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**Precision • Quality • Performance**

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# About Keats

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## Keats

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Established in 1958, the Keats companies have been providing customers with the highest quality precision custom small metal stampings, wire forms, and assemblies for decades. Bert & Glenn Keats founded the company on the principle of producing the highest quality product at the best price and delivering on time.



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## Capabilities

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- Keats operates out of three locations housing more than 150 metal stamping and wire forming machines using four slide/multi slide and progressive die stamping press technologies, which operate 5 days a week, 24 hours a day. This means that we can facilitate orders ranging from low volume prototypes to high volume orders up to 100 million parts.
- Keats engineers design all tools & dies from inception to first piece sampling, ensuring that the most precise tolerances are maintained from the very first piece to the very last production run. We combine innovative technological processes including CAD/CAM, EDM, and CNC machines, all operated by 25 of the industry's most experienced die makers, to create tools of uncompromising quality built to last a lifetime.

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## Quality & Customer Satisfaction

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- Quality control and quality enhancement are of the utmost importance to the Keats companies. A 15-person quality team operates state of the art inspection equipment, and reports directly to CEO, Wade Keats. All three of our locations adhere to the most demanding quality control systems. The goal of zero defects drives the Keats organization to continually improve its processes and develop/adopt new technology to meet customer requirements.

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## Certifications

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# A Long History of Precision, Quality & Performance



## Our History

**1958**

### Keats Mfg Co. Established

Setting up two #1 Baird four-slide machines in a storefront on Cicero Avenue on the north side of Chicago, Bert & Glenn Keats founded G.A. Keats Manufacturing Company with the simple principle of producing the best quality product at the best price, delivered on time.

**1984**

### Wire EDM Technology

The company was one of the first stamping businesses to adopt wire EDM technology; with two wire EDM machines in-house, Keats can make replacement tooling parts for internal use in a matter of hours. They continually strive to stay at the forefront of technology in the industry.

**1989**

### Keats Moves to Wheeling, IL

Keats moved from their original Chicago location to their current corporate HQ and Technology Center in Wheeling, IL. The facility employs over 120 people and has nearly 70,000 square feet of manufacturing, design, tool development, and office space.

**1997**

### QS 9000 & ISO/TS 16949

To conform to QS 9000, which later became ISO/TS 16949, Keats implemented numerous quality standards to ensure that all facilities were operating with a goal of zero defects.

**2016**

### Keats de Mexico Established

Keats' newest facility is located in Queretaro, Mexico. This new 15,000 square foot manufacturing plant was established to meet growing customer demand for Mexican content in finished goods.

The facility features progressive die stamping as well as four-slide/multi-slide stamping and tooling development.

**1971**

### First Automotive Customer

With their high quality standards, Keats was a perfect fit for the automotive industry. The company began by making spring clips and terminals for automotive applications in 1971 — now, in 2017, Keats parts can be found in nearly every car made in North America.

**1987**

### Wünsch System

An early adopter of state-of-the-art vertical slide-forming & stamping technology, Keats is the only company in North America to operate Wünsch machines, specialized vertical slide forming machines. With five machines in-house, the company continues to invest in the latest precision metal forming technology to further refine all processes.

**1994**

### Keats Southwest Established

In response to customer requests, Keats established a facility near the Mexican border in El Paso, TX. The Keats Southwest facility has since grown to over 60 employees and 30,000 square feet, serving customers primarily in Northern Mexico, but also throughout the world.

**2013**

### ISO:14001 Certification

Continuing to lead the way in the industry, Keats achieved the highest level of environmental policy certification. The company is committed to lowering their environmental impact through reduced consumption of raw material and MRO products.

# Our Locations



## Locations

Keats plants are strategically located throughout North America to serve our customers with the highest quality product at the best price and delivered on time. Keats produces parts using the best manufacturing equipment. The objectives of the company include a focus on just-in-time delivery and a zero-defect goal. Keats is located in key manufacturing regions in order to facilitate the growth of our customers.



