POWER TRANSMISSION

NON-THREADED FASTENERS & GREASE FITTINGS

POWER TRANSMISSION COMPONENTS

HUYETT.COM
Company History

G.L. Huyett was founded in Minneapolis, Kansas in 1899 by Guy L. Huyett, a German immigrant. The business was incorporated in 1906, and is now one of the oldest continuously operating businesses in the state. In 1930, Guy Huyett turned the operation of the business over to Henry Hahn. At the time, the Company had six accounts. Louis Hahn, Henry's son, bought the business in 1948. During this period, the business generated $18,000 in annual sales. G.L. Huyett began a major transformation in the 1970’s when Louis’ son, Bob, joined the business. He had an entrepreneurial urge and felt that G.L. Huyett had a great deal of unrealized potential. In November of 1992, Bob sold the business to Tim and Carol O’Keeffe. In recent years, G.L. Huyett has made substantial investments in facilities and technology, working to establish itself as a World Class leader in the specialty fastener industry. G.L. Huyett counts itself as a successful example of the American Dream and looks forward to another century of triumph.

About Us

WHAT WE SELL

Keystock • Non-Threaded Fasteners
Washers • Grease Fittings

Parts that are Hard to Manufacture.
Short Runs • Odd Configurations • No Tooling

Parts that are Hard to Find.
Metric • Stainless Steel • Big or Little Sizes

Parts made by Manufacturers that are Hard to Do Business with.

“What you need when you need it.”

HOW WE SELL IT

Ship Next Business Day
Multiple Commodities
“Packaged in the Quantity You Want by Friendly People.”

Purveyors of a Way of Life™

It’s not what you buy, It’s why you buy...

- Over 95,000 Parts
- Over 600 Product Lines
- Stock Quotes and Orders Acknowledged and Returned within 4 Hours
- Phones Answered by Real People in Kansas
- Informative, Fact-filled Catalogs
- Innovative Manufacturing and Sourcing
- Complete In-house Manufacturing Facility
- Knowledgeable Staff
- In Stock Orders Ship Next Business Day
- One Purchase Order
- One Bill of Lading
- One Dock Receipt
- The Pack List that Will Change Your Life™

The right part, at the right time, at a fair price. Every time.
Where are the Parts?

**BEARINGS**
- Retaining Rings
- Shims & Shim Rings
- Grease Fittings
- Steel Balls

**DRIVES**
- Machine Keys
- Retaining Rings
- Keyed Shafts
- Shims
- Washers

**CLUTCHES**
- Wave Springs
- Spiral Rings
- Belleville Washers
- Shim Rings

**COUPLINGS**
- Shaft Collars
- Shafting
- Tool Steel
- Shaft Locknuts
- Retaining Rings
- Bushings

**GEARS & SPROCKETS**
- Machine Keys
- Gib Keys
- Woodruff Keys
- Retaining Rings

**MOTORS AND TRANSMISSIONS**
- Pins
- Shaft Keys
- Shafts
- O-Rings
- Grease Fittings
- Seals
- Hose Clamps
The specifications of “keystock” are complicated, which makes it important for users and engineers to understand what they are specifying and the economics of industry specifications as they consider design standards since this can have an impact on the costs of producing to the specifications.

In general, cold drawing of squares and flats (or rectangles as they are also called) is more costly and less desirable to steel producers. For example:

- Forming right angles is complicated and difficult to control. If not closely monitored, the formation can take the shape of a parallelogram or trapezoid.
- For keystock, sharp corners are generally desired so that the interference fit of the key into the corners of the keyway is optimized. Sharp corners are not easy to draw.
- As the material passes through the die, stresses from cold working are introduced. For a round, the stresses can move and not affect the shape. For a square or flat, the stresses can cause twisting, which is a problem.

Keystock is a near-finished good when drawn; nearly all other steel is processed into some other form. However, the surface finish of keystock must be more uniform and precise, a condition generally not needed for rounds or other forms. Additionally, grinding squares and flats is a far more complex process than the centerless grinding process used for rounds.

Tolerances for keystock tend to be more precise than for rounds because of the desired interference fit into the keyway.

The reality is that keystock is far more costly and difficult to produce than conventional steel bars. Therefore, the market for keystock is less fluid than for other material. These conditions make the buying of keystock more difficult.

In general, material grades are widely available depending on the user requirements and availability of hot melt. It is in the tolerances that specification of keystock is made more complicated. The user must first determine if an undersized or oversized tolerance is required.

Steel mills cannot make “perfect” material so tolerancing aligns to the permitted variances allowed in manufacturing.

