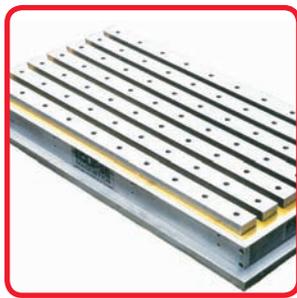


# Magnetic Workholding



Improving process efficiency and precision accuracy



A world leader in magnetic technology



When precision counts,  
**Eclipse delivers...**

# Eclipse Magnetics

100 years of manufacturing excellence



Serving some of the leading names in industry

**Toyota**

**Honda**

**NSK**

**Denso**

**BMW**

**BAE Systems**

**JCB**

**TATA Steels**

**Ford**

## A world leader in magnetic technology

With 100 years of experience in the design and manufacture of high performance magnetic systems, we supply critical equipment to some of the leading names in the most demanding industries. Our magnetic technology is widely used at leading worldwide companies and in major development projects, all requiring a guarantee of equipment performance.

## Designing excellence

We have a track record of producing high quality products backed by a commitment to total customer service. Our technical application teams have a wealth of experience, thus ensuring many of our products are market leading innovations. All manufacturing is carried out under an ISO 9001 certified quality management system.

## Unrivalled product range

We serve worldwide markets with an extensive product range including workholding systems, filtration systems, foreign body removal systems, magnet assemblies and complex magnetic industrial equipment used in industries such as automotive, aerospace and nuclear. Many of our products are unique and are covered by global patents.

## Worldwide support

We offer worldwide support through our offices in the UK, Canada and China. We also have numerous employees in various territories and a network of technically trained partners to provide local product support.

# Driving competitive edge into precision operations

## High Performance Magnetic Workholding Systems

**How a machined part is held is as important as how it is cut.....**

An efficient manufacturing process requires good machine selection, premier cutting tools, good quality clean fluids and dependable workholding. The first three areas often receive substantial consideration and investment, but the workholding solution is often neglected.

With manufacturing operations using higher cutting speeds that place greater force on workholding equipment, choosing the correct workholding method is essential.

Eclipse Magnetics manufacture high performance magnetic workholding systems for a range of machining applications, from low volume single piece to high volume multi-part operations. Specifying an Eclipse system provides a range of advantages for your process:-

### Vast improvements in production efficiency

-  **Faster set up, feed rates and metal removal – can give 500% increase in units per hour**
-  **Clamping time reduced to virtually zero – instant location, no manual clamping**
-  **Continuous machining of 5 faces - no need to stop and relocate the workpiece**
-  **Easy access for through machining, cutting and drilling**
-  **Improved safety – failsafe permanent magnetic technology guarantees a secure hold**

### Guaranteed precision

-  **100% consistent clamping – no operator variations**
-  **Eliminates vibration – extends tool life and improves accuracy**
-  **Ideal for multi-part and multi-directional machining**





# 100% Accuracy: Repeatability

One of the biggest challenges for precision manufacturers is to produce a consistent quality product. Repeated accuracy requires perfect holding integrity.

Using permanent magnetic technology, Eclipse Magnetics workholding systems generate a consistent clamping force which drastically reduces the risk of part variations during machining.

# Give your business the edge.....

A few of our many satisfied customers...



## **Mason Pinder** **Mould making**

### **Product: Supermill**

As specialists in precision design and manufacture of mould tools, accuracy is vital for Mason Pinder.

Magnetic workholding has become the norm on their machining processes, every time a new machine is commissioned a magnetic workholding system is also ordered. Supermill is used on horizontal machines with the chucks mounted on tombstones, the main benefit is that it gives access to machining 5 sides. The Supermill chucks currently in use include a 1m high x 600mm wide x 2m long unit with 2 sides magnetic.



## **Novapax** **Precision mould making**

### **Product: Premier Range Circular**

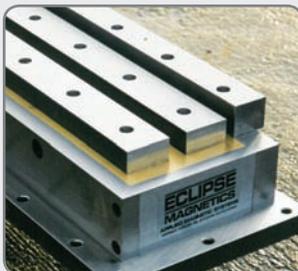
Novapax are a leading mould maker for the plastics industry. Premier range magnetic chucks are used for holding grinding tools whilst they are being refurbished. It is vital that the tools are in premium condition to ensure that the moulds are produced to precise tolerances. The main advantage is that magnetic workholding does not damage the tooling during clamping. In addition downtime was reduced as mounting components can be done in just a few seconds. The concentric chuck eliminates any vibration thus ensuring an accurate repeatable grind.



