For example:

kitchen = 4 m × 5 m × 2.5 m = 50 m^3
air changes required = 12
50 × 12 = 600 m^3/h

Manufacturers' catalogues give the maximum and minimum extract rates in litres/second and cubic metres/hour.

one m^3/h = 0.777 l/s
one l/s = 3.6 m^3/h

Extractor fan outputs range from about 200 to 800 m^3/h

Depending on size, extractor fans in cooker hoods are approximately rated between 220 to 380 W.

Siting of fans

The most common cause of unsatisfactory mechanical ventilation is short circuiting of air movement between the fan and nearby air inlets, such as open windows or external doors.

Fans should be mounted as far as possible from such sources to work effectively.

Insufficient air replacement can also cause problems especially in well insulated houses with draught-proof windows.
If necessary make provision for air replacement with gaps under room doors, internal grilles in doors, airbricks, etc.

Fans and cooker hoods should not be positioned above a high level grill, nor should the underside of a cooker hood be too low over a hob for fear of catching fire.
Each fan manufacturer will give recommended clearances.
Typically they may be:

65 mm minimum over a gas hob
55 mm minimum over an electric hob.

Ducting

Ducts from extractor fans should ideally be as short as possible and as close to an outside vent grille as possible.
For maximum efficiency a duct should be no longer than 5 m deducting 1.2 m for every 90° bend.

Ducts should rise up immediately a minimum of 300 mm from the extractor fan before any bends to avoid turbulence.

Where possible use 45° bends rather than 90° bends.
If 90° bends are necessary, use large radius bends.

Suitable materials for extractor fan ducts are:

rigid PVC, galvanised sheet steel and flexible aluminium

Avoid *spiral-concertina* hoses which reduce air flow and generate noise by flapping.

Avoid any *flat* ducting (rectangular in section) as these will considerably reduce performance.

Horizontal ducts should have a 25 mm fall to outside to get rid of any condensate.

Long vertical ducts may need *condensation traps* to allow condensate to evaporate.

Duct diameters should always be the same size as the outlet from the extractor and never reduced.
Usual sizes are: 100, 120 and 150 mm diameter

Terminate ducts on the outside wall with a louvered grille incorporating a *back-draught shutter.*