Among squares and flats, tolerances are called out either over the nominal ("oversized") or under the nominal ("undersized"). In rounds it is common to specify a plus or minus tolerance from the nominal thus the terms "over" and "under" sized are not used as often. Therefore, the first task in specification after knowing material grade is to understand the permitted tolerances.

### Standard G.L. Huyett Material Grades and Codes

<table>
<thead>
<tr>
<th>Material Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Nickel Alloy</td>
<td>02</td>
</tr>
<tr>
<td>Aluminum</td>
<td>04</td>
</tr>
<tr>
<td>Brass</td>
<td>06</td>
</tr>
<tr>
<td>Inconel®</td>
<td>08</td>
</tr>
<tr>
<td>Monel®</td>
<td>10</td>
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<tr>
<td>Nylon</td>
<td>12</td>
</tr>
<tr>
<td>Special Grade 1215</td>
<td>15</td>
</tr>
<tr>
<td>Standard Undersized Plain</td>
<td>30</td>
</tr>
<tr>
<td>Standard Undersized Zinc Plated</td>
<td>31</td>
</tr>
<tr>
<td>Standard Oversized Plain</td>
<td>35</td>
</tr>
<tr>
<td>Standard Oversized Zinc Plated</td>
<td>36</td>
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<tr>
<td>Special Tolerance (.002) 1045 Undersized Plain</td>
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<tr>
<td>Special 1045 Undersized Plain</td>
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<tr>
<td>Special 1045 Undersized Zinc Plated</td>
<td>46</td>
</tr>
<tr>
<td>Special 1045 Oversized Plain</td>
<td>50</td>
</tr>
<tr>
<td>Special 1045 Oversized Zinc Plated</td>
<td>51</td>
</tr>
<tr>
<td>Special Tolerance (+.001) 1045 Plain</td>
<td>54</td>
</tr>
<tr>
<td>Special Grade 1095 Plain</td>
<td>55</td>
</tr>
<tr>
<td>Special Grade 1095 Zinc Plated</td>
<td>56</td>
</tr>
<tr>
<td>Moltrup Plain</td>
<td>60</td>
</tr>
<tr>
<td>Moltrup Zinc Plated</td>
<td>61</td>
</tr>
<tr>
<td>Special Grade 4140 Alloy</td>
<td>65</td>
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<tr>
<td>Special Grade 4140 Alloy Zinc Plated</td>
<td>66</td>
</tr>
<tr>
<td>Standard Undersized Stainless Steel</td>
<td>70</td>
</tr>
<tr>
<td>Standard Oversized Stainless Steel</td>
<td>75</td>
</tr>
<tr>
<td>Special 316 Stainless Steel</td>
<td>80</td>
</tr>
<tr>
<td>Special 416 Stainless Steel</td>
<td>85</td>
</tr>
</tbody>
</table>
KEYSTOCK – If you can come up with a size, we have it, or can make it.

Cut to length for your application

MACHINE KEY UNDER 12"  KEYSTOCK OVER 12"

THE TERMS MACHINE KEY AND KEYSTOCK ARE USED INTERCHANGEABLY TO THE POINT OF CREATING CONFUSION. TECHNICALLY, THE TERM KEYSTOCK REFERS TO A STOCK OF MATERIAL THAT IS ONE FOOT OR GREATER IN LENGTH, AND FROM WHICH SHAFT/MACHINE KEYS ARE MADE. A KEY MAY BE CUT FROM STOCK IN THE FIELD AND FITTED INTO THE KEYWAY. THESE PARTS WOULD BE USED AS AFTERMARKET REPAIR PARTS, OR IN CONTRACT SHOPS THAT USE SHORT PRODUCTION RUNS.

Step Keystock

Often referred to as offset keystock

TYPE 1 IN FIELD REPAIR  TYPE 2 OEM ASSEMBLY

SHAFTING – Available in lengths up to 12’.

Keyed Shafting

Keyed shafting is round shafting that has a keyway cut into the material to mate with a machine key for assembly components

Hex Shafting

Hex shafting is similar in function to round shafting but with a hexagon shaped profile

Round Shafting

Round shafting is used on drive shafts to connect mirroring parts from one side to another

KEYED SHAFTING PAIRED WITH MACHINE KEYS PROVIDE A MEANS TO ASSEMBLE COMPONENTS IN A NON-PERMANENT MANNER.

USED IN HEX SHAPED APPLICATIONS, OFTEN WITH HEX NUTS AND BOLTS IN ASSEMBLIES.

