CLEANING LABORATORY EVALUATION SUMMARY

SCL #:	2011
DateRun:	07/14/2011
Experimenters:	Johnny Le, Mahima Tank
ClientType:	Cleaning Equipment Mfr
ProjectNumber:	Project #1
Substrates:	Plastic
PartType:	Coupon
Contaminants:	Dirt
Cleaning Methods:	Mechanical Agitation
Analytical Methods:	Gravimetric, Timing
Purpose:	To compare various vacuum cleaning methods and angles.

Experimental Procedure:

The supplied ProTeam Super Coach vacuum cleaner was previously conditioned for one hour with a wide-open inlet (without the hose). Upon completion of the conditioning of the vacuum cleaner, the vacuum bag (ProTeam Intercept Micro hose) was weighed three times on an analytical balance and reinserted into the vacuum cleaner.

An eight foot long by eight-foot-wide resin floor was used in this test. Silica Sand, sieve size range, 40/+50 was applied to the surface. The soil was spread across each tile using a small paint brush to assist in even distribution.

The vacuum cleaner nozzle was placed on the hard surface floor so that the front edge of the vacuum cleaner nozzle lip was aligned with the edge. The nozzle was lifted off the hard surface floor and then the vacuum cleaner was turned on. The nozzle was then lowered to begin testing. Once the nozzle touched the floor, the timing began. Vacuum proceeded from the middle of one end to 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. When the nozzle reached the last corner of the flooring, the timer was stopped, and the clean time was recorded. The vacuum was run for an additional 10 seconds to capture soil into the filter bag.

The filter bag was then removed and weighed three more times to determine the amount of soil collected.

The floor was then swept with a handheld brush to collect any missed soil. A final sweep along the sub floor outside the 8’x8’ resin floor was performed to collect any soil pushed outside the tile floor. This collected soil was added to the residual soil left on the tile flooring to determine the total soil left behind after cleaning.

Following the vacuum cleaning, a different cleaning method was used. Starting from one corner, the vacuum was held parallel to the body, at approximately 45 degrees and preceded walking towards the opposite end while sweeping the wand side to side covering an 8’x4’ area. After reaching the opposite end, the vacuum continued sweeping side to side while walking backwards towards the remaining 4’ space.

Results:

There was a statistical difference of removing soil (sand) between the ProTeam side to side method and the other two vacuum cleaner methods. On average the vacuum cleaner removed more than 89% of the sand in 46 seconds from a 64 square foot area using the ProTeam recommended method as described from the online training video. Using the “Swab the Deck” method, on average the vacuum cleaner removed more than 86% of the sand in 53 seconds.

In each case the total soil collected after cleaning was less than the initial 100 grams added to the floor. Some of the fugitive soil can be accounted for in losses in transfer from the container to the floor.

Result table:				
Initial Soil: 100 g				
Floor Type: Resin 8'x8'				
Equipment: ProTeam SuperCoach vacuum cleaner				
Method	Removal	Ave soil	Std Dev	Time for removal
Stationary back and forth	87.7	86.4	1.2	53
		85.6		
		85.8		
ProTeam side to side	88.2	89.7	2.2	46

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		88.6		
		92.2		

Comparison of Vacuum vs. Dust Mop for sand removal from an 8’x8’ resin floor

System	Method	Soil collection	Std dev	Time
Vacuum	ProTeam side to side	89.7	2.2	46
Vacuum	Stationary back and forth	86.4	1.2	53
Vacuum	Up and back	84.6	2.1	67
Microfiber	Up and back	86.4	5.6	44
Cotton	Up and back	83.0	5.1	44

Summary:

Substrates:	Plastic				
Contaminants:	Dirt				
Company Name:	**Product Name:**	**Conc.:**	**Efficiency:**	**Effective:**	**Observations:**
ProTeam	ProTeam ProVac		0.00	☑	

Conclusion:

For sand removal from a resin floor, there was a statistical difference for collecting soil between the “Swab the Deck” and ProTeam recommended method with the ProTeam method working more effectively. Both of these vacuuming methods were more consistent than the two dust mops tested previously.