**Gripper Basics**

**Parallel gripper**
The jaws movement is on a straight line.

**Angular gripper**
The jaws are pivoted and move on an angular line with a 10° – 40° angle.

**Three jaws gripper**
Is generally used to handle loads of cylindrical shapes, maintaining the same axis, even if different diameter parts are being gripped.

**Radial gripper**
The jaws move on an angular line with a 90° angle; because of this the moving back can be avoided in order to withdraw the gripping tools from the working plane.

**Self-centering**
On the pneumatic gripper generally the jaws are symmetrically moved, and because of this, the load is centered.
Gripping force
They must be built as short and light as possible, to reach the maximum gripping force, keeping the inertia to a minimum.
**Gripper Calculation Example**

Calculation example:
A 1kg load is to handle as in the figure with a coefficient of friction $\mu = 0.1$. The gripper, Gimatic MG-0050, moves upward with acceleration $a=4\text{m/s}^2$
Verify that the safety factor is at least $\eta = 1.5$

$$m = \text{mass}$$
$$g = \text{acceleration of gravity}$$
$$a = \text{acceleration of handling}$$
$$\mu = \text{coefficient of friction}$$
$$\eta = \text{safety factor}$$

$m = 1 \text{ kg}
\quad g = 9.8 \text{ m/s}^2
\quad a = 4 \text{ m/s}^2
\quad \mu = 0.1
\quad \eta = 1.5$

$F = 106\text{N}$
$\eta m(g+a) = 2\mu F$
$\eta = \frac{2\mu F}{m(g+a)} = \frac{2 \times 0.1 \times 106}{1(9.8+4)} = 1.536 \text{ OK}$

![Gripper Diagram](image)