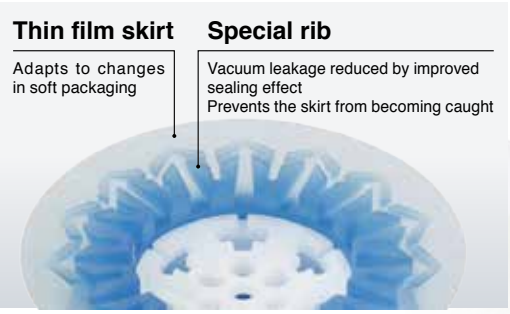
Vacuum Pad/Bellows Type

ø20, ø25, ø32, ø40, ø50

New

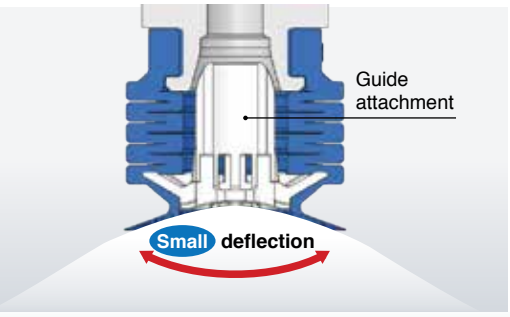
Adsorption transfer of workpiece with a soft film flexible packaging

Thin film skirt and special shape rib



Guide attachment function

Acceleration/deceleration: Adsorption transfer possible at 4G*1
Deformation of pad and deflection of workpiece are reduced.
Sucking prevention



*1 Based on SMC's specific testing conditions (p. 8)

FDA (USA Food and Drug Administration) regulations compliant materials are used for pad and guide attachment.

Blue colored pad

Easy to distinguish the vacuum pad by color during contamination inspection

ZP3P-JT Series

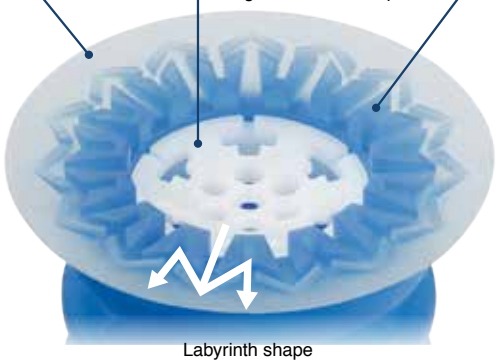
Unstable workpiece such as bagged liquid or powder can be transferred.

Thin film skirt Improved sealing

Skirt adaptable to changes in packaging shape

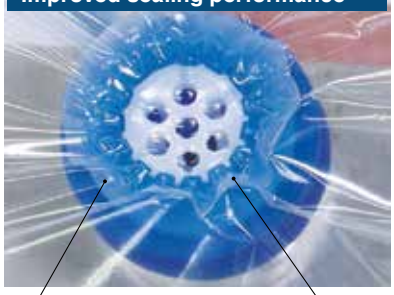
Guide attachment

Prevents workpiece from being sucked into the pad



Labyrinth shape

Special rib Vacuum leakage has been reduced. Improved sealing performance



Sealed by contact of ribs

Prevents the skirt from becoming caught

Liquid filled packaging

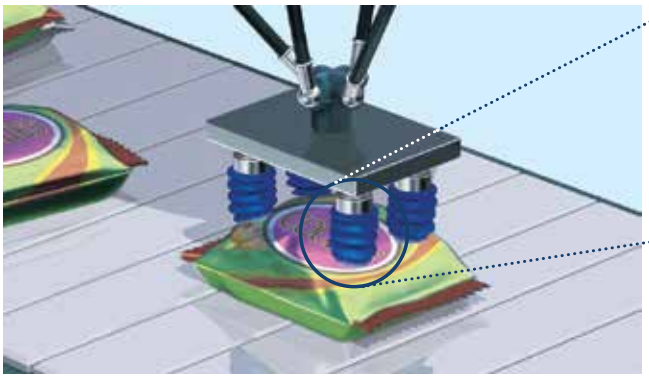
Powder filled packaging

Gas filled packaging

Pouch packaging

Guide attachment

Deformation of pad and deflection of workpiece during adsorption transfer are reduced.



