

## TEST REPORT NO: AL-21-429M

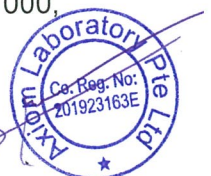
Company Name : Speco Singapore Pte Ltd  
Address : 317 Outram Road, #01-40, Singapore 169075  
Date Tested : 27 July 2021  
Date Reported : 03 August 2021  
Sample Description : Efficacy Test for Contact Cleaning (Abrasion Test) on Plastic

**Product Name** : Speco AMC Active  
**Number of Coating** : 2 Coats  
**Substrate** : Plastic

Microbiological test for Contact Cleaning was conducted by our technical personnel in a controlled room environment with a temperature of 23.4°C and relative humidity of 55.0%.

### Abrasion Test Procedure:

- 1) Coat the substrate with 2 coats of the sample with 24 hours drying interval for each coat as 'dry film' on the areas labelled as **Treated** (T1, T1A, T2, T2A) and label the surface without coating as **Control** (C1, C1A, C2, C2A). The duplicate tests are labelled as "A".
- 2) Prepare the *Staphylococcus aureus* culture by inoculating a stock in a 10ml saline tube. Conduct serial dilutions to identify the concentration of the solution.
- 3) Based on the calculations, select the correct dilution tube and 5800 cfu/ml was achieved for the test. Prepare 100ml of *Staphylococcus aureus* culture with saline solution in a spray bottle.
- 4) Spray the whole surface of Treated and Control with the *Staphylococcus aureus* culture.
- 5) Immediately after the spray, use a cotton swab to swab **T1, T1A, C1, C1A** and put into 10ml of saline solution respectively. Stand for 10 mins and pipette **1ml** into a petri dish. Pour approximately 12 ml of TSA into the plate and mix well. Allow to solidify and incubate at 35°C for 48 hrs.
- 6) 15 mins after spraying the culture, use a cotton swab to swab **T2, T2A, C2, C2A** and put into 10ml of saline solution respectively. Stand for 10 mins and pipette **1ml** into a petri dish. Pour approximately 12 ml of TSA into the plate and mix well. Allow to solidify and incubate at 35°C for 48 hrs.
- 7) Abrasion was conducted using a microfibre cloth measuring 20cm x 20cm and moistened with alcohol type disinfectant for 500 times with a weight of 500g.
- 8) Repeat Step 4 to Step 7 for abrasion in increments of 500 to get results for 500, 1000, 1500 times abrasion.



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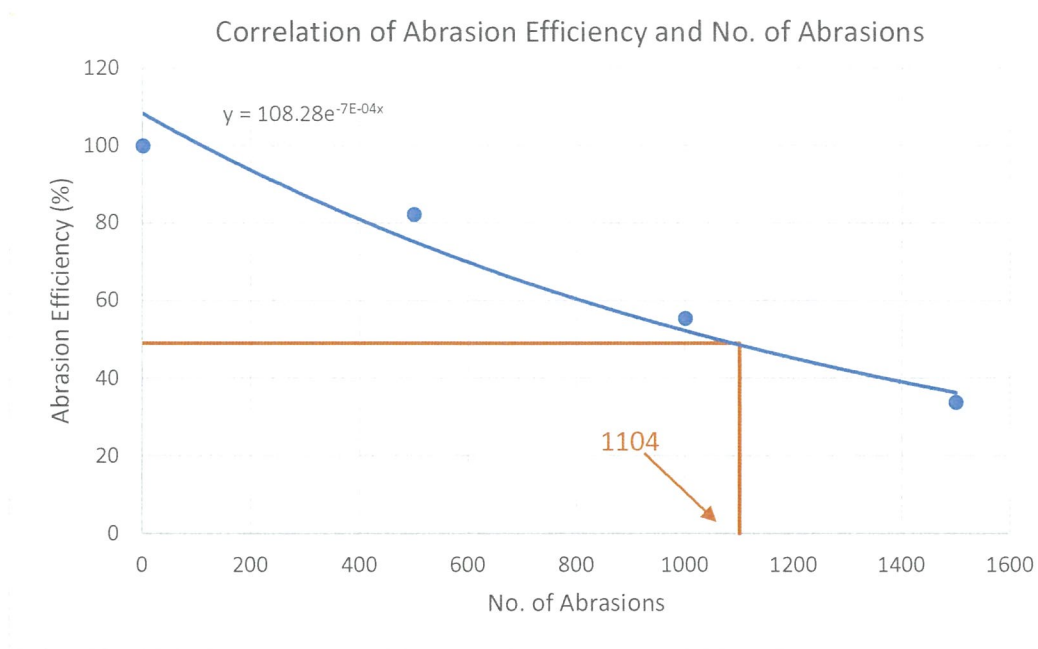
**Test Results for Plastic with Speco AMC Active:**