## **TATA Steels** **Steel plate machining**

### **Product: Supermill**

Tata are one of the world's largest steel producers. Supermill magnetic workholding has been key to reducing costs on the plate machining processes at 3 sites in the UK. The sites replaced manual clamping with magnetic systems. The access to 5 sides and faster clamping significantly improved process times. Subsequently magnetic systems have been used for weld preparation at the sites.



## **John Brown Engineering** **Sub-contract engineering**

### **Product: Supermill**

Magnetic workholding systems played a vital role in successfully completing a project to manufacture a new aircraft catapult launch rail for an aircraft carrier. During the assembly, clamping the main support bar was difficult as there were no straight sides or holes for mounting. Traditional clamping systems could not provide a reliable, uniform hold. Supermill solved the problem and ensured that the contract could be fulfilled.

# Optimum workholding solutions

## Important considerations

### Premier chucks



### Standard chucks



### Supermill



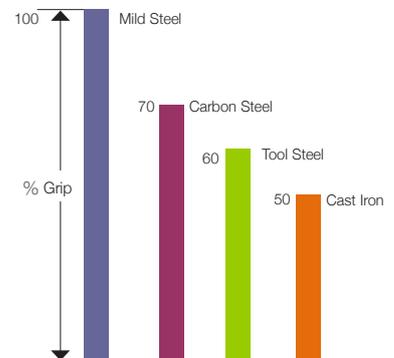
## Product Selector

Product Type	Page	Applications			
		Turning	Grinding	Light Milling	General Heavy mi
<b>Rectangular Range (Manual Chucks)</b>					
Premier Range Rectangular Chucks	9		✓	✓	
Standard Range Standard Pole Rectangular Chucks	13		✓	✓	
Standard Range Fine Pole Rectangular Chucks	13		✓		
Magnetic Sine Tables	15		✓		
<b>Circular Range</b>					
Premier Radial Pole Circular Chucks	12	✓	✓	✓	
Premier Straight Pole Circular Chucks	11	✓	✓	✓	
Standard Range Standard Pole Circular Chucks	14	✓	✓	✓	
Standard Range Fine Pole Circular Chucks	14	✓	✓	✓	
Supermill	17			✓	✓

## Material Type

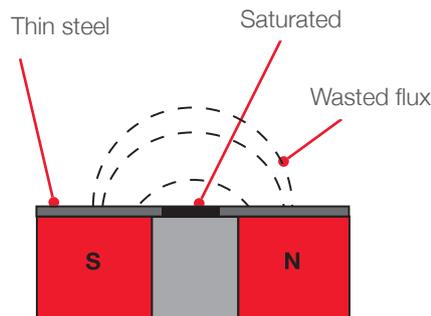
The scale opposite highlights the effect that material type has on clamping forces.

## Workpiece Material

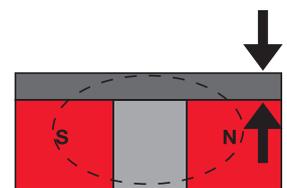


## Material Thickness

To achieve maximum clamping force minimum materials should be observed.