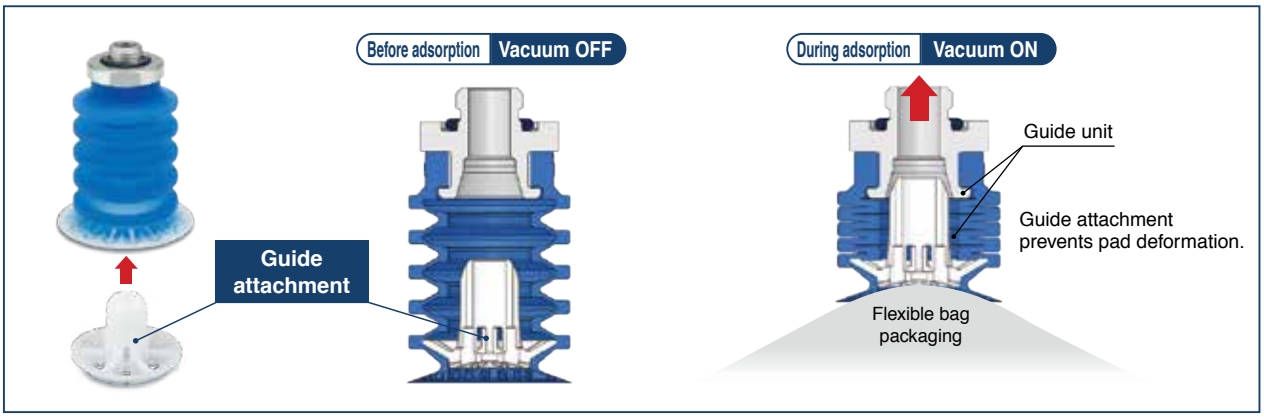
With guide attachment

Small deformation and deflection

Without guide attachment

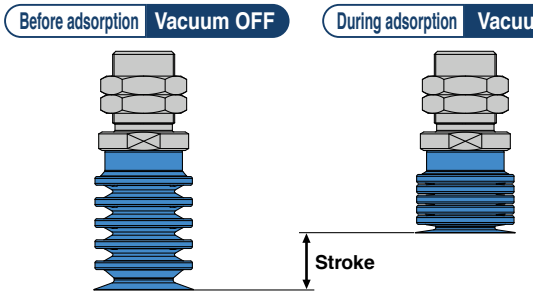
Large deformation and deflection

Transfer conditions	Pad diameter: ø40 [mm], Workpiece mass: 700 [g], Supply pressure: –85 [kPa], Acceleration/Deceleration: 4 [G]



5.5-Stage Bellows Type

- **Adaptable to changes in height and angle of the workpiece**
- **Ease the impact to the contents**



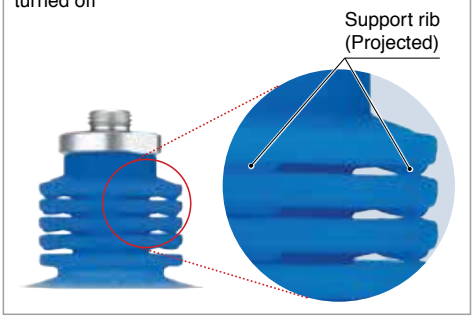
Stroke [mm]

