The choice of cooling appliances depends upon the shopping habits of the clients and the space available in the kitchen.

As the third component of the kitchen triangle, the refrigerator is both an essential and frequently used appliance.

Urban dwellers with no children and no garden, with easy access to local shops and who do not mind frequent shopping trips, can make do with a relatively small refrigerator compared with the large family in a country house. In the very large household, a north facing larder or a cold room will reduce the need for a large refrigerator and with a freezer in an outhouse, a fridge-freezer would be all that is needed in the actual kitchen.

Model types

The various types and combinations of refrigerators and freezers can be loosely categorised as:

refrigerator with icebox
larder refrigerator
fridge-freezer
‘side-by-side’
‘bottom freezer’
wine store
upright freezer
chest freezer

with small freezing compartment
with no freezing compartment
refrigerator stacked with freezer
American style, wide fridge-freezer with two doors, often with ice and chilled water dispenser
fridge-freezer with bottom drawer as freezer
refrigerator set at 10°C for wine, cigars and cheese
freezer with side hung door
freezer with hinged lid
Corner refrigerator 1650 × 1050 mm on plan

Typical integrated in-column refrigerator stacked on top of freezer

Typical large chest freezer 500 litres with counter-balanced lid

Typical integrated built-under refrigerator or freezer

Typical minimum clearances needed for side-by-side freestanding refrigerator between oven and tall unit

Freestanding American style Side-by-side refrigerator typically: 900 w × 660 d × 1800 h

Typical minimum clearance needed to remove drawers from interior of freestanding side-by-side refrigerator
Fully integrated fridge-freezer with ice dispenser by Gaggenau

Freestanding ‘Bottom Freezer’ with freezing compartment in bottom drawer – by Gaggenau

Freestanding corner refrigerator in SS by Norcool

Temperature control cabinet with three climate zones for red wine, white wine, cheese and cigars – by Gaggenau

Refrigeration unit for cold room or wine cellar by Norcool

So-called ‘50’s style refrigerator available in silver and seven colours by Smeg
Fitting format

Most of the different models listed above are available as:

freestanding usually cheap small models or large side-by-side and ‘retro style’ (i.e. with rounded corners) fridge-freezers

built-in generally means appliance will fit into 500 or 600 mm wide spaces to suit standard cabinets with facility for a ‘decor’ panel to match cabinet door fronts

in-column means appliances built into tall cabinets, sometimes stacked one above the other. This may mean they are fully integrated but also, confusingly, can mean ‘built-in’

Check with the manufacturer

built-under as ‘built-in’ (above) but low enough to fit under a standard 900 mm high worktop so is about 865 mm high

fully integrated can be built into standard tall or base cabinets, accept matching doors and variable plinth heights

Note that fully integrated appliances fit seamlessly into standard cabinets.

Built-in and built-under appliances, which are not fully integrated, will have dirt trapping gaps at the sides and will break the continuous plinth line of adjacent cabinets.

Cooling appliances unless freestanding will need ventilation space at the back and at plinth level to suit manufacturer’s requirements.

Side-by-side fridge-freezers are generally larger than a 600 mm deep worktop. They take up a lot of floor space and need from 250 to 450 mm both sides for full access to door storage. See p. 126.

Those with ice and water dispensers need a water connection.
Capacity

The volume of different models can vary from as little as 120 litres for a built-under larder refrigerator to 600 litres for a side-by-side fridge-freezer.

As a guide, allow about 28 litres (one cubic foot) for each person in the household.
This volume may be reduced if there is a separate freezer.

Most families find that 140–170 litres is adequate.

For the household with a kitchen garden, a total of 400 litres may be more suitable. Here a 250 litre chest freezer outside the kitchen and a refrigerator in the kitchen might be appropriate.

Defrosting

There are three methods:

- **manual** appliance is turned off, contents removed and ice left to thaw and drain from the bottom shelf into a bowl
- **auto defrost** during normal operation, ice builds up on the back wall which subsequently melts and runs down the back wall into a container from which it is evaporated by the heat of the compressor.
- **frost free** sensors monitor the temperature and direct a fan at the back of the appliance to circulate chilled air through a system of vents evenly round the interior. This has the benefit that frozen packs do not stick together, labels stay legible and ice never builds up. However, it can make food somewhat dry, is expensive to run and tends to be less energy efficient.
Controls

The adjustable thermostats and the on/off switches should be easily visible and accessible.
Note that the numbers on the thermostats do not refer to temperatures. Normally (but not always), the higher the number, the colder the temperature.
Warning lights in freezers should be seen at a glance. With fridge-freezers, it is much more convenient, but more expensive to have separate controls for the two compartments, particularly if the freezer has to be defrosted manually, this allows the refrigerator still to operate.