### Keats Manufacturing

- 120 Employees
- 76 Four-slide and Multi-slide Machines
- 12 Progressive Die Machines
- Operate 24 Hours a Day, 5 Days a Week

### Equipment Quantity & Type

- (5) # 1 Baird
- (3) 00 Baird
- (7) S1F Nilson
- (5) 752 Nilson
- (10) 33 U.S. Baird Multi-Slide
- (1) 60 Ton Johnson, Niagara
- (5) 0 Nilson
- (3) S2F Nilson
- (12) 28 U.S. Baird Multi-Slide
- (1) 15 Ton Minster
- (2) 45 Ton Stamtec, Walsh
- (3) 60 Ton Minster



### Keats Southwest

- 60 Employees
- 40 Four-slide and Multi-slide Machines
- 11 Progressive Die Machines
- Operate 24 Hours a Day, 5 Days a Week

### Equipment Quantity & Type

- (1) Minyu CNC
- (4) #1 Baird
- (5) S1F Nilson
- (2) 752 Nilson
- (5) 33 U.S. Baird Multi-Slide
- (1) 2000 Wunsch
- (1) 37 Ton V&O
- (1) 60 Ton Johnson, Niagara
- (1) 100 Ton Bliss
- (1) 0 Nilson
- (3) S2F Nilson
- (16) 28 U.S. Baird Multi-Slide
- (1) 15 Ton Minster
- (1) 35 Ton Perkins
- (3) 45 Ton Stamtec, Walsh
- (1) 90 Ton Bliss
- (2) 60 Ton Minster
- (1) 150 Ton Niagara



### Keats de Mexico

- 10 Employees
- 4 Four-slide and Multi-slide Machines
- 3 Progressive Die Machines
- Operate 16 Hours per Day, 5 Days per Week

### Equipment Quantity & Type

- (2) S1F Nilson
- (2) #1 Baird
- (1) 60 Ton Komatsu
- (1) 88 Ton AIDA
- (1) 120 Ton AIDA



# Keats Sales & Customers



## Diverse Customer Base

ABB

ACSmith.

BAIRD

BOSCH

BOURNS

BRK

Continental

COOPER

DELPHI

EAT•N

EMERSON

FEDERAL  
MOGUL

FLEXTRONICS

Grote

HELLA

HITACHI

Honeywell

ITW

K  
RAIN

KROMBERG  
& SCHUBERT

LiftMaster  
Garage Access Systems

MERSEN

3M

molex

Nidec  
-All for dreams

Schneider  
Electric

SIEMENS

TRW

## Industries



32%

Automotive



30%

Power  
Distribution



18%

Consumer  
Goods



12%

Appliance



6%

Medical



2%

Military/  
Aerospace

# Production Tooling



## Cutting Edge Tool & Die

Keats designs and builds the highest quality tooling for multi-slide and progressive die/punch press machines in the industry. All Keats tools are designed by veteran industry experts and built to last a lifetime. Design starts with a focus on optimum raw material performance while also minimizing scrap throughout the production process.

Our engineers and toolmakers consistently adhere to the extremely tight tolerances required by our customers. Tools are built with ease of maintenance and longevity in mind from the very start. We always use the best quality removable cutting inserts and punches so as to make for quick adjustments and ease of maintenance.

You can trust Keats to design and build nothing but the absolute best tooling for your next project.



- Over 50 Years Tool & Die Experience
- 4 Full Time Tool Design Engineers
- 25 Full Time Tool and Die Makers
- 20,000 sq. ft. Tool Room
- Zero Tooling Maintenance Cost
- Tools Built to Last a Lifetime
- Top Industry Craftsmen

- Short Lead Times
- In-Die Inspection / Lasers / Camera
- A2 & M2 Tool Steel
- Carbide Tool Steel
- Removable Inserts
- Replaceable Components

- AutoCAD & Stamping Simulation Software
- Heat Treatment
- Shut Height Standardization
- Quick Release Clamps
- 5 S Die Storage
- SMED / Quick Die Change

