

RESEARCH TRIANGLE INSTITUTE



February 4, 2000

Ed Waters
WM Plastics
4237 Raleigh Street
Charlotte, NC 28213

Dear Mr. Waters,

Under contract with WM Plastics, the Research Triangle Institute evaluated the ability of two HEPA filter urethane-gel sealants ability to support microbial growth under controlled test conditions. The tests were performed following ASTM 6329-98 "Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers." The method quantifies microbial growth on indoor materials by measuring sporulation of the test organism and was used for ASHRAE research project 909-RP (Foarde and Hanley 1999).

Two urethane gels, Soft Seal Gel and Easy Pour Gel, were provided by WM Plastics. The urethane gels were mixed according to the instructions provided by WM Plastics. After preparing the gels and allowing them to cure for 48 hours at 25°C, they were cut into 1.5" X 1.5" blocks, inoculated with the test organism and replicate pieces placed into a static chamber maintained at 97% RH. The test organism was *Penicillium chrysogenum*. This fungus was chosen as a representative of the fungi to which HEPA filter media may potentially be exposed. Samples were processed for Colony Forming Units (CFUs) on Day 0, 1 month, 2 months and 3 months.

Table 1 presents a summary of the microbial growth/material susceptibility testing. The first column lists the media type. The second column gives the relative humidity. The columns present the mean CFU from each of the sampling days for the microbial growth experiment. The results are expressed as CFUs/block of material. Some of the results are listed as Below Detectable Limit (BDL). The minimum detection limit for this experiment was 150 CFUs/block of material. The raw data for the experiment is attached.

Table 1. Summary of the Results of the Microbial Growth/Material Susceptibility Test

Material	Relative Humidity	Results (CFUs/block of material)			
		Day 0	1 month	2 months	3 months
Easy Pour	97% RH	26,595	BDL	BDL	BDL
Soft Seal	97% RH	14,985	BDL	BDL	BDL





The results of the microbial growth testing showed that neither of the two media were able to support growth of *Penicillium chrysogenum* over the three month test exposure when maintained at 97% RH.

REFERENCES

- American Society for Testing and Materials. Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers. *Annual Book of ASTM Standards*. D6329-98
- Foarde K. and Hanley, J. Determine the Efficacy of Antimicrobial Treatments of Fibrous Air Filters. Final Report for the American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. 909-RP. 1999.

Please contact me by phone at 919-541-8041 or email me at emyers@rti.org if you have any questions concerning these results.

Sincerely,

A handwritten signature in black ink that reads "Eric Myers".

Eric Myers
Environmental Microbiologist

C. ORC (R. Corbett)
K. Foarde
File 6113-011



project #: 6113-011		Soft Seal										
date: 10/19/99												
description: static chamber total counts for Soft Seal at 97% RH												
		CFU		CFU								
Pen	block #	plate 1	plate 2	mean	amt pltd	tot vol	recip dil	CFU/block	mean	std dev	CI	
	I-1	47	43	45.0	0.1	30	1.E+00	1.35E+04				
day 0	I-2	67	67	67.0	0.1	30	1.E+00	2.01E+04				
	I-3	57	44	50.5	0.1	30	1.E+00	1.52E+04				
	I-4	248	228	238.0	0.1	30	1.E+00	7.14E+04				
	I-5	35	32	33.5	0.1	30	1.E+00	1.01E+04				
	I-6	40	49	44.5	0.1	30	1.E+00	1.34E+04				
	I-7	60	57	58.5	0.1	30	1.E+00	1.76E+04				
	I-8	59	51	55.0	0.1	30	1.E+00	1.65E+04				
	I-9	26	19	22.5	0.1	30	1.E+00	6.75E+03				
	I-10	280	264	272.0	0.1	30	1.E+00	8.16E+04	26595	26676	16534	
		CFU		CFU								
day	block #	plate 1	plate 2	mean	amt pltd	tot vol	recip dil	CFU/block	mean	std dev	CI	
day 28	I-1	0	0	0.5	0.1	30	1.E+00	1.50E+02				
11/16/1999	I-2	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-3	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-4	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-5	0	0	0.5	0.1	30	1.E+00	1.50E+02	150	0	NA	
day 56	I-6	0	0	0.5	0.1	30	1.E+00	1.50E+02				
12/14/1999	I-7	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-8	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-9	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-10	0	0	0.5	0.1	30	1.E+00	1.50E+02	150	0	NA	
day 84	I-11	0	0	0.5	0.1	30	1.E+00	1.50E+02				
1/11/2000	I-12	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-13	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-14	0	0	0.5	0.1	30	1.E+00	1.50E+02				
	I-15	0	0	0.5	0.1	30	1.E+00	1.50E+02	150	0	NA	
* numbers in bold are place holders for BDL results												