

## WORKHOLDING



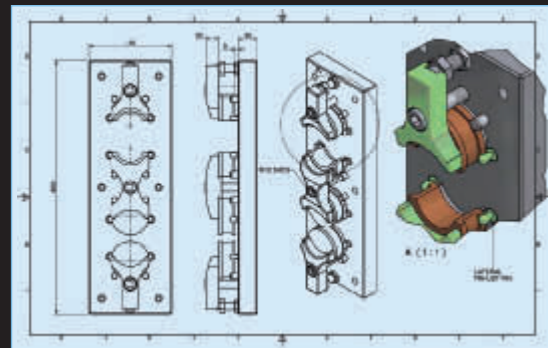
**CRAFTSMAN  
TOOLS**

Collaborating with the World's Finest

# Services and Customer Relations

**Craftsman Tools has been established for more than 55 years.**

We offer an extensive standard range of workholding equipment and are able to provide bespoke solutions to meet your exact specifications.



All our design and manufacture is undertaken in-house and we pride ourselves on our technical expertise.



The company operates a cellular structure, with each cell having its own manager acting as a single point of contact for prospective customers.

## Our Strength

Craftsman Tools has worked with many successful blue-chip companies, including:

- A.O. Smith
- Cinetic Landis Grinding
- Gardner Denver
- Honda
- Metaldyne
- Ricardo
- Visteon
- BAE Systems
- Curtiss Wright
- Goodrich
- Mazak
- Nissan
- Sandvik Coromant
- Sulzer Pumps



# Product Range

## EXPANDING MANDRELS

Precise and versatile.  
Pages 3 to 6.



## CUBES

Perfect for horizontal machining centres.  
Pages 7 to 10.

## CENTRES

Ideal for CNC lathes.  
Pages 11 to 13.



## FIXTURES

Precise and rigid.  
Page 14.

## Bespoke Solutions

**Our experienced team is available to help you find the optimum solution.**

### Our Process

- 1 We discuss your requirements and recommend the best approach.
- 2 A proposal drawing is produced, then a detailed quote and delivery schedule are submitted.
- 3 Manufacture commences on receipt of drawing approval of proposal.
- 4 Continuous after-sales support is provided.

### This allows us to

- Understand your needs.
- Offer you a suitable way forward.
- Respect short lead times.
- Build long-term relationships.

For bespoke designs and other workholding requirements please contact us.

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# Expanding Mandrels

With over 50 years experience in the design and manufacture of Expanding Mandrels, we have developed the highest level of expertise.

More versatile and accurate than solid mandrels or similar workholding, Expanding Mandrels can be used during almost all machining and inspection procedures. They are frequently used during turning, milling, gear cutting, grinding, vertical boring, assembly and inspection operations.

## Features and Advantages

- Ability to accommodate a very generous component bore tolerance whilst maintaining concentricity.
- Quick and secure clamping.
- Facility to link to existing machine mechanisms.
- Consolidation of components against backstops.
- Positive clamping and release mechanism.
- Single tapers to ensure maximum support, where feasible.
- Interchangeable sleeves to cover a range of component sizes.
- Controlled datums.



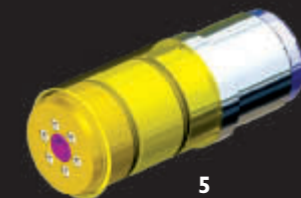
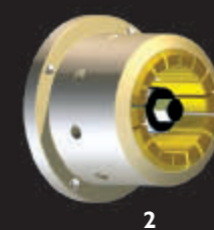
## Opportunity to Achieve:

- Higher machining precision (concentricity to 0.005 mm TIR)
- Lower production costs.
- Increased output.
- Reduction in operational sequences.
- Reduction in loading, unloading and ejection times.
- Reduction in reject rates.

## Different Types of Mandrel

The most commonly used type is the **Expanding Sleeve (1)**. Based on a high-quality, tapered spring steel ring it is heat-treated and precisely split in order that parallel expansion is possible when acted upon by a matching cone.

Other styles include **Collet (2)**, **Hydraulic (3)**, **Segmented Jaws (4)**, **Flexiring (5)** and **Disc Element**.



95% of Craftsman Tools' Expanding Mandrels are bespoke - designed and manufactured to meet exact specifications.