Minimum part thickness provides 100% performance



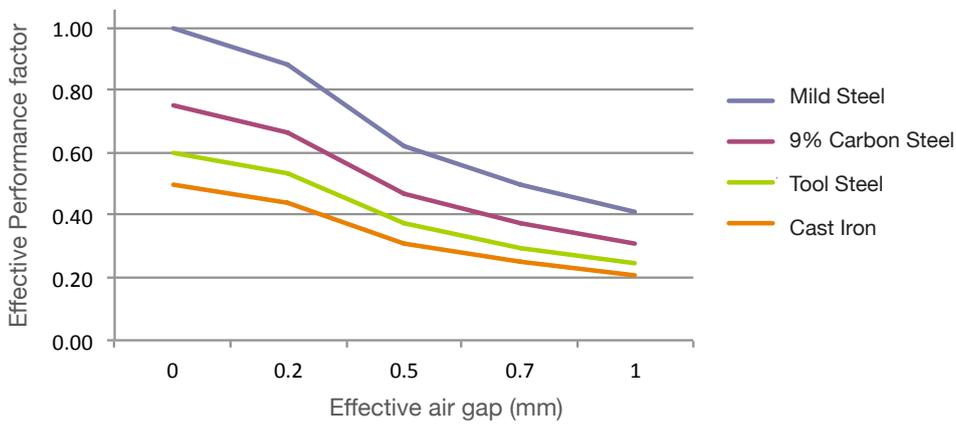
Closed Circuit  
Maximum holding power



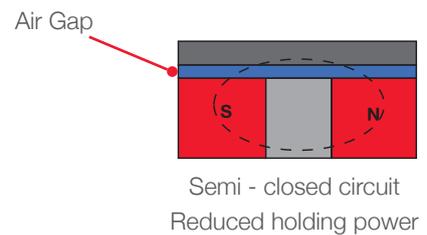
Material	Material Thickness (mm)					
	1	2	5	10	15	20 and above
Aluminum			✓	✓	✓	✓
Brass		✓	✓	✓	✓	✓
Copper	✓	✓	✓	✓	✓	✓
Iron	✓	✓	✓	✓	✓	✓
Lead				✓	✓	✓
Nickel			✓	✓	✓	✓
Steel		✓	✓	✓	✓	✓
Zinc	✓	✓	✓	✓	✓	✓

## Air Gaps

An air gap between the magnet and the workpiece will also affect performance. The chart below shows the effect on different materials.



As the air gap increases the magnetic performance reduces.



# Premier Range

## Premier Rectangular Chuck

Eclipse Magnetics invented the world's first permanent magnetic chuck in 1934 and we continue to set the benchmark for quality workholding with the Premier Range.

Guaranteed to retain their magnetism, the premier chucks are manufactured from high performance materials providing optimum holding power and efficient use of the workholding area.

### Robust chrome plated side and end stops

For location on product and for fencing in the smaller parts.

### Extended base plate

For fixing the chuck to the machine bed with the clamps supplied. (Tee nuts not included).

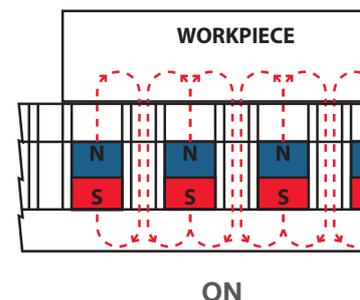


### Technical Data

Product number	Dimensions mm			
	Length	Height	Width	Pole pitch
AX47/P	203	42	127	17.6
AX510/P	276	53	129	35
AXS612/P	322	63	151	32
AXS614/P	360	63	151	32
AXS618/P	451	63	151	32
AXM824/P	601	63	201	35

### How it works

The chuck is switched on and the workpiece is in pitch with the top plate. When the chuck is switched off, the workpiece is out of pitch with the top plate.