ø20	10
ø25	12
ø32	16
ø40	20
ø50	26

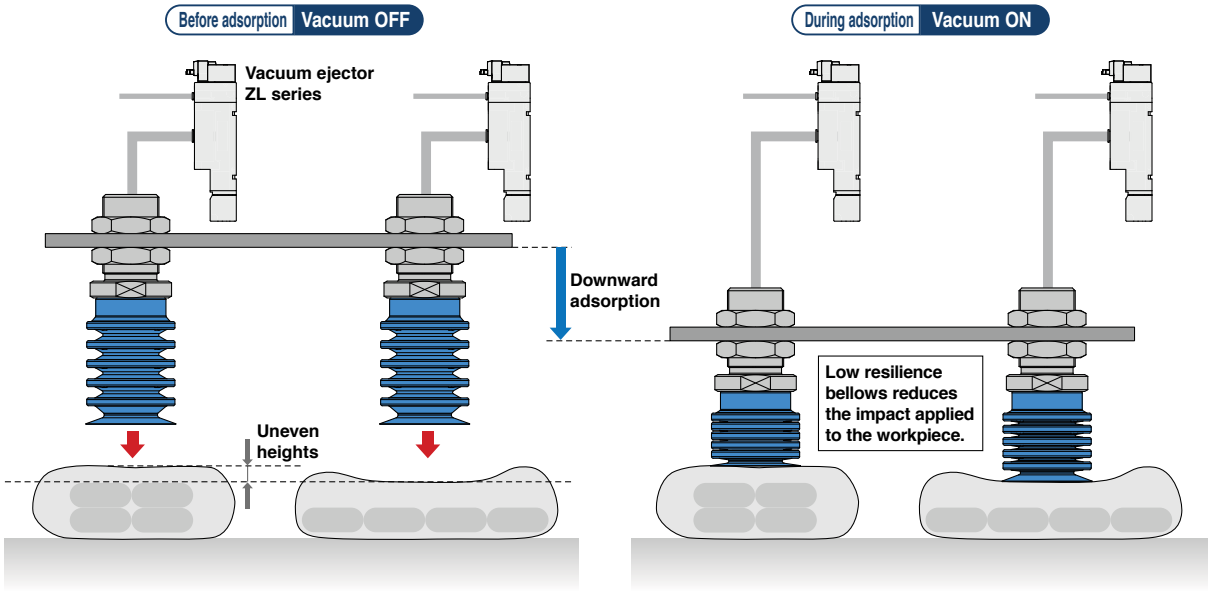
∗ Achieved vacuum pressure: Reference at –85 [kPa]

Sticking is prevented.

Support ribs prevent sticking of the bellows.
Reduces returning failure when vacuum pressure is turned off



Variation of workpiece height is adsorbed by stroke.



Variations

Form		Connection thread/Vacuum inlet		Pad diameter	Material ∗1 FDA (USA Food and Drug Administration) regulations compliant product	Page
5.5-Stage Bellows Type		–		ø20 ø25 ø32 ø40 ø50	Pad: Silicone rubber∗1 Guide attachment: Synthetic resin∗1	4
		Male thread	G1/8, G1/4			4
		Female thread	G1/8, G1/4			5
		Vacuum inlet (Female thread): Rc1/8, 1/4, NPT1/8, 1/4 Connection thread (Male thread): M16 x 1, M20 x 1				5

How to Order

Pad unit **ZP3P – 20 JT 5 SF – WG**

With adapter **ZP3P – T 20 JT 5 SF – AG01 – □**

① ② ③

- ① **Pad diameter**
- **Bellows type**
- **5.5-stage**
- **Silicone rubber**
  Compliant with the FDA (USA Food and Drug Administration) regulation 21CFR§177.
- **With guide attachment**

① **Pad diameter**

20	ø20
25	ø25
32	ø32
40	ø40
50	ø50

With adapter

② **Connection thread/** ③**Vacuum inlet**

② Connection thread				③ Vacuum inlet			Pad diameter [mm]	
Type	Thread	Symbol	Size	Thread	Symbol	Size	ø20, ø25	ø32 to ø50
Direct mounting	Male thread	**AG01**	G1/8	—	**Nil**	—*1	●	—
		AG02	G1/4				—	●
	Female thread	**BG01**	G1/8	—	**Nil**	—*1	●	—
		BG02	G1/4				—	●
Plate mounting	Male thread	**A16**	M16 x 1	Female thread	**B01**	Rc1/8	●	—
					BN01	NPT1/8		
		A20	M20 x 1		**B02**	Rc1/4	—	●
					BN02	NPT1/4		

*1 Use the connection thread.