We take account of all your requirements concerning the interface or mounting method to be used, your preferred actuation method, the operation to be performed and the bore and tolerances of the component.

See some examples of our Bespoke Expanding Mandrels on the following pages.



# Bespoke Expanding Mandrels

These illustrations show some of the permutations of mounting, actuation, and location in various applications.

## Common Mounting Types

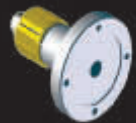
### Spindle Nose Mounted

Mounted onto the spindle, replacing the standard machine chuck. Simple, direct and repeatable loading.



### Face Plate Mounted

Mounted to a faceplate or the face of the chuck. Simple, direct and repeatable loading. Ideal for large, medium or small production runs.



### Spigot Mounting

Spigot extending from the back of a standard faceplate style mounting. Grip using the soft jaws of the chuck. Quicker installation and removal of the mandrel.



### Morse Taper Mounted

Ideally for tailstock mounting. Typically actuated using a cantilever nut, allowing long components to be supported at both ends during machining.



### Between Centres Mounted

Supporting both ends of the expanding mandrel allows longer components to be accurately held. Usually actuated using a cantilever nut. Front nut arrangements can be utilised on larger sizes.

## Common Actuation Methods

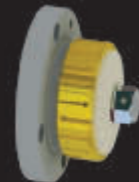
### Drawbar Actuated

Automatic, in-cycle clamping of the part. Useful when combined with robotic loading and un-loading. Accurate control of the clamping force. Useful for thin and delicate components.



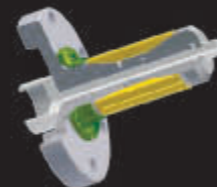
### Thread Actuated

Manually operated method. Suitable where drawbar actuation is not available. Sleeve energised using a threaded nut on the front of the mandrel.



### Opposed Tapers

Ideal for gripping a variety of components with a wide length range. Variation in component length (and diameter) accommodated by a series of sleeves and appropriate spacers. Quicker changeovers.



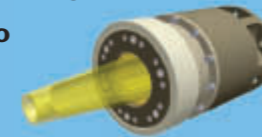
### Cantilever Nut Actuated

Used where drawbar actuation is not available and front access to the mandrel is not possible. Actuation provided by a large nut situated behind the sleeve. Component backstop usually included for accurate positioning.



## APPLICATION EXAMPLES

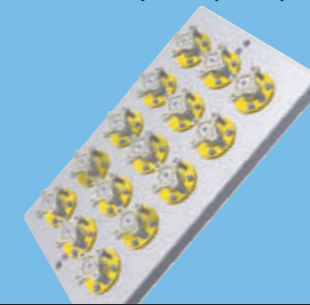
### Collet chuck system to mount to the spindle nose of a lathe.



Had to accommodate three sizes of shell body, and grip during fuse thread machining at the small end. Achieved by designing to include quickly changed collets and component backstops.

### Small flanged parts that needed to be accurately machined fully on the external profile, and in significant numbers in batches.

Achieved by multiple expanding sleeve mandrels mounted onto an aluminium baseplate that itself includes interface elements for zero-point type connection to a master plate on VMC table.



## Standard Mandrels

**Boxed sets and individuals available.**

Between Centres, Self-Locking (BCSL) expanding sleeve mandrels are ideal for low-volume production and one-off applications.

The considerable expansion of the sleeves eliminates the need to carry a large stock of odd sized solid mandrels.

These self-holding sleeves are located on a tapered arbor and are released by impact.

Sets of arbors and sleeves are available in attractive polished wooden boxes as a handy aid for inspection departments and tool rooms.

Set Ref	Grip Range	Content
0 F	12 – 26 mm	5 Arbors, 7 Sleeves
1 F	25 – 45 mm	2 Arbors, 8 Sleeves
2 F	45 - 65 mm	2 Arbors, 8 Sleeves
50 F	65 – 80 mm	1 Arbor, 7 Sleeves
60 F	80 – 100	1 Arbor, 8 Sleeves

- Arbors and sleeves can be ordered individually.
- Items above 100 mm can be ordered upon request.
- Available on short delivery.

