

flexible couplings

The Company & Its Products

Huco products are manufactured in Hertford, England, in a modern plant equipped with all necessary design, development, toolroom and production facilities. The plant operates a total quality assurance system assessed to ISO 9001-2000.

Huco products are available through distribution or Huco warehouses in most of the industrialised nations of the world. Recognised as one of the leading manufacturers of small flexible couplings, Huco has been responsible for several 'firsts' since its inception in 1965

Huco was first to use thermoplastics as active transmission elements and was demonstrating plastic universal joints as far back as 1962. Other 'moving parts' couplings followed, notably the Uni-Lat and Oldham concepts. In the early 1990's Huco launched the Flex-M high integrity membrane coupling and this was followed by the Flex-B series of bellows couplings, another new and innovative design.

With the recent addition of the Multi-Beam and Single-Beam range of helical beam couplings, Huco can offer solutions that address specific issues in most coupling applications.

Whether the accent is on high torsional stiffness, generous misalignment capability, high speed operation recyclable hubs, or a capacity for operating in push/pull mode, Huco can help. If your needs should fall outside our standard range, we offer a customised service to meet your low-cost, high volume requirements.

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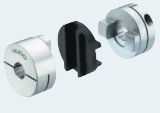



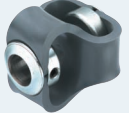


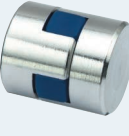






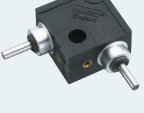

Certificate No. GB00304

Product Overview

Product Overview

Stainless Steel Bellows type	Nickel Bellows type	Membrane type	Multi-Beam type	Single-Beam type	Step-Beam type
<p>Flex B Short 3-convolution</p>  <p>Stretched 2-convolution</p>  <p>Long 9-convolution</p> 	<p>Flex Ni</p>  	<p>Flex M Single-stage</p>  <p>Short two-stage</p>  <p>Long two-stage</p> 	<p>Multi-Beam 6-Beam</p>   <p>Material Options: Aluminium Stainless Steel Acetal</p>	<p>Single-Beam</p>  <p>Material Options: Aluminium Stainless Steel</p>	<p>Step-Beam</p>  <p>Material Options: Nylon</p>
General description					
Precision couplings with excellent kinematic properties. The 3 types offer differing combinations of stiffness, radial compensation and axial motion.	Precision couplings with excellent kinematic properties. The 3 types offer differing combinations of stiffness, radial compensation and axial motion.	Precision couplings with excellent kinematic properties. Dynamically balanced construction. Single-stage versions make up into 'whirl' free Cardans. The 2-stage versions offer short envelopes and low bearing loads respectively.	General purpose single piece couplings Single stage (3-beam) Two stage (6-beam) Material options for moisture and corrosion resistance.	More flexible than Multi-Beam but less torsional rigidity.	Unique coupling design gives excellent combination of radial flexibility with torsional stiffness.
Where to use					
High-end servo drives, pulse generators, scanners, positioning slides, metering valves, etc.	High-end servo drives, pulse generators, scanners, positioning slides, metering valves, etc.	High-end servo drives, pulse generators, scanners, positioning slides, high speed dynamometers, unsupported drive shafts, etc.	Stepper and servo drives, encoders, general purpose light duty power transmission applications.	Stepper drives, encoders, general purpose light duty power transmission applications.	Encoders, tachogenerators, small pumps, motors and drives
Speeds					
Up to 5000 rpm in standard form.	Up to 5000 rpm in standard form.	Up to 5000 rpm in standard form. Up to 30000 rpm in balanced form.	Up to 5000 rpm in standard form. Up to 30000 rpm in balanced form.	Up to 5000 rpm in standard form. Up to 30000 rpm in balanced form.	Up to 10000 rpm
Peak torque largest size					
12.5 Nm	12.5 Nm	60 Nm	140 Nm	30 Nm	25 Nm
Standard bores					
3 to 20	3 to 20	3 to 28	1 to 38	3 to 26	3 to 12.7
Temperature range					
-40° to +120°C	-40° to +120°C	-40° to +120°C	-40° to +140°C	-40° to +140°C	-20 to +150°C
Electrically isolating					
No, unless used with insulating bore adaptors	No, unless used with insulating bore adaptors	No, unless used with insulating bore adaptors	Aluminium } No Stainless Steel } Acetal } Yes	Aluminium } No Stainless Steel }	Yes
Connection					
Clamp or Set Screw	Clamp or Set Screw	Clamp or Set Screw	Clamp or set screw	Clamp or Set Screw	Clamp or Set Screw
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Product Overview

