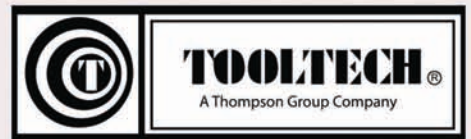




**DRILCO
INDUSTRIAL**





**THOMPSON
INTERNATIONAL
INC.**

**Serving
the
World**





Thompson International was founded in 1952 in Henderson, Kentucky. We manufacture quality products for the drilling industry and stand behind our name with dependable service and competitive pricing.

The capabilities of our three manufacturing plants, Thompson International, Drilco Industrial and Tooltech Inc., provide our customers with complete drill string from top-to-bottom.

This catalog represents our continued efforts to meet the demands for quality and performance so important to you, our customers. Our engineering and research departments are committed to providing our three manufacturing facilities with ongoing technological improvements that help us produce consistently dependable, quality drilling tools.



SELECTING THE PROPER DRILL BIT

DESIGN

Tricone Rotary Drill Bits consist of three primary components; the cutters, internal bearings and the bit body. Cutters may be of either milled steel tooth or tungsten carbide insert design.

Soft Formation Bits drill with a tearing and gouging effect more suited for softer, unconsolidated formations.

Hard Formation Bits have cutters on a near true rolling and offset angle which breaks the harder rock with a chipping and crushing action.

Weight on the bearings is distributed through a five-part anti-friction bearing system. Radial loads are carried by a balanced distribution over the RBF (roller-ball-friction) or RBR (roller-ball-roller) internal bearing design. Axial thrust loads are distributed over hard faced surfaces. Bearings are matched and ground with precision to exacting tolerances to ensure load distribution and long bearing life. Ball bearings also provide additional radial and axial load support. Critical areas prone to excessive wear on the outer portions of the cutters, such as the steel cutter teeth and outer gauge areas, are additionally protected with tungsten carbide alloy hard-facing to retard wear caused by cuttings removal and abrasion. Strategic placement of wear resistant materials lower the wear rate in these critical areas, thus ensuring consistent hole diameters and reducing outer bearing exposure.

CIRCULATION SYSTEMS

Rotary drill bits are designed for use with compressed **AIR** or **FLUID** circulation systems. Compressed air circulates through the bit to pressurize and cool the bearings, keeping the internal structure free of cuttings and contaminants. This same air flushes the cuttings from the bottom of the drilled hole. Fluid systems utilize either water or special drilling muds to keep the complete bit cool and to lift the cuttings to the surface of the drilled hole.

REGULAR CIRCULATION DESIGN

Regular circulation bits utilize a full diameter center hole to maximize cutter tooth cleaning. This hole may be left fully open or can be restricted in size through a center orifice plate, which will produce higher or lower pressure across bearing surfaces and on the hole bottom depending on the size of the orifice and air compressor or fluid pump output. Regular circulation air bits have passageways directly to the internal bearing surfaces to provide cooling and cleaning. For fluid drilling these passageways may be omitted or plugged prior to service to prevent contaminants from entering the bearing areas.



JET CIRCULATION DESIGN

Jet circulation bits incorporate three orifices strategically placed between the cutters along the outer portion of the bit body. These orifices are equipped with field replaceable nozzles, which direct the high velocity jet stream to the outside diameter of the hole being drilled, providing optimum cleaning. As with regular circulation bits, passageways are machined into the leg components directly to bearing surfaces for air circulation and are omitted or closed off for fluid drilling.

Circulation system design, bit size and drill pipe size are critical considerations in determining which nozzle size, if any, should be used.



SE BIT SERIES



Sizes Available - 2 15/16" – 12 1/4"

When ordering please specify:

- **Bit Size**
- **Pin Size**
- **IADC Code**
- **REGULAR or JET Circulation***
- **Air or Fluid Drilling**

* If JET Circulation, please include nozzle sizes in your description.

Bits can be bored and skirted for use with RC (Reverse Circulation) Drilling.

SE 52 : Soft Formation

The SE 52 utilizes the largest chisel-shaped tungsten carbide inserts with greater extension and spacing to perform best in the softest formations. Maximum bearing offset and cutter angle ensure the highest penetration rates and the most efficient cuttings removal in a wide variety of soft unconsolidated formations.

