

## Abstract

This master thesis presents results of energy performance for different ventilation strategies such as balanced ventilation, central exhaust ventilation, natural ventilation and hybrid ventilation. The results are attempted to be improved by implementing air flow windows to increase the indoor comfort, while decreasing energy consumption.

Results for the report were derived from the programs: Be06, EES, IESVE and WIS. On basis of documented knowledge air flow windows were implemented by a series of heat balance calculations for each window pane and cavity in both; air flows window and 3 layer window. The results from this were used to further evaluate the validity and performance of air flow windows in connection to ventilation strategies such as natural ventilation, central exhaust systems and hybrid ventilation.

From the results it could be concluded that only hybrid ventilation with heat recovery of 65% could perform at the same levels as balanced ventilation in the heating season, from which it is concluded that heat recovery is needed in order to implement an all year strategy to also perform well in heating season.

The air flow windows proved to preheat the outdoor air between 0,27°C to 8,66°C with varying solar gains of 0-500 W/m<sup>2</sup>. Furthermore these windows proved to be part of a successful ventilation strategy in connection with central exhaust systems during 18,3% of the daytime in the transition months, April to October.

Finally can be concluded that natural ventilation cannot alone maintain the minimum air change and therefore needs mechanical assistance such as a central exhaust system.