Sliding Disc type	Universal / Lateral type	Double Loop type	Jaw Coupling	Universal Joints & Teleshfts	Friction Clutches	Bevel Gearboxes
<p>Oldham Blind bored</p>  <p>Thru' bored</p>  <p>Thru' bored</p>  <p>Material Options: Aluminium Stainless Steel</p>	<p>Uni-Lat</p>  	<p>Flex-P</p>   	<p>Jaw coupling</p> 	<p>Huco-Pol Single joints</p>  <p>Double joints</p>  <p>Teleshfts</p> 	<p>Vari-Tork Basic clutch</p>  <p>Basic clutch + sleeve adaptor</p>  <p>Basic clutch + Oldham coupling</p> 	<p>L-Box</p>  <p>T-Box</p> 
General description						
<p>General purpose, robust, easy to use 3-part couplings with replaceable wear elements. Generous radial compensation and pull-apart / re-engage facility for blind assemblies.</p>	<p>Unique, general purpose light duty couplings with generous angular and radial misalignment compensation. Resist axial motion, can anchor unrestricted shafts and perform light push/pull duties.</p>	<p>Exceptional flexibility in all three directions, radial, angular and axial</p>	<p>High torque capacity and high speed are available from this naturally balanced coupling</p>	<p>Light duty plastic universal joints and extensible drive shafts (teleshfts). Low mass, corrosion resistant, ideal where conventional steel joints would be under-utilised.</p>	<p>Small, user-adjustable torque limiters for concentric or in-line mounting. Operate by friction using interleaved clutch plates.</p>	<p>Small 90° drives encased in molded housings providing electrical isolation between shafts and mounting surface. The L-Box is rated for intermittent use, the T box for continuous. 1:1 & 2:1 ratios are available with the T-Box.</p>
Where to use						
<p>Stepper drives for most applications including positioning slides, pumps, actuators, etc.</p>	<p>Encoder, resolver, tacho, potentiometer drives. Small positioning slides, dosing pumps, & light drives generally.</p>	<p>Light power drives, pumps and small generators</p>	<p>Light power drives where misalignment is small</p>	<p>Intermittent applications in business machines, instrumentation, lab equipment, analytical apparatus, etc., where steel joints would be under-utilised.</p>	<p>Friction clutches interrupt rotation when the load being transmitted reaches a pre-determined threshold. Used in all kinds of small drives to help protect personnel and equipment.</p>	<p>L-box offers a compact means to route drives thru' 90°. T-box offers 2 & 3 shaft configurations for multiple power offtake.</p>
Speeds						
Up to 3000 rpm.	Up to 3000 rpm.	Up to 3000 rpm.	Up to 40,000 rpm.	Up to 1000 rpm	Up to 1000 rpm slipping speed	Up to 1500 rpm for T-box
Peak torque largest size						
44 Nm	12 Nm	18 Nm	133 Nm	10.7 Nm	3 Nm	0.68 Nm
Standard bores						
2 to 30	3 to 22	3 to 16	3 to 16	3 to 20	6 to 20	4 & 5 (shafts)
Temperature range						
-20 to +60°C	-20 to +60°C	-40 to +100°C	-40 to +80°C	-20 to +60°C	-10 to +80°C (when operating)	-20 to +60°C
Electrically isolating						
Yes	Yes	Yes	Yes	Yes	No	See General Description above
Connection						
Clamp or Set Screw	Clamp or Set Screw	Set Screw	Clamp or Set Screw	Set Screw, Bonding, or Cross-Pinning	Clamp or Set Screw	N/A
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Selecting Flexible Couplings

Introduction to couplings

In the simplest of terms a coupling's purpose is to transfer rotational movement from one shaft to another. Reality is somewhat more complicated, though, as flexible shaft couplings have also to compensate for misalignment between two shafts. This ability must be balanced with the need to be pliable in the planes of misalignment while still having the torsional strength to carry out the coupling's main function. This is known as the Compliance mechanism where compliance is the capacity for allowing relative displacement.