COMPRESSIVE STRENGTHS: 2,000 - 8,000 (psi)

ROTARY SPEEDS: 45 to 100 rpm

DRILLING WEIGHTS: 1,000 to 3,000 (lbs/inch of bit diameter)

IADC: 411 - 432



SE 53 : Soft Formation

The SE 53 utilizes a high offset that features large chisel-shaped inserts to provide high penetration rates in the softest formations. Wide insert spacing allows effective hole cleaning in low compressive formations such as shale, clay, limestone and sand.

COMPRESSIVE STRENGTHS: 2,000 - 10,000 (psi)

ROTARY SPEEDS: 45 to 100 rpm

DRILLING WEIGHTS: 1,000 to 3,000 (lbs/inch of bit diameter)

IADC: 441 - 512



SE 54 : Soft-Medium Formation

The SE 54 utilizes and offset with large chisel-shaped inserts spaced to provide high penetration rates in softer formations. It is extremely effective in shale, clay, soft/medium limestone and other formations of relatively low compressive strength with hard streaks or abrasive qualities.

COMPRESSIVE STRENGTHS: 5,000 - 12,000 (psi)

ROTARY SPEEDS: 45 to 100 rpm

DRILLING WEIGHTS: 1,000 to 5,000 (lbs/inch of bit diameter)

IADC: 521 - 532



SE 56 : Medium-Hard Formations

The SE 56 is adaptable to a wide variety of formations with higher compressive strengths, and is designed to perform well in sandstone, limestone, hard shale and other formations with high abrasive qualities, numerous hard streaks and broken formations.

COMPRESSIVE STRENGTHS: 7,000 - 15,000 (psi)

ROTARY SPEEDS: 40 to 95 rpm

DRILLING WEIGHTS: 2,000 to 5,000 (lbs/inch of bit diameter)

IADC: 541 - 622



SE 57 : Medium-Hard / Hard Formation

The SE 57 effectively combines chisel and conical inserts to produce a design to drill slightly harder formations such as hard limestone, dolomite, hard sands and other formations with hard cherty streaks. The arrangement of the inserts provides maximum durability, reduces drill vibration and allows greater drilling weights in highly compressive strength formations.

COMPRESSIVE STRENGTHS: 10,000 - 18,000 (psi)

ROTARY SPEEDS: 40 to 90 rpm

DRILLING WEIGHTS: 3,000 to 6,000 (lbs/inch of bit diameter)

IADC: 631 - 712



SE 58 : Hard Formation

For maximum penetration rates in harder formations, the SE 58 utilizes breakage resistant, projectile shaped inserts. They are closely spaced for maximum bottom hole cleaning in hard, abrasive and homogenous limestone, dolomites, basalt, granite and chert.

COMPRESSIVE STRENGTHS: 12,000 - 20,000 (psi)

ROTARY SPEEDS: 40 to 80 rpm

DRILLING WEIGHTS: 4,000 to 7,000 (lbs/inch of bit diameter)

IADC: 721 - 742



T BIT SERIES



Sizes Available - 2 7/8" – 10 5/8"

When ordering please specify:

- **Bit Size**
- **Pin Size**
- **IADC Code**
- **REGULAR or JET Circulation***
- **Air or Fluid Drilling**

* If JET Circulation, please include nozzle sizes in your description.

Bits can be bored and skirted for use with RC (Reverse Circulation) Drilling.

T4 : Soft / Medium-Soft Formation

The T4 is designed with high cone offset and longer, widely spaced teeth to provide maximum penetration in soft formations and medium-soft formations such as shale, clay, soft sandstone, red beds and other soft formations with low compressive strengths.

COMPRESSIVE STRENGTHS: 1,000 - 5,000 (psi)

ROTARY SPEEDS: 60 to 110 rpm

DRILLING WEIGHTS: 1,000 to 3,000 (lbs/inch of bit diameter)

IADC: 131 - 142



T3 : Medium Formation

The T3 performs well in unconsolidated shale, medium soft limestone, medium sandstone and other formations of slightly higher compressive strength with intermittent hard streaks.