SHAFT IS WELDED TO THE GEAR

OFTEN USED IN MACHINES AS A ROTATING DEVICE OR TO CONNECT OR ALIGN COMPONENTS.
ANSI B17.1-1967

ANSI B17.1-1967 (R1989) is the prevailing standard for keystock, but even this standard causes confusion. Within the standard are call outs for “Class 1, a clearance or metal-to-metal side fit using barstock and keyseat tolerances... This is known as a relatively free fit and applies only to parallel keys.” and “Class 2, a side fit, with possible interference or clearance, obtained by using keystock and keyseat tolerances... This is a relatively tight fit.” While the terms “barstock,” “keystock,” and “parallel keys” are used in the standard, the definitions are somewhat ambiguous.

The standard defines that there are two classes of stock for parallel keys: Class 1; broad, negative tolerance barstock, and Class 2; close, plus tolerance keystock. There is a Class 3 noted, but no standards are given and it is suggested to use Class 2 for Class 3 applications.

### ANSI Keystock Tolerance Specifications

<table>
<thead>
<tr>
<th>ANSI B17.1-1967 (R1989)</th>
<th>Key Width</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Over</td>
<td>To (incl.)</td>
</tr>
<tr>
<td>Class 1:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“A clearance or metal-to-metal side fit obtained by using barstock keys and keyseat tolerances.”</td>
<td>---</td>
<td>1/2</td>
</tr>
<tr>
<td></td>
<td>1/2</td>
<td>3/4</td>
</tr>
<tr>
<td></td>
<td>3/4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1-1/2</td>
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<tr>
<td></td>
<td>1-1/2</td>
<td>2-1/2</td>
</tr>
<tr>
<td></td>
<td>2-1/2</td>
<td>3-1/2</td>
</tr>
<tr>
<td>Class 2:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“A side fit, with possible interference or clearance, obtained by using keystock and keyseat tolerances.”</td>
<td>---</td>
<td>1-1/4</td>
</tr>
<tr>
<td></td>
<td>1-1/4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3-1/2</td>
</tr>
</tbody>
</table>

The variance in standards is to account for the availability of material at economic costs in the marketplace. Some refer to the Class 1 standard as “barstock” and the Class 2 as “keystock” or “true keystock.”

Class 2 aligns to the conventional and historical definition of keystock. This specification denotes oversized, close tolerance standards of +.001”/-0.000” from nominal on sizes up to 1-1/4”. The idea is that such tolerance will insure a tight fit with minimum rocking of the key in the keyway.

Class 1 widens the permitted standards to more or less the standards of ASTM A108 used by the commercial steel industry. It is thought that this second standard was created to insure a commercially viable alternative to so-called “true keystock.”

### DIN and ISO

Historically, keystock was specified under DIN 6880 and parallel and tapered keys in DIN 6885, ISO R773 and ISO 2491. These standards have been withdrawn without replacement standards. Because there was no replacement standard issued, these standards are still in use today with DIN 6885 as the predominant standard. Contrarily, ANSI standards contemplate close tolerance oversized material for Class 2, and wider tolerance undersized for Class 1; ISO contemplates ONLY UNDERSIZED and only one tolerance specification that is roughly equal to Class 2 ANSI, except the tolerances are under the nominal.

Now that is confusing!

### Branding and Trade Names

The traditional branding and trade names for keystock add additional complexity and confusion. Class 2 and ISO keystock is difficult to make, and only specialized mills using specialized equipment can maintain such close tolerances.

Moltrup Steel of Beaver Falls, Pennsylvania, was one such company, and is one of the more famous brand names for keystock. Moltrup was bought out as the steel industry consolidated in the 1980’s. The plant closed and is no longer in operation. Moltrup is still listed on many prints and when listed, the general inference is that the user wants ANSI B17.1 Class 2 fit.

Mak-A-Key, a trademark of Illinois Tool Works, Inc. (ITW), was the first company to brand keystock as an aftermarket product. Technically a shaft key is a custom-made or cut-to-length part for an application, while “keystock” is a “stock” of material in 12” or 36” lengths that is cut in the field. Mak-A-Key has a moniker that means to “cut, file, and fit.”

