

Ionics Air AB
Trädgårdsgatan 22, 8 tr
172 38 Sundbyberg

Handläggare, enhet / <i>Handled by, department</i>	Datum / <i>Date</i>	Beteckning / <i>Reference</i>	Sida / <i>Page</i>
Johan HP Johansson, Energy Technology Tel +46 (0)33 16 55 16	2001-11-12	ETs P1 04514C	1 (2)

Dust coverage percent on collector of an air cleaner in comparison to an inactive collector

The aim of the project was to find out whether the ionised particles were found equally on all surfaces in the room or mainly on the collector. The equivalent cleaning ratio, ECR of the item is reported in report ETs P1 04514A.

Item tested

Air cleaner: Vitalair (September 2001) with stainless steel collector (diameter ca 139 mm) was delivered to SP on September 20, 2001 by Ionics Air AB. The air cleaner is of ionization type (carbon brush) and is equipped with a collector.
Reference: Inactive stainless steel collector (diameter ca 110 mm). The test results apply only for the item tested.

Place and date of testing

The tests of particle reduction efficiency were carried out in an office at SP's Energy Technology / HVAC department in Borås between October 3 to November 6, 2001.

Test procedure

The air cleaner was placed on a desk in an office (ca 10 m²). The office was used during weekdays and is ventilated by an HVAC system (mixed ventilation). The reference (inactive collector) was placed on the same desk on the same height 88 cm from the air cleaner. No object were closer than 20 cm from the ionisation point or the collectors.

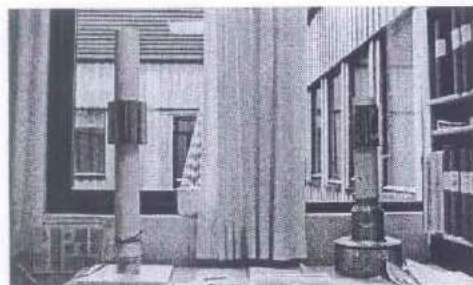


Figure 1. Placing of the air cleaner (active collector) and the reference (inactive collector)

An instrument for measuring dust on hard surfaces, BM Dustdetector, measures the dust coverage percent on the cleaned collectors and periodically after some weeks use. A geltape is pressed to the “dusty” surface and thereafter placed in the BM Dustdetector. BM Dustdetector measures the dust coverage percent by a laser beam through the “dusty” tape, which absorbs the light depending how dirty it is. Photos of both collectors were taken after each measurement of the dust coverage percent to visually show the dust layer.

Results

The dust coverage percent on both collectors during the exposure period are presented in table 1 (and as graph in appendix 2). Photos of both collectors initial and after 34 days from start are presented in appendix 1.

	Time from start [days]	Dust coverage percent [%]	
		Active collector	Inactive collector
October 3 (initial)	0	0.0	0.0
October 9	6	7.0	1.0
October 17	14	8.9	0.6
October 24	21	12.0	0.8
November 6	34	17.1	1.3

Table 1. Dust coverage percent on the collectors after different exposure time.

Measurement equipment

- Dust coverage percent: BM Dustdetector, SPs inventory No 201 566

Estimated uncertainties of measurement


- Dust coverage percent $\pm 2\%$ (dust coverage percent units)

Appendix

Appendix 1. Photos of both collectors initial and after 34 days from start

Appendix 2. Graph of the dust coverage percent on both collectors during the exposure period

**SP Swedish National Testing and Research Institute
Energy Technology**



Svein Ruud
Technical Manager



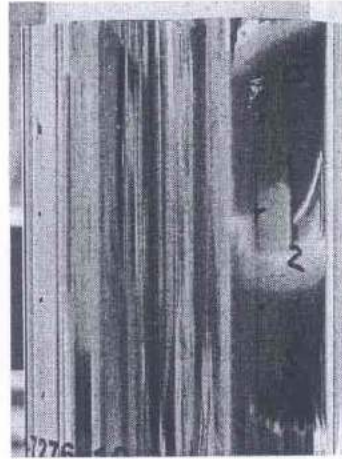
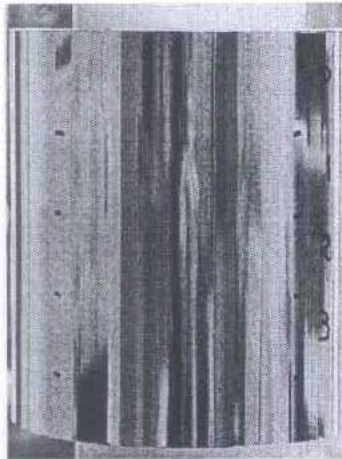
Johan HP Johansson
Technical Officer

Photos

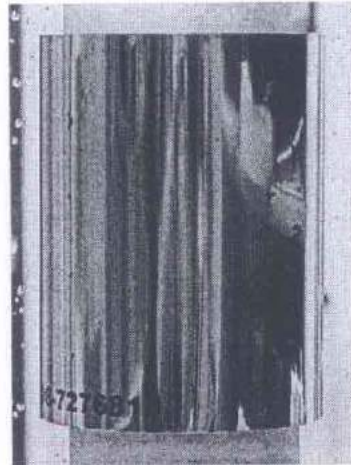
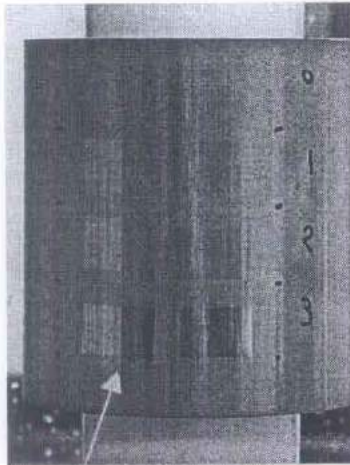
Active

Inactive

Collectors (cleaned, initial)



Collectors after 34 days



Comment: The rectangular areas are sampling points after different days from start

Dust coverage percent on both collectors during the exposure period