Pad, adapter assembly, and mounting nuts are included but do not come assembled.

Specifications

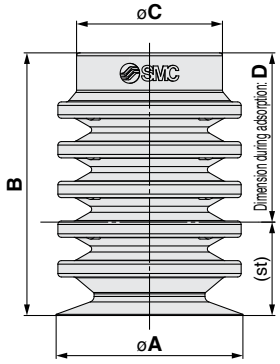
Operating temperature range		–30 to 90°C
Pad	**Material**	Silicone rubber*1
	Color	Blue
	Hardness HS (±5°)	A40/S
Guide attachment	**Material**	Synthetic resin*1
	Color	White

*1 Compliant with the FDA (USA Food and Drug Administration) regulation 21CFR§177.

Dimensions/Models

Pad unit

ZP3P – 20 JT5SF – WG
①



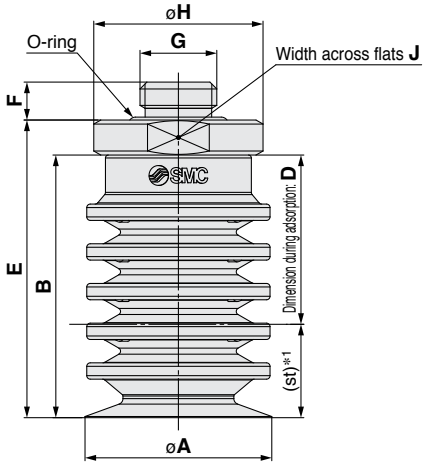
Model						A	B	C	D	(st)*1	Weight [g]
	① Pad dia.	Form	Number of bellows stages	Material	Guide attachment						
ZP3P	20	JT	5	SF	WG	20	31.2	16	21.2	10	4.6
	25					25	35		23	12	6.3
	32					32	45	25	29	16	14.8
	40					40	51.5		31.5	20	20.3
	50					50	59		33	26	26.9

*1 (st) indicates achieved vacuum pressure: Reference at –85 [kPa]

With adapter Direct mounting type (Male thread)

ZP3P – T 20 JT5SF – AG01
①
② **Connection thread (Male thread)**

AG01	G1/8
AG02	G1/4



Model							E	F	G	H	J	Weight [g]	Min. opening hole size of the adapter
	Vacuum inlet direction	① Pad dia.	Form	Number of bellows stages	Material	② Connection thread							
ZP3P	T	20	JT	5	SF	AG01	35.2	5.5	G1/8	18	17	8.3	ø5
		25					39					10.1	
		32				AG02	51	6.5	G1/4	29	27	28.2	ø8
		40					57.5					33.7	
		50					65					40.2	

*1 Same dimension as the pad unit

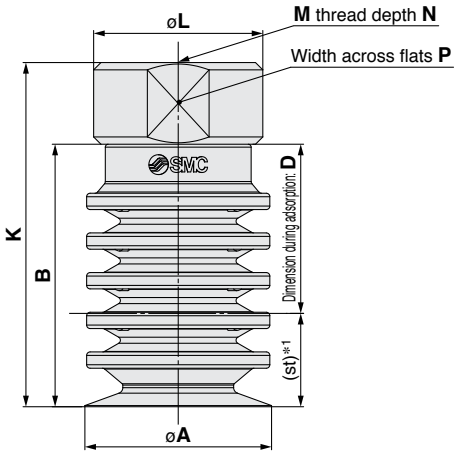
Dimensions/Models

With adapter Direct mounting type (Female thread)

