

## Hydraulic Micromanipulators

Narishige offers two types of hydraulic micromanipulators, i.e. oil and water hydraulic systems. Each hydraulic system has its own advantages and disadvantages. A suitable system should be chosen in accordance with the application and other requirements. In this web news we discuss the advantages and disadvantages of each hydraulic system.




### Oil Hydraulic Micromanipulator

#### ▼Advantages

- The hydraulic oil for our micromanipulators evaporate slowly, thus the system sustains good condition for a long period of time.
- Compared with water, oil transmits pressure better and responds better for your operation. Particularly, the oil hydraulic system is better suited for quick movement.

#### ▼Disadvantages

- Compared with water, oil is more affected by temperature change and drift occurrence can follow.
- Oil is not durable under ultraviolet light. Direct sunlight and ultraviolet light changes the condition of the oil. If you need to have the system work under such conditions, you need to wrap the hydraulic lines in aluminum foil or by other means.
- You cannot change the oil. When the oil has deteriorated, it must be serviced in our office. The color of the oil is a guide for the necessity of service.

	<b>Pale Blue~Pale Green</b> This is an ordinary condition.
	<b>Pale Yellow~Yellow</b> It does not affect much on the movement. However, the oil condition is becoming inferior. If you feel uncomfortable with the movement, we can provide maintenance service, which includes the necessary adjustment of other parts.
	<b>Reddish Brown~Dark Brown</b> Oil is clotting and not functioning. The oil needs to be changed. When the color is dark brown, the clots can detach from the tube and clog the hydraulic system. In this case, the entire tubing may need to be replaced.

### Water Hydraulic Micromanipulator

#### ▼Advantages

- The expansion rate of water is 1/4 as compared with that of oil. It reduces drift occurrence. (Note: This does not mean that drift occurrence is zero.)
- You can replenish water to the system.

#### ▼Disadvantages

- Water can evaporate from the connection parts more quickly than oil does. When the response of the system is poor, you need to replenish water to the system.
- When the system is operated quickly, the movement may tend to be delayed, compared with the oil hydraulic system.

### Applications

Due to the differences of characteristics, oil hydraulic tends to be utilized for microinjection experiments which require quickness in movement. On the other hand, water hydraulic tends to be utilized for electrophysiology experiments in which drift occurrence should be minimized.

If you have any questions or need further information, please contact us.

Narishige Group Website

URL: <http://narishige-group.com>