

City Talk



GET HUMIDITY RIGHT AND THE HEAT WILL BE NO SWEAT



At this late stage in summer, when we have been subjected to a prolonged spell of taxing heat followed by humid weather, it may be useful to

revisit the effectiveness of air-conditioning and fans and opening windows and doors to cool and air things.

The ability to cool oneself in hot weather is generally dependent on effective perspiration.

The cooling mechanism inherent in our bodies allows us to perspire, and as sweat evaporates, latent heat (heat required to change water to a gaseous state) takes away heat energy to cool us.

The ability to perspire freely is the key to allowing sweat to evaporate.

Atmospheric water content is measured in percentages, and when this value is below 70, we can perspire freely to cool effectively. As it goes above 90 percent, we continue to sweat but as it does not evaporate freely, it fails to cool us.

We end up wiping ourselves but still feel uncomfortably warm.

The beauty of air-con systems is that it not only cools the air but also reduces humidity to 65 percent relative humidity.

We may not notice it, but as long as indoor air is dry, we will continue to feel comfortable between roughly 21 and 25 degrees Celsius.

Above this range, we start to feel uncomfortable; and below it, we feel cold when dressed only in light clothing.

In countries where humidity levels are low, people can endure high temperatures up to about 27 degrees, as they can still perspire freely.

Natural drafts or fans, which increase the rate of evaporation of sweat, will provide the necessary cooling effect.

In Hong Kong, where relative humidity often exceeds 90 percent in summer, fans alone would not be effective.



Nuts and bolts

Edmund Leung

Tenants of subdivided flats without windows often find they cannot cool themselves even with fans on full blast.

Sweat droplets stay on them, and even wiping them off and repeated replenishment of one's hydration levels will not help to restore comfort.

Hence arguments between those living on high floors with natural drafts who claim fans will cool and those in small flats with no cross drafts are fruitless.

But even with air-conditioning, some restaurants and shops have the bad habit of not closing windows and doors properly, resulting in little humidity relief.

A typical phenomenon is condensation on air-con air grilles.

The problem here is simply a case of temperatures being set too low, causing dew to form on cold metal surfaces that invariably drop onto floors or customers.

With some restaurants often adhering to the practice of keeping entrances or kitchen doors open, large amounts of humid air are admitted, and not only will interiors be unable to cool effectively, even with thermostats turned down low, but also certain areas near air outlets can't cool below the dew point and condensation may form, causing a nuisance.

Air-conditioning only works when the amount of outside air admitted is controlled.

Too much and it works against cooling and drying and wastes energy.

Perspiration is a natural and effective means of cooling, but humidity control is more important than a purely temperature approach.

Veteran engineer Edmund Leung Kwong-ho casts an expert eye over features of modern life