COMPRESSIVE STRENGTHS: 3,000 - 6,000 (psi)

ROTARY SPEEDS: 50 to 100 rpm

DRILLING WEIGHTS: 1,000 to 4,000 (lbs/inch of bit diameter)

IADC: 211 - 232



T2 : Medium / Medium-Hard Formation

Medium to medium-hard formations such as hard sandstone, limestone and broken formations with hard streaks may require the T2. Short, closely spaced teeth applied with tungsten carbide hard-facing to help reduce vibration through harder formations.

COMPRESSIVE STRENGTHS: 4,000 - 9,000 (psi)

ROTARY SPEEDS: 40 to 100 rpm

DRILLING WEIGHTS: 2,000 to 5,000 (lbs/inch of bit diameter)

IADC: 241 - 312



T1-H : Hard Formation

The T1-H is designed for hard, abrasive formations such as hard sandstone, limestone, dolomite and granite. The outer gauge rows have webs joining adjacent heel teeth, which are heavily applied with tungsten carbide hard-facing to provide maximum resistance to gauge wear.

COMPRESSIVE STRENGTHS: 8,000 - 14,000 (psi)

ROTARY SPEEDS: 40 to 90 rpm

DRILLING WEIGHTS: 2,000 to 5,000 (lbs/inch of bit diameter)

IADC: 321 - 342



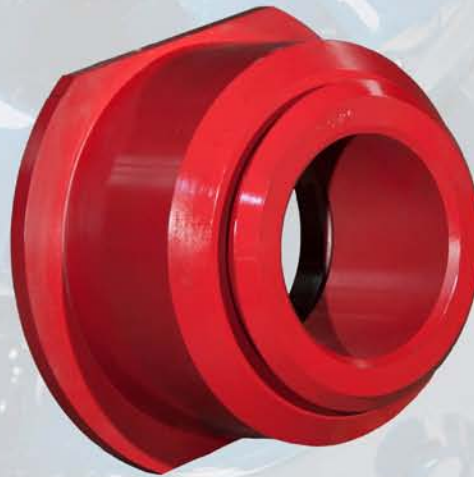
ADDITIONAL PRODUCTS

DRAG BITS

Thompson International, Inc. provides quality drag bits ranging in size from 1 7/8" diameter and up. Available in both Step and Chevron configurations and in 3 and 4-Way blade designs with various pin sizes available to fit your drilling needs. These bits are designed for use in soft drilling material with compressive strengths of 2,000 psi and under.



ROTARY DECK BUSHINGS



THREAD PROTECTORS



DRILCO INDUSTRIAL



8700 SERIES SHOCK SUB

The 8700 Series Shock Sub has been designed and proven to significantly reduce axial and torsional vibration between the rotary head and drill string.

Shock and vibration are effectively and efficiently absorbed through a series of field-replaceable shock elements, resulting in increased drilling rate and bit life. As well as the benefit of reduced drill rig maintenance and improved operator comfort.

Rebuild Kits are available and the only tools needed to replace the shock absorption units are sockets, screwdrivers and a pry bar.



63-B ROLLER STABILIZER

When Drilco Industrial's 63 Series of Roller Stabilizers were introduced, it opened a new era in blast hole stabilization. Increased life and reduced operating costs are achieved with the 63-B design through the use of rollers and bearings.

Rollers with pressed-in tungsten carbide compacts, working against deeply carburized, precision honed, air-cooled bearings assure long life. Increased air circulation is accomplished by the use of a patented aero construction that conducts air through the bearing pins to the drill bit.

The Genuine Drilco 63-B brand of roller stabilizer has some of the largest rollers in the industry, which provide better stabilization and longer life than brands with smaller less costly rollers.

BENEFITS FROM THE USE OF STABILIZERS IN BLAST HOLE DRILLING

Decreased gauge and shirrtail wear of the drill bit since the stabilizer forces the bit to drill in a straight line.

Smoother hole walls for easier loading of explosives and more even distribution of explosive, giving more efficient and consistent blasting results. Smoother bores also provide a better conduit for cutting removal with less up-hole air turbulence.