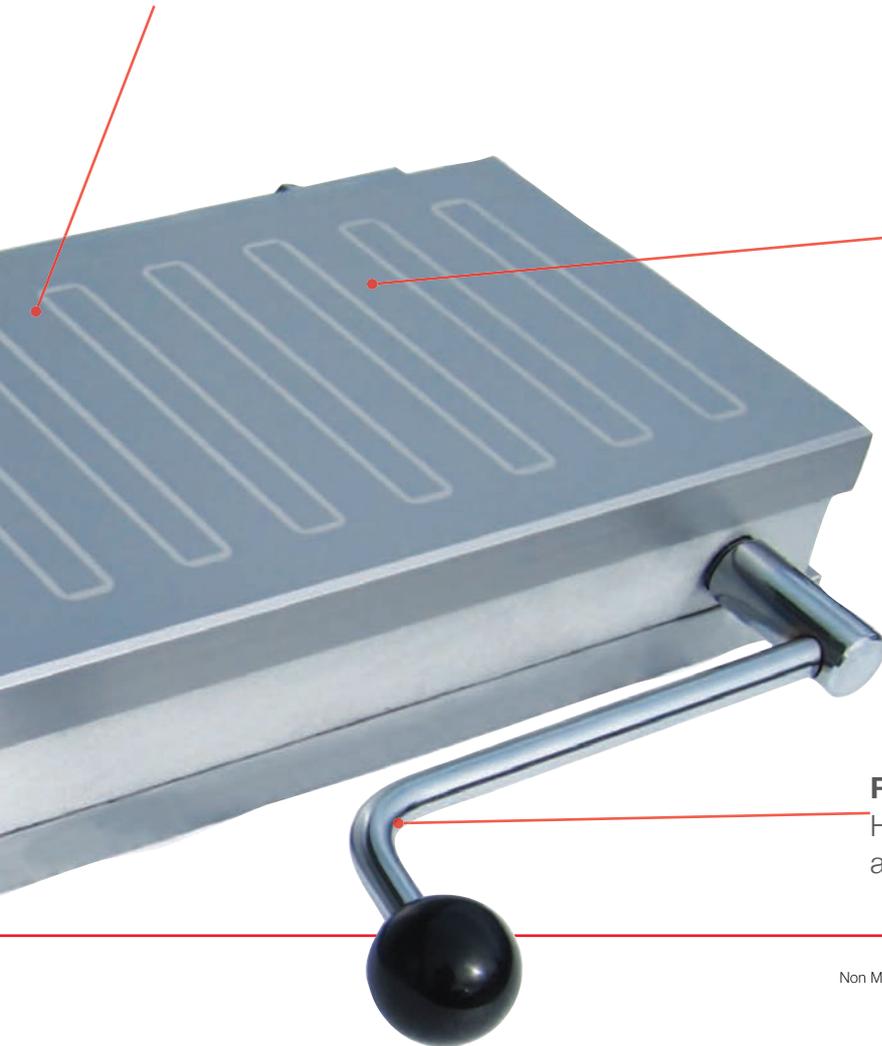


### Additional top plates

These chucks offer additional top plates.

These plates can be mounted on the top of the original and can be fully machined to provide location or nesting of parts.

These are generally used as fixtures where they are changed for different components.



### Thick all metal top plate

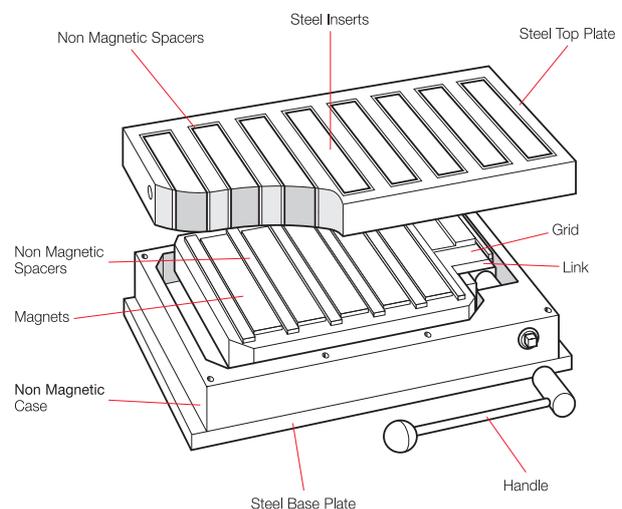
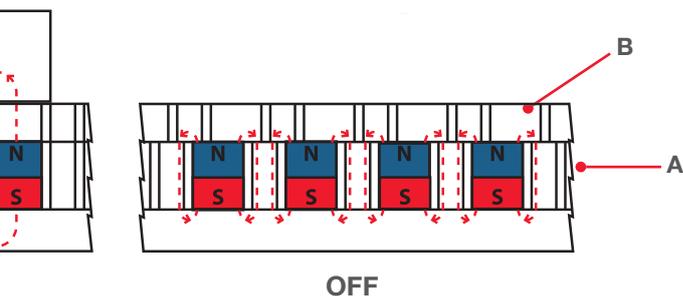
- This is a one piece section with steel inserts.
- Inserts are fixed with white metal.
- Provides high accuracy and ample life for multiple regrinds.
- Allows the top plate to be machined and drilled for location on large production runs.\*

\* Please consult manufacturer for positioning.

### Removable ergonomic operating handle

Handle can be removed once required power is achieved.

...d off by moving the central magnet pack **A**. When it  
**B** magnetism is directed into the workpiece, when it  
 ...ate magnetism is directed away from the workpiece.



# Premier Range

## Premier Circular Chucks

### Premier Circular Chuck

Ideal for a wide range of applications including inspection, grinding and turning.

Ideal for thinner materials from 3mm thick upwards and disc materials.

### Concentric guide rings

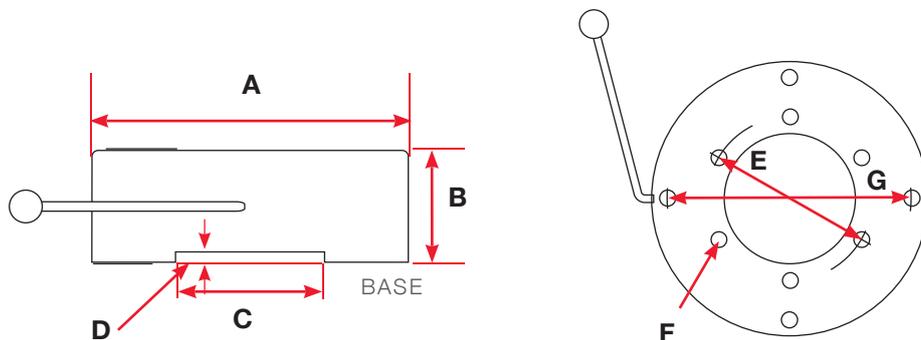
The parallel pole version is manufactured with concentric rings machined into the front face to act as a positional guide for the part prior to clocking.

