

CHAPTER 2 - CONSERVATION AND EFFICIENCY: BUILDING SYSTEMS

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502.10 EXHAUST AIR ENERGY RECOVERY SYSTEMS AND CONDENSATION OF WATER



INTENT

To reduce cooling demand by recovering energy from exhaust air and condensate water.

REQUIREMENT

For Silver Sa'fa and for all new buildings that require treated outdoor air of over 1,000 l/s, energy recovery systems must be provided for at least 50% of the total exhaust air. The energy recovery systems must have at least 70% sensible load recovery efficiency.

For Golden Sa'fa and for all new buildings that require treated outdoor air of over 1,000 l/s, energy recovery systems must be provided for at least 60% of the total exhaust air. The energy recovery systems must have at least 75% sensible load recovery efficiency.

For Platinum Sa'fa and for all new buildings that require treated outdoor air of over 1,000 l/s, energy recovery systems must be provided for at least 70% of the total exhaust air. The energy recovery systems must have at least 80% sensible load recovery efficiency.

For Golden and Platinum Sa'fa and for all new buildings with a cooling load of 1 MW or greater, condensate water must be recollected and used as described in *Regulation 601.03*. The thermal energy from the retrieved condensate water can be restored and can be re-used either in cooling the walking lanes in parking spaces or for public places within plot building limits or for cooling of potable water.

SIGNIFICANCE

In hot climatic zones, in the HVAC systems, the exhaust air stream would be cooler than the incoming outdoor air stream. Energy recovery is possible by exchanging the energy contained in exhaust air and using it to treat or precondition the incoming outdoor air in buildings.

An energy-recovery system would transfer the cooling energy from the outgoing exhaust air to the incoming fresh air. This decreases the incoming air's temperature, thereby reducing the amount of energy necessary to cool the air to a level required for thermal comfort. Also, by utilising energy recovery systems, size of central cooling plant can be reduced, which further reduces the capital expenditure on HVAC systems.

Also, based on climatic conditions, a good amount of condensate water is generated in HVAC systems. Generally, the condensate water is discarded. By reusing condensate water, a part of energy used could be reduced. It makes the building more energy efficient and helps reducing its carbon footprint.