Refrigerator features

Some or all of the following features may be included:

- adjustable shelves
- interior light
- rollers
- ice cube tray
- egg tray
- dairy compartment
- wine rack
- wine/cheese compartment
- salad drawer (crisper)

- wire/glass/plastic
- useful for servicing
- usually in door
- set at 10°C
- usually at bottom

Freezer features

Some or all of the following features may be found in freezers:

- food drawers
- interior light
- warning light
- acoustic alarm
- thermometer

- wire/clear or solid plastic
- useful for freezer in outhouse
fast-freeze switch or fast-freeze compartment handle lock useful for freezer in outhouse ice and chilled water dispenser

**Temperature zones**

Some refrigerators have compartments with different temperature zones. Typically this may be a relatively warm +10°C drawer for wine, cheese, etc.

Some have a salad/crisper drawer where the humidity can be adjusted for optimum freshness of fruit and vegetables. This drawer is the warmest part of the fridge and is generally found at the bottom where it picks up heat from the compressor.

**Food storage temperatures**

- **0°C freezing**
  - Safe refrigerator zone
  - Slow growth of poisonous organisms without damage to health
  - No growth of poisonous organisms but some deterioration to texture, flavour and odour

- **4°C**
  - Slow food spoilage

- **10°C**
  - Bacteria gradually killed above 70°C

- **100°C boiling**
  - Rapid growth of poisonous organisms

- **70°C**

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**STAR RATINGS:**

- Frozen food for 1 week
  - * – 6°C
- Frozen food for 4 weeks
  - ** – 12°C
- Frozen food for 3–12 months
  - *** – 18°C
- Frozen food for 12 months
  - +++ – below –18°C
The coldest part of the fridge, between 0 and 5°C, is usually the lower two shelves, but refrigerators with an ice box at the top have the coldest part immediately under the ice box.

Upper shelves and door storage will be cool zones +5° to 7°C suitable for dairy and wine storage.

In frost-free appliances, the temperature is even throughout the interior.

**Star ratings**

Star ratings for freezers and ice boxes are as follows:

*  \(= -6°C\) suitable for storing pre-frozen food for a week

**  \(= -12°C\) suitable for storing pre-frozen food for 4 weeks

***  \(= -18°C\) suitable for storing pre-frozen food for 3 to 12 months

****  \(= -18°C\) (or colder) suitable for storing frozen food for 12 months and freezing fresh food up to 1/10th volume of freezer without using a fast-freeze facility.

**Climate class**

All cooling appliances are ascribed a climate class. This denotes the range of room temperatures that an appliance is designed to operate within effectively:

\(N\)  \(+16°–32°C\)

\(SN\)  \(+10°–32°C\)

\(N-ST\)  \(+16°–38°C\)

\(SN-ST\)  \(+10°–38°C\)
Noise levels

Some appliances can be a great deal noisier than others. Models which work by absorption are quieter but more expensive than those with compressors.

Noise levels are given for all cooling appliances and are expressed in decibels as dB(A) re 1 pW. These range from low at about 33 to high at 47 decibels.

Energy consumption

All cooling appliances are given an energy-efficient class. These rate from A (good) to G (bad). Most fridges and freezers are rated A or B.

Frost-free refrigeration tends to be less energy efficient.

All appliances should carry the EU energy label which describes the manufacturer, model number, energy efficiency class, energy consumption (kW/cycle), net volume of fresh and frozen food compartments (litres), noise levels (dB(A) re 1 pW). See pp. 40, 41.

Running costs can be high as cooling appliances operate all hours every day.

Most manufacturers state energy consumption for 24 hours (kWh) and an indication of annual running costs (£/kWh).

Larders and cold rooms

Before refrigeration was invented, houses were equipped with larders, either in an outhouse or in a north-facing room where part of the window would be fitted with perforated or woven copper or brass screens to let in the cool air but keep the insects out. The room would be lined with slate shelves and the ceiling fitted with hooks on which to hang game.
This type of room can of course be replicated as it is particularly useful for keeping cheese, fresh fruit and vegetables, prepared and left-over food.

Today it is possible to create a cold room without the need for north-facing outside walls by using two basic components – a refrigeration unit and a cold room door. The walls (and floor if necessary) should be suitably insulated.

Refrigeration units are designed for temperatures of 3–12°C and for different sized rooms. They are also available as ‘split units’ where the warm and cold parts are separately installed – the cold part inside the room and the warm part up to 12 m away in another room where heat emission is not a problem. The two components are connected by a copper pipe and electric wiring.

The cold room doors can be supplied with panelling to match the house doors or be faced in stainless steel. The door is insulated, has magnetic door seals and the inside is lined with storage boxes.

This type of installation is also suitable for making a wine cellar.

**Source:** Norcool

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**Green issues**

Today the refrigerant and insulation of cooling appliances are CFC (chlorofluorocarbon) free and most are HFC (hydrofluorocarbon) free. However HFC, which does not deplete ozone, is still a powerful greenhouse gas.

The alternatives, which are more generally used today, are natural gases such as propane and isobutane which have no effect on global warming. Some appliances use a refrigerant called R600a which is considered safe.

**Source:** *Which?*