MICROSTAT LABORATORIES
RIVER'S EDGE TECHNICAL SERVICE
ESD and Cleanroom Materials Testing Specialists

TEST REPORT

For

Tempo Plastics Company, Inc.

Organic Analysis of Polystyrene Sample (C334E with #264A Anti-Stat) Trays using a Fourier Transformed Infrared Spectrometer for Silicone (Dimethicone) and Liquid Particle Counting (LPC).

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SUMMARY

FTIR Analysis

The two sample trays made of polystyrene were received and processed (C334E with #264A Anti-Stat) for FTIR analysis for silicone and liquid particle analysis by liquid particle counter (LPC).

A sample tray of material, broken into pieces to fit into extraction beaker, was extracted in enough hexane to cover for 10 minutes. The hexane was then evaporated. The resulting extract was allowed to evaporate to a dry residue. The residue was extracted with 5-ml hexane and evaporated onto a Horizontal Attenuate Total Reflectance (HATR) trough plate drop-wise. The remaining residue was extracted with 2-ml of hexane and evaporated onto the HATR with the residue from the previous extraction. The HATR was placed in a FTIR and the residue was analyzed. The FTIR spectrum was compared to that of silicone oil. The four signature peaks for silicone oil are at approximately 1258, 1088, 1017 and 796 cm^{-1}.

Liquid Particle Counting (LPC) Analysis-Zero-Stress Method

A sample tray was placed in a clean tray with 1000-ml ultrapure deionized water, from which a method blank had been taken from consisting of three 10-ml aliquots. Then 1000-ml of ultrapure deionized water was poured over entire surface. The sample was allowed to remain for 1 minute, while being sloshed 10x, then the sample was removed and then flipped over and sloshed 10 more times in 1 minute. The sample was removed and three 10-ml aliquots were taken using a PMS CLS-200 liquid particle counter. The results are reported in approximate counts/cm^2 counts/in^2 impart due to the shape of the tray. A single count represents a single particle.

DISCUSSION

Silicone (dimethicone) was not present in the sample and the major peaks identified represent polystyrene residue from extraction. The results of the LPC analysis are listed in the table below.

Table 1. Particle Generation Results of C334E with #264A Anti-Stat Sample.

Trial 1	Counts/ml	MB counts/ml	Counts/cm^2	Counts/in^2
≥0.3 *u*m	3513.5	92.0	13833.9	35138.3
≥0.5 *u*m	1243.5	23.9	4931.1	12525.1
≥1.0 *u*m	378.3	8.3	1496.0	3799.8
≥2.0 *u*m	139.9	3.1	553.1	1404.9
≥3.0 *u*m	91.2	1.9	361.1	917.1
≥5.0 *u*m	48.2	1.1	190.4	483.7
≥10.0 *u*m	14.4	0.3	57.0	144.8
≥15.0 *u*m	5.8	0.1	23.0	58.5

EQUIPMENT USED FOR TESTING

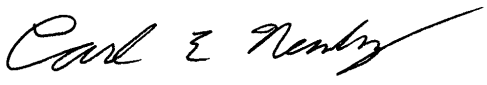
Thermo Mattson Satellite FTIR
Thermo Spectra Tech Foundation Series HATR
Hiac-Royco 8103 LPC

SPECTRUM APPENDIX

Figure 1. Spectrum C334E with #264A Anti-Stat, Hexane Extract
C334E material (blue) with silicone oil (dimethicone) (red) spectra
Peaks: 2954.04, 2915.86, 2849.13, 1540.85, 1470.07 ethyl group; 1736.40, 1177.33 R2-C=CH_2; 1540.66, 1395.25 methyl group; 1596.78, 1109.26, 758.27, 717.77, 699.26, aromatic benzene; 1736.40 ester. (dimethicone) 1259.68 Si-CH_3; 1088.04, 1018.62 Si-O-Si; 797.23 Si-CH_3.

The results provided in this report are accurate within the limits appropriate to each test standard. The results of this report are statistically significant only to the samples submitted for testing. MicroStat Laboratories has no controls, and assumes no responsibility for the tested product's functionality or use.

Michael Tosolini — Date: 08/27/03



Carl E Newberg — Date: 08/27//03

Figure 1. Project 2003-108 C334E with #264A Anti-Stat, Hexane Extract Residue