## Technology & Equipment



**Surface Grinder**



**Conventional Mill**



**Heat Treatment Furnace**



**Automatic Lathe**



**Wire EDM**



**CNC Machining Center**



**Punch Press**



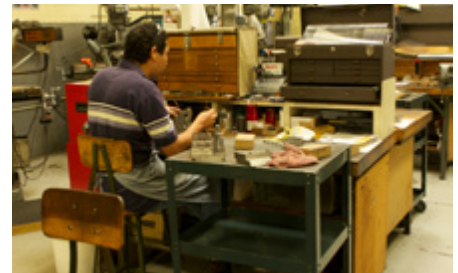
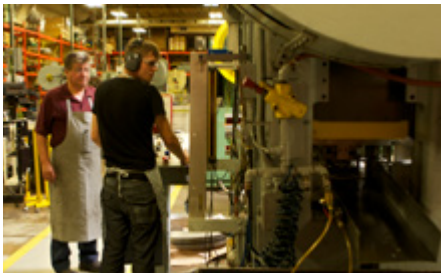
**Coordinate Measuring Machine**

# Prototype & Short-Run Parts



## Individually Formed Prototype & Short-Run Parts

The experienced Keats team of engineers designs and builds prototypes for just about any part. In some cases, there may not be demand to justify building a production tool. Keats may suggest a soft prototype tool and produce parts in smaller short-run quantities. This can save costs on production tooling. It can also allow for design changes in pre-production without modifying an expensive production tool.



### Production Technology & Equipment Used

#### Custom Prototype Process

- Laser Blank Cutting
- Wire EDM Blank Cutting
- Precision Soft Tooling
- Hand Forming
- Stage Tool Forming

### Keats Prototype Advantages

#### Rapid Product Development

- Short Lead Times
- Low Cost Tooling
- Engineering Support Throughout the Process
- Prototype 1 - 500 pcs
- Short Run < 10,000 pcs
- Custom Design Process

### Main Raw Materials

#### Slit Coil or Sheet Stock

- Cold Rolled Steel
- Copper
- Brass
- Aluminum
- Stainless Steel
- Annealed steel
- Phosphor Bronze



# Clips & Bushings

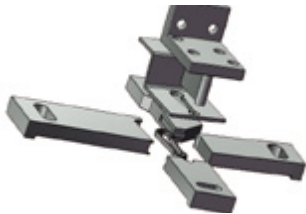


## Clips, Clamps & Flat Springs

### Component Description

Custom precision clips and flat springs for all types of applications. Used in automotive, appliance, industrial, consumer goods, electrical, mechanical, military, & medical industries.

- Custom Spring Back Tension
- Parts Hold Critical Gap Dimensions
- Fasten or Clip for Nearly any Application



### Production Technology & Equipment Used

#### Four-Slide / Multi-Slide Stamping

- 1 – 40 Tons of Die Pressure
- Cutting Die & Forming Tools
- Most Material Efficient Manufacturing Process
- Minimal Scrap (Possibly Scrapless)
- Cost Effective Tooling
- High Volume Capable 40MM+
- Lower Operating Cost
- Material can be Bought Exactly to Part Width to Save Scrap

### Main Raw Materials

#### Typically 0.010 inch – 0.050 inch Thickness

- Annealed Spring Steel
- Cold Rolled Steel
- Stainless Steel
- Aluminum

### Secondary Processes

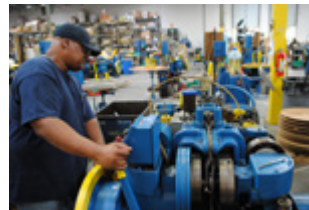
- Heat Treatment (Austemper)
- Stress Relieve
- Plating
- Roto Deburr
- Load Tests
- Washing

## Bushings, Rolled & Locked Shields

### Component Description

Typically used in automotive applications. High volume. Multiple parts per assembly.

