GlaxoSmith Kline Study:
Reducing wheel and footborne contamination

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This research was to evaluate the effectiveness of adhesive peel off mats versus washable polymer floor mats in the removal and control of microbial contamination in a working pharmaceutical manufacturing unit. The different types of mats were placed in side by side entrances to the PMU clean suite for foot traffic and the entry to the corridor area for carts.

The two floor mats were tested using the swabbing technique. Swabs were moistened with sterile 0.9 percent peptone water (PW) and samples were taken from cartwheels (two wheels from each cart) and the soles of operators footwear were plated out onto Tryptone Soya Agar plates (bacteria) and Sabourands's Dextrose Agar plates (yeasts and moulds) and incubated at 30-35^{0}C and 20-25^{0}C respectively for up to seven days.

Batch information: TSA-N (9cm): 742698701; Incubators; 1 (30-35^{0}C) 2 (20-25^{0}C); SDA (9cm): E23002; PW (9ml): B03100761.

The above procedure was repeated and swabs were taken from cartwheels (two wheels from each cart) after being pushed across the polymeric floor covering and the adhesive peel off mats. In addition, swabs were taken from operator's footwear after walking across either type of floor covering – making at least six imprints onto the floor and plated out using the procedure described above.

Experiments were performed under test conditions comparable with those used in practice. The length of the floor mats allowed a minimum of at least six footfalls (three for each foot). Swabs were taken from the right foot of operator(s) before taking a minimum of six steps over the polymeric flooring; swabs were then taken from the left foot after stepping over the flooring.

The results were averaged where mean percentages reduction values were calculated. The mean percentage reduction values for the polymeric flooring were 99.8 percent (TSA and SDA plates) for foot-borne contamination.

In contrast, the mean percentage reduction values for "adhesive peel off mats" were 25.2 percent (TSA plates) and 27.15 percent (SDA plates) for wheel-borne contamination and 11.5 percent (TSA plates) and 15 percent (SDA plates) for foot-borne contamination.

These tests and study have demonstrated that polymeric floor mats were far more effective in controlling microbiological contamination compared with adhesive peel off mats for both operators' footwear and cartwheels under the guidelines of this comparison.

The results for mean viable counts and percentage reduction values for wheel and footborne contamination

Table 1: Adhesive Peel Off Mat

Contamination Surface	Mean Viable counts (cfu/40cm^2)				Mean Percentage Reduction	
	Before Peel Off Mat		After Peel Off Mat			
	TSA	SDA	TSA	SDA	TSA	SDA
Wheelborne	539	151	403	110	25.2%	27.15%
Footborne	698	226	618	192	11.5%	15.0%

Table 2: Polymer flooring

Contamination Surface	Mean Viable counts (cfu/40cm^2)				Mean Percentage Reduction	
	Before Polymeric Mat		After Polymeric Mat			
	TSA	SDA	TSA	SDA	TSA	SDA
Wheelborne	347	53	2	0	99.4%	100%
Footborne	472	122	1	0.2	99.8%	99.85%