Decreases the vibrations caused by the drill pipe rubbing against the hole wall and deck bushing. This reduction of drill pipe scraping also leads to longer pipe life.

When the above benefits are analyzed the results are reduced drill bit cost, reduced explosive cost, reduced drill pipe cost and reduced maintenance cost on the drill. All factors combined reduce the TDC (Total Drilling Cost).

WELDED BLADE STABILIZERS

The welded blade stabilizer is manufactured with a body of alloy steel with steel wear bars welded to the body and covered with hard metal. Available with straight or spiral blades and effective in soft to medium formations.

WHEN ORDERING - *Please Specify:*

1. Hole Size
2. Drill Make/Model
3. Drill Pipe
4. Connections and any special requirements



DRILL STEEL

Blast Hole Drill Steel in Fabricated and Integral Designs

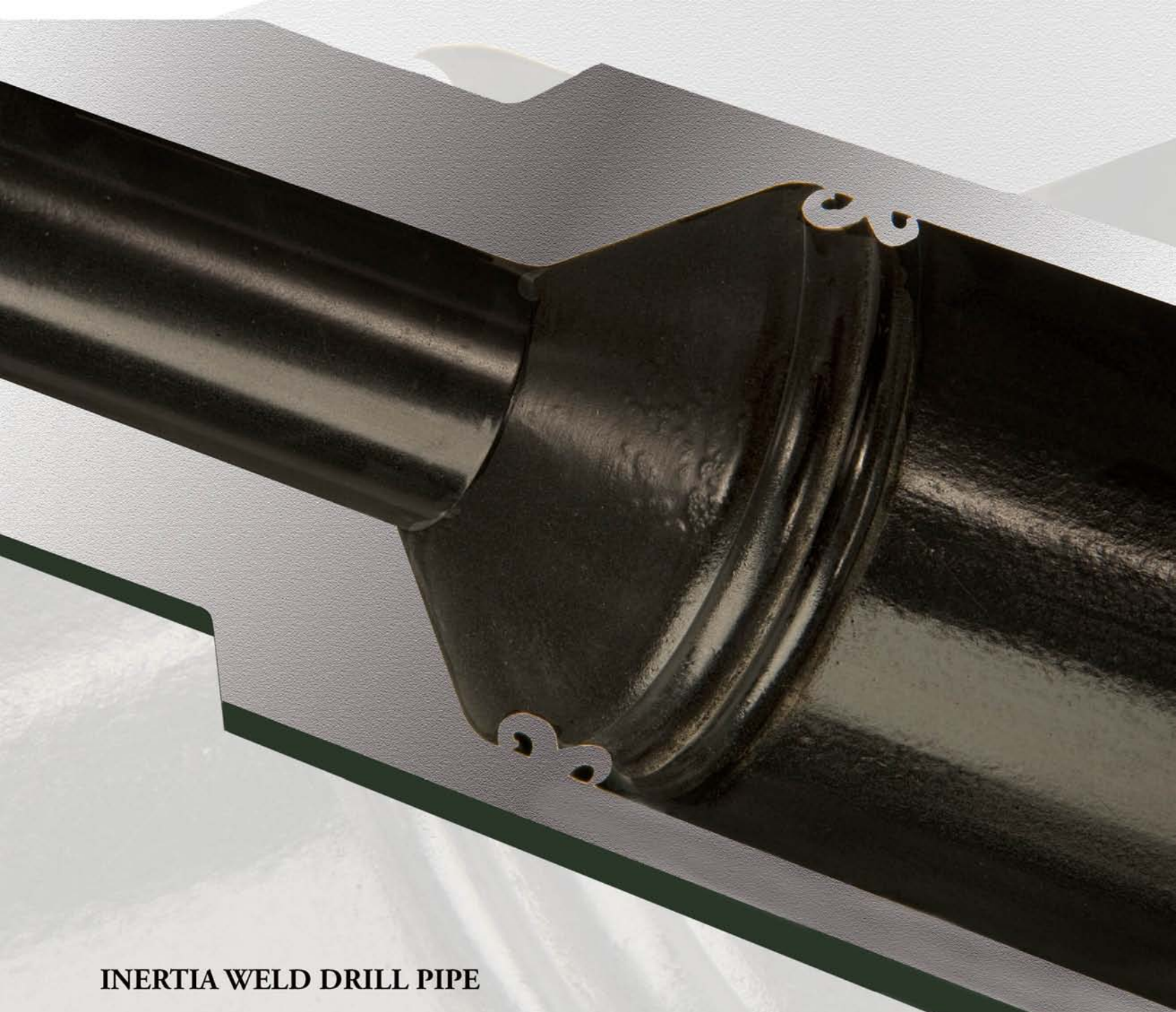
FABRICATED DRILL STEEL features tool joints made from steels selected for each application. All tool joint material is inspected by ultrasonic means to assure quality. All welds are made by selected shielded arc methods and are post heated to remove residual welding stresses. Axial alignment and concentricity of the fabricated assembly are held to a close tolerance. Wrench slots or flats are milled to suit the requirements of the drill. All Drilco rotary-shouldered connections receive a special treatment to allow them to hold more thread lubricant for protection against thread galling.