### Thick all metal top plate

- This is a one piece section with steel inserts
- Inserts are fixed with white metal.
- Provides high accuracy and ample life for multiple regrinds.
- Allows the top plate to be machined and drilled for location on large production runs



### Technical Data



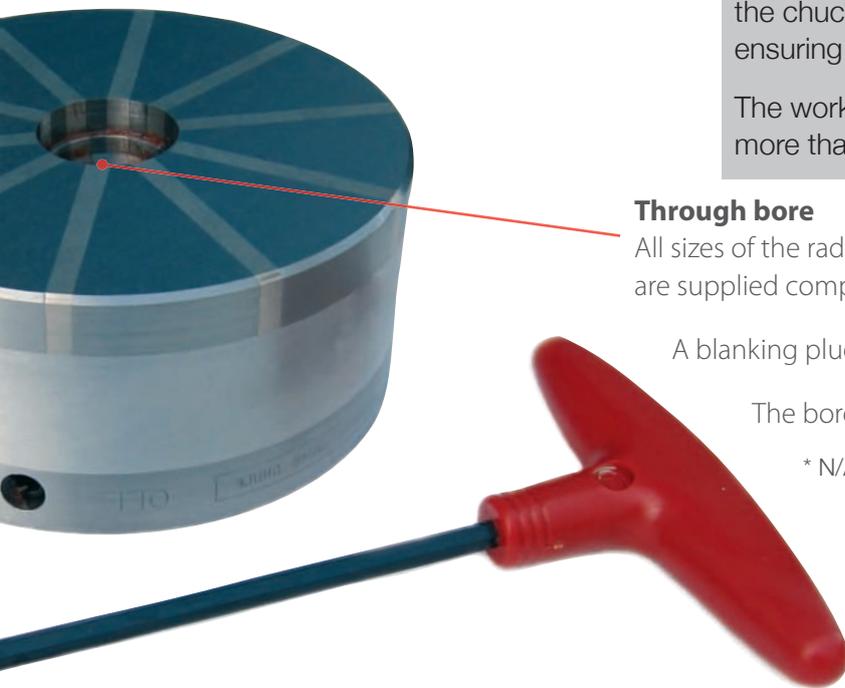
Product number	Dimensions mm						
	A*	B	C	D	PCD E	F	PCD G
AX475C/P	121	45	50.8	6.5	76.2	M6	101.6
AX651C/P	167	60	76.22	6.5	101.6	M10	139.7
AX91C/P	229	60	85.8	6.5	114.3	M10	190.5
AX12C/P	305	72	152.4	4.75	184.15	M12	254

\*Reference diameter only



### Variable hold on both parallel and radial pole versions

(Operating handle can be stopped in any position)  
Provides option of partial (variable) hold essential for clocking the work concentrically prior to switching to full power.



### Premier Radial Pole Chuck

Ideal for a wide range of precision grinding and medium/heavy turning applications, the radial pole is the best option for ring type applications such as inspection and precision grinding.

The radial pole is the best option for heavy turning on ring type components.

The design concentrates the entire magnetism from the chuck to the point in contact with the workpiece, ensuring excellent hold.

The workpiece on this type of chuck should not cover more than 50% of the pole area.

### Through bore

All sizes of the radial pole chucks from the 150mm diameter and above are supplied complete with a through bore.

A blanking plug is available for when the bore is not required.\*

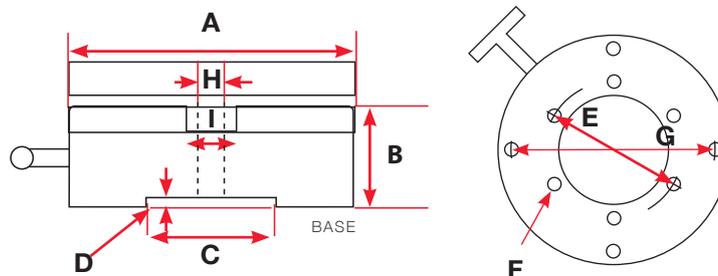
The bore is ideal for through spindle coolant applications.

\* N/A for NR100C.

### Radial Pole is radially balanced

While the switching principle is the same on all of the premier range the radial pole version uses a round magnet pack that rotates to switch. This ensures that the chucks stay in balance when rotating and can be spun up to a maximum of 3000rpm.