ZP3P – T [20] JT5SF – [BG01]
① ②

② **Connection thread (Female thread)**

BG01	G1/8
BG02	G1/4



Model							K	L	M	N	P	Weight [g]	Min. opening hole size of the adapter
	Vacuum inlet direction	① Pad dia.	Form	Number of bellows stages	Material	② Connection thread							
ZP3P	T	**20**	JT	5	SF	**BG01**	42.2	18	G1/8	7.4	17	11	ø5
		25					46					12.8	
		32				**BG02**	59	29	G1/4	11	27	37.7	ø8
		40					65.5					43.2	
		50					73					49.8	

*1 Same dimension as the pad unit

With adapter Plate mounting type (Male thread)

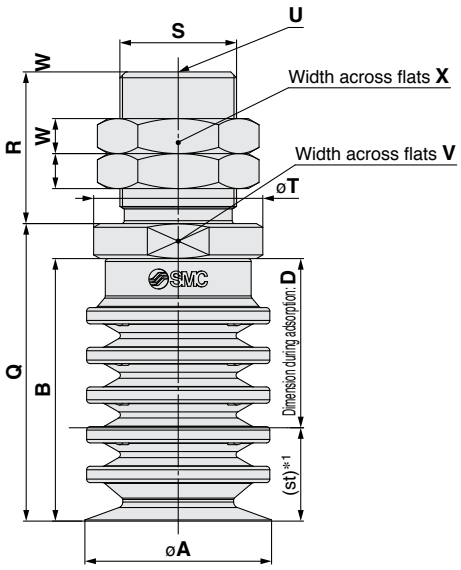
ZP3P – T [20] JT5SF – [A16] – [B01]
① ② ③

Connection thread (Male thread) ②

A16	M16 x 1
A20	M20 x 1

③ **Vacuum inlet (Female thread)**

B01	Rc1/8
BN01	NPT1/8
B02	Rc1/4
BN02	NPT1/4

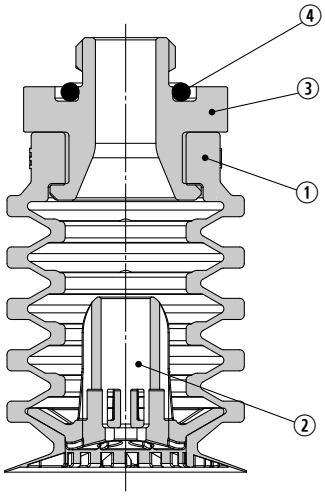


Model								Q	R	S	T	U	V	W	X	Weight [g]	Min. opening hole size of the adapter
	Vacuum inlet direction	① Pad dia.	Form	Number of bellows stages	Material	② Connection thread	③ Vacuum inlet										
ZP3P	T	**20**	JT	5	SF	**A16**	**B01**	35.2	22	M16 x 1	18	Rc1/8	17	5	19	25.8	ø5
							BN01					NPT1/8				25.7	
		25					**B01**	39				Rc1/8				27.5	
							BN01					NPT1/8				27.4	
		32				**A20**	**B02**	51	26	M20 x 1	29	Rc1/4	27	6	24	60.8	ø8
							BN02					NPT1/4				60.6	
		40					**B02**	57.5				Rc1/4				66.3	
							BN02					NPT1/4				66.1	
		50					**B02**	65				Rc1/4				72.9	
							BN02					NPT1/4				72.7	