Abrasion	Test Condition	Count	Average	Percentage Efficiency	Abrasion Efficiency	Reduction Efficiency 50
0	Control	560	580	95.7%	100%	<b>RE50 = 1104</b>
	Control Duplicate	600				
	Treated	30	25			
	Treated Duplicate	20				
500	Control	590	635	78.0%	82.3%	
	Control Duplicate	680				
	Treated	140	140			
	Treated Duplicate	140				
1000	Control	660	615	51.2%	55.5%	
	Control Duplicate	570				
	Treated	280	300			
	Treated Duplicate	320				
1500	Control	650	675	29.6%	33.9%	
	Control Duplicate	700				
	Treated	470	475			
	Treated Duplicate	480				



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**Trendline Graph for Speco AMC Active:**



Equation of the graph is given as:

$$y = 108.28e^{-7E-04x}$$

To obtain 50% reduction efficiency,

Calculate the value of x:

$$50 = 108.28e^{-0.0007x}$$

$$\ln(-0.0007x) = \ln\left(\frac{50}{108.28}\right)$$

$$-0.0007x = -0.77727$$

$$x = 1103.853 \approx 1104$$

**Conclusion:**

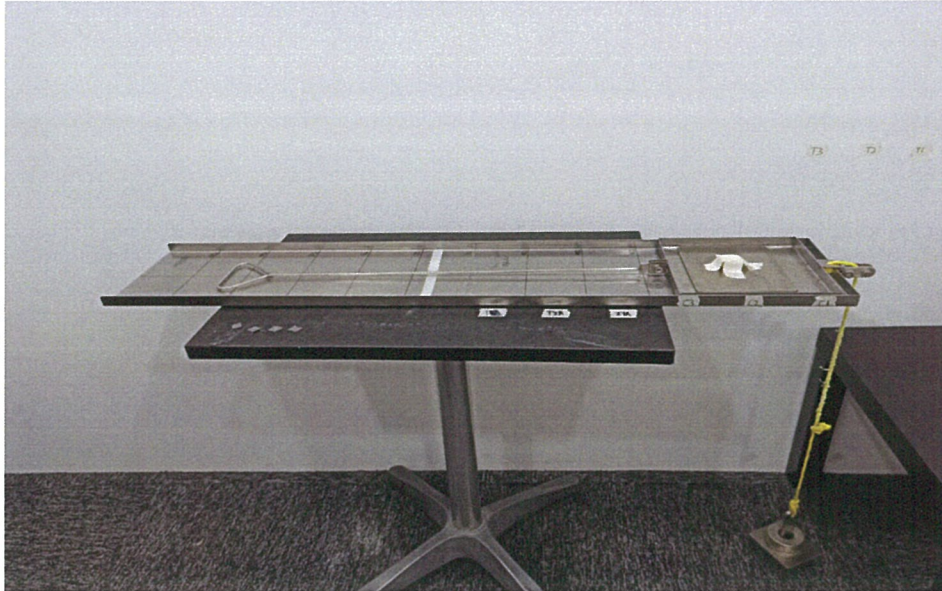
Based on the trendline graph assumption using Microsoft Excel, we can extrapolate the basis of abrasion efficiency with starting point 100% and a downtrend to estimate 50% Reduction Efficiency (RE50). Subsequently, the abrasion efficiency of the product drastically decreases as the abrasions increase. In this regard, we can conclude that the 50% Reduction Efficiency (RE50) for Speco 180 (enhanced formula) is 1104 abrasions.



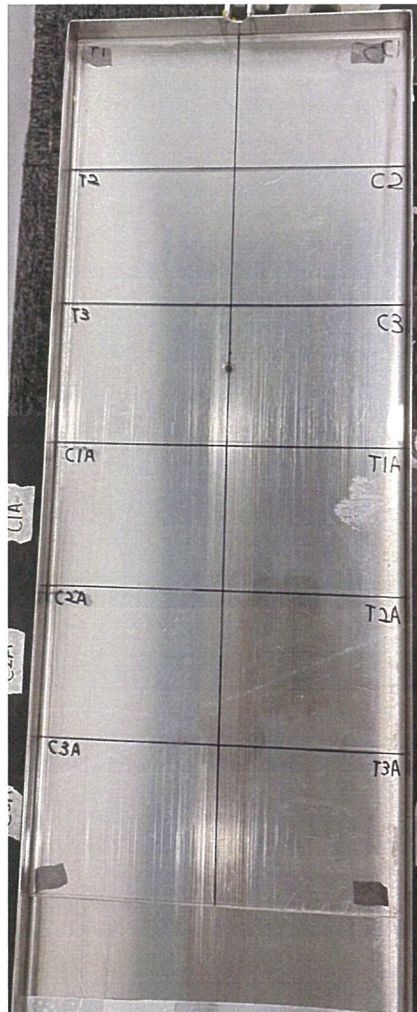

**Chang Hee Kuan**  
Principal Consultant  
Environmental Services



**APPENDIX A - PHOTOS OF ABRASION EXPERIMENT**



**Abrasion Equipment  
(500g of Hand Cleaning Weight Pressure on Surface)**



**Plastic Surface**