Which Evaporator?

What is an “evaporator”?

This item is installed inside the insulated cabinet and through which the liquid refrigerant is forced, evaporating (or boiling) as it does so. The R134a refrigerant boils off at around -25 degrees Fahrenheit, and in doing so absorbs large quantities of heat out of the surrounding air, thereby lowering the temperature of the items inside the box. Looking at the aluminum “Flat Plate” evaporators (also referred to as “roll bond” evaporators) used in Frigoboat systems you can see the channels through which the refrigerant travels.

What ***type*** of evaporator should I use?

All Frigoboat evaporators start life as a thin, flat sheet. These are easily bent, by the installer, to conform to the contours of the box, and can be bent anywhere where the channels run horizontally (more detailed instructions come with the evaporator). Mounted high in the box, and on the stand-offs provided, a Flat Plate evaporator will keep the area it is installed in at either refrigerator or freezer temperatures, depending on the design, application, and thermostat. Frigoboat designates these evaporators as “F”, for “Flat”, with five sizes available. Two “F” models have a stainless steel cover added to one side for applications where exceptionally rugged use is expected.

Frigoboat also offers “Bin” (B), and “Horizontal” (H) evaporators in various sizes. These are simply Flat Plate evaporators that have been formed to make an enclosed area, with a floor or end piece added. The Bin models are designed to mount on a vertical wall, while the Horizontal models have a plastic door added and mount to the ceiling of the box (the Bin models do not require a door). The interiors of B and H models then become freezer compartments, while keeping the rest of the box at refrigerator temperatures.

What ***size*** evaporator should I use?

If you are planning on the box being all refrigerator, or all freezer, then you will be using a Flat (F) evaporator. For a freezer, the general rule is to install the largest plate that it is practical to install. For a refrigerator, consult the specifications to see which size evaporator will be applicable. If you have two adjoining boxes separated by an insulated barrier, you may be planning a Spillover system. In this case halve the refrigerator area volume, add it to the freezer volume and treat the box as all freezer. Example. 3 cu ft freezer, 6 cu ft refer. Calculating, 6/2 + 3 = 6, so consider system as a 6 cu ft freezer and ensure that the evaporator you choose, i.e. the largest practical, is rated for that volume freezer or above. The plate will be mounted in the freezer section, and a Spillover device installed in the barrier to deliver cold air to the refer section under control of a thermostat.

If you plan on using a Bin (B) or Horizontal (H) evaporator, again consult the specifications to see which size model is best for your application. However, if you wish to install a larger B or H model than is recommended, i.e. to utilize a larger freezer section, you may find that you have to cover some of the evaporator surface with some stick-on insulation or similar material to force the system to run longer. This is necessary to ensure that the contents of the freezer section remain frozen solid. Suitable insulation materials can be found in DIY stores, etc.

Flat “F” bent for installation.

Bin “B” for vertical mount

Horizontal “H” with door