INTEGRAL DRILL STEEL is made from premium quality alloy steel bars. Bores are trepanned to sizes that result in proper balance for the selected rotary shouldered connection.

WHEN ORDERING - *Please Specify:*

1. Drill Rig Make/Model
2. OD (Outside Diameter)
3. Length
4. Wall Thickness
5. Connections
6. ID (Inside Diameter) if required
7. Any special request or modifications





INERTIA WELD DRILL PIPE

INERTIA-WELDING, when applicable, is the best method of joining tool joints to drill pipe. Inertia welding is an autogenous process in which heat for coalescence is produced by direct conversion of mechanical energy to thermal energy at the joint interface. The mechanical energy is generated by the sliding-action friction between the rotating or rubbing surfaces at the point of the weld interface. Plainly speaking, inertia welding produces a uniform, fine-grained, clean, high quality, stronger weldment without the injection of filler material.

All inertia weld areas are subjected to a two stage, coil induction heat treatment to restore the physical and metallurgical properties affected during inertia welding.

DRILL COLLARS

Drill collars are heavy drill string members used as weight, which forces the bit to penetrate the formation being drilled. All drill collars are full-length heat treated to obtain the best physical properties and to provide a combination of hardness, strength and ductility. The collars are made from selected bars of chromium molybdenum alloy steel.

General Notes on DRILCO INDUSTRIAL Drill Collars

SURFACE FINISH

As Rolled
Machined

LENGTH

Drilco Industrial standard water well drill collars are available in 10, 15, 20 and 30 foot length, or as specified.

BORE

Standard bores are available. Special bores for particular projects as well as step bore bores for increased joint strength and/or improved hydraulic conditions are available at additional cost.

CONNECTIONS

Standard connections are precision machined to API specifications. Additional connections such as: DI Series, FEDP, Mayhew, Full Hole, PAC, American Open Hole, X-Hole and others are available. All connections are protected by phosphate surface coating to minimize galling during makeup.

