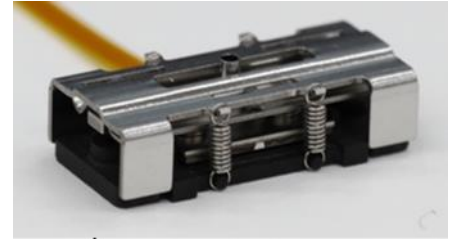


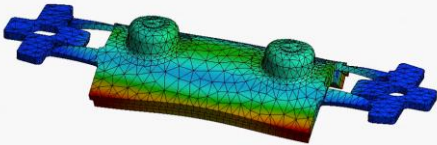
Feature of Canon Linear USM

- High torque/force
- Steady low speed without a gear.
- Low inertia
- Electromagnetic motor carries mass of magnet or iron core and winding.
- Low audible noise -> above 20kHz driving frequency
- High response
- Precise motion with accuracy
- Holding torque/force without power

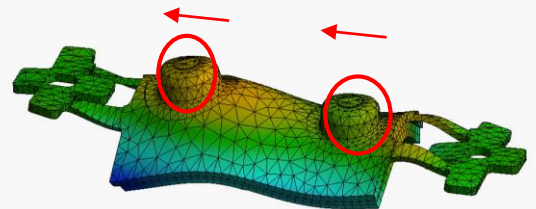
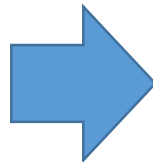
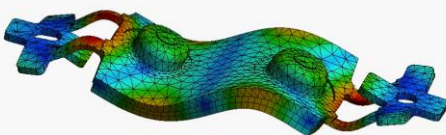


Elliptical motion on the protrusion with feed + thrust

Push up vibration



Feed vibration

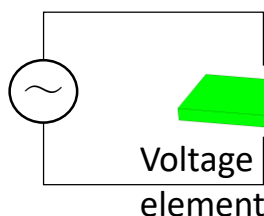


Principle of the USM

Piezo-ceramic elements generate ultrasonic standing wave propagating the stator.

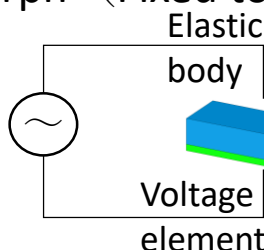
Drive principle ① Voltage element

When a voltage is applied, it expands and contracts due to the inverse piezoelectric effect.



Drive principle ② Unimorph (Fixed to elastic body)

Bending vibration occurs when fixed to metal



The combination of two ultrasonic standing waves produces a ultrasonic traveling wave. Therefore elliptical rotation is generated on the stator surface.

The rotor is in contact with the stator. The elliptical rotation makes it rotate in the opposite direction of the ultrasonic traveling wave due to the frictional force by elliptical rotation .

