

Ventilation

Together with room heating, ventilation has been crucial through the ages to managing the internal climate of multi-storey buildings and has undergone significant technological development.

Extraction

When apartments were heated by open fireplaces or stoves, the chimney flue took care of removing indoor air – or at least in those seasons when the colder air outside could draw the warmer inside air outwards. In the relatively few instances where dry earth closets were housed in apartments, the introduction of the Building Act of 1889 required that a ventilation duct be added to the barrel.

The intake of sewer gas was prevented once the requirement was introduced for water traps to be added to the drain from the kitchen sink and for the drain to be vented over the roof.

Similar requirements relating to water traps on and ventilation of toilet drains served the same function.

However, the functionality of water traps was dependent upon the water not being sucked out. Consequently, many parts of the country had a special requirement for drains to be ventilated after the water trap and before connection to the waste pipe. These requirements ultimately affected drains from hand basins, bathtubs and floors, etc. as well.

Such requirements did not result in the availability of fresh air, merely the prevention of bad air. With the introduction of toilets, requirements pursuant to sanitary regulations on the ventilation of the room itself quickly followed.

The Copenhagen Building Act of 1889 introduced requirements for specific ventilation pipes in kitchens equipped with ovens, which were determined by the number of ovens in proportion to the size of the chimney flue.

Later Copenhagen building legislation (Building Act and Building Regulations from 1939) included additional and more specific requirements relating to the extraction of air from further rooms. The design of installations relating to these was laid down in separate regulations.

With the first common building regulation, BR-61, options and guidelines appeared for mechanical extraction as an alternative to natural methods. The requirement for extraction to be mechanical did not appear until BR-95.

The material used for chimneys and early ventilation ducts was usually brick. With the introduction of gas for cooking and the arrival of toilets – and later bathrooms – the use of other structures/materials became relevant.

Air shafts could, for instance, be made from pipes with rectangular cross-sections and of sheet iron or concrete, often as thin-walled constructions reinforced with asbestos in

the latter case. They could also be cast iron pipes, as in the case of ventilation for toilet water traps, for example.

Mechanical extraction was achieved using square or circular cross-sectional conduits of galvanised iron plating.

Indoor air

While there were increasing demands over time for the removal of indoor air, the only requirement relating to the availability of fresh air in residential buildings was the presence of windows for opening.

This demand was first expressed in connection with ventilation requirements in the first common building regulations from 1961.

Previously, the requirement for windows (or a window) that could be opened in apartments was justified only in connection with the rescue of persons in the event of a fire. Requirements that otherwise appeared over time relating to the supply of fresh air were described in specific cases as the presence of either windows (for opening) or adjustable valves.

A recurring principle from the outset was that air from the living room should be fed to “contaminated” rooms, such as the toilet/bathroom and kitchen, for its subsequent extraction.

Note to Illustration 1. “Ventilation of drains” in the Gallery:

In buildings erected up to the mid-1920s, it is possible to find pipes for ventilating water traps – pipes which are (probably) no longer in use, because the drainage systems have since been replaced. The figure on the left shows the possible extent of such ventilation pipes, while the figure on the right shows the later situation without such ventilation. (Bygningshygiejne, Eilertsen 1938)