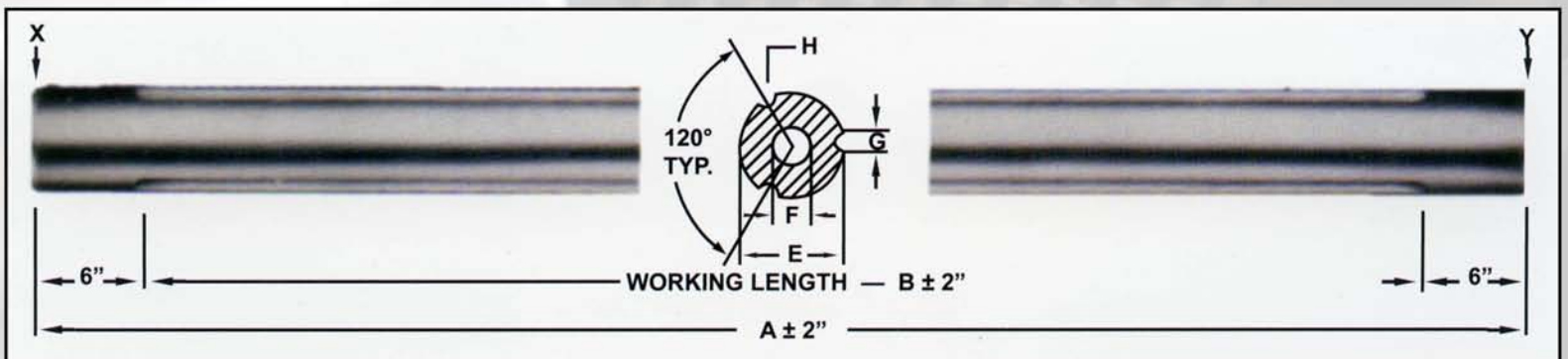


WHEN ORDERING - *Please Specify:*

1. Outside Diameter (O.D.) – Bore – Length
2. Size and type of tool joint. Any special joint features.
3. Step Bore or Straight Bore
4. Surface Finish – As Rolled or Machined
5. Drill Rig – Make & Model
6. Other special features such as elevator and slip recesses, wrench squares, flats, slots or special breakout configurations.

ROTARY KELLYS

Drilco Industrial Kellys are made from alloy bar. The bar is full-length heat treated to obtain the best physical properties and to provide a combination of hardness, strength and ductility. All ends and center drive sections are machined. Drilco Industrial Kellys can be provided with several I.D. options to meet your specific drilling requirements.



WHEN ORDERING PLEASE SPECIFY:

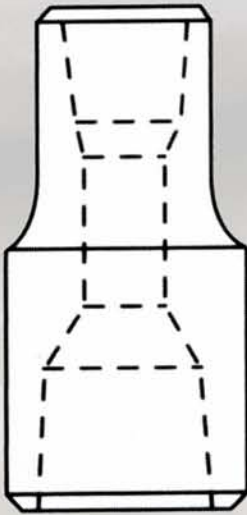
1. Type of Kelly flute
2. Nominal size and length
3. Required working length
4. Bore
5. Top and Bottom Connection
6. Flute width and radius

ROTARY SUBS

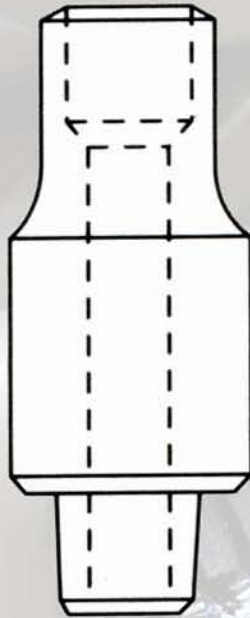
Drilco Industrial Rotary Subs are machined from quality alloy steel. All threads are precision machined and protected by a phosphate surface coating after machining to prevent galling on initial makeup.

Rotary Subs are used where threads of one size or type must be coupled together with threads of another size or type. Other subs are used as wear prevention at connection points that are frequently made up and broken out, such as Kelly Saver Subs.

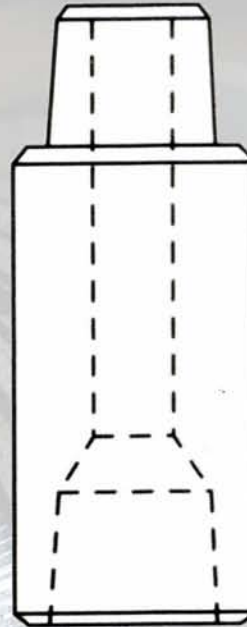
If you desire subs with special configurations, send drawings and specifications when requesting a quotation.



