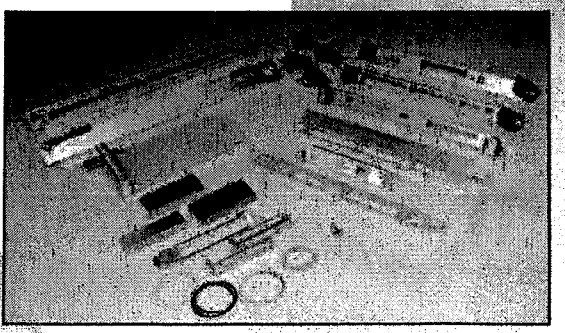
- Wakefield offers custom aluminum enclosure support on a complete assembly and piece part basis.
- Complete extruded aluminum enclosures with integral PCB guides, internal component mounting provisions, front panels/end plates, etc.
- Complimented by customized fabrication and assembling services.



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

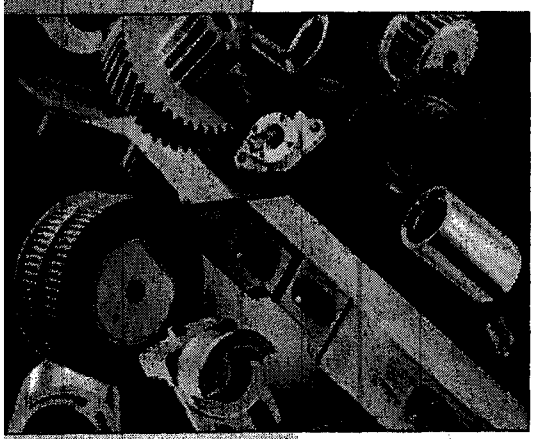
Board and plug- in- unit mounting retention systems ideally suited to the most challenging environments.

WAKEFIELD SOLUTIONS
INDUSTRIAL APPLICATIONS

Over 10 million pounds extruded a year!

ALUMINUM EXTRUSIONS AND FABRICATIONS

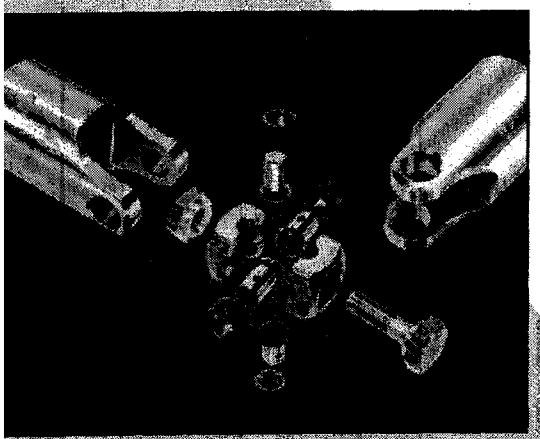
- 3,000 ton press 12" Circumscribing Circle Diameter (CCD)
- 1,800 ton press 9" CCD
- Kevlar handling system
- Post Extrusion Fabricating Service
- 100+ CNC machines
- 25 punch presses
- 5 CNC cut off machines
- 5 turning centers
- Welding, assembly, debur & wash



Production of "net shapes" to minimize secondary machining.

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.



Zero backlash® repairable universal joints.

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.

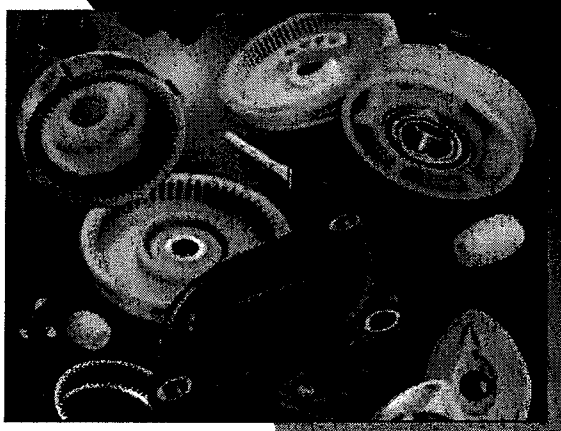
Needle Bearing Block Universal Joints
- The only repairable needle bearing joints on the market.