## Technical Data



Product number	Dimensions mm									Number of Poles
	A*	B	C	D	E	F	G	H	I	
NR100C	100	48	50.8	6.5	n/a	M6	76	n/a	n/a	6
NR150C	150	69	76.2	4	n/a	M10	102	32	36	10
NR225C	225	71	85.8	5	114.3	M10	190.5	50	54	14
NR300C	300	71	152	5	184	M12	254	62	66	18

# Standard Chuck Range

## Standard Rectangular Chucks

Available in a choice of 2 pole formats.

Both options are manufactured with steel and brass laminations and integral high performance neodymium magnets in the top plate to enhance the performance.

### Top plate

Rectangular chucks have full width active top plate  
Both units can be drilled to a depth of 3mm.

### Robust chrome plated side and end stops

For location on product and fencing in the smaller parts.

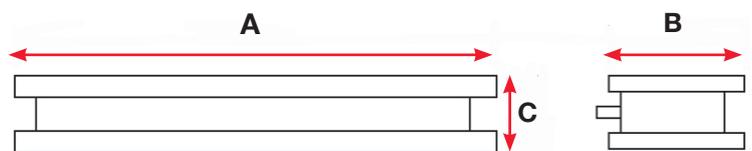
### Base plate

Recessed ends for fixing the chuck to the machine bed with the clamps supplied.  
(Tee nuts not included).



## Technical Data

Product number		Dimensions mm		
STD POLE	FINE POLE	A	B	C
ERSP1018	ERFP1018	180	100	50
ERSP1325	ERFP1325	255	130	50
ERSP1530	ERFP1530	300	150	50
ERSP1535	ERFP1535	350	150	50
ERSP1545	ERFP1545	450	150	50
ERSP2060	ERFP2060	600	200	50





## Standard chucks are available with a choice of 2 pole spacings:



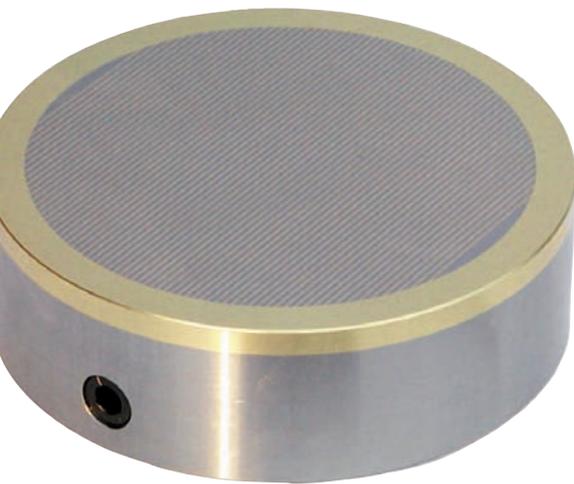
### Fine Pole

1.5mm steel / 0.5mm brass, ideal for thin and small work pieces less than 3mm thick down to 0.7mm.



### Standard Pole

4mm steel / 2mm brass, effectively clamping all work pieces above 3mm thick



Fine pole

### Performance

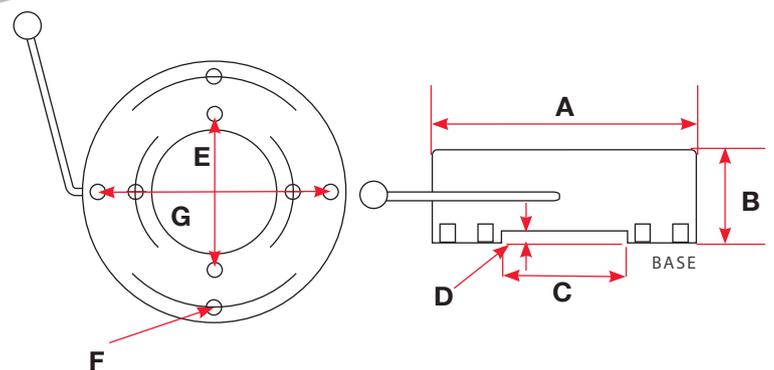
Both variants produce 80N/cm<sup>2</sup> clamping force.

### Fixing details

Rear drilled and tapped holes with datum locator.

### Removable ergonomic operating handle

Handle can be removed once the required power is achieved.