*1 Same dimension as the pad unit

Construction

Direct mounting type (Male thread): ZP3P-T□JT5SF-A□



Direct mounting type (Female thread): ZP3P-T□JT5SF-B□

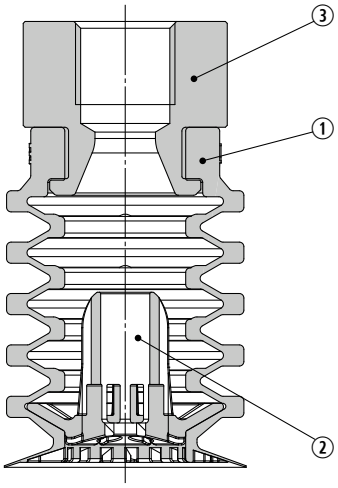
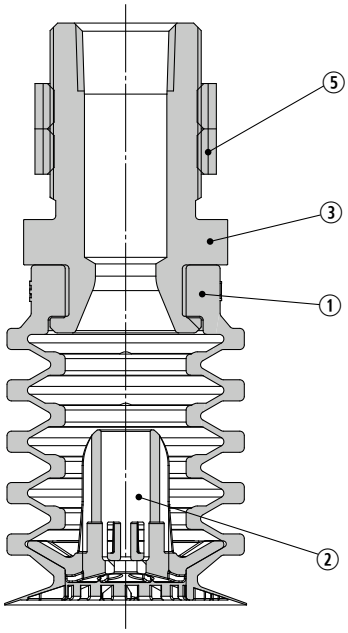


Plate mounting type (Male thread): ZP3P-T□JT5SF-A□-B□



Component Parts

No.	Description	Material (Surface treatment)
1	**Bellows pad**	Silicone rubber*1
2	**Guide attachment**	Synthetic resin*1
3	**Adapter**	Aluminum alloy (Anodized)
4	**O-ring**	Silicone rubber
5	**Mounting nut**	Steel (Trivalent zinc chromated)

*1 Compliant with the FDA (USA Food and Drug Administration) regulation 21CFR§177.

Replacement Parts
Pad Unit (Without guide attachment)

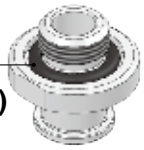
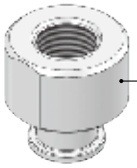
Part number	Applicable pad dia.
ZP3P-20JT5SF	ø20
ZP3P-25JT5SF	ø25
ZP3P-32JT5SF	ø32
ZP3P-40JT5SF	ø40
ZP3P-50JT5SF	ø50

Guide Attachment Unit

Part number	Applicable pad dia.
ZP3PWG-20JT5	ø20
ZP3PWG-25JT5	ø25
ZP3PWG-32JT5	ø32
ZP3PWG-40JT5	ø40
ZP3PWG-50JT5	ø50

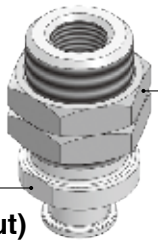
Mounting Bracket Assembly

Adapter Assembly: Direct Mounting Type

Product part number	ZP3P - T ① JT5SF - ② ① Pad diameter ② Connection thread (Male/Female thread)
Component parts	Ⓐ Adapter (With O-ring)   Adapter

Ⓐ Adapter ② Connection thread	Type	Size	Symbol	❶ Pad diameter symbol				
				20	25	32	40	50
	Male thread	G1/8	AG01	ZP3PA-T1JT-AG01		–		
		G1/4	AG02	–		ZP3PA-T2JT-AG02		
	Female thread	G1/8	BG01	ZP3PA-T1JT-BG01		–		
		G1/4	BG02	–		ZP3PA-T2JT-BG02		

Adapter Assembly: Plate Mounting Type

Product part number	ZP3P - T ① JT5SF - ② - ③ ① Pad diameter ② Connection thread (Male thread) ③ Vacuum inlet
Component parts	Ⓑ Mounting nut  Ⓐ Adapter (With mounting nut)

Ⓐ Adapter ② Connection thread	Type	Size	Symbol	③ Vacuum inlet Type	Size	Symbol	❶ Pad diameter symbol				
							20	25	32	40	50
	Male thread	M16 x 1	A16	Female thread	Rc1/8	B01	ZP3PA-T1JT-A16-B01		–		
					NPT1/8	BN01	ZP3PA-T1JT-A16-BN01		–		
		M20 x 1	A20		Rc1/4	B02	–		ZP3PA-T2JT-A20-B02		
					NPT1/4	BN02	–		ZP3PA-T2JT-A20-BN02		
Ⓑ Mounting nut (Single unit) (Sales unit: 10 pcs.)				M16 x 1			KQ08-P01A		–		
				M20 x 1			–		KQ10-P01A		

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website.

