




For correct use of the electromagnet, be sure to read carefully these “Safety Precautions” and Instruction Manual packaged with the product before installation, operation, maintenance and inspection of it.
In this manual, the safety precautions are classified into “WARNING” and “CAUTION”.

	WARNING	Mishandling may cause hazardous situations resulting in death or serious injury.
	CAUTION	Mishandling may cause hazardous situations resulting in moderate disability or minor injury, or property damage only.

Even if an instruction is classified as “CAUTION”, failure to observe may lead to serious results, depending on the situation.
Since all the instructions are important, be sure to observe them.
Keep the Instruction Manual in a safe place for easy reference when necessary.
Be sure to deliver the Instruction Manual to a final owner who use the product.

Principle


■ Applying direct current to the coil of electromagnet produces attracting magnetic force, which attracts magnetic substance such as iron.

**WARNING**

- If magnetic materials such as iron get close to the electromagnet while the current is flown to its coil, it attracts. Be careful to prevent your hand or leg from being inadvertently trapped.
- Never get your body, hand or leg below suspended object. If it drops, it may cause serious accident.

How to use

- Use the electromagnet with the power within the voltage range marked on it.
- Connect one end of the cord to the positive terminal of power supply and the other end to the negative terminal.
- When a voltage is applied to the electromagnet, it is excited and attracts magnetic substance such as iron.

**CAUTION**

- If you use the electromagnet with a voltage exceeding the marking, it may cause burning the electromagnet.
- The electromagnet is not waterproof. Ingress of water may cause breakdown and prevent use.
- Use the electromagnet at ambient temperature not exceeding 40℃ and at the temperature of attracted object not exceeding 50℃. Failure to observe this may cause burning of the electromagnet.

Residual attracting force

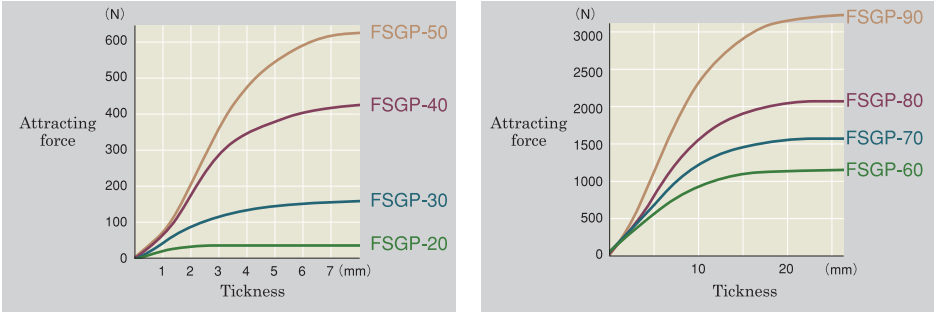
■ Just an interruption of current flown to the coil of electromagnet may not be able to cause detachment of attracted magnetic substance due to residual attracting force resulting from residual magnetism.
For smooth detachment, we recommend you use the electromagnetic controller, Model FSCG or FSCE.

Characteristics of attracting force

■ Maximum attracting force
Maximum attracting force described in the catalog and Instruction Manual is based on the assumption that the attraction is made with its whole attracting surface under the most suitable conditions such as material of attracted object, thickness, finished surface.

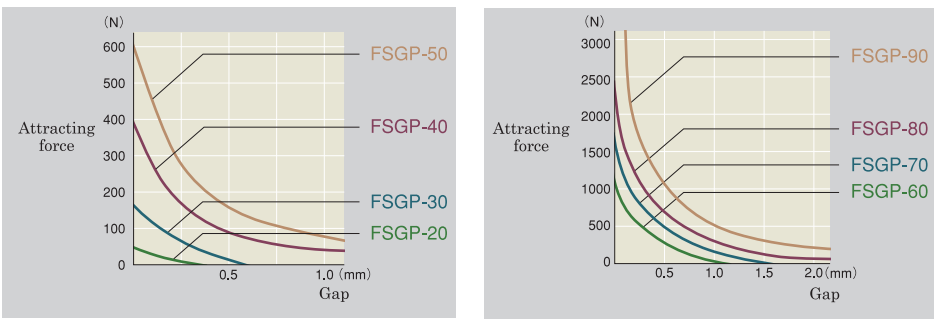
■ Relationship between thickness and attracting force
Attracting force significantly differs depending on the thickness of attracted object.

[Reference material]
The relationship between thickness of cylindrical electromagnet Type-FSGP and its attracting force is as shown below.

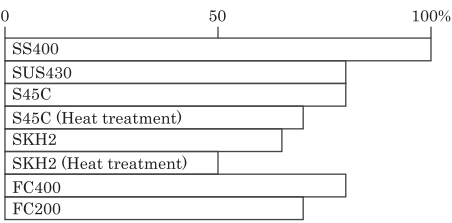


■ Relationship between gap and attracting force
Attracting force significantly differs depending on the gap between attracting surface and attracted object.

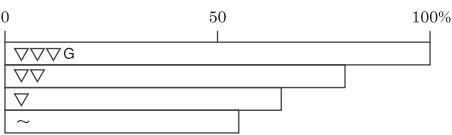
[Reference material]
The relationship between the gap of cylindrical electromagnet Type-FSGP and its attracting force is as shown below.




■ Relationship between material and attracting force
Attracting force significantly differs depending on the material or heat treatment of attracted object.
The following graph shows the percentage of attracting force of each material, assuming that the attracting force of SS400 is deemed as 100%.



■ Relationship between surface roughness and attracting force
Attracting force significantly differs depending on the surface roughness of attracted object. The following graph shows the percentage of attracting force with surface roughness, assuming that the attracting force with ground surface of SS400 is deemed as 100%.



**CAUTION**

- When selecting an electromagnet, consider carefully the conditions of attracted object such as thickness, shape, attraction area, material, heat treatment, and those of transfer such as vibration of equipment, size of gap, center of gravity of attraction. If you feel difficult to select an electromagnet, contact us in advance.