Several factors should always be taken into consideration when looking to specify flexible shaft couplings. These are torsional stiffness, backlash, torque, life and attachment system. All of these have bearing on coupling selection.

Selecting the ideal coupling

The choice of couplings available to today's engineers can be daunting, but follow our guide;lines and you will arrive at the optimum coupling for your particular application.

- Does the coupling provide adequate misalignment protection?
- Can it transmit the required torque?
- Do I need axial motion or axial stiffness?
- Can it sustain the required speed of rotation?
- Will it fit within the available space envelope?
- Can it operate at the designated ambient temperature?
- Does it provide torsional stiffness required for positional accuracy?
- Does it provide electrical isolation between the shafts?
- Will it have the required life expectancy?



6 Service Factors

- Peak torque values quoted in the coupling performance tables apply to uniform load conditions at constant speed where there is no misalignment or axial displacement.
- The torque capacity of flexible couplings will reduce when acceleration is present, for example, in stop/start or reversing conditions.
- The more severe the acceleration, the greater reduction in torque capacity.
- Sliding couplings (Oldham and UniLat) are subject to a wear rate dependent on the number of cycles completed.

Peak torque must be greater than application torque x service factor

	Load					Duty (Hours/Day)				
	Steady State	Stop/Start	Reversing	Shock	Shock & Reversing	<1	1 - 2	3 - 5	6 - 12	>12
Huco Flex B	1.5	2.0	2.0	3.0	4.0	-	-	-	-	-
Huco Flex M	1.5	2.0	2.0	3.0	4.0	-	-	-	-	-
Huco Flex Ni	1.0	2.0	2.0	3.0	4.0	-	-	-	-	-
Huco Flex P	1.0	1.5	1.5	3.0	4.0	-	-	-	-	-
Huco Flex G	1.0	2.0	4.0	4.0	4.0	-	-	-	-	-
Huco MultiBeam	1.0	1.5	2.0	(Note 1)	(Note 1)	-	-	-	-	-
Huco S-Beam	1.0	1.5	2.0	(Note 1)	(Note 1)	-	-	-	-	-
Huco TorqLink	1.0	1.5	2.0	(Note 1)	(Note 1)	-	-	-	-	-
Huco Oldham	-	-	-	-	-	1.0	2.0	4.0	6.0	8.0
Huco Flex - B	-	-	-	-	-	1.0	1.5	2.0	3.0	4.0
Uni-Lat	-	-	-	-	-	1.0	1.5	2.0	3.0	4.0

Note 1: Not recommended in these conditions

How to Order

All shaft mounted products in this catalogue can be specified with inch and/or metric bore diameters. A standard range of sizes is listed for each product. Where physical dimensions permit, keyways may be specified at extra cost.

For the sake of uniformity and avoidance of errors when ordering, bore diameters are designated with a 2-digit number which forms part of the order code.

Please note that only the bore diameters listed for each

product in the product pages are standard.

The table below lists the 2-digit designations for bore diameters spanning 1mm to 38mm and includes the metric equivalents for bores conforming to inch sizes. The columns at the right of the table show the key dimensions for the related bores. Designations for keywayed bores are shown in the last column.

To specify a **keywayed** bore, prefix the 2-digit

number with a 'P' for metric keyways or an 'R' for an inch keyway.

Standard keyways are machined to 2 specifications:

Bore codes prefixed 'P' denote a metric keyway conforming to

ISO 773/774 (BS 4235 Pt. 1).

Bore codes prefixed 'R' denote an inch keyway conforming

to BS 46 Pt. 1.

In most cases, keyways prefixed 'R' are compatible with AGMA 9002-A86 but can differ in the depth of the key seat. Shafts fitted with AGMA keys should be measured to determine dimension K and the key width. If these do not conform to the values shown in the table, please photocopy this page and enter the required dimensions on the drawing below.

Please enter all three dimensions, key width, shaft diameter and dimension K.