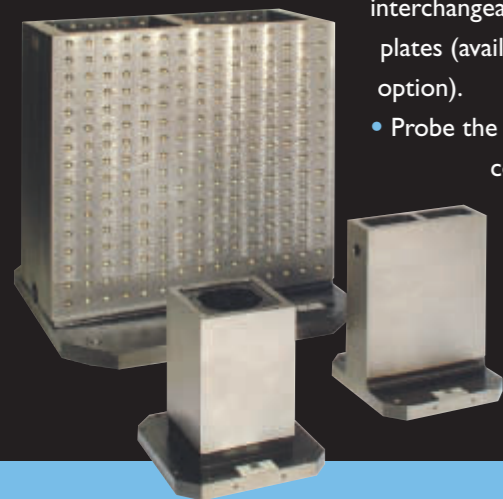


# Cubes

The use of prismatic, or cubic type workholding, brings all of a machine's axes into play - and each pallet can be loaded with the maximum number of components.

## Features and Advantages

- Fits directly to machine pallet with no need for further machining.
- Safe load/unload outside machine.
- Base and faces finish machined.
- Strong construction and integral base providing dimensional stability and capacity for arduous work.
- Easier machine set up and programming.
  - Permanent datums and interchangeable fixture plates (available as an option).
  - Probe the cube, not the component.



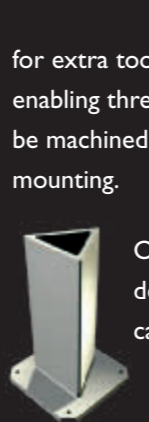
Craftsman Tools offers a wide range of prismatic workholding; all made from cast iron to provide both strength and increased damping capability.

## Flexible Options

The different shapes we offer maximise machine capacity and provide more versatile solutions.



**Extended Tee Brackets**, for example, overhang the machine pallet to accommodate larger components (or more on each face).



**Cruciforms** are designed for extra tool and spindle clearance, enabling three faces of a component to be machined and are well suited to vice mounting.

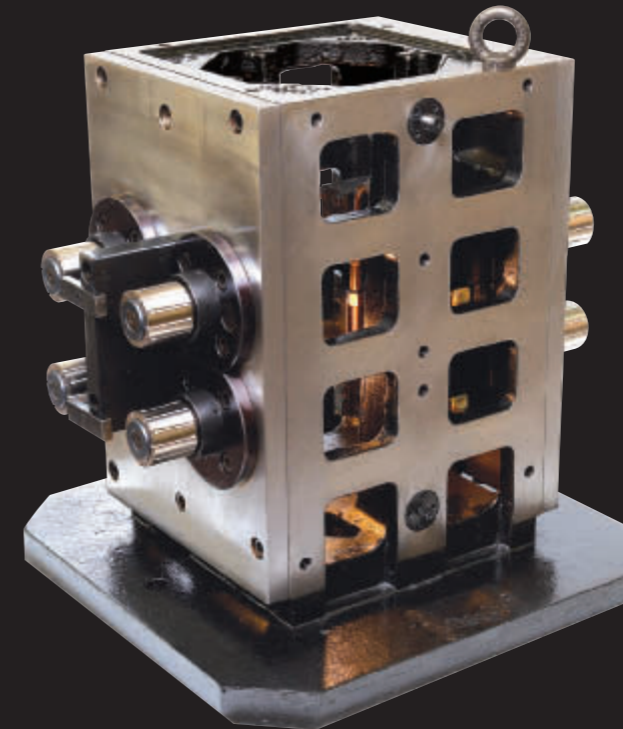


Our **Triforms** are specially designed to increase the machining capability for larger components.

## Range of Options Available

- Cube
- Angle Bracket
- Cruciform
- Triform
- Tee Bracket
- Extended Tee Bracket
- Hexaform (special)
- Window (special)

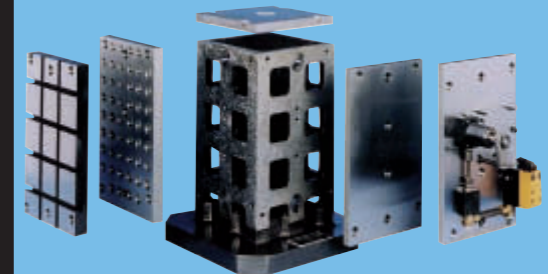
Choose the right prismatic workholding for your machine using the illustrations and tables of available sizes on the following page.



