University of Cincinnati

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I, Jory Gould, hereby submit this original work as part of the requirements for the degree of Master of Science in Industrial Hygiene (Environmental Health).

It is entitled:

Aerosol and Volatile Organic Compound Emissions during PolyGel® Application and Removal

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Aerosol and Volatile Organic Compound Emissions during PolyGel® Application and Removal

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by

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ABSTRACT

Nail technicians utilize a wide variety of ever-changing nail products that contain or release hazardous chemicals. A new type of nail product created by Gelish is a nail enhancement technology called PolyGel®. This product was made to combine the best aspects of two popular nail services: gel polishing, and acrylic nail extensions. The PolyGel®'s major difference compared to either of these products is the removal of the novel material. While both gel polishing and acrylic nail extensions are removed through soaking in acetone, PolyGel® must be filed off which is typically done using an electric nail file for efficiency. This study aimed to look at the relationship between nail file speed and curing time during the application and removal of PolyGel® to volatile organic compound (VOC) concentration, particle size and concentration. Samples (n=54) were taken from a chamber every minute using a Flow-2 air quality sensor, an Optical Particle Sizer, and a NanoScan to determine these VOCs and particles, respectively. The PolyGel® was applied with variable curing times and then removed with variable file speeds within an air-tight chamber. The data were analyzed through statistical software using multiple linear regressions and two-way ANOVAs to determine the significance of file speed and cure time on VOC and particle emissions. VOCs were detected during both application and removal. File speed was correlated with a change in both geometric mean diameter and particle concentration. All average geometric mean diameter measurements were under 2 μm: therefore, these particles are predominately respirable particles. Overall, these results suggest that nail technicians should use the slowest file speed possible when removing PolyGel® with an electric nail file, and a suggested cure time of 60 seconds should be used during the application of PolyGel®. These suggestions, in tandem with ventilation measures such as general ventilation and nail dust vacuums, will help mitigate the risk of exposure and

possible adverse health effects for nail technicians performing the application and removal of PolyGel®.

ACKNOWLEDGEMENTS

This research study was supported by the National Institute for Occupational Safety and Health through the University of Cincinnati Education and Research Center Grant #T42OH008432. I would like to first thank Dr. Jun Wang for his support throughout this study as well as for sharing his expertise in the study of occupational aerosols. Next, I would like to thank Dr. Lynne Haber and Dr. Mary Beth Genter for their time participating on my thesis committee and providing their helpful comments and suggestions. Further, I would like to thank John Singletary for his expertise and time commitment in helping conduct the laboratory samples and statistical analysis. Finally, I would like to thank my cohort in the Department of Environmental and Public Health Sciences for their constant support throughout my time in the program.

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INTRODUCTION

Working in a nail salon requires utilizing a wide variety of products, some of which either contain or can release hazardous components upon applications. Some nail beautification techniques require the use of nail polish, fingernail glue, nail primer, nail polish remover, fingernail glue remover, nail hardener, and artificial nail liquid. The use of these products exposes the nail technicians to a variety of hazardous chemicals such as acetone, acetonitrile, butyl acetate, dibutyl phthalate (DBP), ethyl acetate, ethyl methacrylate (EMA), formaldehyde, isopropyl acetate, methacrylic acid quaternary ammonium compounds, and toluene while they perform their jobs[1]. Nail technicians could be exposed to these hazardous chemicals through inhalation, ingestion, and dermal exposures. One common exposure in nail salons is to volatile organic compounds (VOCs) which are found in a variety of products[2]. These products are used in many nail salon services such as the application of gel polish and acrylic nail extensions, which are the most common task in nail salons throughout the United States.

Although the products used in nail salons are hazardous, most nail salons are small businesses that have limited knowledge of health and safety regulations and lack resources to control these potentially hazardous exposures[2]. In 2014, 42% of nail technicians were immigrants and it was believed that a sizable percentage were undocumented workers[3]. The limited English skills of these immigrants and undocumented workers add additional risk as they may not comprehend warning labels or safety training and may not report or express concern for their working conditions[3]. In addition, many nail salons lack engineering controls such as adequate ventilations. Meanwhile, nail technicians are not provided with the proper personal protective equipment (PPE) appropriate for their workplace exposures[2]. There have been limited exposure assessments done for nail technicians, and most research has focused on ventilation and education[2]. Even so, the few studies

which have reported ventilation rates have revealed that many nail salons are poorly ventilated[3]. Further studies are required to understand the effects of the vast number of products and formulations on this high-risk population.