Round & Keywayed Bore Details & Codes

Metric mm	Inch fraction	Inch decimal	Round bore code	Metric keys		Inch keys		Keywayed bore code
				Key size w x h	K	Key size w x h	K	
1	–	0.0394	08	–	–	–	–	–
1.588	1/16	0.0625	10	–	–	–	–	–
2	–	0.0787	11	–	–	–	–	–
2.286	–	0.0900	12	–	–	–	–	–
2.382	3/32	0.0938	13	–	–	–	–	–
3	–	0.1181	14	–	–	–	–	–
3.048	–	0.1200	15	–	–	–	–	–
3.175	1/8	0.1250	16	–	–	–	–	–
*3.969	5/32	0.1563	–	–	–	–	–	–
4	–	0.1575	18	–	–	–	–	–
4.763	3/16	0.1875	19	–	–	–	–	–
5	–	0.1969	20	–	–	–	–	–
5.556	7/32	0.2188	21	–	–	–	–	–
6	–	0.2362	22	–	–	–	–	–
6.096	–	0.2400	23	–	–	–	–	–
6.350	1/4	0.2500	24	–	–	–	–	–
7	–	0.2756	25	2 x 2	8.00	–	–	P25
7.144	9/32	0.2813	26	–	–	–	–	–
7.938	5/16	0.3125	27	–	–	1/8 x 1/8	0.3755	R27
8	–	0.3150	28	2 x 2	9.00	–	–	P28
8.731	11/32	0.3438	29	–	–	1/8 x 1/8	0.4068	R29
9	–	0.3543	30	3 x 3	10.40	–	–	P30
9.525	3/8	0.3750	31	–	–	1/8 x 1/8	0.4380	R31
10	–	0.3937	32	3 x 3	11.40	–	–	P32
11	–	0.4331	33	4 x 4	12.80	–	–	P33
11.113	7/16	0.4375	34	–	–	1/8 x 1/8	0.5005	R34
12	–	0.4724	35	4 x 4	13.80	–	–	P35
12.700	1/2	0.5000	36	–	–	1/8 x 1/8	0.5630	R36
13	–	0.5118	37	5 x 5	15.30	–	–	P37
14	–	0.5512	38	5 x 5	16.30	–	–	P38
14.288	9/16	0.5625	39	–	–	3/16 x 3/16	0.6535	R39
15	–	0.5906	40	5 x 5	17.30	–	–	P40
15.875	5/8	0.6250	41	–	–	3/16 x 3/16	0.7160	R41
16	–	0.6299	42	5 x 5	18.30	–	–	P42
17	–	0.6693	43	5 x 5	19.30	–	–	P43
17.463	11/16	0.6875	44	–	–	3/16 x 3/16	0.7785	R44
18	–	0.7087	45	6 x 6	20.80	–	–	P45
19	–	0.7480	46	6 x 6	21.80	–	–	P46
19.050	3/4	0.7500	47	–	–	3/16 x 3/16	0.8410	R47
20	–	0.7874	48	6 x 6	22.80	–	–	P48
22	–	0.8661	49	6 x 6	24.80	–	–	P49
22.225	7/8	0.8750	50	–	–	1/4 x 1/4	0.9930	R50
24	–	0.9449	51	8 x 7	27.30	–	–	P51
25	–	0.9843	52	8 x 7	28.30	–	–	P52
25.400	1	1.0000	53	–	–	1/4 x 1/4	1.1180	R53
28	–	1.1024	54	8 x 7	31.30	–	–	P54
28.575	1-1/8	1.1250	55	–	–	5/16 x 1/4	1.2400	R55
30	–	1.1811	56	8 x 7	33.30	–	–	P56
31.750	1-1/4	1.2500	57	–	–	5/16 x 1/4	1.3580	R57
32	–	1.2598	58	10 x 8	35.30	–	–	P58
34.925	1-3/8	1.3750	59	–	–	3/8 x 1/4	1.4830	R59
35	–	1.3780	60	10 x 8	38.30	–	–	P60
38	–	1.4961	61	10 x 8	41.30	–	–	P61

*Not manufactured. Nearest alternative 4mm.

Order Codes

Combine the COUPLING REF in Main Product Tables with BORE REFS in Standard Bores Table.

Please identify both bores e.g.

706.19.1924

Coupling ref.

Ø B1 ref.

Ø B2 ref.

