The Influence of the size of the transport load

The carrying capacity of a vacuum lifting device depends not only on the carrying capacity of the suction cups but also or the carrying frame and on the size of the transport load, especially.

If you transport a larger sheet with a small carrying frame, the suction cups are affected not only by even if distributed gravity (gravitation at power) on the transport load but also additional forces such as bending and leverage forces. Under certain conditions may this lead to the overstressing of an individual suction cup.

Experiment:
(horizontally)
Take a thicker 20 x 30 cm magazine and put it on the fingertips of your out stretched hand.
Now the magazine is nearly straight and flat on your fingertips. You will feel an even pressure on your fingertips.

Now try to move the fingertips equally to the middle of the magazine, (but don't allow the magazine fall down.
You will notice a change in the pressure conditions.
The weight of the magazine has not changed, but additional forces are in affect and these are not distributed equally.

This also happen to the suction cups if the carrying frame is not adapted to the transport load.
With that we have demonstrated the dependency of the transport load size on the horizontal loading case.

Experiment:
(vertically)
Take a thicker 20 x 30 cm magazine and hold it only with your thumb and forefinger at the longitudinal side of the magazine edge. In order to get a good demonstration of this experiment place your "finger tong" in the range 2/5 to 3/5 of the side length. That means quite aware of the middle of the magazine. Hold the magazine up with your "finger tong", so that it hangs vertically down under your "finger tong".
The position of the magazine is inclined. As expected. You need a certain, not too high pressure of your "finger tong", to hold the magazine.

Now try to align the magazine so that the upper edge of the magazine is ligned up horizontally and this only with your "finger tong".
You will feel a change of the pressure conditions of your "finger tong".
The weight of the magazine has not changed but additional forces are in affect and these are not distributed equally.

The same occurs to the suction cups if the carrying frame is not adapted to the transport load.
With that we have demonstrated the dependency of the transport load size on the vertical loading case.

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