

Refrigerated Cool Box *by Gerald Fitton*

There used to be 'mini bars' in hotel rooms. I recall that the price of even the soft drinks used to be exorbitant! However, when I had to go visiting as part of my job (it was a long time ago), I used to take along my favourite Coke or Tango cans and put them in the mini bar 'fridge and drink them instead of partaking of the expensive selection provided.

Later, when on holiday, we used to buy a pint of milk and keep it in the 'fridge overnight because we didn't like the small sachets of processed milk which the hotels supplied. You and I both know that real milk can't be beaten when it comes to a morning cup of tea!

Then the design of the hotel mini bars changed to something more like a slot machine where any use of the 'fridge resulting in a charge on the bill. The final nail in the coffin was that the mini bars disappeared completely from the hotels which we frequented.

With varying degrees of success we tried to keep the milk cool overnight in a conventional cool box. Then, this summer, I discovered the Refrigerated Cool Box.

What does it look like?

I have to say that I was immediately attracted to its colour



The Evercool Thermoelectric Cooler and Warmer

The box is a beautiful shade of blue and the bright yellow inside matches perfectly. As an empty box it weighs about 4.5 kg (less than 10 pounds avoirdupois). The yellow catch is strong enough to feel totally secure when the box is filled with heavy cans and the yellow plastic handle on top feels wonderfully solid.

How big is it?

I have made some measurements and the inside of the box is tapered slightly so that the widest part is a couple of centimetres larger than space at the bottom of the box.



The internal dimensions are 200 mm by 285 mm

For those of you who are not into all this new fangled metric stuff I have included a selection of (non alcoholic) cans in my picture of the bottom of the box so that you can get a feel' for the size. The bottom of the box is about 180 mm by 265 mm.



The internal height of the lower section is 200 mm
with a further 100 mm in the lid

Unless you are used to deep lids you might find it difficult to fill the box completely because the lid accounts for 100 mm of the total usable height, one third of the volume.



The volume of the lid is about one third of the total

Performance

The specification states that the 'fridge can maintain 20 degrees below ambient but I found that it would do better than that. With an ambient of 12 degrees I found that the empty box cooled to below -15 in less than fifteen minutes using a supply of about 13.8 Volts.



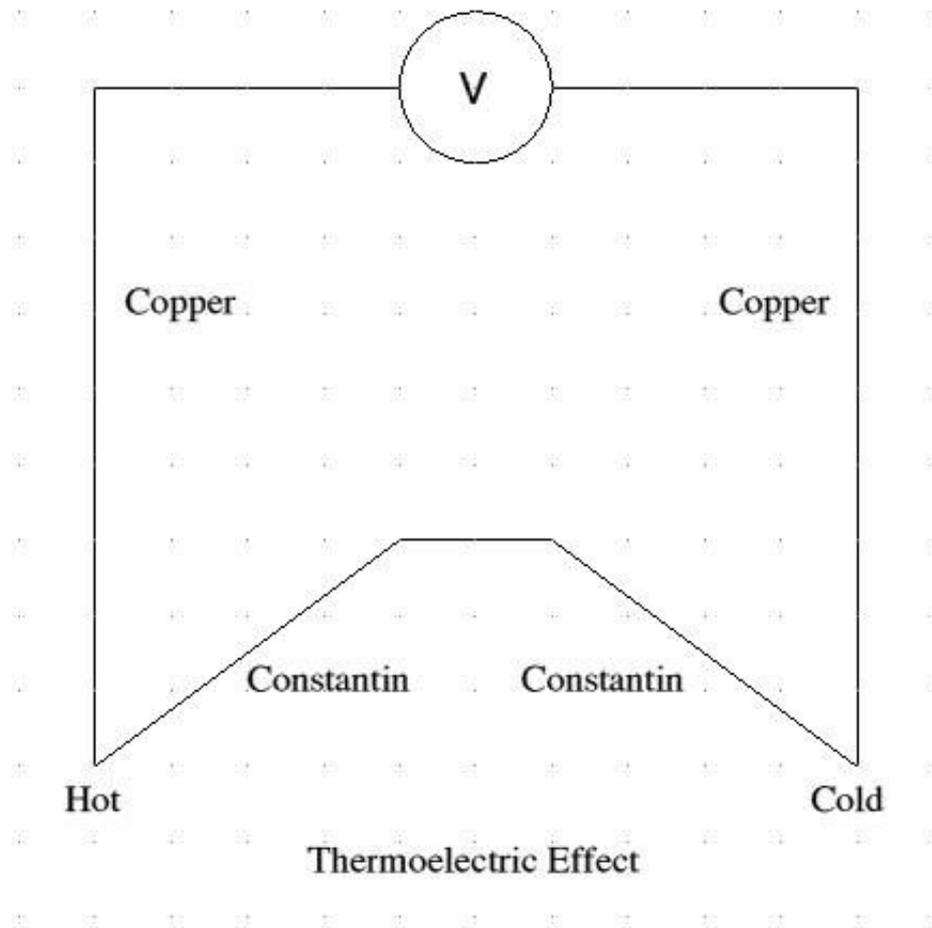
Minus fifteen degrees within fifteen minutes

