# Specialized for adsorption and fixing in place of thin sheets, glass substrates, and soft workpieces.

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# Ideal for adsorption and fixing in place of thin sheets, glass Adsorption Plate

# Adsorbs workpieces and holds them in place without leaving wrinkles, air bubbles or marks.





750

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# The entire surface area of the adsorption surface contains minute holes of $\emptyset 0.12^*$ at a density of approximately 1,300 holes per square centimeter.



# Adsorption Plate **SP** Series



- •Suitable for adsorption and fixing in place of film and soft sheets
- High processing precision (adsorption surface)
- •Large, evenly distributed adsorption force



RoHS

SP

#### Standard Specifications

Tumo	Rectangular	SP1130	SP1230	SP1330	SP1430	SP1530	SP1630		
Type	Square	SP2130	SP2230	SP2330	SP2430	SP2530	SP2630		
Flatness	s (μm, or less)	15	15	15	25	25	25		
Parallelis	m (µm, or less)	30	30	30	40	40	40		
Weight	Rectangular	0.5	1.2	2.1	3.2	5.8	8		
(kg)	Square	0.4	1.0	1.8	2.9	5.3	7.4		
	Size mm	□50 x 50	□100 x 100	□150 x 150	□200 x 200	□250 x 250	□ 300 x 300		
	Sintered body particle diameter MM	ø0.3 (sphere)							
Adsorption	Aperture ratio	15% or more							
	Material	Stainless steel							
	Finishing	Wrapping processing							
	Material			Aluminu	m casted				
Body	Surface processing	Chror	nated (excep	t for adsorpti	on surface a	nd seating su	rface)		
	Finishing			Grinding p	processing				
Ambient	temperature °C	10 to 40							
Suction	port Rc			1,	/8				



#### Circuit example



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# SP Series



Part no.	Adsorption surface size	Α	В	С	D	Е	F	G	N
SP1130	□50 x 50	80	110	20	50	65	95	70	5
SP1230	□100 x 100	130	160	20	100	115	145	95	9



Part no.	Adsorption surface size	Α	В	С	D	E	F	G	N
SP1330	□150 x 150	180	210	20	150	82.5	97.5	120	16
SP1430	□200 x 200	230	260	20	200	107.5	122.5	145	25
SP1530	□250 x 250	280	310	25	250	132.5	147.5	170	36
SP1630	□300 x 300	330	360	25	300	157.5	172.5	195	49

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Related Products



Square/SP2 30

Part no.	Adsorption surface size	Α	В	С	D	E	F	G	N
SP2130	□50 x 50	80	80	20	50	65	65	55	5
SP2230	□100 x 100	130	130	20	100	115	115	80	9



Part no.	Adsorption surface size	Α	В	С	D	E	F	G	Ν
SP2330	□150 x 150	180	180	20	150	82.5	82.5	105	16
SP2430	□200 x 200	230	230	20	200	107.5	107.5	130	25
SP2530	□250 x 250	280	280	25	250	132.5	132.5	155	36
SP2630	□300 x 300	330	330	25	300	157.5	157.5	180	49

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Please contact SMC for detailed specifications, delivery and pricing.

### 1 Changeable Suction Port Position and Element Type (Particle Diameter)

#### How to Order



Particle diameter Ø0.2

Particle diameter Ø0.3

Time.

Particle diameter Ø0.4





#### Special Order Products

Products with a stainless steel body or in other shapes can be manufactured. Consult SMC separately.
Manufacturable Range Re



Configuration	Square b	Circular board					
	Perpendicular A (mm) (Dimension classification)	Horizontal <b>B</b> (mm) (Maximum dimensions)	Diameter ø <b>D</b> (mm)				
	under 20 to 50	200 or less					
Body size	under 50 to 100	300 or less					
Douy Size	under 100 to 150	er 100 to 150 350 or less					
	under 150 to 200	400 or less	2010 330				
	under 200 to 250	450 or less					
	250 to 370 or less	500 or less					
Adsorption surface size	The maximum dimensions of the adsorption surface are 5mm						
Body material	St	ainless steel					
Douy material	Aluminium						

#### **Recommended Body Thickness**

Body area	Thickness	Equivalent	size
(cm <sup>2</sup> )	(mm)	Square board (mm)	Circular board (mm)
100 or less	14	□100 x 100	113
361 or less	16	□190 x 190	214
625 or less	18	□250 x 250	282
900 or less	20	□300 x 300	339
Over 900	23	—	

\* Order a thickness equal to or greater than that shown on the table. If the thickness is less than that shown, the product may not be able to be manufactured, due to warping.

