

Summary report

Carry-over test of three SWEGON rotary heat recovery sections

Three regenerative (rotary) heat exchangers were tested for carry-over of exhaust air to supply air, according to the European standard EN 308:1997. The tests were carried out 2011-04-28 at Swegon Test Center in Kvänum Sweden, by Lars Ekberg, CIT Energy Management AB.

The units were adjusted according to Swegons instructions and the tests were carried out at about 11-13 Pa higher pressure in the supply air duct compared to the exhaust air duct. The rotors were operated at nominal speed. The exhaust and supply mass flow rates were documented.

Tracer gas - dinitrogen oxide - was injected far upstream of the heat exchangers, and the concentration mixing (uniformity) was verified by measurements in multiple points of the cross section of the duct - immediately upstream of the heat exchanger. The tracer gas concentration in the supply air duct was also measured in multiple points of the duct cross section, to verify the mixing conditions. The results are summarized below:

Unit ID	Description	Supply /exhaust airflow rate	Supply – exh. static pressure difference	Carry-over (percent of the supply airflow rate)
GOLD 08 installed in test-rig	New rotary heat exchanger	0.87 / 0.88 (kg/s)	13 Pa	0.36 – 0.45 %
Compact Unit	Unit TA/FA 56 in operation since 2008	0.17 / 0.13 (kg/s)	12 Pa	0.23 – 0.45 %
PM Luft/GOLD-3-4-3	Unit TA/FA 22 in operation since mid nineties	1.46 / 1.32 (kg/s)	9 Pa	0.8 – 2,6 %

The tests of the *GOLD 08* and the *Compact unit* met the uncertainty criterion given in EN 308. However, the test of the old *PM Luft GOLD 3-4-3* unit showed an uncertainty higher than this criterion due to incomplete mixing of the tracer gas in the exhaust air duct. This unit is installed in a ventilation system in operation, and no action could be taken to decrease the uncertainty. Despite the uncertainty, it is concluded that this old unit met a requirement of maximum 3% carry-over. The two newer units showed a carry-over of less than 0.5%.

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