It draws close to 4 Amps from my battery when float charged at a nominal 13.8 V.

I left it on overnight to make some ice cubes (well, triangular prisms rather than cubes) and it certainly worked. However, more extensive testing shows that this wonderful gadget relies more for its performance on its 30 mm of polyurethane insulation than on its cooling power. Indeed the advice given is that, unless you have a lot of time to spare, it is better to put food which is pre-cooled in the box rather than rely on the box to cool it down.

How does it work?

The thingamajig which does the job is called a Peltier Effect device. Jean Charles Athanase Peltier (1785 - 1845) discovered this effect but it was the physicist Heinrich Friedrich Emil Lenz (1751 - 92) who first used it to freeze water (just like my ice segments). Its action is rather like a thermocouple in reverse.



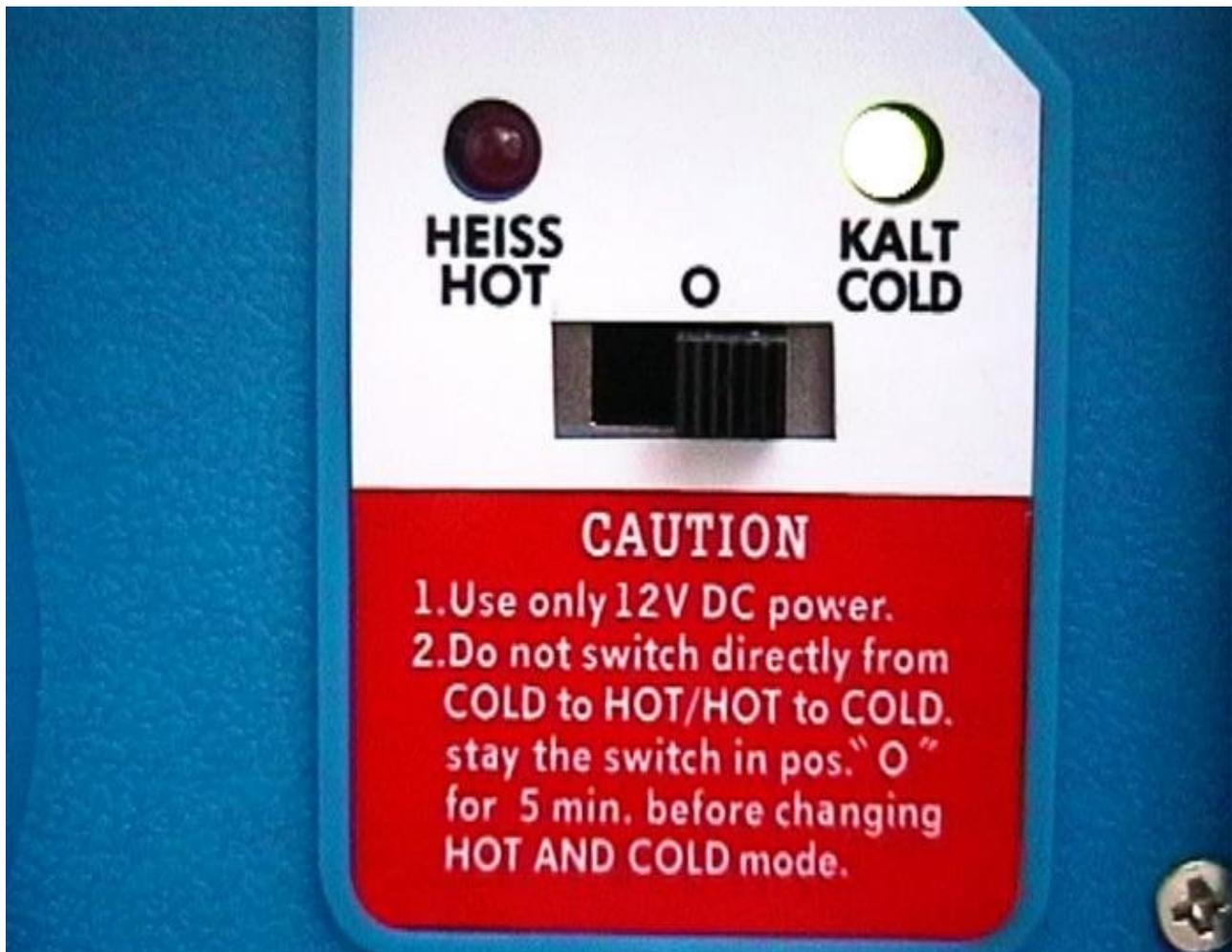
If you make up the simple circuit shown above using copper wire for most of the circuit and another metal (an alloy called Constantan is a popular choice) then you can prove for yourself that the thermoelectric effect exists! Heat up one of the junctions leaving the other at room temperature and the voltmeter will show a few millivolts. This effect can be refined and used to measure temperatures accurately to within a fraction of a degree.