A new nail product called PolyGel® was created by Danny Haile of Gelish (Brea, CA) in 2017[3]. PolyGel® is a nail extension product that was created as a hybrid between hard gel polish and acrylic extensions. PolyGel® nail enhancements were created to combine the positive aspects of both gel and acrylic without the negative aspects[4]. Polygel® is considered safer for the nails according to Haile because it is less harsh to the nails and has a weaker scent than acrylic[4]. It is much lighter than acrylic nails but can still be applied as an overlay or nail enhancement just like acrylic nail extensions. As this product is marketed as a safer alternative to acrylic nail extensions, it is becoming more popular throughout the United States as a service offered in nail salons. It is well documented that there are VOC exposures related to traditional acrylic nail sculpting and gel nail polish procedures[2]. As PolyGel® was designed as a combination of acrylic nail sculpting and gel nail polish, it is expected that preparation, application, and removal of PolyGel® would also create exposure to VOCs and particles.

The PolyGel® process differs from acrylic in that it must be cured under ultraviolet (UV) light, where acrylic extensions dry naturally. Further, while acrylic nails and gel polish must be soaked in acetone for removal, PolyGel® nails are buffed off typically using an electric file, however a manual nail file could be used[5]. When nails are filed with an electric file either for shaping or removal, the artificial nail product could potentially be aerosolized through abrasion. As the PolyGel® technology is new to the market, there is minimal research on the product. There are known biological hazards of nail dust from the filing of natural nails as there is a potential for exposure to bacteria, fungi, and viruses. Further, natural nail dust particles are

estimated to be between 0.8 and 1.6 μm, with the majority being less than 5 μm, making them possible to be inhaled and deposited in the alveoli and bronchioles[6]. Therefore, artificial nail dust could be another possible hazard for nail technicians which would be exacerbated by the shaping and removal process of PolyGel®. If the PolyGel® process creates longer exposure to aerosolized nail extensions, technicians could be at a greater risk for adverse health effects.

PURPOSE AND SCOPE

The purpose of this study was to evaluate the volatile organic compound (VOC) emissions during the performing of PolyGel® product and the effects that file speed and curing time have on aerosol emission from applying and removing of PolyGel® product.

SPECIFIC AIMS AND HYPOTHESES

The following aims will be completed to accomplish the objectives and test the hypothesis:

1. Measure VOC emissions during the laboratory study during PolyGel® application and removal.
2. Measure aerosol emissions during the laboratory study during PolyGel® application and removal using an electric file at different speed settings and curing times.
3. Perform statistical analysis of the data collected from the simulated aerosol exposures, comparing VOC concentration, particle count, and geometric mean diameter between various electric filing speeds, and curing time of PolyGel®.
4. Determine if there are correlations between the electric file speeds and curing time of PolyGel® and a change in VOCs and aerosol particle emissions.

The following hypotheses were evaluated during the study:

H_1: Throughout all simulations, VOCs will be present during both application and removal compared to the background levels.

H_2: Particle size distribution will be different with different filing speeds and curing times of PolyGel®.

H_3: Particle concentration will be different with different filing speeds and curing times of PolyGel®.

MATERIALS AND METHODS

Chamber Setup

The study included the preparation, application, and removal process of PolyGel® and utilized a hand mannequin inside an air tight chamber with arm openings equipped with nitrile gloves. The chamber was 35 inches wide by 24 inches deep by 25 inches tall and was made with static-dissipative acrylic and a stainless-steel working surface. The chamber can be seen in Figure 1. This setup prevents the buildup of static and minimizes the wall loss of particles. One ¼" port was mounted near the breathing zone of the nail technician and connected to a pair of particle sizer instruments with focus on nanoparticles and micron-sized particles, respectively. VOCs were measured in parts per billion (ppb) using a Flow-2 (Plume Labs, Paris, France) placed in the chamber just beyond the mannequin hand and continuously measured throughout each experiment session. The Nanoscan SMPS Nanoparticle Sizer 3910 (TSI, Shoreview, MN) was used to determine particle sizes up to 420 nm, and the Optical Particle Sizer (OPS) 3330 (TSI, Shoreview, MN) was used for measuring particles between 0.3 to 10 microns. These instruments took readings as close to the breathing zone as possible within the chamber to determine the particle size distribution. HEPA-filtered air was used at 1.19 liters per minute to simulate a regular air exchange rate in a nail salon, and exhaust was sent into a nearby chemical fume hood.

