

## Cooling Post

- [Home](#)
- [World News](#)
- [UK News](#)
- [Features](#)
- [Blog](#)
- [Products](#)
- [Training](#)
- [Fun](#)
- [Apps](#)
- [About](#)
- [Contact](#)

**TOSHIBA**  
Leading Innovation >>>

# Toshiba Proud To Be Different

>>> Industry's only **fully comprehensive warranty**

>>> Industry **leading SEER & SCOP** figures

>>> Industry's only **24/7 technical helpline**

>>> Industry's original & **best customer loyalty** scheme

>>> A full range of software tool and mobile phone apps to **support your business**

## Huge variation in plug-in power demands

Posted on Monday, August 25, 2014 · [Leave a Comment](#)



GERMANY: Plug-in retail refrigerators and freezers can offer a more energy efficient option than distributed systems, says a new report, but the power consumption of cabinets can differ wildly.

Although estimates suggest that refrigeration can account for 50% of energy consumption in supermarkets, rising to 70% or more in smaller shops, a new study by German energy consultancy Dr Steinmaßl Managementberatung claims that a large number of retailers have no clear picture of the energy consumption of the refrigerators and freezers in their stores.

Dr Steinmaßl's figures in the report *Plug-in Refrigerated Cabinets in Food Retail* are based on the actual performances of installed cabinets and show huge differences in energy consumption figures. Tests carried out amongst German retailers showed that the annual cost of running medium temperature plug-in open display cabinets ranged from €785/m<sup>3</sup> to €3,567/m<sup>3</sup>, based on German energy prices of €0.18/kWh. Closed cabinets were more efficient generally but still showed differences ranging from €613/m<sup>3</sup> to €1,385/m<sup>3</sup>. Open chests varied in energy costs from €1,284/m<sup>3</sup> to €6,303/m<sup>3</sup> and closed chests from €212/m<sup>3</sup> to €57/m<sup>3</sup>.

The differences in annual consumption figures of freezers were even more marked, ranging from €92/m<sup>3</sup> to €1,178/m<sup>3</sup> in closed cabinets without electric defrosting and from €336/m<sup>3</sup> to €3,554/m<sup>3</sup> in closed chests with electric defrosting.

The power requirements of plug-in chillers and freezers were found to depend on a multitude of factors, some of which the producers of appliances have no influence on. This includes environmental conditions at the store location, proper maintenance, rate of use, age of the appliance and temperature settings, to name only a few.

And it's not that plug-in units are less efficient than distributed systems. On the contrary, Dr Steinmaßl states: "It is in fact the case that energy-optimised, highly efficient plug-in refrigeration appliances boast lower – or at worst similar – power requirements compared with newest-generation integrated systems. We have found that energy-efficient freezer chests – even when used in large numbers – are only responsible for 12 % of heat generation in stores at most, and that operation of energy-optimised plug-in appliances does not necessitate the installation of in-store air conditioning."

He maintains that potential savings with the use of energy-optimised plug-in refrigeration appliances in the food retail industry would amount to around 400 million kWh per year in Germany alone.

"If the costs of plug-in refrigerated cabinets are viewed over their entire life on the shop floor, it is clear that comparatively small amounts can add up to very considerable sums," he says.

The report cites the case of a beverage refrigerator with just under 900 litre volume costing around €3,100 to run over 10 years. A different refrigerator, 360 litres smaller, can cost €1,500.

"The decision to install an additional beverage refrigerator is often made in seconds, but can cost the store owner a total of €3,400 more than necessary. The additional cost represents a loss in available capital that is cumulative – and ultimately decides or at least partially determines a retailer's ability to compete."

The situation for low temperature refrigerated chest freezers is similar, according to the report. One chest with an approximate nominal volume of 645 litres over ten years can cost €5,700; a different chest with just 395 litres (almost 40% lower nominal volume) can cost €21,000 over ten years.

#### Potential savings

In roughly one in four stores visited by the report compilers, the temperatures were at least 5°C to 8°C too low. In some cases, the LT chests are set to the lowest temperature as a precaution, meaning the actual temperatures in the chest reach values down to -40 °C.

The use of covers overnight or during store closures as a potential source of energy savings varied considerably from cabinet to cabinet. From around 250 measurements, the difference in practice ranged from "not detectable" to "26%" but, on average, there was an approximately 20% reduction in power consumption when chests were covered. If covered for around 50% of the time, the power consumption may be reduced by 10% overall.

Regular condenser cleaning is also important with dirty coils adding an extra 10-15% to the power consumption.

The location of a plug-in refrigerated cabinet in the store can also have a major influence on the power consumption. In the following example, two islands with three refrigerated cabinets of the same types were measured at different location within a store. The first MT island was located right next to the dairy product shelf and the serving counter, i.e. in the refrigeration zone. The second MT island was placed in the fruit and veg department at the entrance. A glass facade also means that significant heat will enter the store, particularly on sunny days.

Although all six refrigerated cabinets were the same model from the same manufacturer, the differences in power consumption are considerable. The temperature was not set lower for MT island 2, so could not be a cause of the higher power consumption. It seems to be the case that refrigerated cabinets in warmer areas to need around 25% to 30% more power than in the cooler zones of the store.

Other factors like maintaining the maximum fill levels, switching off lighting after closing time and unplugging units when not required are also key to lowering energy consumption. In addition, fitting timers to items like beverage refrigerators can lead to weekly savings of up to around 50%.

The full report in German and English versions is now available to download [here](#).



Filed under [News Headlines](#), [World News](#) · Tagged with

#### Leave A Comment

Name (required)

Mail (will not be published) (required)

Website

Submit Comment

Search For...

In All Categories



Search