

PISCO® Vacuum Pad Mark-free Type User's Manual

Thank you for purchasing our Vacuum Pad Mark-free Type. Please be sure to read this User's Manual before using it to prevent any trouble. Please keep this manual handy with care so you can refer to it whenever necessary.

⚠ Warning

- Take safety measures to prevent falling in advance where a dropping work-piece can cause danger.
- Make sure to install a vacuum pad holder securely. Looseness may cause trouble.
- There is a possibility of troubles due to the leakage of vacuum system, clogging, vacuum pad abrasion, crack, deterioration, the galling of slider part in the holder and the looseness in joints. Carry out maintenance inspection periodically.
- When a work-piece is conveyed by a vacuum pad, consider the acceleration, impacts and wind pressure. Otherwise, the work-piece may drop during conveyance.

⚠ Caution

- The resin made lip of the pad leaves less residual tracing mark, comparing to conventional rubber made vacuum pad. However, carry out the evaluation and check the residual mark on the work under an actual operating condition before use.
- There is a possibility that the flexible adapter of Mark-free Series wears down due to its structure. When using Vacuum Pads Mark-free Series in clean-room, make sure that the dust emission from the abrasion does not affect to the product and production line in advance.
- The flexible adapter of Marking-free Series has a stroke of 1mm in order to suck inclined work-pieces. Spring type holder is recommended for absorbing impacts. Minimize the load from the transverse direction. Otherwise, there is a possibility of malfunction or the dust emission due to the abrasion.
- There is no rotation stopper structure between the flexible adapter and resin pad. This series is not suitable for conveyance with rotary movement.
- Vacuum leakage of resin pads is larger than that of rubber pads. This series is not suitable for vacuum retention. Secure an enough vacuum flow rate and minimize the pressure drop due to the leakage.
- Be sure to wash the suction surface of pad before operation. Adhered substances can cause tracing marks on work-pieces. Pay attention not to scratch suction surface and do not use organic solvent when washing.
- Special stainless steel used in this product is not for the purpose of rust prevention. Rust may be generated depending on the use environment.
- When attaching the flexible adapter to an actual system or the pad holder, tighten hexagonal-column with proper tools. Refer to the following tightening torque and make sure that there is no looseness.

Thread size	Tightening Torque
M4×0.7	0.7 ~ 0.8 (N·m)
M6×1.0	1.5 ~ 2.0 (N·m)

- When attaching vacuum pad to the flexible adapter, there is a possibility of loosening the screw by a creep phenomenon. Carry out maintenance inspection periodically. When there is a looseness of the screw, tighten it with proper tools and replace pads as needed.

Vacuum Pad material	Thread size	Tightening Torque
PEEK	M5×0.8	1.4 ~ 2.1 (N·m)
Conductive PEEK	M5×0.8	2.0 ~ 2.3 (N·m)
POM	M5×0.8	0.6 ~ 0.7 (N·m)

- When using conductive vacuum pad, static electricity needs to be dissipated through a metal plate, etc., used to fix the holder. Otherwise, the static electricity remains on the vacuum pad.
- When using a conductive PEEK pad with a holder equipped with free holder or vacuum filter (optional parts), static electricity needs to be dissipated through the resin pad.

Specification of Pad Holder & Flexible Holder

Fluid medium	Air
Operating vacuum range	0 ~ -100kPa
Operating temp. range	0 ~ 60°C (No freezing)

How to select Vacuum Pad Mark-free type

1. Theoretical suction force

From the pad area and the vacuum level created in pad, the theoretical suction force can be calculated as follows :

$$W = \frac{C \times P}{101} \times 10.13 \times f$$

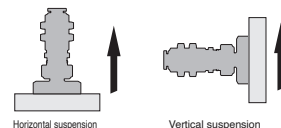
W: Suction force (N)

C: Pad area (cm²)

※) Effective suction area (Refer to ød2 of appearance dimension below.)

P: Vacuum level (-kPa)

f: Safety factors Horizontal suspension 1/4
Vertical suspension 1/8



※ 1) The theoretical suction force is calculated by above numerical formula. However, as the lip is made of resin, the suction force might drop due to the unevenness and rough surface of work piece. Therefore, please make an allowance for the setting value and make sure the safety on actual use.

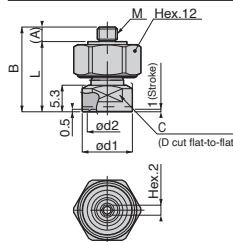
2. Material Characteristics and Application Field

	PEEK	Conductive PEEK	POM
Highest operating temp.	250°C	250°C	95°C
Lowest operating temp.	-50°C	-50°C	-60°C
Weatherability	○	○	×
Acid-resistance	○	○	×
Alkaline-resistance	○	○	△
Self-lubricity	○	○	○
Abrasion-resistance	○	○	○
Volume resistance	—	10 ⁵ ~ 10 ⁶ Ω·cm	—
Application Field	Semiconductor, LCD mfg. Equipment	Semiconductor, LCD mfg. Equipment, Electronics equipment parts	Various Mfg. Line, Food involved equipment, Packing machinery

Evaluation ○ : Excellent: Can be used with little or no influence on the material
○ : Good: May cause problems with the material depending on conditions
△ : Poor: Sufficient confirmation is required before use
× : Fail: Cannot be used because of no resistance or durability

- ※ 1) The above "Physical Properties" shows the data of pad resin material only. The holder of Mark-free Series is not included.
 ※ 2) The above "Physical Properties" shows general properties of resin materials and not a guaranteed value. Carry out the necessary evaluation under an actual operating condition.
 ※ 3) The highest / lowest operating temp. is for momentary usage. Carry out durability evaluation in case of continuous usage under the highest / lowest operating temp.
 ※ 4) Volume resistance is a representative value from the material manufacture, and not a guaranteed value.

Appearance dimension



Unit: mm

Model code	Pad O.D. ød1	Pad I.D. ød2	M	A	B	L	C
VP10Q □ -M4	10	8	M4×0.7	2.9 (3.2)	16.9	14 (13.7)	8
VP20Q □ -M6	20	18	M6×1	4	17.9	13.9	17
VP30Q □ -M6	30	28	M6×1	4	17.9	13.9	27

※) Parenthetic dimensions are the one with non copper metal specification (-S3).

※) Please make inquiry about other details to our nearest sales office.

NIHON PISCO CO.Ltd.

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