## Technical Data

Product number	Dimensions mm								
	STD POLE	FINE POLE	A	B	C	D	PCD E	F	PCD G
ECSP100	ECFP100	100	50	50.8	6.35	76.2	M6	n/a	
ECSP125	ECFP125	125	50	50.8	6.35	76.2	M6	101.6	
ECSP160	ECFP160	160	50	76.2	6.35	101.6	M10	139.7	
ECSP195	ECFP195	195	50	76.2	6.35	101.6	M10	139.7	
ECSP255	ECFP255	255	50	85.73	6.35	114.3	M10	190.5	
ECSP310	ECFP310	310	50	152.4	6.35	184.15	M12	254	
ECSP350	ECFP350	350	50	196.85	6.35	196.85	M12	n/a	

# Workholding Accessories

## Simple magnetic sine tables (short lift)

- Accuracy of sine table within (+/- 5 secs of arc)
- Pole spacing 2mm (1.5mm Steel 0.5mm Brass)
- Sine table calculations included
- Clamping force 80N/cm<sup>2</sup>
- Incorporates neodymium magnets



## Technical Data

Product number	Chuck	Top Plate		Base		Height at Zero	Unit Weight
		Length	Width	Length	Width		
SSTFP1018	ERFP1018	180	100	215	115	73	10
SSTFP1325	ERFP1325	255	130	295	195	78	20.5
SSTFP1535	ERFP1535	350	150	390	165	89	36

## Chuck blocks (For use with Premier Chuck range)

Chuck blocks can be used for a number of reasons:-

- Transfer magnetism from the top plate of the chuck through to the workpiece.
- Support irregular workpieces
- Acts to make the top face of the blocks finer pole for thinner workpieces
- Provides a magnetic side support for taller products

Can be used horizontally or vertically.

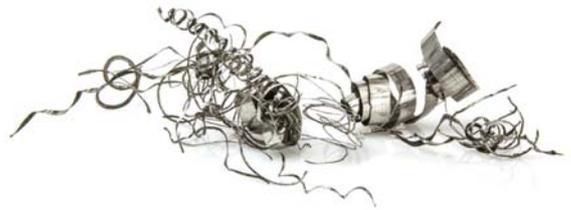


## Technical Data

Product number	Length	Width	Height	Pole direction
950	60	75	30	longitudinal*
950v	50	100	40	longitudinal*

\*Along width

Supplied in matched and numbered pairs.



## 'V' blocks

'V' blocks are ideal for holding cylindrical and complex workpieces for marking, spark erosion, grinding and measurement operations.

Can be used on its base, side or end.

## Technical Data

Product number	Width	Length	Height	Max. dia. of workpiece		Unit Weight
				Top 'V'	Bottom 'V'	
mm						
<b>25 Micron Accuracy</b>						
E934	70	101.6	95.5	65	22	1.98
E934MP	70	101.6	95.5	65	22	3.96
E935	70	80	95.5	65	22	3.12
E935MP	70	80	95.5	65	22	6.24
<b>10 Micron Accuracy</b>						
E933A	70	120	95	65	22	4.4
E933MPA	70	120	95	65	22	8.8
E935A	70	80	95	65	22	2.95
E935MPA	70	80	95	65	22	5.9



MP and MPH= Matched Pair

## Table top demagnetiser

This is a lightweight unit for the removal of residual magnetism following grinding. Some materials will retain magnetism following long periods of magnetic clamping. The more alloys in the material the more magnetism will be retained.

- Operation is simple, the part is simply drawn across the top plate.
- We supply the unit in 3 different power ranges, it is important to select the correct voltage for your installation.

## Technical Data

Product number	Voltage	Width	Height	Depth	Unit Weight
	v	mm			kg
DA955/UK	240	150	117	87	3.83
DA955/EUR	220	150	117	87	3.83
DB956/EUR	110	150	117	87	3.83



# Supermill

The ultimate permanent electro-magnetic chuck

The Supermill heavy duty chuck is the ultimate in workholding, outperforming traditional clamping systems and other milling chucks.

- Provides an instantaneous 100 tonnes m<sup>2</sup> of clamping force
- Failsafe permanent magnetic technology – maintains hold even if power is cut
- Maximises feed rates
- Uniform clamping, no vibration
- Push button, remote control
- 5 side access to workpiece

## Ease of tooling

- As the poles are long parallel strips the tooling is simple.
- Bars can be cut to any length and simply screwed to the base poles to transfer the magnetism into the workpiece.
- This allows the ability to protect the chuck surface and allow through drilling and machining to take place without the risk of damaging the chuck.