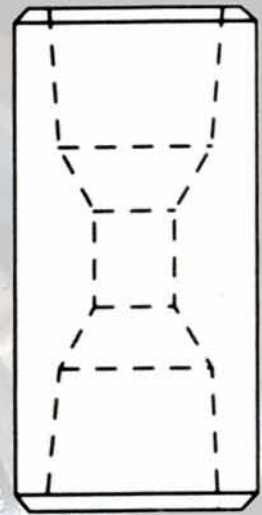
BOX X BOX



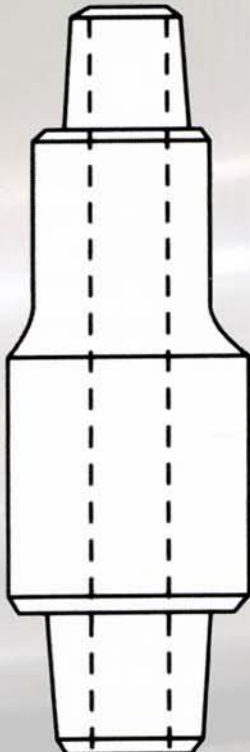
BOX X PIN



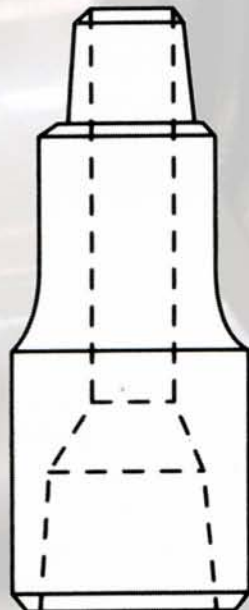
PIN X BOX



BOX X BOX



PIN X PIN



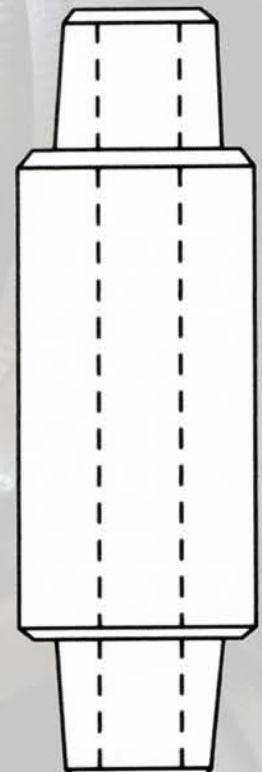
PIN X BOX

WHEN ORDERING PLEASE SPECIFY:

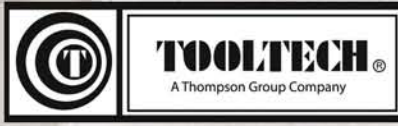
1. Type of Sub and Example of Use (Top Sub, Bit Sub, Kelly Sub, etc.)
2. Overall Length
3. Largest Diameter
4. Bore
5. Size and Type of Connections (Pin or Box)

For OD Reduction Subs, include this additional info:

1. Diameter of Reduced Section
2. Length of Reduced Section



PIN X PIN



At **Tooltech Inc.**, we produce drill pipe for portable rotary rigs in the water well, mining, construction, environmental, oil and gas industries. Tool joints are manufactured on site from heat-treated alloy steel adhering to strict Tooltech's specifications.

Using the latest CNC equipment available, all tool joints are precisely machined to API specifications, and each joint must pass rigid quality control inspections. By checking thread lead, taper, pitch and form along with gauging every joint, we assure interchangeability on site during actual drilling operations. Threads and shoulder faces are treated to provide corrosion resistance and lubricating properties to help prevent galling during the initial break-in period. Hard-banding of the tool joints is also available.

INERTIA-WELDING, when applicable, is the best method of joining tool joints to drill pipe.