1 mm to 0.0393701 inch
1 g to 0.035274 oz
1kPa to 0.145038 psi

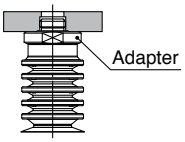
Operating Precautions

⚠ Caution

1. When mounting the product, tighten with the tightening torque shown in the table below.

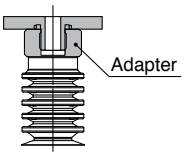
If an applied tightening torque is out of the specification, sealing failure or loose screw can result.

Direct mounting type (Male thread)



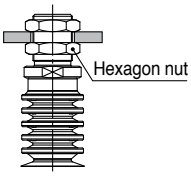
Product part number	Connection thread size	Proper tightening torque [N·m]
ZP3P-T20JT□-AG01	G1/8	3 to 5
ZP3P-T25JT□-AG01		
ZP3P-T32JT□-AG02	G1/4	8 to 12
ZP3P-T40JT□-AG02		
ZP3P-T50JT□-AG02		

Direct mounting type (Female thread)



Product part number	Connection thread size	Proper tightening torque [N·m]
ZP3P-T20JT□-BG01	G1/8	3 to 5
ZP3P-T25JT□-BG01		
ZP3P-T32JT□-BG02	G1/4	8 to 12
ZP3P-T40JT□-BG02		
ZP3P-T50JT□-BG02		

Plate mounting type (Male thread)



Product part number	Connection thread size	Proper tightening torque [N·m]
ZP3P-T20JT□-A16-□	M16 x 1	7 to 9
ZP3P-T25JT□-A16-□		
ZP3P-T32JT□-A20-□	M20 x 1	14 to 17
ZP3P-T40JT□-A20-□		
ZP3P-T50JT□-A20-□		

2. Depending on the achieved vacuum pressure, the theoretical lifting force exceeds the strength of the vacuum pad, deforming or breaking the pad.

The safety factor should be 16 times or more of the theoretical lifting force for horizontal lifting, and it should be 25 times or more for vertical lifting.

[Calculation of theoretical lifting force]

$W = P \times S \times 0.1 \times \frac{1}{t}$

W: Lifting force [N]
P: Vacuum pressure [kPa]
S: Pad area [cm^2]
t: Safety factor Horizontal lifting: 16 or more
Vertical lifting: 25 or more

3. When a bagged workpiece is lifted, the skirt changes its form according to the changing of workpiece form.

As the vacuum pad skirts change its form, the actual lifting force may be below the theoretical lifting force. Before use, please check with the customer's equipment.

4. Mount the guide attachment for use.

Without the guide attachment, the vacuum pad will be deformed, causing adsorption failure.

5. When the vacuum pad is pressed onto the workpiece, keep the stroke range.

When the maximum stroke is exceeded, the guide attachment may contact the adapter, leading to malfunction.

6. When the guide attachment is inserted to the vacuum pad, the guide attachment may damage or break the skirt if it is pulled with excessive force as the skirt is thin.

Damage or breakage of the vacuum pad leads to adsorption failure.

7. When the achieved vacuum pressure is low (approx. –20 [kPa]), the vacuum pad does not completely operate its stroke.

In this case, the guide attachment is not inserted to the adapter and the effect of guide function is not realized adequately.