Mak-A-Key has added confusion in that while it has historically been advertised as “keystock,” the material was actually oversized-drawn barstock. In this regard Mak-A-Key is unique. Oversized barstock is quite rare, and nearly never specified in an application. Yet the Mak-A-Key brand is often referenced in the vernacular as keystock, along with Moltrup and other brand names.
The Implications of Steelmaking, Standards, and Brands on Material Specification

In short, the world of keystock is confusing and non-standardized. For the user, it is important to note:

- Producing keystock is more difficult than it looks.
- Imperial (inch) product tends to be close tolerance oversized if called "keystock" and wider tolerance undersized if called "barstock."
- Metric (mm) parts are nearly always close tolerance undersized.
- The tighter the tolerance the more the product costs to manufacture.

The addition of other features and attributes such as heat treatment can further complicate production of shaft keys. Heat treatment can relieve material stresses, and parts can swell and shrink. In close tolerance keystock applications, the addition of heat treatment can result in additional processing costs for stress relieving, grinding, or milling.

The engineer and designer should carefully work with G.L. Huyett engineers to find the right balance of specification and costs, so that the part yields desirable mechanical benefits at the desired cost.

Contact our engineering team at engineering@huyett.com for immediate assistance.

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The ends of the key can impact performance. Round or radiused ends refer to an end design where the end is milled or broached into a full radius. Keys may have one end or both ends round. In the DIN 6885 standard, which is a leading international standard for parallel and tapered keys, the ends are called out as forms. The letter “A” refers to a round end and “B” refers to a square end. A key with one end round is referred to as Form AB, while a key with both ends rounded is Form A, and both ends square is Form B.

Because keyways are milled into the side of shafts using a rotating cutter, the entry and exit points of the cutter into the shaft form a radius or slot. Form A keys match the pattern of the keyway and it is for this reason that round end keys are specified. Some believe that the round design eases installation into the keyway. Round end keys are more common in Europe than the United States.
**MACHINE KEYS** – Every grade and tolerance the world has ever known.

Form A

Both ends round

Form B

Both ends square

Form AB

One end round, one end square

Special Keys

Made to your specifications

**INFO**

The terms Shaft Keys and Machine Keys are used interchangeably and reference the same thing.

Machine keys are basic keys installed into shaft keyways to lock a shaft and hub assembly together to transmit torque in a power transmission assembly. Machine keys are available with squared ends, rounded ends, and chamfered ends to lessen damage to keyways.

Machine keys can be designed with special dimensional features like set screws, tapers, and other attributes. Mechanical features to yield certain tensile strength, shear strength, or wear can be affected by materials and secondary processes (like heat treating), that might give parts added benefits.
MACHINE KEYS – Customized to fit your needs.

Gib Keys

Woodruff Key

Hi-Pro Key

SHAFT COUPLINGS – Used to connect two shafts in power transmission applications.

Set Couplings

Single Split Couplings

Double Split Couplings

Woodruff Keys are used to avoid milling a keyseat near stress-concentration prone shaft shoulders at the end of a shaft.

As a variation of the Woodruff key, these keys have feet on each end to prevent rocking and additional movement typical in a conventionally smooth rounded keyway.

Tapers are expressed in terms of rise over run. In other words, the amount of taper is stated per linear units of measure. A 1/8” taper per foot means that for every 12” in linear distance (run) the thickness of the part (rise) decreases by 0.125”.

Gib keys are tapered and notched machine keys that are used on keyed shafts to hold pulleys and gears tightly on the shaft.

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**RETAINING RINGS** – The world’s most complete inventory in imperial and metric sizes.

**Internal Snap Rings**
- Installed axially into shaft

**External Snap Rings**
- Installed axially onto shaft

**C-Clips**
- Shaped like a “C”

**E-Clips**
- Shaped like an “E”

- Since internal snap rings have a tapered design, this allows the ring to remain circular when installed.

- Snap rings require more precise grooves.

- C-clips use a tapered section to maintain circularity or possess toothlike grip points that yield greater thrust load ratings.

- An E-clip “wraps” around the shaft with toothlike grip points that yield greater thrust load ratings and typically dig into deeper grooves than a wire ring.

**Interlocking Clips**
- Two semicircular halves that interlock

**Poodle Clips**
- Heavy duty ring with large shoulders or “ears” similar to an E-Clip

**External Axial Wire Rings**
- Installed axially onto shaft

**External Radial Wire Rings**
- Installed radially onto shaft

- Install axially onto a shaft using pliers.

- Install radially onto a shaft using an applicator.
Nearly all retaining rings provide design and engineering benefits vs. other fasteners. In most cases, machining a groove is cheaper and more resilient than turning threads and using a "nuts and bolts" approach.

Support washers conform to the DIN 988 standard.