"Double" Block Universal Joints
- Connects two blue block, hex block or solid block joints.

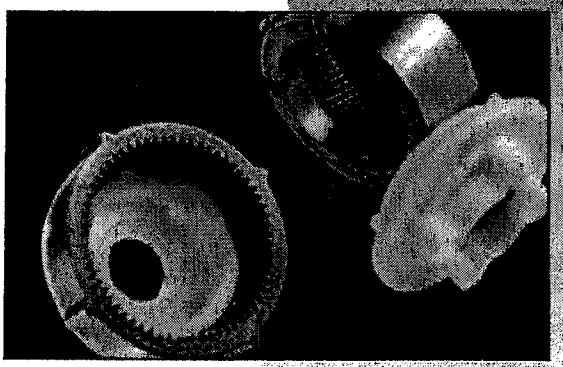
Repair Kits and Boots
- On-site repair kits can repair any size blue block u-joint.

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.

WAKEFIELD SOLUTIONS

www.wakefield.com

New Hampshire Operations • Headquarters
33 Bridge Street • Pelham, NH 03076
Phone: 603-635-2800 • Fax: 603-635-1900
info@wakefield.com • www.wakefield.com

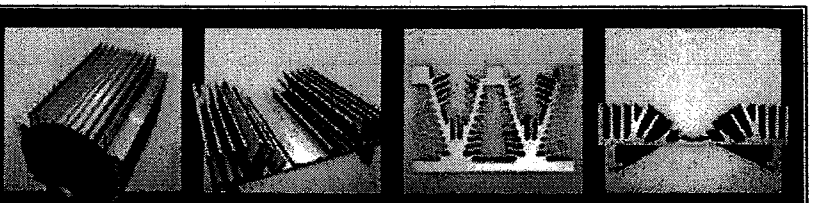
Connecticut Operations • ESP
140 Commercial Street
Watertown, CT 06795
Phone: 860-274-8877 • Fax: 860-274-4406

North Carolina Operations • Simon Industries
200 Towerview Court
Cary, NC 27513
Phone: 919-469-2004

West Coast Operations • Los Angeles, CA

Asia Operations • Guangdong, China

Thermal Solutions International, Inc.



Heatsinks
(High Power to Board Level)

Extrusions
(View Stocked Extrusions)

Thermal Interface Materials

Bonded Fin & Folded Fin Heatsinks

DC/DC Converter Heatsinks

BGA and Surface Mount Heatsinks

Heat Spreaders

Copper Heatsinks

Custom Sheet Metal Housings

CNC Machining

CNC Lathe Work

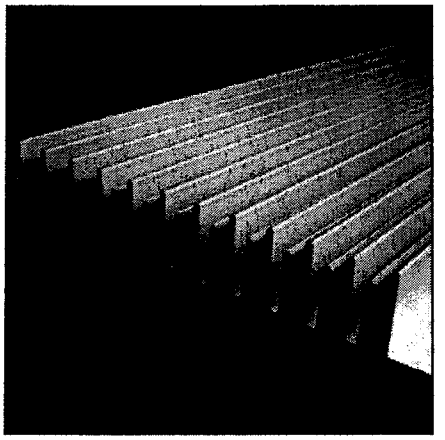
Precision Metal Sawing

Full Plating Capability

Assembly Operations

Heatsinks

Thermal Solutions International, Inc. carries a wide variety of heatsinks that we custom make for the high power and low power industry. Our heatsinks are generally made from 6063 material but we can accommodate all types of metal requirements.