## Fixture Plates

All Plain Faced Cubes can be provided with precise location pins to enable them to accept a large range of fixture plates. These permanent datums ensure quick interchangeability.

Plates are made from stress-relieved steel (aluminium is an option). They are precision finished and ready to accept modular or special fixturing. Versions include plain, tee-slot, and grid pattern.



# Standard Cubes

Craftsman Tools' Standard range of prismatic workholding (size from 200 to 1000 mm) are available on short delivery, and made-to-order specials can be produced to sizes well in excess of one metre.

## PLAIN FACED CUBES

Dimensions (mm)			Tolerances (mm)			Mass (kg)	Product Code
Upright Section	Base (Sq)	Height	∕	⊥	∕∕		
200x200	300	480	0.010	0.017	0.020	80	PFC 203048
200x200	320	370	0.010	0.017	0.020	70	PFC 203237
200x200	320	550	0.010	0.017	0.020	90	PFC 203255
250x250	400	550	0.010	0.017	0.020	120	PFC 254055
250x250	400	700	0.010	0.017	0.020	175	PFC 254070
300x300	400	600	0.015	0.017	0.020	155	PFC 304060
300x300	400	900	0.015	0.017	0.020	215	PFC 304090
300x300	500	600	0.015	0.017	0.020	180	PFC 305060
300x300	500	900	0.015	0.017	0.020	245	PFC 305090
400x400	630	750	0.015	0.017	0.020	330	PFC 406375
400x400	630	1000	0.015	0.017	0.025	420	PFC 406310
500x500	630	800	0.015	0.017	0.020	410	PFC 506380
500x500	630	1000	0.017	0.020	0.025	500	PFC 506310
500x500	800	1250	0.017	0.020	0.025	835	PFC 508012
600x600	1000	1250	0.017	0.020	0.025	1500	PFC 601012
700x700	1000	1250	0.017	0.020	0.025	1700	PFC 701012

Tolerances Key	
∕	Flatness
⊥	Perpendicularity
∕∕	Parallelism

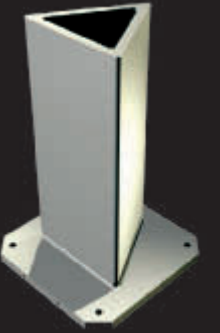


## PLAIN TEE BRACKETS

Dimensions (mm)			Tolerances (mm)			Mass (kg)	Product Code
Upright Section	Base (Sq)	Height	∕	⊥	∕∕		
100x320	320	450	0.010	0.017	0.020	60	PTB 103245
120x320	320	520	0.010	0.017	0.020	90	PTB 123252
160x400	400	670	0.015	0.017	0.020	165	PTB 164067
200x500	500	760	0.015	0.017	0.025	270	PTB 205076
240x630	630	610	0.015	0.017	0.025	315	PTB 246361
240x630	630	860	0.015	0.017	0.025	415	PTB 246386
320x800	800	1100	0.017	0.020	0.025	860	PTB 328011
400x1000	1000	1250	0.017	0.020	0.025	1470	PTB 401012

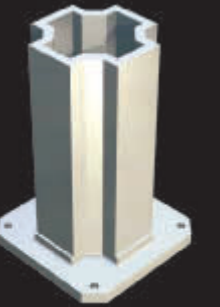
## PLAIN FACED TRIFORMS

Dimensions (mm)			Tolerances (mm)			Mass (kg)	Product Code
Face Width	Base (Sq)	Height	∕	⊥	∕∕		
250	400	450	0.015	0.017	0.020	95	TF 254045
250	400	700	0.015	0.017	0.020	130	TF 254070
300	500	520	0.015	0.017	0.025	150	TF 305052
300	500	900	0.015	0.017	0.025	280	TF 305090
400	630	670	0.015	0.017	0.025	230	TF 406367
400	630	1000	0.017	0.020	0.025	380	TF 406310



## PLAIN FACED CRUCIFORMS

Dimensions (mm)			Tolerances (mm)			Mass (kg)	Product Code
Face Width	Base (Sq)	Height	∕	⊥	∕∕		
150	400	700	0.015	0.017	0.020	150	CF 154070
170	500	900	0.015	0.017	0.025	510	CF 175090
200	630	1000	0.015	0.017	0.025	910	CF 206310
250	800	1250	0.017	0.020	0.025	1325	CF 258012
300	1000	1250	0.017	0.020	0.025	1350	CF 301012



