

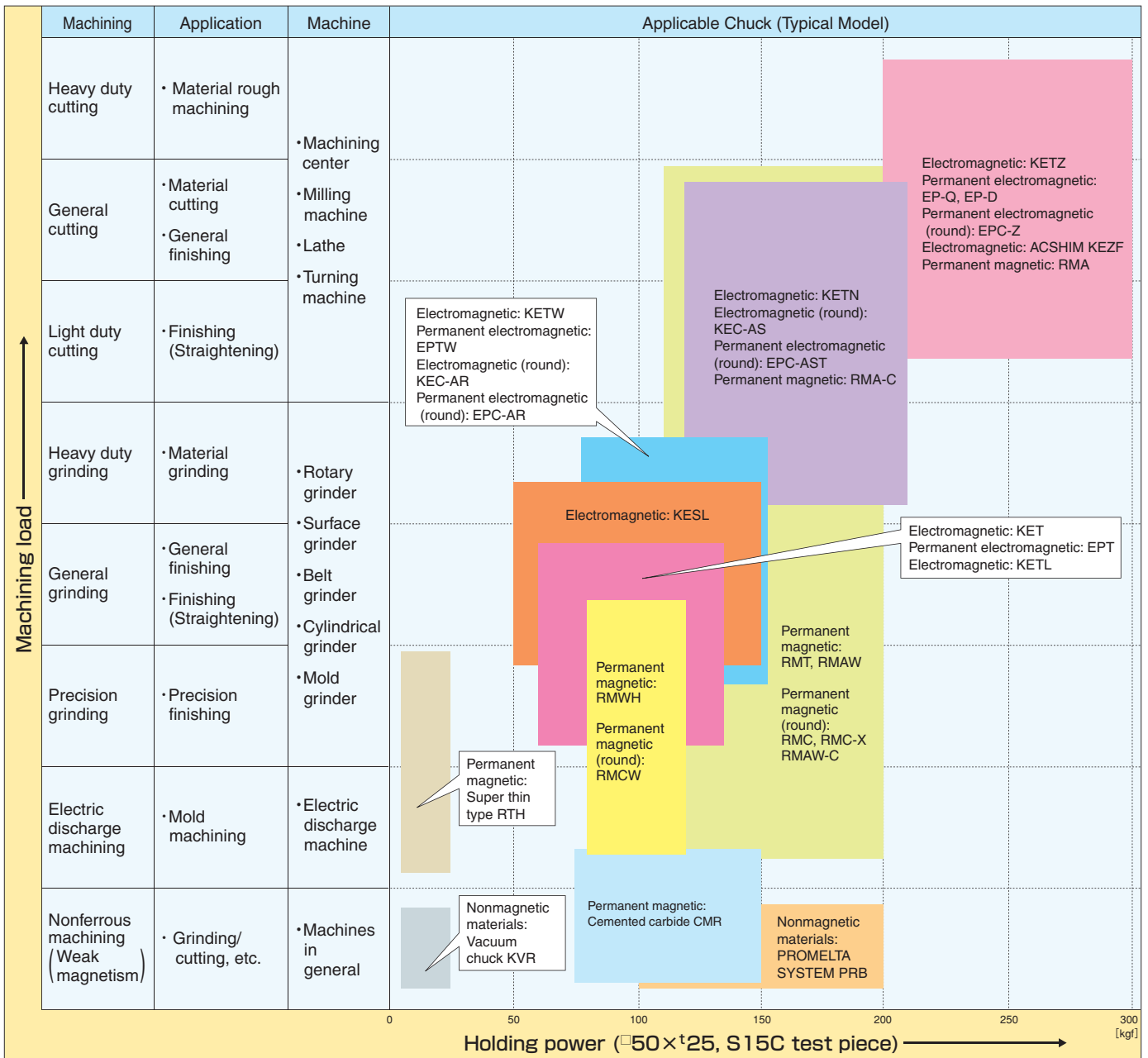
# Magnetic Chucks

Magnetic chucks include several types such as **electromagnetic chucks, permanent magnetic chucks and permanent electromagnetic chucks**, each having particular functional features.

In the machining industry, it has been known since the beginning of the 20th century to apply magnets to holding workpieces. In particular, recent technological development has expanded the scope of applications of magnetic chucks from only grinding machines to heavy duty cutting processes by machining centers, lathes, milling machines, etc. Today the applications have further been expanded to include metallic mold machining and electric discharge machining. Thus, the magnetic chucks that meet these high precision machining requirements play a very important role in many machining fields.

