

Heating non-flammable liquids and solids in test tubes

For using Bunsen burners and especially use of different flames, see *CLEAPSS Student Safety Sheet 92*.

For heating flammable liquids and solids, see *CLEAPSS Student Safety Sheet 94*.

For handling hot liquids in beakers, see *CLEAPSS Student Safety Sheet 95*.

Test tube holders

- **Test tube holders** (if of the metal wire design shown right) **must have the O-ring in the correct place, so that the clamping ends cannot slip apart.** (The test tube holder shown on the right does *not* have the O-ring in the correct position and should not be used).
- **Wooden peg-type test tube holders are also suitable if they are not badly burnt.**
- **Tongs should not be used for holding test tubes, they are intended for crucibles.**



Heating non-flammable solids in test tubes

- **Wear eye protection.**
- Do not have the test tube more than one-fifth full of solid.
- If the solid is a powder, shake it so that it is sloped in the test tube.
- Using a suitable holder, which is in good condition, keep the test tube pointing just up from the horizontal.
- Take care that the test tube is not pointing directly at yourself or anybody else.
- Hold the test tube so that the bottom is just in the tip of the flame and the top is well clear of the flame.
- Start with a gentle flame (see *CLEAPSS Student Safety Sheet 92*), increase to a medium flame and then a roaring flame, if necessary.



Heating non-flammable liquids in test tubes

- **Wear eye protection.**
- If possible, use a wide-diameter test tube (usually called a boiling tube).
- Do not have the test tube more than *one-tenth* full (it is much less likely to boil over).
- Add an anti-bumping granule ('boiling chip') before starting to heat (but **never add one when it is already warm**, which might result in it frothing up).
- Using a suitable holder, which is in good condition, keep the test tube at an angle.
- Take care that the test tube is not pointing directly at yourself or anybody else.
- Hold the test tube so that the bottom is just at the tip of the flame and the top is well clear of the flame.
- Start with a gentle flame (see *CLEAPSS Student Safety Sheet 92*), and increase it only if necessary.
- Flick your wrist continuously **but gently**, so that the liquid is shaken all the time it is being heated.