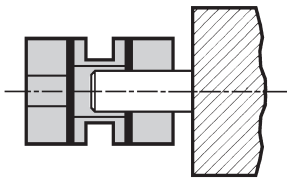
Installing Couplings

Flexible Coupling Types

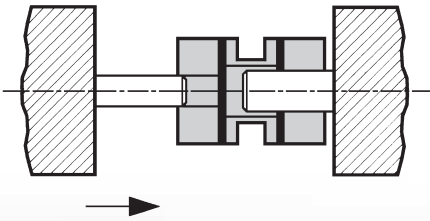
General instructions

1. Ensure that shafts are free of burrs, damage, or foreign matter, and can penetrate the bores.
2. Install the coupling by holding the shaft and the related hub, rotating it back and forth as you progress it along the shaft.
3. Do not apply any forces that cause extension, compression or lateral displacement of the coupling beyond its permissible offsets.

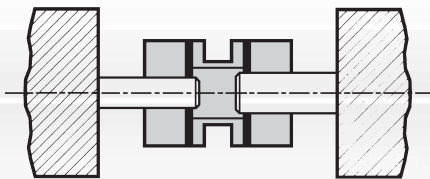
Normal installation



- a) Position and secure the larger of the 2 shafts (if different) and progress the coupling onto it.



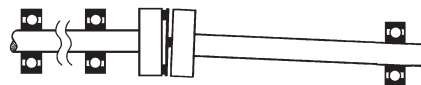
- b) Progress the second shaft into the bore, taking care not to lever either shaft against the inner wall of the spacer.



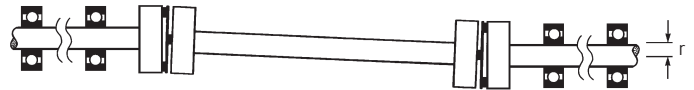
- c) Progress the coupling along the shafts to a position midway between the shaft terminations. Rotate the coupling to ensure it is not binding and is in its natural state, ie., neither extended nor compressed.
- d) Align the second shaft with the first using a straight edge and feeler gauges or a dial indicator.
- e) Secure the second shaft and re-check alignment. Final alignment must be within the permissible offsets.
- f) Secure one hub, tightening each screw alternately. Repeat for the second hub.

When to use single & two-stage couplings

Single-stage



Example 1. With partially supported (1 bearing) shafts.



Example 2. With unsupported intermediate shafts.

Single-stage couplings are radially supportive and function as supplementary bearings. They are used when the connected shaft lacks a full complement of bearings.

Two-stage



Two-stage couplings are radially compliant and are used when both shafts are fully supported by bearings.

CAUTION

These are precision high couplings that have a limited range of permissible flexure. They can be damaged through careless handling. Avoid gratuitous flexure in any direction.

No axial forces are permitted across the membranes when fitting Huco-Flex M couplings. Keyways with interference fits are not recommended.

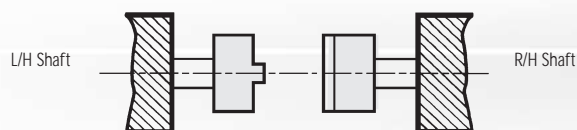
Bellows couplings are more tolerant of axial motion, but flexure beyond the permissible limits should be avoided.

Note: Bellows couplings do not provide the same level of radial support as Flex M when used with partially or wholly unsupported shafts. When essential for reasons of greater axial motion, use the 3-convolution type for these purposes.

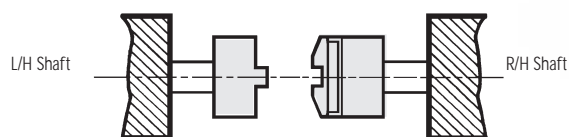
Installing Couplings

Sliding Disc type (Oldham)

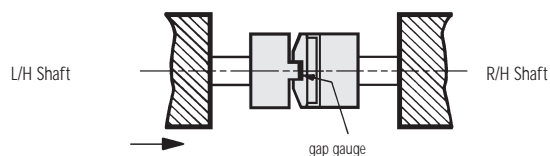
Blind hub



- Slide hubs on to both shafts until fully seated and tighten screws.
- Position and secure R/H shaft.



- Seat disc fully on R/H hub.



- Place a gap gauge flat against the bottom of the exposed slot in the disc and push the L/H hub into full engagement by manipulating the L/H shaft.
 - Align shafts within the permissible offsets and secure L/H shaft.
 - Check alignment and correct if necessary.
 - Remove gap gauge.
- To fit a new disc, withdraw L/H shaft complete with hub and remove old disc. Repeat steps c) to g).