In addition to magnetic chucks, KANETEC offers chucks designed for nonmagnetic materials to respond to requirements in grinding of various materials. We believe you will find products in this brochure that meet your diversified needs.

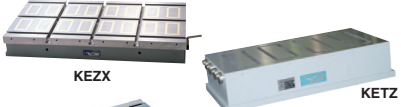
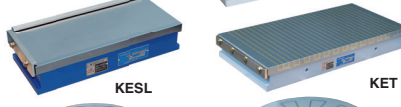


## Types of Chucks by Applications



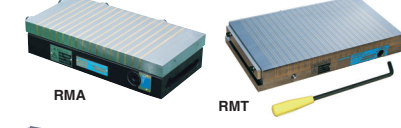
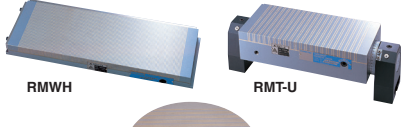
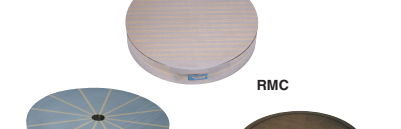
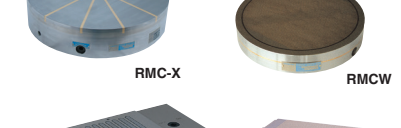

## Overview and Features of Chucks

<b>Electromagnetic chuck</b>	<ul style="list-style-type: none"> <li>● Very efficient since workpieces can be attached/detached by switching operation.</li> <li>● Easy automation by interlocking the chuck and the machine.</li> <li>● Easy adjustment of the holding power.</li> <li>● Easy to make a larger type of the chuck.</li> </ul>	<b>Permanent magnetic chuck</b>	<ul style="list-style-type: none"> <li>● Energy-saving type, requiring no power source. No fear of power failure and capable of holding workpieces for a long time.</li> <li>● No heat generation and thus no thermal distortion due to temperature rise.</li> </ul>
<b>Water-cooled electromagnetic chuck</b>	<ul style="list-style-type: none"> <li>● Constructed to reduce heat generated during power on by water cooling.</li> <li>● Suitable for high-precision machining and exhibits features of electromagnetic chucks.</li> <li>● Most suitable for dry grinding. (Heat from workpieces themselves is absorbed also.)</li> </ul>	<b>Sine bar chuck</b>	<ul style="list-style-type: none"> <li>● Magnetic chuck equipped with a sine bar for high-precision grinding and inspection.</li> <li>● Precisely finished to overall accuracy of 0.005 mm or better.</li> <li>● Various types are available; electromagnetic, water-cooled electromagnetic, permanent magnetic and permanent electromagnetic chucks.</li> </ul>
<b>Permanent electromagnetic chuck</b>	<ul style="list-style-type: none"> <li>● Very efficient since workpieces can be attached/detached by switching operation.</li> <li>● Energy-saving, since electric power is used momentarily for attaching/detaching workpieces only.</li> <li>● High accuracy because of no thermal distortion due to heat generated during power on.</li> <li>● No change in the holding power in the event of power failure while the workpiece is being held.</li> </ul>	<b>Vacuum chuck</b>	<ul style="list-style-type: none"> <li>● Holds workpieces by action of atmospheric pressure.</li> <li>● Vacuum chucks nonmagnetic materials.</li> </ul>
		<b>PROMELTA system</b>	<ul style="list-style-type: none"> <li>● Secures workpieces to a dedicated chuck using workpiece fixing agent.</li> <li>● Secures nonmagnetic materials.</li> </ul>

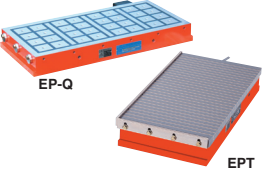
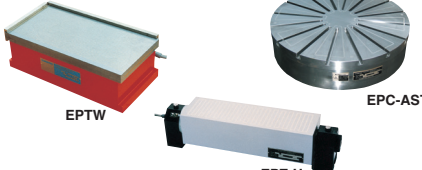
## Types of Electromagnetic Chucks

