



# Vacuum Pads Precautions

Be sure to read this before handling products.

## Design

### ⚠ Warning

1. In cases where the workpieces are heavy or dangerous objects, etc., take measures to address a possible loss of adsorption force (installation of a drop prevention guide, etc.).

In the case of transportation by vacuum adsorption using vacuum pads, the adsorption force is lost when there is a drop in vacuum pressure. Furthermore, since vacuum pressure can also deteriorate due to the wear and cracking of pads, vacuum leakage from piping, etc., be certain to perform maintenance on vacuum equipment.

## Selection

### ⚠ Caution

1. The pad materials which can be used differ depending upon the operating environment.

An appropriate pad material should be selected. Furthermore, since vacuum pads are manufactured for use with industrial products, they should not come into direct contact with medicines, food products, etc.

2. Depending upon the weight and shape of the workpieces, the diameter, quantity, and shape of pads suitable for use will vary.

Use the pad lifting force table for reference. Also, the selectable pads will differ based upon conditions other than the above, such as the condition of the workpiece surface (presence or absence of oil or water), the workpiece material, and its gas permeability. Confirmation is necessary by actually performing vacuum adsorption on the subject workpieces.

3. Use a buffer for the adsorption of fragile workpieces.

The cushioning performed by the buffer is also necessary when there is variation in the height of workpieces. If further positioning of the pads and workpieces is required, a non-rotating buffer can be used.

4. The life of the buffer will be reduced if lateral force is applied to the buffer shaft.

Note that sometimes a load is applied to the buffer by a piping tube (pulling, pressing, etc. in a lateral direction).

5. Do not apply an impact or large force to a pad when adsorbing a workpiece.

This will cause the deformation, cracking, and wear of the pad to be accelerated. The stiffening ribs, etc., should touch lightly, while staying within the pad skirt's deformation range. Positioning should be performed accurately, especially in the case of small-diameter pads.

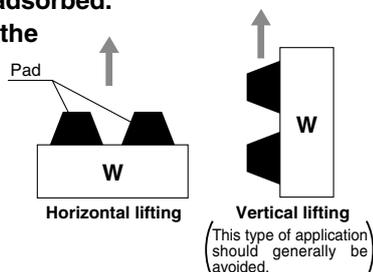
6. When transporting vertically, factors such as acceleration, wind pressure, and impact force must be considered in addition to the workpiece weight.

Use caution particularly when lifting items such as glass plates and circuit boards because a large force will be applied by wind pressure. When a workpiece which is oriented vertically is transported horizontally, large forces are applied by acceleration when movement is started and stopped. Furthermore, in cases where the pad and workpiece can slip easily, accelerations and decelerations of horizontal movement should be kept to a minimum.

7. When transporting flat shaped workpieces that have large surface areas using multiple pads, care must be taken in arranging the pads, so that the workpieces are evenly adsorbed.

8. Use caution since the workpiece could rotate during transfer.

Use of more than one pad for each workpiece is recommended.



## Maintenance

### ⚠ Caution

1. Perform pad maintenance regularly.

Since pads are essentially rubber, deterioration is unavoidable. The rate of deterioration depends upon factors such as conditions of use, environment, and temperature. Regular maintenance should be performed. If any damage, splitting, cracking, or abrasion has occurred in a pad, replace it immediately. Also, take care not to damage the outside of the pad.

## Storage

### ⚠ Caution

1. It is recommended to store vacuum pads in the environment shown in the table below.

Storing in an environment other than that recommended below may lead to changes in properties (deformation, discoloration, cracking, increased adhesiveness, etc.).

Table 1. Recommended Storage Environment for Vacuum Pads

Temperature	15 to 25 [°C]
Humidity	50[%] or less, No condensation
Other	Location that is shaded from direct sunlight or fluorescent light Location without the presence of ozone (For NBR and conductive NBR)