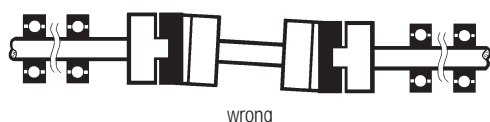
Gap gauges for all hub types

Coupling size	Gap gauge
06, 09 & 13	0.05mm
19 & 25	0.10mm
33 & 41	0.15mm
50 & 57	0.20mm

Clearances are set to allow for thermal shaft growth and / or end-float. Gaps may be increased, but total shaft movement should not exceed the values shown under *Axial Compensation* in the Performance Table.

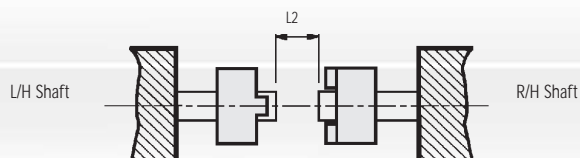
Radial support

Shafts must be fully supported by 2 bearings and have minimal overhang. Oldham couplings cannot be used in pairs.

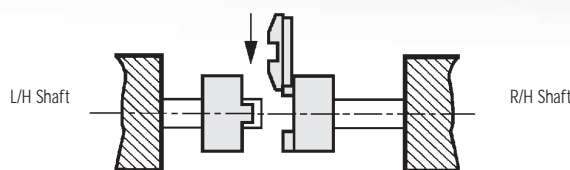


Note: It is important that installed couplings are not end-loaded. To help avoid this, thro' bored hubs are recommended for shafts which have fixed axial locations such as face-mounted motors.

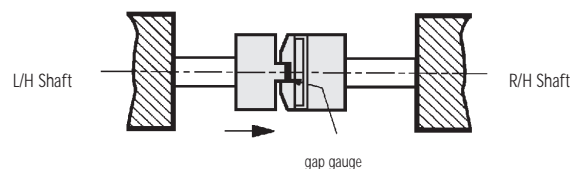
Thro' hub



- Slide hubs on to both shafts.
- Align shafts to within the permissible offsets and position to leave *minimum* gap 2 between terminations. Secure both shafts, check alignment and correct if necessary.



- Position R/H hub with inboard face flush with shaft termination and tighten screws.
- Slide disc radially on to the tenons of the R/H hub. Ensure the disc is fully seated.



- Place a gap gauge flat against the bottom of the exposed slot in the disc and push the L/H hub into full engagement.
- Tighten fastening screws and remove gap gauge.

To fit a new disc, slacken the fastening screws on one hub and retract it along the shaft. Slide the old disc out radially and replace with the new. Repeat steps d) to f).

To retain shaft phasing, withdraw L/H shaft and repeat steps c) to g) as for Blind hub couplings.

Over-penetration of shafts can impair function of coupling with solid disc. Min shaft gap L2 must be observed. Specify thro' bored disc for near-butted shafts.

Coupling size	19	25	33	41	50	57
L2 min	7.2	9.2	12.0*	15.3	18.4	21.2

*types 243, 245, 454 and 456 = 18.0

Clamp hubs

To improve clamp action, apply a little grease under the head of the clamp screw.

Installing Couplings

Beam Type

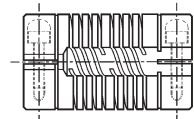
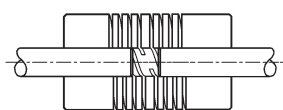
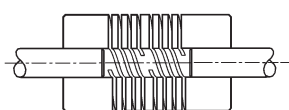
Relief Under The Beams

Most Multi-Beam couplings can be supplied with or without relief under the beams as shown in the diagrams below. When the drive or driven shafts extend under the beams relief is essential to ensure that the coupling remains flexible. Where non-relieved versions are used, shafts must not be allowed to penetrate under the beamed section of the coupling. Unless otherwise specified, relieved versions will be supplied.

Pilot Bores

Couplings can be supplied 'pilot bored' for opening out by the customer. Pilot bores are plain drilled holes, which are not produced with the same accuracy as finished machined bores. The largest bore provided in a pilot bored product is that needed to make the coupling flexible and this will always be larger than the minimum possible bore size 'B1' shown in the bore tables. For sizes 13 to 25, the pilot bore is also larger than the 'B2' minimum shown in the bore tables. Further details are available on request.

Non-Relieved



Relieved

