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TEST REPORT

For

Tempo Plastics Company, Inc.

Organic analysis of polystyrene/polyphenylene oxide (GECET) copolymer samples using a Fourier Transformed Infrared Spectrometer for Silicone (Dimethicone) and Liquid Particle Counting (LPC).

Report #: 2003-074
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SUMMARY

The sample was received and processed for FTIR analysis of polystyrene/polyethylene for Silicone and particle analysis by liquid particle counter (LPC).

No silicone was detected, and the liquid particle counts are listed below in Table 1.

EXPERIMENTAL PROCEDURE

Approximately 13.0 grams of material, approximately half the sample, was extracted in enough hexane to cover for 10 minutes. The hexane was then evaporated and the rest of the 13.0 grams sample was placed in the same weighing dish and again extracted in enough hexane to cover. The resulting extract was allowed to evaporate to a dry residue. The residue was extracted with 5-ml hexane and evaporated onto a Horizontal Attenuated 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 extract. 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 was taken from consisting of three 10-ml aliquots. Then 500-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 counts/cm^2, and counts/in^2. A single count represents a single particle.

DISCUSSION

Silicone (dimethicone) was not present in the two samples and the major peaks identified represent polystyrene residue from extraction. There was very little residue from the sample and a large scaling had to be used to obtain most of the peaks. The results of the LPC analysis are listed in the table below.

Table 1. Particle Generation Results of GECET Sample.

Trial 1	Counts/ml	MB counts/ml	Counts/cm^2	Counts/in^2
≥0.3 *u*m	664.2	87.1	2818.8	18185.9
≥0.5 *u*m	343.1	31.7	1521.0	9813.0
≥1.0 *u*m	134	17.5	569.0	3671.2
≥2.0 *u*m	47.9	9.2	189.0	1219.5
≥3.0 *u*m	29.6	5.5	117.7	759.5
≥5.0 *u*m	13.4	1.7	57.1	368.7
≥10.0 *u*m	4.1	0.3	18.6	119.7
≥15.0 *u*m	1.4	0.2	5.9	37.8

EQUIPMENT USED FOR TESTING

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

SPECTRUM APPENDIX

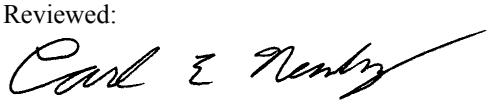
Spectrum 1

GECET polymer material (blue) with silicone oil (dimethicone) (red) spectra Peaks: 2953.65, 2918.94, 2850.09, 1539.50, 1464.10, 1075.12 ethyl group; 1740.06, 1163.45 R2-C=CH_2; 1539.50, 1397.37 methyl group; 1647.69, 1539.50, 1722.21 para trisubstituted aromatic; 1740.06 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: 07/14/03

Reviewed:



Carl E Newberg — Date: 07/14//03

Figure 1: Project 2003-074 Sample GECET/Hexane Extract