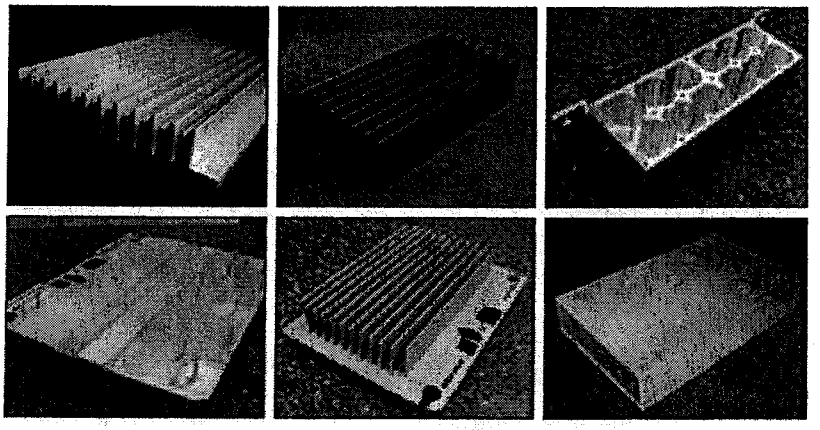


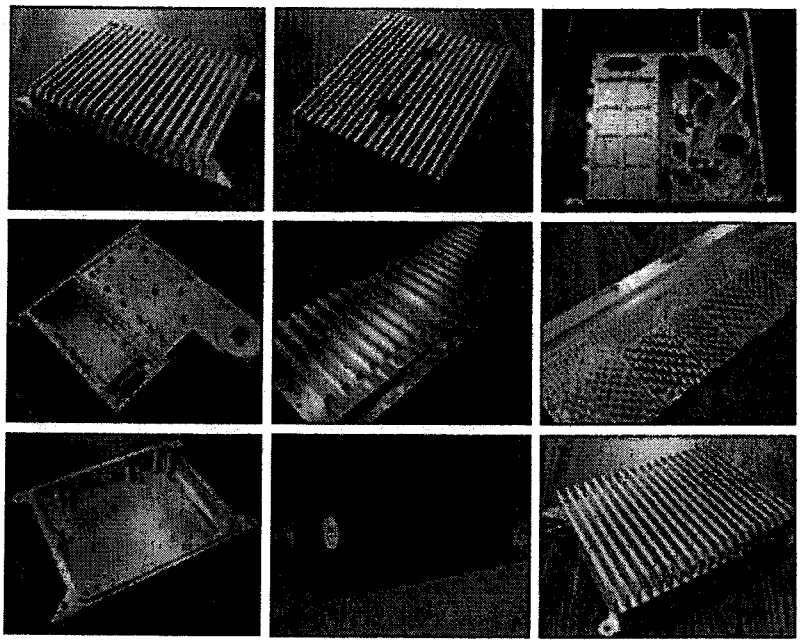
We invite you to bring your heatsink or other mechanical hardware product drawings to TSI. Whether it is a new design or an existing design that needs cost reduction, we are able to support you with exceptional service. TSI has focused our efforts to assist the OEM and MRO markets with advanced thermal solutions.

Our pricing is very competitive and lead times are typically 2-4 weeks. Compared to the rest of the industry at 8-10 weeks, we can deliver your products in a timely fashion to support your prototype and production needs.

Our on-time delivery is consistently at 99% and quality is maintained through our Real-Time SPC, CMM and Optical Comparator Equipment, all of which are used by trained professionals.

Click one of the photos below to view a gallery of different heatsinks we have created over time.





If you'd like to learn more about our capabilities or have questions, please contact us today and experience what quick turn and true customer service is all about!

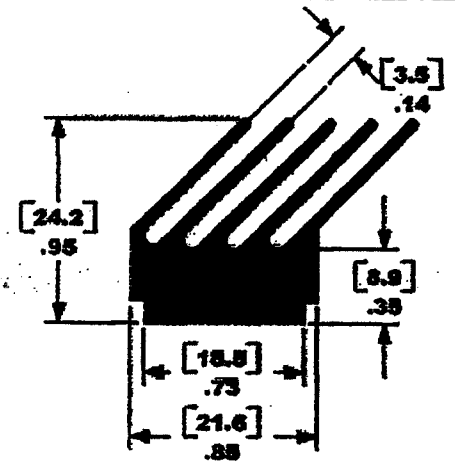
Thermal Solutions International, Inc. - 4109 Eagle Flight Drive, Simi Valley, CA 93065

Phone: (805) 277-9118 - Email: info@thermal-solutions.us

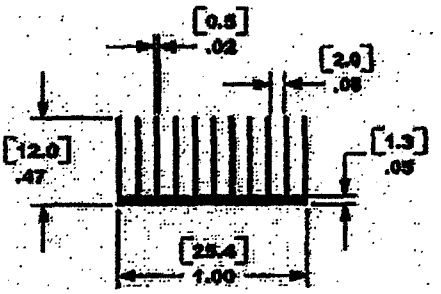
© Copyright 2007 Thermal Solutions International, Inc. All Rights Reserved.

