

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



The test tube holder shown does not have the O-ring in the correct position (circled) and should not be used.

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, agitate 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 to medium flame only if necessary.
- Flick your wrist continuously but gently so that the liquid is agitated all of the time that it is being heated.