## PLAIN ANGLE BRACKETS

Dimensions (mm)			Tolerances (mm)			Mass (kg)	Product Code
Upright Section	Base (Sq)	Height	∕	⊥	∕∕		
18x300	320	520	0.010	0.017	0.020	80	AB 321852
20x380	400	700	0.015	0.017	0.020	150	AB 402070
22x450	500	900	0.015	0.017	0.025	200	AB 502290
25x630	630	1000	0.015	0.017	0.025	395	AB 632510
28x690	800	1250	0.017	0.020	0.025	500	AB 802812
30x1000	1000	1250	0.017	0.020	0.025	820	AB 101012



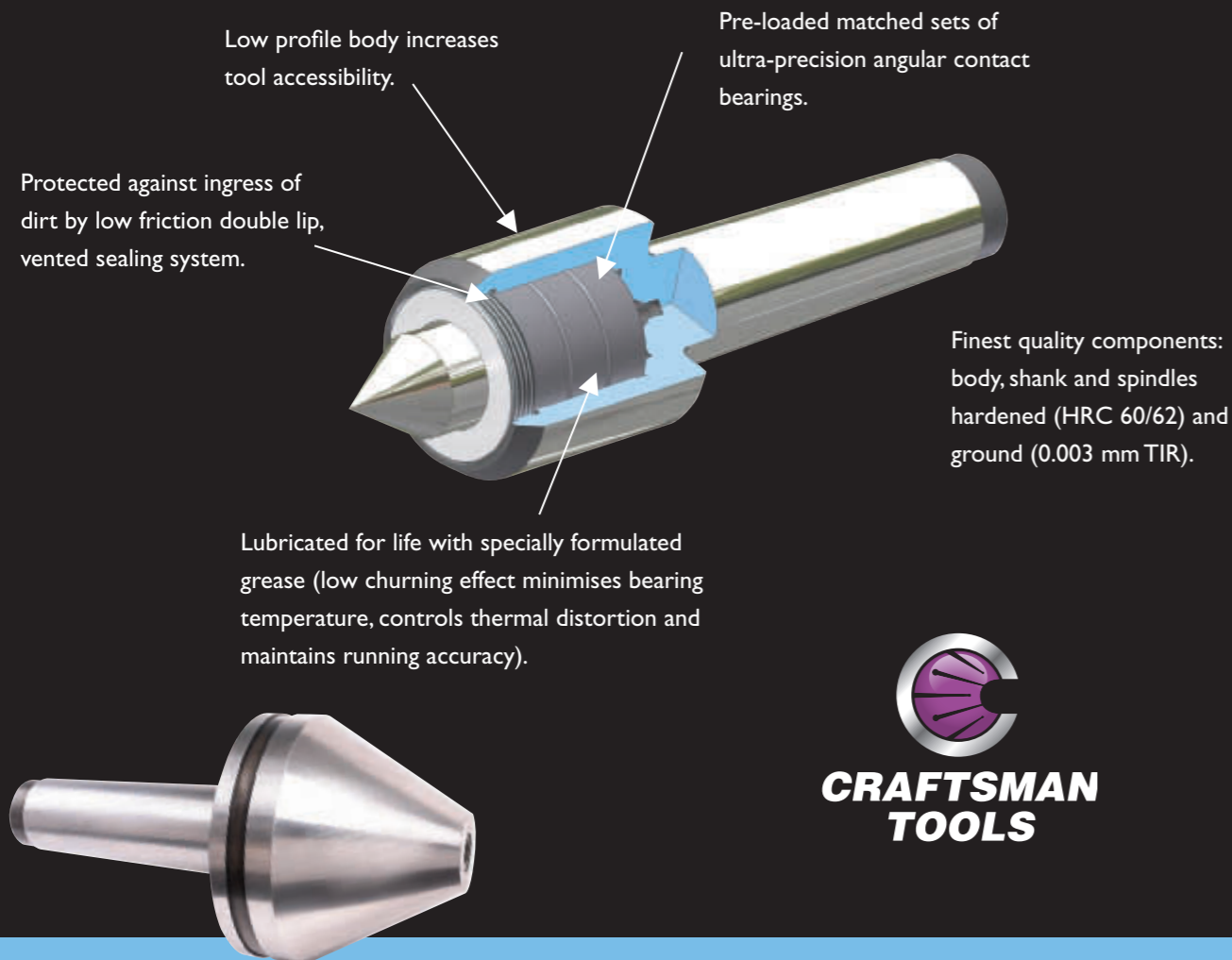
## EXTENDED TEE BRACKETS

Dimensions (mm)			Tolerances (mm)			Mass (kg)	Product Code
Upright Section	Base (Sq)	Height	∕	⊥	∕∕		
120x400	320	520	0.010	0.017	0.020	105	PTM 123252
160x530	400	670	0.015	0.017	0.020	200	PTM 164067
200x650	500	760	0.015	0.017	0.025	320	PTM 205076
240x820	630	860	0.015	0.017	0.025	490	PTM 246386
320x1000	800	1100	0.017	0.020	0.025	980	PTM 328011
400x1350	1000	1250	0.017	0.020	0.025	1880	PTM 401012



# Centres

**Craftsman Tools' centres are specially designed for CNC lathes and possess a range of performance enhancing features.**



## **Productive & Efficient**

Capable of running at speeds of up to 8000 rpm and undertaking heavy duty applications (5MT capable of supporting 1000 kg), Craftsman Tools' centres provide superior finishes and improve the productivity and efficiency of machine tools.

