CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2012

DateRun: 10/10/2012

Experimenters: Johnny Le, Nathalie Regis, Anni Geng

ClientType: Cleaning Equipment Mfr

ProjectNumber: Project #1

Substrates: Vinyl Composite Tiles

PartType: Part

Contaminants: Food

Cleaning Methods: Mechanical Agitation

Analytical Methods: Gravimetric

Purpose: To compare vacuum cleaning against sweeping for hard surface cleaning in a food industry setting using small soil mixture.

Experimental Procedure:

ProTeam's ProVac vacuum cleaner was operated for one hour with a wide-open inlet (without the hose). Upon completion of the conditioning of the vacuum cleaner, the vacuum bag (ProVac Intercept Micro) was weighed on an analytical balance and reinserted into the vacuum cleaner.

A fifteen foot long by eight-foot-wide vinyl composite tile (VCT) floor was used (120 square foot area). Approximately 114-298g soil mixture was applied to the VCT floor surface for the broom and vacuum tests. The range in soil mass resulted from changing the composition of soil to practice performing the initial tests and to determine acceptable soil loading levels. The soil was spread across each tile using a measuring spoon and small paint brush to assist in even distribution.

The vacuum cleaner nozzle was placed on the VCT floor so that the front edge of the vacuum cleaner nozzle lip was aligned with the edge of the adjacent wall. The nozzle was lifted off the hard surface floor and the vacuum cleaner was turned on. The nozzle was then lowered to begin testing. Vacuuming proceeded from the middle of one end of the floor, to the end of the opposite side, then pulled back to the starting point, and repeated following a counterclockwise direction. This back-and-forth cleaning proceeded until the entire floor was cleaned. The vacuum was run for an additional 10 seconds to capture all soil into the vacuum bag. The vacuum bag was then removed and weighed to determine the amount of soil collected.

After the test, the floor was swept with another broom to collect any missed soil. The floor was then mopped with water to remove any remaining soil.

Following the vacuum cleaning, the same basic procedure was followed using a standard synthetic angle broom from Rubbermaid (model 6375). The soil was weighed in the dustpan used to collect the soil; the initial weight of the dustpan was recorded. This collected soil was weighed and the total weight was subtracted by the weight of the empty dustpan. The same post cleaning procedure was followed as in the vacuum cleaning to remove missed soil.

Results:

In the soil removal test, there was a difference in soil removal efficiency between the two cleaning methods. On average the ProVac BP HEPA vacuum cleaner removed more than 96% of the soil from the 120 square foot area compared to sweeping which had an average efficiency of less than 90%.

Method	Initial Wt	Final Wt	Efficiency	Overall Ave
Vacuum	289.72	280.14	96.69	98.13
	247.37	234.20	98.31	
	113.96	113.26	99.39	
Broom	297.86	256.99	86.28	89.18
	196.57	178.44	90.78	
	211.12	191.05	90.49	

Summary:

Substrates:	Vinyl Composite Tiles				
Contaminants:	Food				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
Fisher Scientific	Absolute Ethanol	0	0.00	☐	
ProTeam	ProTeam ProVac		98.00	☑	vacuum

Conclusion:

Testing using small soils resulted in an 8% increased average soil removal with vacuuming compared to sweeping. This indicates better collection efficiency with vacuuming. With the reduced soil amounts, efficiency went up for both methods. For subsequent testing, the higher soil loading will be used.