Gripper selection

- Depends on the coefficient of friction and the gripping conditions between soft fingers and work piece.

When gripping a workpiece as in the figure as shown above:

F: Gripping force of single finger (N)
n: Number of finger
μ: Coefficient of friction between the attachments and the workpiece
m: Workpiece mass (kg)
g : Gravitational acceleration (=9.8m/s^2)
a : Safe factor

the conditions under which the workpiece will not drop are,

$$n \times \mu F > m \times g$$

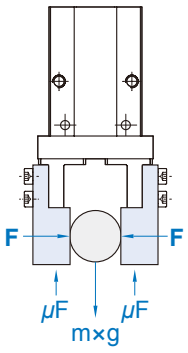
Therefore,

$$F \geq \frac{m \times g}{n \times \mu}$$

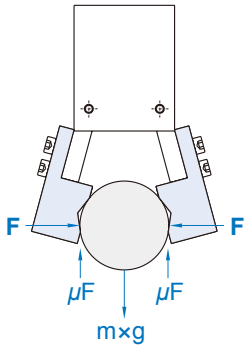
With "a" representing the extra margin, "F" is determined by the following formula:

$$F \geq \frac{m \times g}{n \times \mu} \times a$$

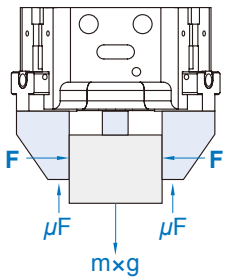
Parallel gripper (2-Finger)



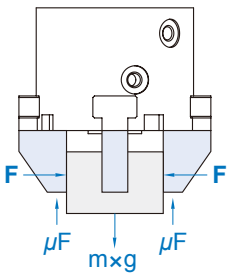
Angular gripper



Parallel gripper (3-Finger)



Parallel gripper (4-Finger)

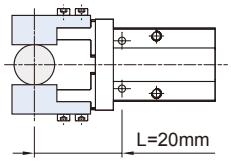


Model selection suggestions

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of single finger can be found at the gripping force table.
3. The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.

Model selection example

In the motion process did not produce high acceleration, deceleration or impact forces, Workpiece mass: 0.3kg , Gripping method: External gripping, Operating pressure: 0.5 MPa, Coefficient of friction (*μ*): 0.1, Holding position: L=20mm (no overhang)

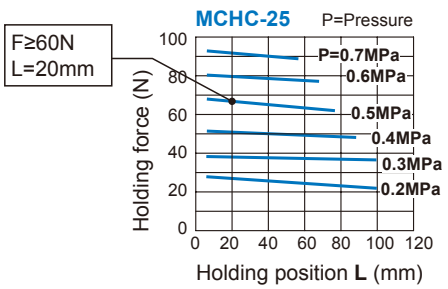


1. Based on the above formula, the required gripping force can be derived:

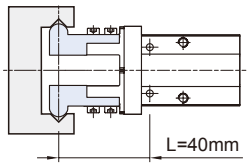
$$F \geq \frac{0.3 \times 9.8}{2 \times 0.1} \times 4$$

$$\geq 60(N)$$

2. From Effective Gripping Force Fig, Operating pressure: 0.5 MPa; Holding position: 20 mm Effective gripping force is greater than 60 (N) So selected **MCHC-25** grippers.



In the motion process did not produce high acceleration, deceleration or impact forces, Workpiece mass: 0.05kg , Gripping method : External gripping, Operating pressure: 0.3 MPa, Coefficient of friction (*μ*): 0.1, Holding position: L=40mm (no overhang)



1. Based on the above formula, the required gripping force can be derived:

$$F \geq \frac{0.05 \times 9.8}{2 \times 0.1} \times 4$$

$$\geq 10(N)$$

2. From Effective Gripping Force Fig, Operating pressure: 0.3 MPa; Holding position: 40 mm Effective gripping force is greater than 10 (N) So selected **MCHC-16** grippers.