## Robust build quality

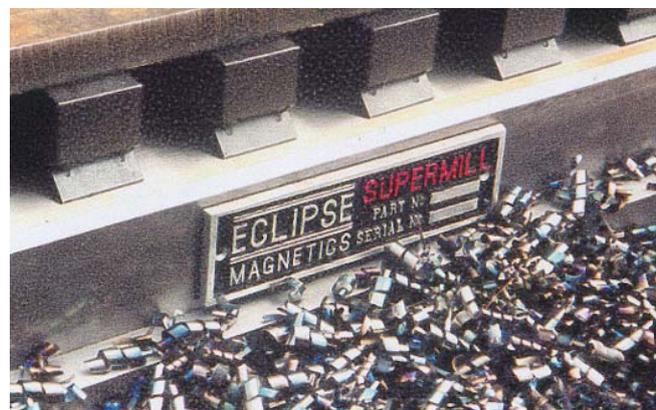
- Milling chuck must be robust to withstand the test of time.
- Many chucks rely on a single central M6 or M8 to provide the structure of the magnet pole.
- The parallel pole design of the Supermill allows for multiple fixings to be made on each pole ensuring the internal rigidity of the chuck.

## Component accessibility

- Being able to machine all 5 sides of the component in a single operation reduces machining time and improves efficiency.
- Reduced vibration also increases, efficiency by allowing faster feed rates, improved finish and longer tool life.

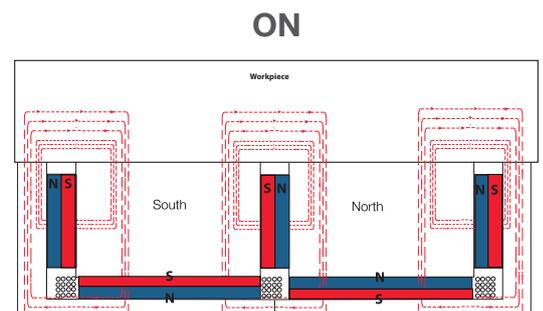
## Parallel pole technology

The parallel pole design ensures maximum clamping force and allows multiple fixtures to be made on each pole.



## How it works

A pulse of power changes the polarity of the base magnet, through the workpiece and out of the workpiece when switching on and off.





## Continuous machining

Supermill can be supplied with pole extensions this allows through drilling and machining without damaging the surface of the chuck.



## Technical Data

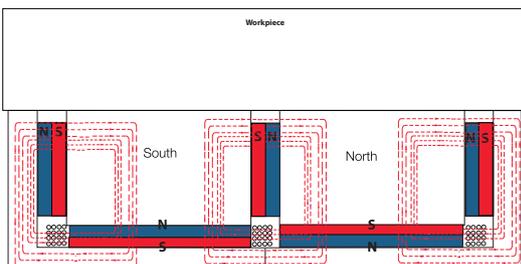
Product Number	Length	Width	Thickness	Weight	Rating
	mm	mm	mm	kg	
SM2618	260	180	95	42	4
SM2625	260	250	95	55	6
SM4518	450	180	95	67	8
SM4525	450	250	95	89	12
SM4532	450	320	95	110	16
SM4539	450	390	95	132	20
SM4546	450	460	95	153	24
SM6318	630	180	95	83	12
SM6325	630	250	95	110	18
SM6332	630	320	95	140	24
SM6339	630	390	95	165	30
SM6346	630	460	95	191	36
SM6353	630	530	95	220	42
SM6360	630	600	95	246	48
SM8118	815	180	95	175	16
SM8125	815	250	95	210	24
SM8132	815	320	95	236	32
SM8139	815	390	95	262	40
SM8146	815	460	95	288	48
SM8153	815	530	95	315	56
SM8160	815	600	95	341	64
SM8167	815	670	95	370	72
SM10018	1000	180	95	139	20
SM10025	1000	250	95	188	30
SM10032	1000	320	95	238	40
SM10039	1000	390	95	287	50
SM10046	1000	460	95	336	60
SM10053	1000	530	95	385	70
SM10060	1000	600	95	435	80
SM10067	1000	670	95	485	90

## Controllers

Product Number	Height	Width	Depth	Voltage	Rating (max)
	mm	mm	mm	v	
EC040/415	300	400	150	415	40
EC080/415	800	600	300	415	80
EC120/415	800	800	300	415	120
EC160/415	800	800	300	415	160
EC200/415	1000	800	300	415	200
EC240/415	1000	800	300	415	240

This directs the magnetic field into

OFF



## Other Products

In addition to our workholding range, Eclipse Magnetics manufacture a wide range of high performance magnetic products for diverse applications.



Sub-micron filtration for industrial fluids



Lifting and handling systems



Magnetic aids for workshop & general engineering applications



Magnetic materials & assemblies



Foreign body removal - separation & detection systems



Heating system filters

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FM31278



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