- Used in Throttle Assembly
- Used in Powertrain
- Plastic Over-Molded
- Locking Latches
- Covers for Appliance Application
- Thermo Controls



### Production Technology & Equipment Used

#### Four-Slide / Multi-Slide Stamping

- 1 – 40 Tons of Die Pressure
- Cutting Die & Forming Tools
- Part Forms Around Mandrill
- Tight Circular Tolerances
- Most Material Efficient Process
- High Volume Capable 20MM+

### Main Raw Materials

#### Typically 0.020 inch – 0.070 inch Thickness

- Cold Rolled Steel
- Galvanized Steel

### Secondary Processes

- Heat Treatment (Austemper)
- Plating (Zinc)
- E-Coat
- Roto Deburring
- Washing



# Terminals & Contacts

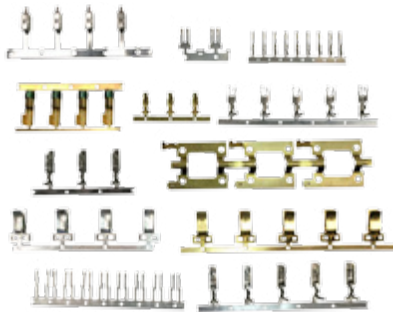


## Reel to Reel Terminals & Contacts

### Component Description

High precision parts used in transmission of electricity typically crimped to wire harness application by production robotics or assembled by hand.

- Specialized Custom Reel to Reel Terminals
- Lead Frames
- Contacts
- Returnable or Disposable Reels
- Tape & Reel
- Digital Part Inspection



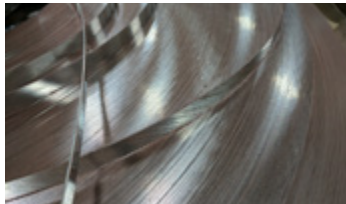
### Production Technology & Equipment Used

#### Progressive Die Stamping

- 5-60 Tons of Die Pressure
- Tight Tolerance
- Numerous Critical Dimensions
- High Volume Capable 20MM+
- Low Volume Capable
- Quick Die Change

#### Four-Slide / Multi-Slide Stamping

- 1 – 40 Tons of Die Pressure
- Cutting Die & Forming Tools
- Most Material Efficient Process
- High Volume Capable 20MM+



### Main Raw Materials

#### Typically 0.010 inch – 0.050 inch Thickness

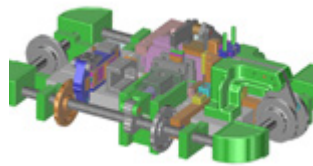
- Copper
- Brass
- Phosphor Bronze
- Pre-Tinned
- Selective Pre-Plated
- Precious Metals

## Loose Terminals & Contacts

### Component Description

Keats utilizes the latest technology to perform in die contact insertion as well as staking electrical parts together in-line through an automated process. This results in substantial cost savings for our customers.

- Specialized Custom Loose Terminals
- Contacts Assembled
- High Conductivity Electrical Application
- Electrical Socket Jaws
- Screw Tapping In-Process



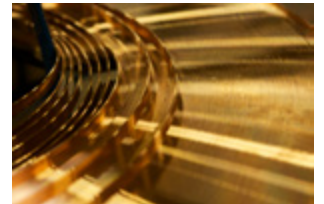
### Production Technology & Equipment Used

#### Progressive Die Stamping

- Camera Inspection Checking
- 10+ Forming Stations in Each Die
- Tight Tolerance
- Tape & Reel Packing

#### Four-Slide / Multi-Slide Stamping

- 1 – 40 Tons of Die Pressure
- Cutting Die & Forming Tools
- Most Material Efficient Process
- High Volume Capable 20MM+
- Bowl Fed Contacts & Terminals
- Computerized Torque Testing



### Main Raw Materials

#### Typically 0.010 inch – 0.050 inch Thickness

- Copper
- Brass
- Phosphor Bronze
- Pre-Tinned
- Selective Pre-Plated
- Precious Metals

# Brackets & Wire Forms



## Brackets, Latches & Covers

### Component Description

Custom Brackets made specifically for customer specified applications.