The reverse effect is called the Peltier Effect. If, instead of heating up one junction, you apply a voltage to the circuit (connect the supply where the voltmeter is shown in the circuit) then one of the junctions will cool down and the other will heat up. In commercial Peltier Effect devices many junctions are used in series so that a reasonable voltage can be applied rather than millivolts. A fan and heat sink is used to cool the hot side of the device.

The Evercool box requires about 4 Amps at a nominal 12 volts so its consumption is about 48 watts of electricity. I don't know how much heat is absorbed at the cooler end because I haven't got around to doing any measurements on that yet

Hot as well as Cold!

On the right hand side of the beautiful blue box is a three position switch. The centre position of Off, right is Cooling and left is heating.



The Peltier cooler can be switched to heating

I have still to do some tests on this extra feature but the booklet which came with the box says that the internal temperature is thermostatically controlled at 65 degrees. Up to now all I have done is to put a cup of hot water in the box with it set to heating. Certainly it stays warm at a suitable temperature for drinking.

How much did it cost?

I bought this "Evercool thermoelectric cooler and warmer" as a Safeway bargain on the 26th July 2003 for £35. I have seen smaller front loaders at places like Poundstretcher for about £50. I prefer the top loading version to the front loader. I haven't seen this particular model but then, I haven't searched the Internet.

Mains use

You will have gathered that my use of this refrigerated cool box is not only in the car from the cigar lighter socket but also in those rooms without a mini bar 'fridge! In order to do this I have called upon two of my other gadgets, a rather superior 12 V battery and a very superior battery charger, both from Argos. I shall save the details for another day.



I have used this refrigerated cool box for many summer picnics over the years and it has worked wonderfully in the car whilst driving along. My soft drinks cans have remained cool in the box after many hours. I have taken with me my superior 12 V battery so that I can keep it running during the picnic without risking running down the car battery but I suspect that the insulation is so good that there was no need to keep the cooler on - I did so because it gave me a chance to use my rather superior 12 V battery.

During long hot summers it has come into its own in my garden when my friendly neighbours and I have an impromptu 'party' under my (bargain from B & Q) gazebo! What do we use it for? Of course you've guessed. We use it to keep the white wine chilled to perfection!