Wave springs and wave washers have similar design and functionality, but vary in the number of wave layers. Wave springs have been gaining popularity due to the compact design while maintaining a more precise load deflection characteristic. This allows for a smaller assembly design with lower free lengths and/or lower operating heights.
SHAFT COLLARS – Install axially or radially as a mechanical stop for positioning.

Set
- Solid shaft collar to be installed axially
- Single split allows for clamping power; installed axially
- Same benefits as the smooth bore, while adding the feature of a threaded shaft

Hex Bore
- Bore allows for a hex shaft application; installed axially

Single Split
- Double split allows for complete disassembly; installed axially or radially

Threaded Single Split
- Same benefits as the smooth bore, while adding the feature of a threaded shaft

Double Split
- Threaded Double Split

Shaft collars have many uses in machine applications from holding components on a shaft to being used as mechanical stops and stroke limiters to reduce mechanical failure.
Standard Materials

Undersized Cold Finished
Oversized Cold Finished
High Nickel Alloy
1215 Low Carbon
Aluminum
Brass
303/304 Stainless Steel
1045 Medium Carbon

1095 High Carbon
4140 Alloy Steel
8630 Alloy Steel
Monel®
Nylon
Moitrup
316 Stainless Steel
416 Stainless Steel

How would you like it?

Standards
Imperial • Metric
DIN • ANSI • ASME • ASTM • ISO

Finishes
Zinc Plating • Passivation • Trivalent

Heat Treatments
Cold Hardening • Annealing
Hot Quenching • Spray Quenching
Tempering • Carburizing

Capabilities

Complete on-site manufacturing and distribution facility.
1 million pounds of square and flat stock on hand.
State-of-the-art machinery.
Experienced staff.

Laser Cutting
Surface Grinding
Stamping
Milling
Wire Forming
Sawing
Centerless Grinding
Turning
Tumbling
Drilling
Marking
Forming

Revision 11-13

HUYETT.COM • 785-392-3017 • SALES@HUYETT.COM
**Fasteners**

**PINS** – Every size and type the world has ever known.

**Lynch Pins**
- Single piece design; spring-tempered ring snaps in place for rigid control

**Bridge Pins**
- Used for hitch pin retention; also known as hitch pin clips or hairpin cotter pins

**Cotter Pins**
- Installed quickly and easily with no tools required

**Red Handle Hitch Pins**
- Used to attach trailers and various turf and agricultural implements

**Grooved Pins**
- Grooved pins are not grooved but rather fluted; material is displaced during manufacturing to allow for gripping once installed

**Additional Products**

**Lynch Pin**

**Bridge Pin**

**Clevis Pin**

**Cotter Pin**

**Grooved Pins**

**Hitch Pins** are used to couple with a trailer hitch and secured with a bridge pin.

**Grooved Pins have three parallel grooves and are commonly used as locking devices, pivots, levers, or locating elements.**
Flux Type Fittings are ideal for applications with hard to lubricate areas and/or in low clearance areas.

Button Head fittings are designed to withstand repetitive abuse from harsh environments.

Straight, 45°, 90°, and more; SAE, PTF, UNF, Thread Forming, Drive Type, Special Use, Flow & Pressure Control, and MORE!

Grease Guns, Couplers, Hoses & Extensions, Quick Connects, Tools, Connecting Parts, and MORE!

Grease Guns, and Accessories

Taper Threads run diagonal to mating material.

Parallel Threads run parallel to mating material.

Note: thread sealant is required on parallel threads for a leak-proof seal.

FLUSH TYPE FITTINGS ARE IDEAL FOR APPLICATIONS WITH HARD TO LUBRICATE AREAS AND/OR IN LOW CLEARANCE AREAS.

BUTTON HEAD FITTINGS ARE DESIGNED TO WITHSTAND REPEETITIVE ABUSE FROM HARSH ENVIRONMENTS.

G.L. HUYETT HAS THE LARGEST, MOST COMPLETE LINE OF GREASE FITTINGS THE WORLD HAS EVER KNOWN. VISIT HUYETT.COM FOR MORE INFORMATION.

G.L. HUYETT

HIGHEST QUALITY
MADE IN USA

EST. 1906

Purveyors of a Way of Life™

AEROSPACE
LINCOLN®

VANGUARD®

HERITAGE®

EURO®

ALEMITE®

Your Original Source for Grease Fittings

MISCELLANEOUS – Thousands of items in stock, ready for delivery.

O-Rings

Used to make a seal in fluid power applications

Hose Clamps

Used to secure a hose connection and prevent leaking

Steel Balls

Used in ball bearing and other industrial applications

Thread Repair

Lasting thread solution to repair stripped threads