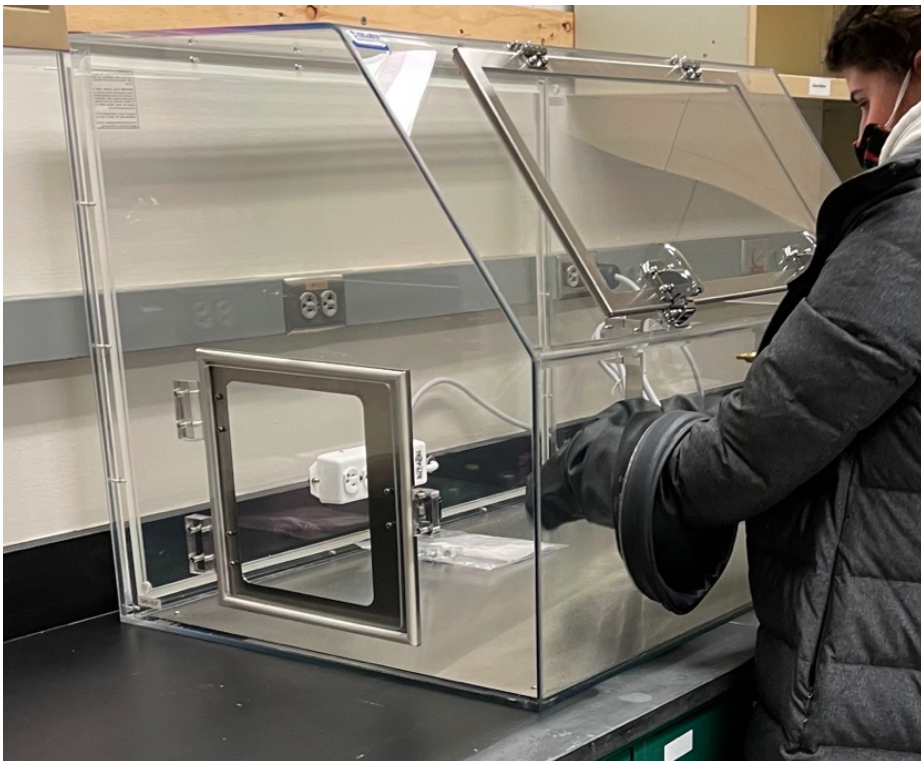

Figure 1. Pictured is the steel chamber used during this study.

A mannequin hand and replaceable fake nail tips were used to simulate the application and removal of PolyGel as it was on a human. Application required the use of these products in the following order: Gelish Nail Surface Cleanse (Gelish, Brea, CA), Gelish pH Bond Nail Prep (Gelish, Brea, CA), Gelish Foundation, Gelish PolyGel® in Natural Clear (Gelish, Brea, CA), Gelish Slip Solution (Gelish, Brea, CA), and Gelish Top it Off (Gelish, Brea, CA). The Pro Subay electric nail driller was utilized to remove the PolyGel® from the nail. This tool provided 6 different nail drill bits, forward and reverse rotation direction options, as well as various speeds up to 20,000 rpm. The mandrel with a new sanding band was the drill bit used for each removal. For curing, the Gelish Harmony 18G Professional Gel Nail Polish LED Lamp (Gelish, Brea, CA) was utilized. The setup of these material inside of the chamber can be seen in Figure 2.