Extrusions

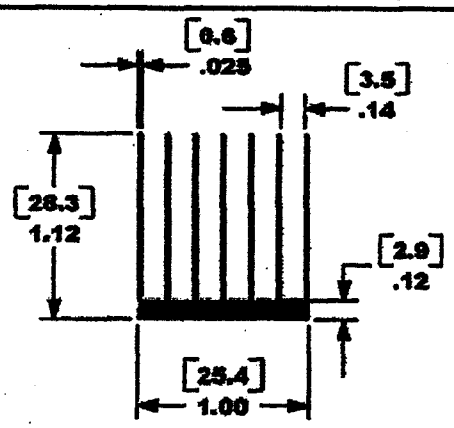
Extrusions shown below are typically stocked. Sizes are normally 4ft to 8 ft long. If you do not see an extrusion size that meets your needs, feel free to contact us. We specialize in custom extrusions of all shapes and sizes and can accommodate up to 19"wide. Please contact us for more details on custom shapes or if you would like to order one of our stocked extrusions.



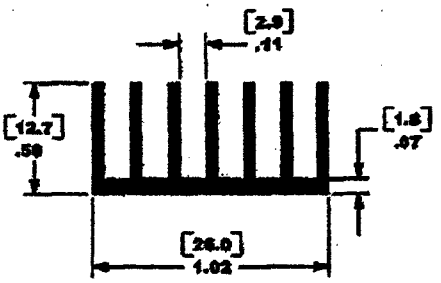
Part # EXT091035 View Larger



Part # EXT100505 View Larger



Part # EXT101112 View Larger



Part # EXT100507 View Larger

ATTACHMENT D

Wind Tunnel for Heat Sink Testing in Lab

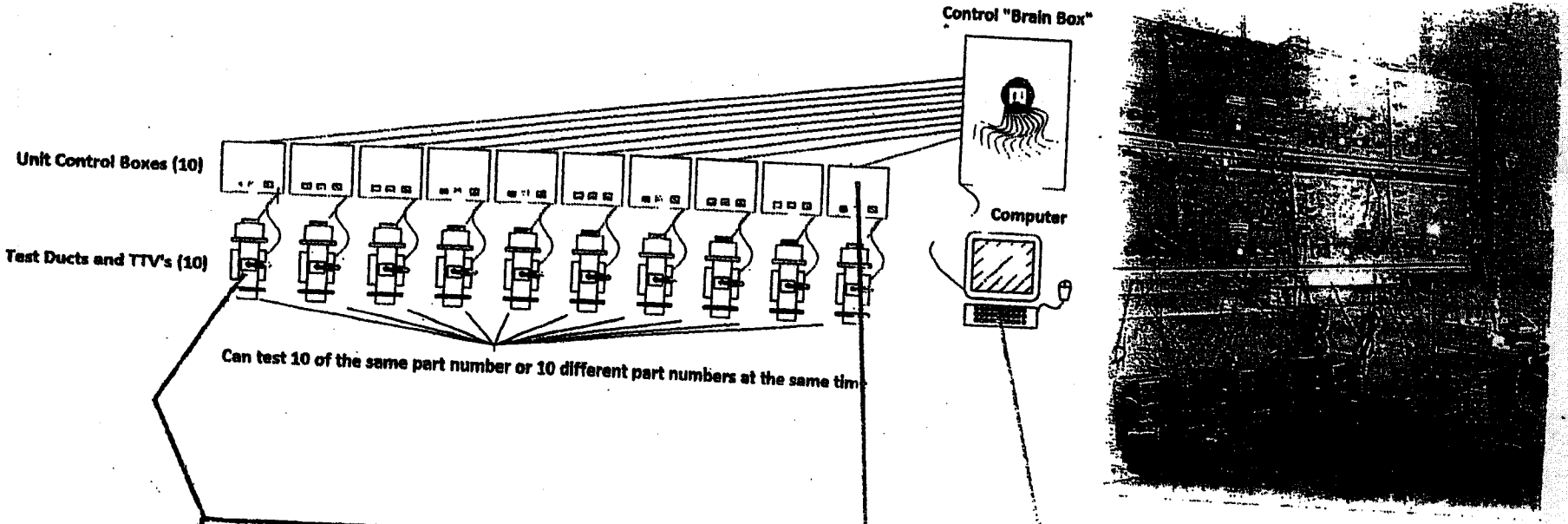
A custom air duct is made for each heat sink