**Choose the right centre for your requirements using the illustrations and tables on the following page.**

**100% Guarantee For 2,000 hours**  
**We have developed the highest level of expertise in this very special product and we commit ourselves to give you total satisfaction.**

All Craftsman Tools centres are 100% guaranteed for 2,000 hours. In the unlikely event of failure as a result of defects in material or workmanship, within the first 2,000 hours, we will replace the part.

*Does not apply to centres which have been modified by the user or another party.*

## **Craftsman Tools Repair Service**

We expect a Craftsman centre to give many years of trouble free service. From time to time, due to extreme circumstances, such as machine collisions, a centre will require repair.

Centres will be rebuilt to a "like new" condition at 60% of the cost of a new centre, with a delivery time of around two weeks.

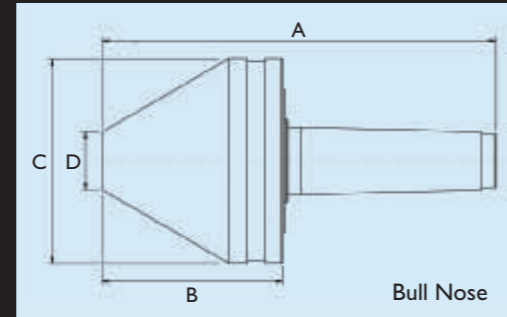
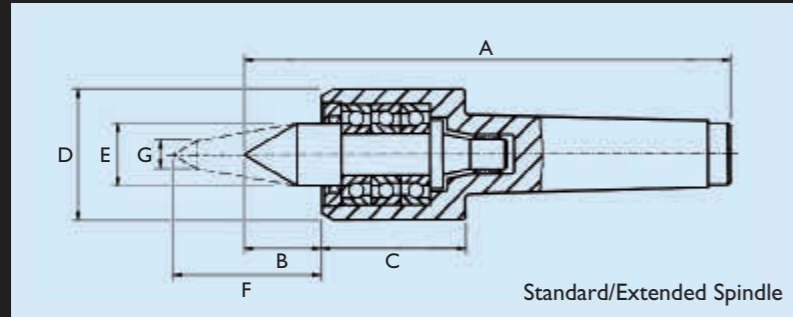
This reconditioning includes:

- New spindle.
- New seal.
- New bearings.
- New lubricant.
- Return to original accuracy.

If the centre is beyond practical repair, for any reason, a preferred customer trade-in allowance of 25% will be given toward the purchase of an equivalent new centre at the time of purchase.