8. Use the product within the operating temperature range.

The heat resistant temperature of the guide attachment (made of synthetic resin) is 90°C.
Operate within the specified operating temperature range (–30 to 90°C).
For temperature outside of the operating temperature range, contact SMC representative.

9. Do not interfere with the vacuum pad stroke with an external stopper.

The vacuum pad will be deformed, causing adsorption failure or breakage. Or the workpiece will be separated and come out.

10. Vacuum pad is a consumable. Please replace it with a new one when crack, wear, or deformation is confirmed during the periodic maintenance.

11. Before use, please check the transfer conditions with the customer's equipment.

Products are confirmed as transferable under the SMC's specific testing conditions in the table below, but these are not guaranteed values. The transfer ability varies depending on the workpiece material, the friction between the pad and workpiece, moment, wind, vibration, etc. The test with the customer's equipment is necessary.

· SMC's Specific Testing Conditions (Reference)

Pad diameter	Workpiece		Adsorption conditions		Horizontal transfer conditions	
	Material	Load [kg]	Ejector part number	Supply pressure [kPa]	Speed [mm/s]	Acceleration/ Deceleration [G]
ø20	Aluminum metalized film	0.17	ZH15D	–85	1,000	2
ø25		0.27				3
ø32		0.5				3
ø40		0.7				4
ø50		1.1				4

∗ Adsorption is confirmed for 1 stroke. Not for a back and forth or repeated operation.

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

⚠ Safety Instructions | Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

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SMC Corporation

MALAYSIA
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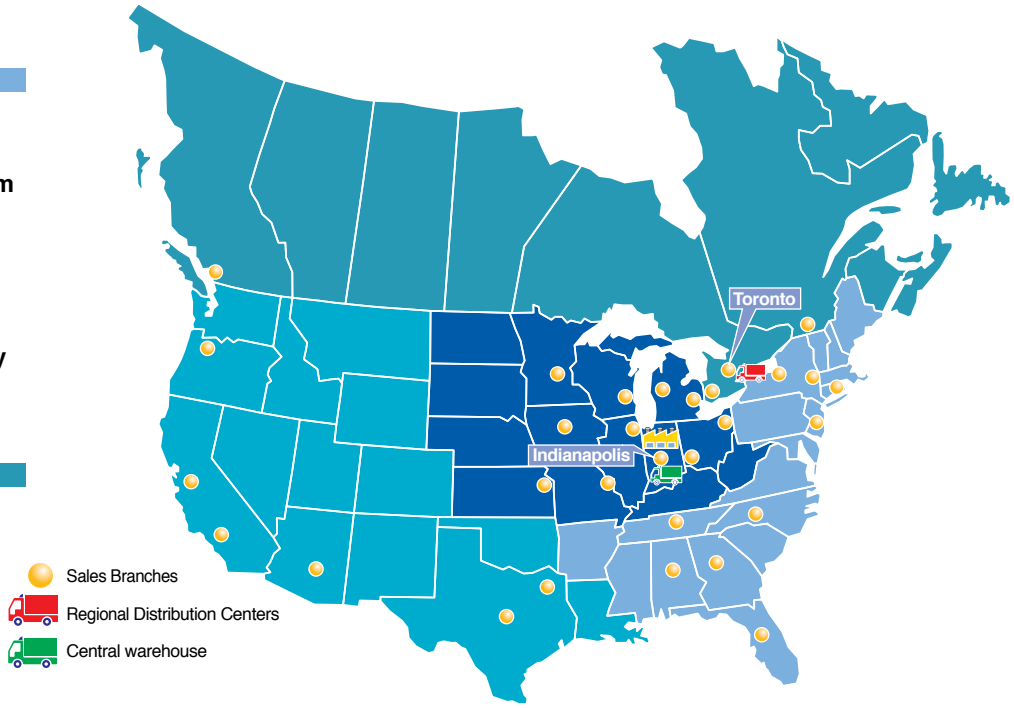

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