Thermal Test Vehicle (TTV) supplies and meters heat into the heat sink

The wind tunnel creates and meters a precise air flow rate through the duct

A computer controls all aspects of the testing and records the test data

Multiple heat sink test unit in Factory



A custom air duct and TTV is made for each heat sink. Air flow rate through each duct is set to the specifications for the particular heat sink

A computer and central "brain box" controls all aspects of the testing and records the test data

Unit control boxes control and monitor individual heat sink tests

Factory Flow Meter to Calibrate Air Flow Rates

- The air flow rate in each leg of the multiple heat sink test units in the factory is set up using a precise flow metering system. This setup is repeated every time the tester is changed over to test a different heat sink part number

ATTACHMENT E

Alexandria Extrusion Company Acquires M&M Metals

Alexandria, MN – November 7, 2008 - Alexandria Extrusion Company is excited to announce its recently completed acquisition of M&M Metals, a manufacturer of heat sinks and custom-fabricated aluminum extrusions, located in Carrollton, Texas. Through this acquisition, M&M Metals will retain its name and operate as a stand-alone precision manufacturer to its long term customer base. M&M Metal's customers will benefit from the additional products and services available as a result of this acquisition. M&M's owner, Jeff McReynolds, will continue to serve as President. "The addition of M&M Metals will provides exciting opportunities for M&M Metals and AEC," stated AEC's CEO, Tom Schabel.

M&M Metals' offerings are a complimentary addition to AEC's current products and services. Following the acquisition, the two companies will work collaboratively to combine their strengths and core competencies. M&M's success can be attributed to its quality service and products provided over the past 34 years. "AEC is excited to enhance the list of offerings not only for our customers, but those of our specialized manufacturing divisions," said Schabel.

AEC is a supplier who focuses on working with their customers to create solutions. This addition adds a new level of experience to the current solutions provided for their customers.

About Alexandria Extrusion Company
Alexandria Extrusion Company is an ISO 9001:2000 certified supplier of precision aluminum extrusions, including advanced engineering services and innovative value-added operations. The company offers custom aluminum extrusion products with the highest degree of quality and tightest tolerances allowed through the aluminum extrusion process.

With over 40 years of experience, Alexandria Extrusion Company (AEC) provides assistance beginning with prototype development through final production. The end result: customized aluminum extrusions that effectively meet its customers' exact specifications. AEC is known for developing and investing in 40+ years of innovative manufacturing practices and holds true to its preferred, historical existence in the industry. The company has become a market driven organization by creating solutions to market needs, while providing domestically enhanced manufacturing processes and systems to serve its customers globally.

About M&M Metals
Since 1974, M&M Metals has been providing heat sinks, custom-fabricated aluminum extrusions and machined prototypes. The company specializes in engineering support of thermal application designs, short run orders, timely deliveries and stocking of high volume production requirements.

CONTACT:
Steve Schabel
Marketing Manager
Alexandria Extrusion Company
(320) 762-6741 Direct
(320) 763-4692 Fax
sschabel@alex-extrusion.com
www.alexandriaextrusion.com

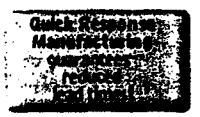
Services

Extrusion Capabilities Overview
Precision Aluminum Extrusions
Aluminum Heat Sinks
Aluminum Fabrication
Aluminum Bending
Stretch Forming
Welding
Product Assembly
Aluminum Extrusion Process
Aluminum Finishing
Alex Plastics

REQUEST A QUOTE

Search

Site Map



SIGN-UP TODAY!
To receive our newsletters

© 2011 Alexandria Extrusion Company and Northern Heart Media