- Capacitor Brackets
- Automotive Assembly Brackets
- Motor Brackets
- Locking Latches
- Covers for Appliance Application
- Thermo Controls
- Brakes & Powertrain



### Production Technology & Equipment Used

#### Progressive Die Stamping

- 30-150 Tons of Die Pressure
- 10+ Forming Stations in Each Die
- Tight Tolerance
- Numerous Critical Dimensions
- High Volume Capable 20MM+
- Low Volume Capable

#### Four-Slide / Multi-Slide Stamping

- 1 – 40 Tons of Die Pressure
- Cutting Die & Forming Tools
- Most Material Efficient Process
- High Volume Capable 20MM+



### Main Raw Materials

Typically 0.040 inch – 0.120 inch Thickness

- Cold Rolled Steel
- Galvanized Steel
- Annealed Spring Steel
- Stainless Steel
- Aluminum

### Secondary Processes

- Heat Treatment (Austemper)
- Plating
- Roto Deburr
- E-Coat
- Anodize
- Washing

## Wire Forms, Wire Clips & Antennas

### Component Description

Custom Precision Wire Forms for almost any application.

- RF Antennas
- Wire Clips
- Wire Hooks
- Hardware
- Fishing "Speed Clip"



### Production Technology & Equipment Used

#### Four-Slide / Multi-Slide Stamping

- Precision Forming Tools
- Part Forms Around Mandrill
- Tight Circular Tolerances
- High Run Speeds
- Most Material Efficient Process
- High Volume Capable 40MM+
- Chamfering
- Swedging



### Main Raw Materials

Typically 0.005 inch – 0.090 inch Wire

- Steel
- Copper
- Aluminum
- Stainless
- Music Wire



# Lead Frames & Brush Guards

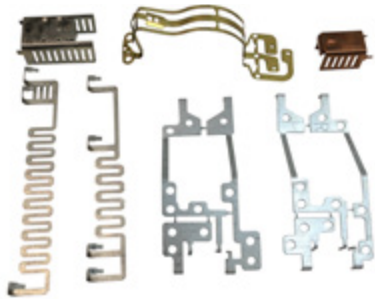


## Conductive Lead Frames & Grids

### Component Description

Keats designs and builds production tooling to meet the most complex part designs in the world. Lead frames are examples of extremely intricate parts produced at Keats.

- Automotive Lighting Applications
- Circuit Complete Lead Frames
- Precision Formed
- Tight Tolerance
- Material Pre-Plated with Precious Metals
- Improved Conductivity



### Production Technology & Equipment Used

#### Progressive Die Stamping

- 5-60 Tons of Die Pressure
- Multiple Forming Stations Per Die
- Multiple Cutting Stations Per Die
- Quick Die Change SMED
- Tight Tolerance
- High Volume Capable 20MM+
- Low Volume Capable
- Custom Automated Tray Packaging
- Hand Packaging
- Digital Part Inspection (Camera)
- Tape & Reel Packing



### Main Raw Materials

#### Typically 0.010 inch – 0.050 inch Thickness

- Copper
- Brass
- Phosphor Bronze
- Pre-Tinned
- Selective Pre-Plated
- Precious Metals

## Brush Guards / Brush Holders

### Component Description

Keats produces numerous brush guards and brush holders for electric motor applications in every industry. We will work directly with your design team to develop the most cost effective part for your motor application.

- Automotive Applications
- Precision Formed
- Critical Gap Tolerances Held
- Tight Tolerance



### Production Technology & Equipment Used

#### Progressive Die Stamping

- 10-40 Tons of Die Pressure
- Suitable for Low Volume High Mix Production of Brush Guards / Holders
- Quick & Low Cost Die Change

#### Four-Slide / Multi-Slide Stamping

- 1 – 40 Tons of Die Pressure
- Cutting Die & Forming Tools
- Least Possible Scrap
- Best for Long Running Brush Holders
- High Volume Capable 20MM+



### Main Raw Materials

#### Typically 0.010 inch – 0.050 inch Thickness

- Brass
- Pre-Tinned



Since 1958 the **Keats** Companies have been providing customers with the highest quality custom precision metal stampings, wire forms, and assemblies. The best and brightest minds in the metal forming industry are constantly innovating products at the three Keats production facilities. We're ready to develop the next complex stamping solution for your project.



**Keats Manufacturing**  
Wheeling, Illinois



**Keats SouthWest**  
El Paso, Texas



**Keats de Mexico**  
El Marques, QRO, Mexico