Type	Model	Application	Applicable Machine	Remarks
With T-groove	KEZX	Heavy duty cutting high-speed cutting	Machining center Milling machine Large planomiller	
Super powerful type	KETZ			
Powerful waveform type	KETN	Cutting		
Lateral fine pitch type	KESL	Grinding, light duty cutting, belt grinding	Milling and grinding machine, mass-production saw blade grinder	
Air-up type	KETB			
Standard rectangular type	KET	Grinding, light duty cutting	Grinder	
Micropitch type	KETW	Thin workpiece grinding		
Tilt type	KET-U	Mold grinding		
Connecting and tilt type	KET-UT	Large workpieces, angular grinding of cutters		
Round type	KEC-AR	Ring pole: Grinding	Grinder, lathe, rotary grinder, turning machine (face lathe)	
	KEC-AS	Star pole: Cutting		
Water-cooled type	KCT/KCT-U	Grinding	Grinder	
	KCC	Grinding, rotary grinding	Grinder, rotary grinder	

## Types of Permanent Magnetic Chucks

Type	Model	Application	Applicable Machine	Remarks
Powerful type	RMA	Cutting, heavy duty cutting	Milling machine	
For small and thin workpieces	RMAW	Light duty cutting and grinding of small and thin workpieces	Grinder, milling machine	
Standard type	RMT	Light duty grinding and cutting of thin to thick workpieces	Grinder, electric discharge machine	
Rectangular type, micropitch	RMWH	Fine-pitch grinding of small and thin workpieces, holding in liquid	Grinder, electric discharge machine	
Tilt type	RMT-U	Mold grinding	Grinder	
Powerful round type	RMA-C	Cutting	Lathe	
Star-pole round type	RMC-X	Light duty cutting, grinding	Grinder, lathe	
Standard round type	RMC			
For small and thin workpiece	RMAW-C			
Round type, micropitch	RMCW	Universal grinding of thin to thick workpieces	Grinder	
Super thin type	RTH	Light duty grinding and high-speed grinding		
For cemented carbide	CMR	Grinding of weak magnetic materials such as cemented carbide	Electric discharge machine	
Rectangular type with jet hole	RMT-ED	Improved water tightness, securing workpieces during electric discharge machining		
Round type with jet hole	RMC-ED			
Rectangular type, micropitch	RMWH-ED			

## Types of Permanent Electromagnetic Chucks

Type	Model	Application	Applicable Machine	Remarks
Powerful type	EP-Q	Heavy duty cutting, general cutting	Milling machine, machining center	
Demagnetizing function type	EP-D			
Rectangular type	EPT	Grinding	Grinder Lathe, turning machine	
Micropitch type	EPTW	Grinding thin workpieces		
Tilt type	EPZ-U	Mold grinding	Cylindrical grinder, rotary grinder	
Round type	EPC	Turning, grinding		

# Magnetic Chucks

## Holding Power of Magnetic Chucks

The holding power varies largely depending on the type of magnetic chucks and material, thickness and attractive area of workpieces and distribution of mass and surface roughness of the attractive face of workpieces. The following graphs show typical examples; you can refer to them for tendency. Please note, however, that values differ slightly among chucks. Always locate workpieces in such a manner that the holding area is positioned over both the N and S poles.

## Holding Power and Pitch between Poles

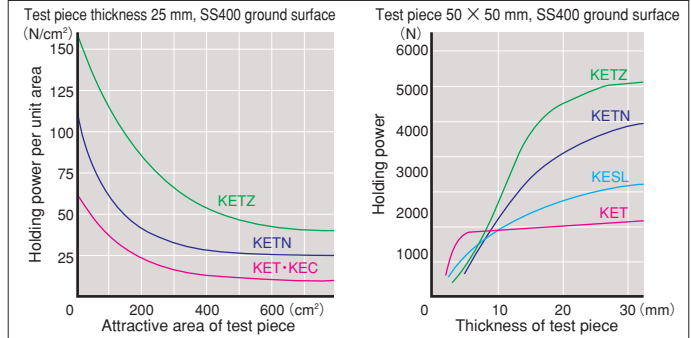
There is no absolute rule for selection of pitches suitable for workpieces. A general guide, however, is that the best condition for holding is that the thickness of workpieces is 2 to 4 times the pitch.

To attract a workpiece firmly, it should be placed over the N pole and S pole, and accordingly, the attractive face of workpieces must at least be 3 times the pitch.

