

## Effects of air pressure on a metal canister

### Object of the experiment

1. Demonstrating the effect of the outside air pressure on a metal canister

### Setup



### Evaluation

After the metal canister has been closed, there is hot water and water vapour inside the canister. The pressure equals the air pressure  $p_0$ .

During cooling the vapour condenses.

This results in an underpressure  $p_1$  inside the metal canister.

We have  $p_1 < p_0$ .

As now the outside air pressure is greater than the inside pressure of the metal canister, the canister is dented by the force  $F_0$  resulting from the air pressure.

### Apparatus

1 Metal canisters, set of 3 .....	379 27
1 Measuring beaker, PP, 2000 ml .....	604 212
1 Butane gas burner .....	666 711
1 Butane cartridge, 190 g, set of 3 .....	666 712ET3
1 Tripod, 26 cm x 14 cm diam.....	666 683
1 Wire gauze, 160 mm x 160 mm .....	666 685
1 Tray 552 mm x 459 mm x 48 mm.....	649 45

### Carrying out the experiment

- Fill cold water into the metal canister so that it is third-full and into the beaker so that it is full.
- Put the canister on the tripod and make the water in the canister boil by means of the cartridge burner.
- Switch the cartridge burner off, and remove it from the tray.
- After a few seconds, close the metal canister with its cover.
- Slowly pour the water from the beaker over the metal canister and observe what happens.

### Observation

After being cooled by cold water, the metal canister is suddenly dented.