



# Flood Prevention in the Laboratory

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Floods result when circulating water escapes from hoses that burst or have connections that fail.

Below are some tips to help avoid creating floods while operating water cooling equipment.

## Water-cooled Condensers

- Use **Tygon tubing** on all water-cooled systems. It's more durable than rubber and more resistant to splitting. Connections must be made with hose clamps.
- Drain hoses from water-cooled systems must be firmly attached in the drain line.
- The use of electrothermal flow monitors are required for water-cooled solvent stills.
- For situations where water-cooled condensers are run continuously, a pressure-sensitive flow detector must be installed on the water outlet feeding the condenser.

## Laser Units

- Thick-walled, reinforced PVC tubing or copper tubing should be used. Connections must be made with hose clamps, or compression fittings. Rubber tubing or connections held with wire should not be used.
- Drain hoses from water-cooled lasers must be firmly attached in the drain line.
- For situations where water-cooled lasers are run continuously, a pressure-sensitive flow detector must be installed on the water outlet feeding the unit.
- New laser cooling systems must be installed according to manufacturer's specifications.

## Install and Maintain Hose Connections to Condensers with Care!

- Use only **tubing** of the appropriate diameter and thickness for carrying the cooling water. Rubber **tubing** will crack or split with time because they are susceptible to chemicals and should be replaced frequently. **Tubing** that is too small or too large in diameter cannot be properly secured.
- Secure **tubing** to the nozzle of the water line and to the inlet and outlet of the condenser with appropriately sized metal or plastic hose clamps or with plastic locking disconnects. Wire is not a substitute.

## Things to Remember

- Make sure the drain is not clogged or blocked.
- Make sure exit **tubing** are well secured in the sink drains by having a long piece of metal tubing secured in the drain and connected to the exit tube.
- Install a pressure regulator on the inlet lines to equipment such as solvent stills that are used for extended periods.
- Whenever possible, avoid running water overnight or on weekends.
- Conduct a visual inspection of all cooling water **tubing** in your laboratory on a monthly basis and replace as necessary.

### DO

- Do use **Tygon tubing**, or something equivalent.
- Do conduct a visual inspection of all cooling water **tubing** in your laboratory on a monthly basis and replace as necessary.
- Do avoid running water overnight or on weekends.
- Do make sure the drain is not clogged or blocked.

### DO NOT

- Do not use rubber tubing or wire to make connections on water-cooled systems.
- Do not use rubber tubing or wire to make connections to laser units.
- Do not use rubber **tubing**, they are susceptible to chemicals and will crack or split with time.