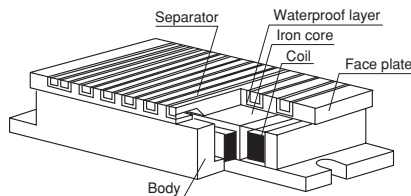
## An example of holding power <<Electromagnetic chuck>> (1N≒0.1kgf)

● Relation between attractive area of workpiece and holding power

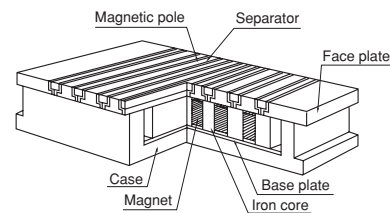
● Relation between thickness of workpiece and holding power



## An example of construction of rectangular electromagnetic chuck

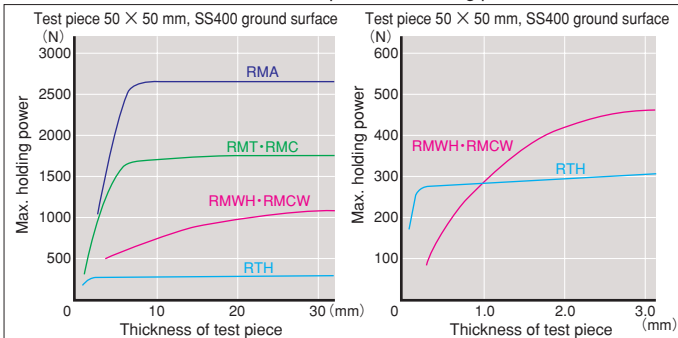


## An example of construction of rectangular permanent magnetic chuck



## An example of holding power <<Permanent magnetic chuck>> (1N≒0.1kgf)

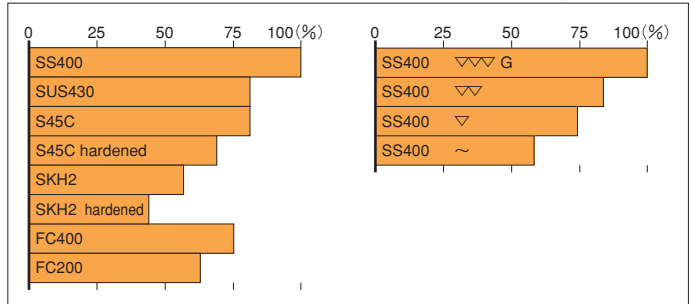
● Relation between thickness of workpiece and holding power



## Relation between material and holding power <<Chucks in general>>

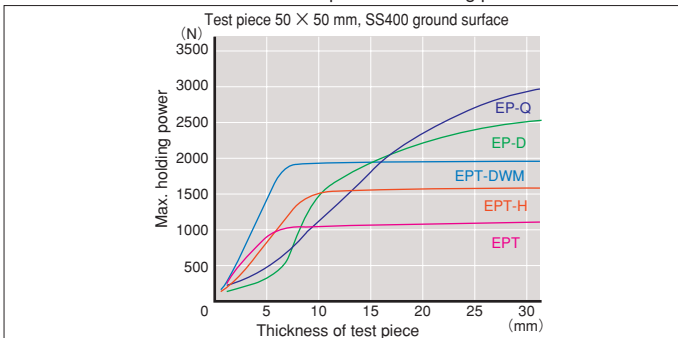
● Difference in holding power due to materials (%)

● Difference in holding power due to attractive surface roughness (%)



## An example of holding power <<Permanent electromagnetic chuck>> (1N≒0.1kgf)

● Relation between thickness of workpiece and holding power



## Selection of grinding fluid

The separator part of the chuck work faces is made of brass, resin, etc. Select grinding fluid that does not corrode these materials. For details, please consult with grinding fluid suppliers.



These magnetic chucks employ special resin for bonding attractive face structural members, instead of solder that is normally used, but is an environmentally hazardous substance.

※The data shown in an example of holding power is reference data taken from typical models and does not indicate warranted values.

※Use the Facsimile Communication Form (Selection Data) at the end.

## Standards

The quality standards of electromagnetic chucks have been established as described in the right-side table for dimensional accuracy (flatness/parallelism), holding power, electrical performance (withstand voltage/insulation resistance/temperature rise limit) and water resistance including testing methods.