# Standard Centres



## STANDARD & BULL NOSE

Size	Mass* (kg)	Max. Speed (rpm)	Dimensions (cm)					Product Code
			A	B	C	D	E	
<b>STANDARD - CNC Type</b>								
4MT	600	8000	198	33	58	53	25	RC-4MT-CNC
5MT	100	7000	256	50	70	80	36	RC-5MT-CNC
6MT	2250	6000	352	59	99	116	55	RC-6MT-CNC
<b>STANDARD - Extra Heavy Duty</b>								
4MT	1000	7000	21	40	64	64	37	RC-4MT-XHD
5MT	1800	6000	258	45	78	78	42	RC-5MT-XHD
6MT	2250	6000	372	59	59	119	55	RC-6MT-XHD
7MT	2700	5000	485	74	74	142	65	RC-7MT-XHD
<b>BULL NOSE - CNC Type</b>								
4MT	1000	7000	220	108	110	27	-	PBN4
5MT	1700	6000	261	120	135	38	-	PBN5
6MT	2300	5000	334	140	165	50	-	PBN6
<b>BULL NOSE - Extra Heavy Duty</b>								
4MT	1800	8300	237	125	130	27	-	PBX4
5MT	2400	6300	281	140	160	38	-	PBX5
6MT	2700	5000	356	162	195	50	-	PBX6

Loads rated at 100 rpm for 2000 hours. Max. Concentricity Error TIR: 0.003 mm.

\*Mass = Workpiece Maximum

## EXTENDED SPINDLE

Dimensions (cm)		Product Code
F	G	
<b>CNC Type</b>		
41	14	RC-4MT-CNC-E
63	20	RC-5MT-CNC-E
114	23	RC-6MT-CNC-E
<b>Extra Heavy Duty</b>		
53	14	RC-4MT-XHD-E
67	20	RC-5MT-XHD-E
114	23	RC-6MT-XHD-E
139	27	RC-7MT-XHD-E

## DEAD CENTRES

A 4MT dead centre is available as standard. Other sizes are also manufactured to order.



## Options

Standard Centres are available with **Carbide Tips** and **Retraction Nuts**. Simply add **-C** or **-R** to the *Product Code* when placing your order.

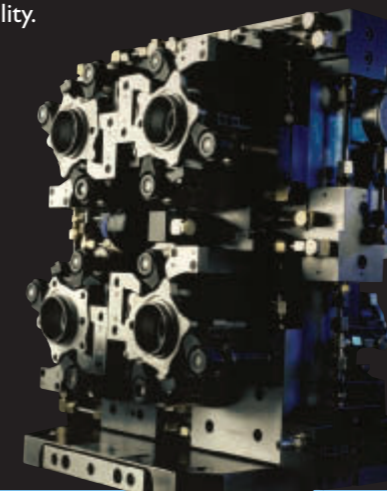
# Fixtures

With special fixturing, individual components are held and located with precision and rigidity.

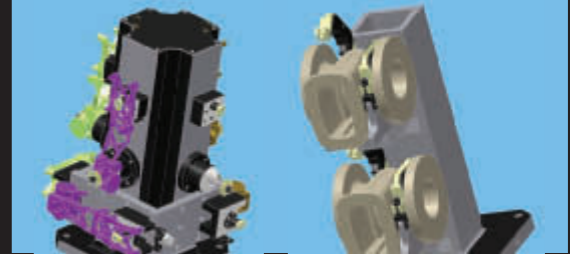
Cycle times (set up and changeover) are decreased while accuracy is maintained. They are ideal for repetitive work, and there is potentially no need to probe the components.

## Features and Advantages

- Higher machining precision.
- Lower production costs.
- Increase output.
- Fewer operational sequences.
- Reduced loading, unloading and ejection times.
- Lower reject rates.
- Dedicated designs.
- Versatility.



Both Manual and Powered fixtures are available. We can help you determine which one best meets your needs.



## MANUAL FIXTURES

- Individual clamping of component.
- Adjustment possible.
- Operator has close control of the fixture and can check for damage or wear.
- Interchangeable items easily designed-in.
- For low volume or large items.
- Ideal for rough or inaccurate castings.

## POWERED FIXTURES

- One shot clamping/unclamping.
- Controlled clamping forces.
- Suited to auto loading.
- Faster set-up.
- For high volume operations.





TOOLHOLDING

WORKHOLDING

SUB-CONTRACT MACHINING



**CRAFTSMAN  
TOOLS**

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