#### Degree of Flatness (reference value)

<b>.</b>										
Body area	Flatness (mm)		Paralleli	ism (mm)	Equivalent size					
(cm <sup>2</sup> )	Stainless steel	Aluminium	Stainless steel	Aluminium	Square board (mm)	Circular board (mm)				
529 or less	0.010	0.015	0.02	0.025	□230 x 230	260				
1023 or less	0.015	0.02	0.025	0.03	□320 x 320	360				
1517 or less	0.020	0.025	0.035	0.04	□370 x 410	—				
Over 1517	0.025	0.03	0.045	0.05	—	—				

\* This table shows the relationship between body area and degree of flatness when square or circular adsorption plates are manufactured at the recommended thickness.

**Specific Product Precautions** 

Be sure to read this before handling the products.

#### **Caution on Design**

SP Series

## ▲ Caution

#### 1 Workpieces not able to be fixed in place by suction

- · Workpieces of a smaller size than the adsorption surface
- Warped workpieces
- Workpieces with holes or porous workpieces
- · Workpieces with rough adsorption surfaces, or with vacuum leakage.

#### 2 Adsorption force (Theoretical fixing force)

- W = P x S x K (0.15) x 0.1
- W : Adsorption force (N)

P: Vacuum pressure (kPa) S : Adsorption surface area (cm<sup>2</sup>) K : Aperture ratio 0.15 (15%) The adsorption force given is calculated on the assumption

that 15% of the surface area of the adsorption surface is taken up by air vents. This value should be used as a guideline.

#### ③ Vacuum release pressure (Positive pressure)

After applying suction to the workpiece, when using a vacuum release to add pressure from the suction port, use a pressure of 0.1 MPa or less. Failure to do so may result in a reduction in flatness.

#### ④ Definitions of flatness/parallelism

- Flatness : The differential between the maximum and minimum values after plane correction, determined by measuring the adsorption surface side with a 3-D measuring machine.
- Parallelism: When measuring the adsorption surface side in the same manner as with the degree of flatness, on the basis of the surface plate of the 3-D measuring machine, this is the differential between the maximum and minimum values of the datum flatness (theoretical flatness) at the point of measurement.



Flatness

#### <sup>(5)</sup> Do not adsorb and fix the workpiece, and then try to lift it.

This exerts negative pressure between the workpiece and the workpiece platform, and may make adsorption impossible. Use in such a way that the workpiece is held in place on top of the adsorption plate.

#### **Operating Precautions**

# ▲Caution

① Connect vacuum sources such as vacuum pumps and ejectors to the suction port when using.

The connection port uses an Rc 1/8 taper thread for piping. Be sure to use pipe tape or sealant when connecting.

- 2 The ambient temperature range should be from 10 to 40°C. Do not apply heat to the adsorption plate. This may result in a reduction in flatness.
- 3 When mounting to equipment, use M5 hexagon socket head bolts, and fix the adsorption plate on a surface with a high degree of flatness.

Mounting on a surface with a low degree of flatness may result in a reduction in flatness of the adsorption surface.

#### **Operating Precautions**

## A Caution

 Do not carry out additional processing on the adsorption plate.

Deformation resulting from processing may cause a reduction in flatness.

5 Dust may be produced from the adsorption part. Cutting particles and fluids may remain and they cannot be

removed completely. Such foreign objects may stick to the workpiece.

6 Do not apply a pressure or load of 0.1 MPa or more to the adsorption surface.

Doing so may cause a reduction in flatness, damage, or impact marks.

The body is made of aluminum (casted) and the adsorption face and seating surface are untreated. meaning that discoloration or corrosion may result if it is used in an environment with water or oil splatters, or very high humidity.

Even when it is used indoors, discoloration may occur if used over long periods of time.

<sup>®</sup> A clearance of up to 0.2 mm may be opened in the outer periphery of the element.

# **∧** Warning

1 Use the adsorption plate to fix the workpiece in place. Do not use it to adsorb and transport workpieces. If such use is unavoidable, be sure to mount appropriate hardware to prevent the workpieces from falling.

Cleaning

## A Caution

1 If foreign particles attach to the adsorption surface, remove them by blowing with clean air.

2 Do not conduct immersion cleansing with solvents, etc. Doing so may cause swelling and degradation of the adhesives used, and may result in a vacuum leakage or reduction in flatness.

3 Restrict use of solvents to just wiping down with alcohol.

When doing so, do not use a fibrous cloth. The fabric may become stuck in the air vents and become debris.

#### Storage

## Caution

#### ① Store in a normal indoor environment.

Storing in an environment where there is splashing of water or oil, etc., may result in discoloration or corrosion.

2 Do not place objects on top of the adsorption plate. Doing so may result in a reduction in flatness.