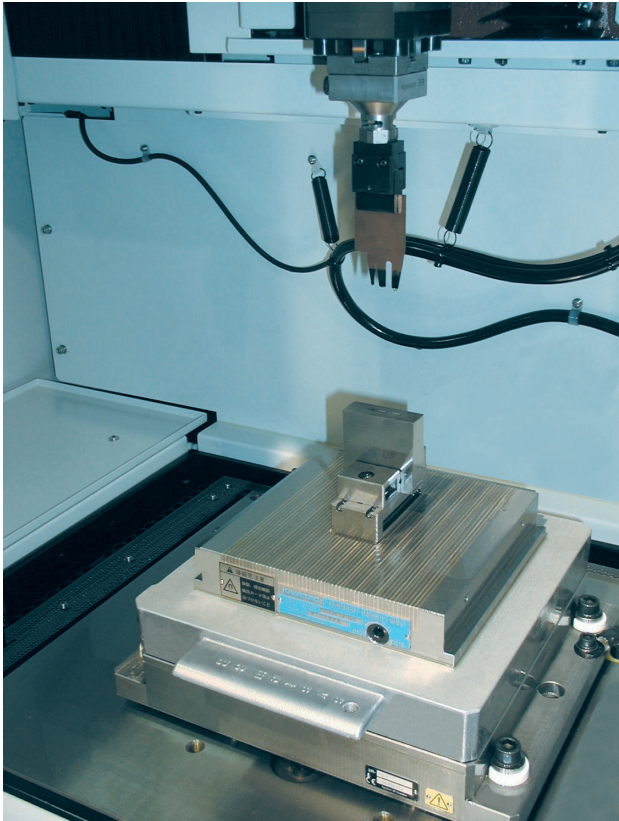
## Standards of electromagnetic chucks

	(mm)			
Length or diameter of face plate	Up to 300	Over 300 up to 600	Over 600 up to 900	Over 900
Flatness	0.01	0.015	0.02	0.025
Parallelism	0.02	0.03	0.04	0.05
Holding power	The holding power on the chuck face plate must be 98.1 N (10 kgf) or over in average and 49 N (5 kgf) or over in the weakest area.			
Withstand voltage	Dielectric breakdown between the charged part and the body is not allowed. (1500 VAC, 1 min.)			
Insulation resistance	The insulation resistance must be 5 ΩM or over. (Measured with 500 V insulation resistance tester)			
Temperature rise	The temperature rise on the chuck work face must be below 15°C. (Powered on for 3 hours)			
Water resistance	When a chuck is immersed in water, no water must enter the inside or its insulation performance must not drop.			

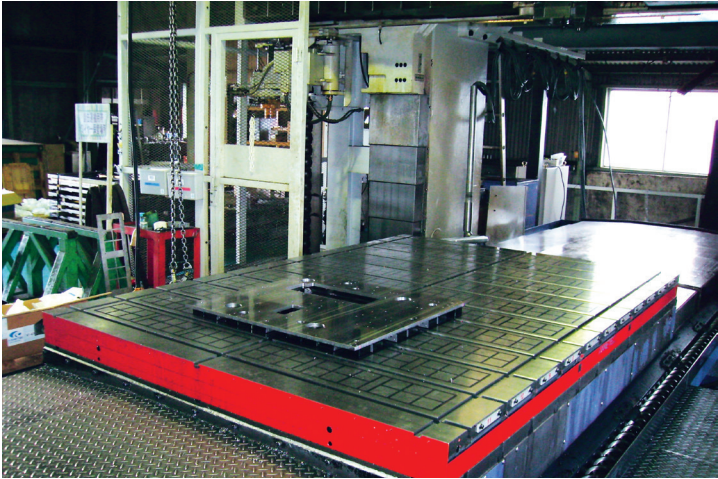
Note: The standards for the holding power and temperature rise vary depending on models.



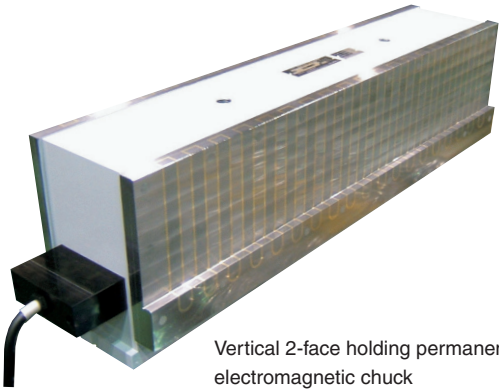
# OVERVIEW OF MAGNETIC CHUCKS



Permanent magnetic chuck for electric discharge machine



Permanent electromagnetic chuck for cutting (An example of large size)



Vertical 2-face holding permanent electromagnetic chuck



Permanent electromagnetic chuck for grinding (An example of large size)

Chucks of special specifications not listed in this catalog are also available.