EXTERNAL / INTERNAL UPSET DRILL PIPE

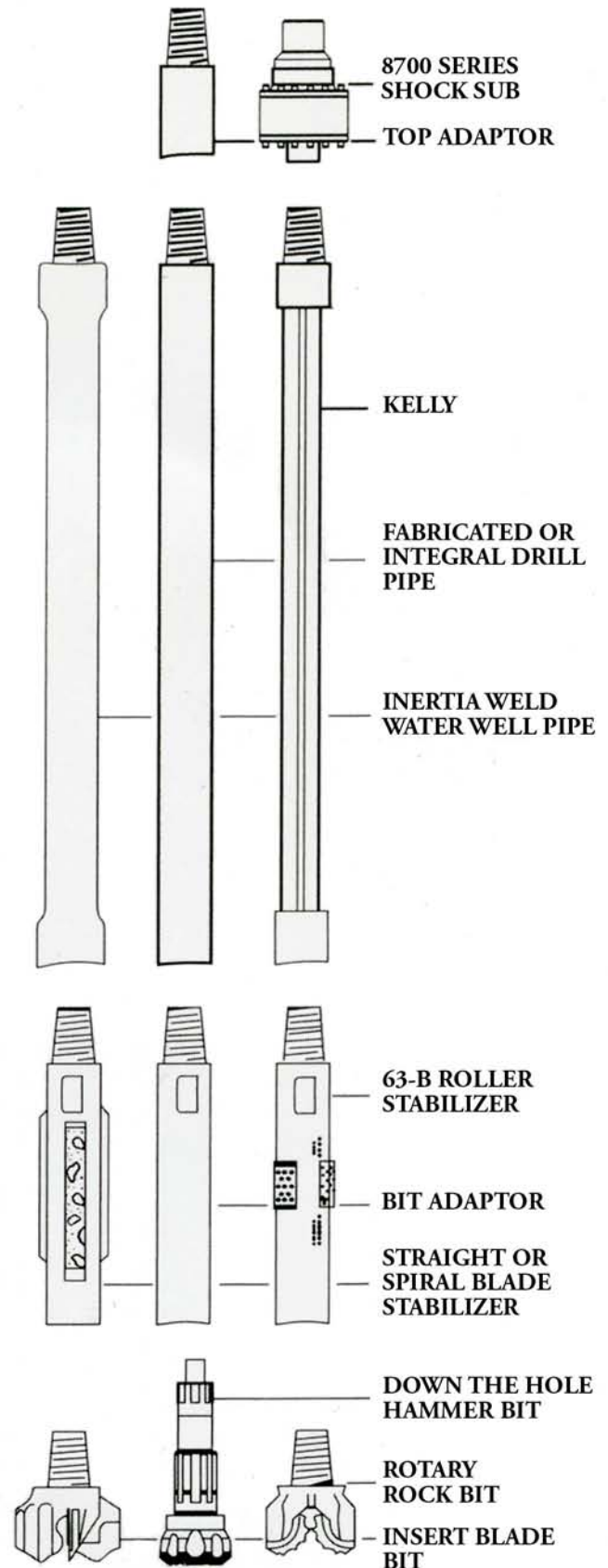
In-house upsetting gives us the flexibility and versatility to satisfy your complete range of requirements for internal, external, and internal/external upset pipe. The upset provides a greater wall thickness and weld surface area at the point where the mid-body tube is jointed to the alloy tool joint. The resulting configuration provides the necessary gradual transition of forces from the pipe, throughout the weld area, into the tool joint.



TIPS FOR TOP PERFORMANCE

- The suggested bit down pressure and rotational speeds in this catalog are guidelines. Best performance is achieved at the drilling site through testing along these basic guidelines.
- Drill Steel should be straight with properly maintained threaded connections. Bent drill steel could drastically reduce drilling performance and bit life.
- Care should be used when attaching or removing the bit from the drill steel.
- Tool joint lubricants are recommended for the threaded connections and shoulder of the drill steel and bits. These lubricants reduce friction, help prevent thread galling and ease the make-up and break-out operation while adding or removing joints of drill steel.
- Make sure air valves are open before starting to drill and keep the air on until the bit is out of the hole.
- A new bit should be broken-in by drilling with reduced down pressure and rotational speed for a short period.
- Guard against dropping the bit and drill steel to the bottom of the hole. This impact can result in serious damage to the bit.
- In wet holes, maintain as high a pressure drop as possible across the bit to ensure adequate cleaning and to avoid stoppages within the air courses of the bit, which may result in premature bearing failure.
- Inspect the bit regularly after drilling the hole to assess impending failure or damage. Cone temperatures should be uniform. Otherwise, obstructed air courses and potential bearing failure may be indicated.
- Before an idle period, the bit may be cleaned by opening the air valves and rotating the cutters by hand. Make certain the cutters turn freely before re-using the bit after an idle period.

SAMPLE OF DRILL STRING COMPONENTS





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