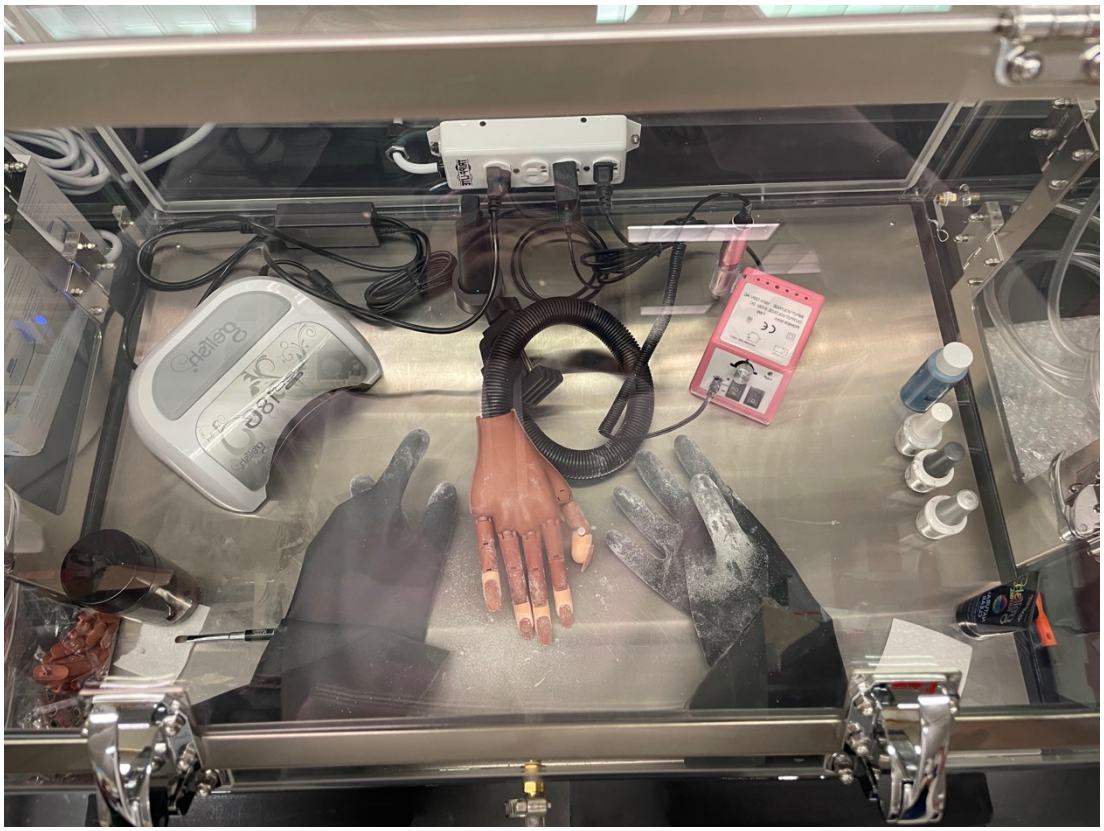

Figure 2. The setup of materials inside of the chamber. The port leading to the particle analyzers can be found in the bottom center of this image.

Experiment Factorial Design and Procedure

To evaluate the VOC and particle emissions and the impact of differing electric file speeds and curing times on individual exposures, 54 experiment sessions were conducted. All sessions were conducted at the Workplace Aerosol and Gaseous (WANG) Laboratory in Room 354 of Kettering Lab Complex. The total numbers of the sessions were determined through a matrix design incorporating electric file speed and cure time. There were three speeds tested of the electric file 1) slow – the lowest reasonable speed, 2) medium – halfway between slow and fast speed, 3) fast – maximum speed. Each of the speeds were noted on the nail drill in sharpie so that they were consistent between simulations. Finally, the cure time simulated the hardness of the PolyGel®. The three cure times were 1)15 seconds – half of the suggested cure time, 2)30 seconds – suggested

cure time, and 3)1 minute – double the suggested cure time. The LED lamp had 5 seconds, 20 seconds, and 30 seconds settings which were used to time the length of the cure in the simulations. All unique combinations of variables were performed for at least six replicates.

During each experiment session, the chamber was first flushed with HEPA filtered air at a rate of approximately five liters per minute (Lpm) for 20 minutes and then 1.19 Lpm for 10 minutes for sessions utilizing a file speed of medium and fast, 5 Lpm for 30 minutes followed by 1.19 Lpm for 10 minutes for sessions using the slow file speed setting. At the beginning of each session, a five-minute background was taken to determine if background deduction was needed. Postmeasurements were also taken. For each simulation, a new set of replaceable fake nail tips was used.

Preparation for PolyGel® began by lightly buffing the fake nail tip, utilizing the slow setting on the electric nail file, to ensure that the products would attach. Next, the Gelish Nail Surface Cleanse was used to remove any debris from the nail. The nail was then prepared with Gelish pH Bond Nail Prep followed by a thin coat of the Gelish Foundation. The Gelish Foundation was cured under the LED lamp for five seconds. Next, the PolyGel® in Natural Clear was applied to each nail in a pea sized amount. The uncured PolyGel® had a gel-like consistency and was manipulated to evenly coat the fake nail tips utilizing the PolyTool brush and Gelish slip solution made of 70-91% isopropyl alcohol. Then, the PolyGel® was cured under the LED lamp for a variable amount of time: 30 seconds, 60 seconds, and 120 seconds. Next, a thin coat of the Gelish Top It Off was applied to the nails and cured for 30 seconds with the LED lamp.

For removal, the artificial nails were filed down to the fake nail tips using variable speeds: slow, medium, and fast. For each of these steps, the fingers were manipulated starting from the thumb and moving to the pinky finger. Further, throughout the simulations, all products were only

left open when in use. Once the PolyGel® was completely removed from each of the fake nail tips, measurements were taken for a subsequent four to five minutes. After each session, the steel box was vacuumed out and wiped down with a wet paper towel. Protocol to prepare, apply and remove PolyGel® nail extensions are based and modified from the suggested Gelish PolyGel® Instructions[7]. The application and removal process used during this study, along with potential emissions at each stage is shown in Figure 3.

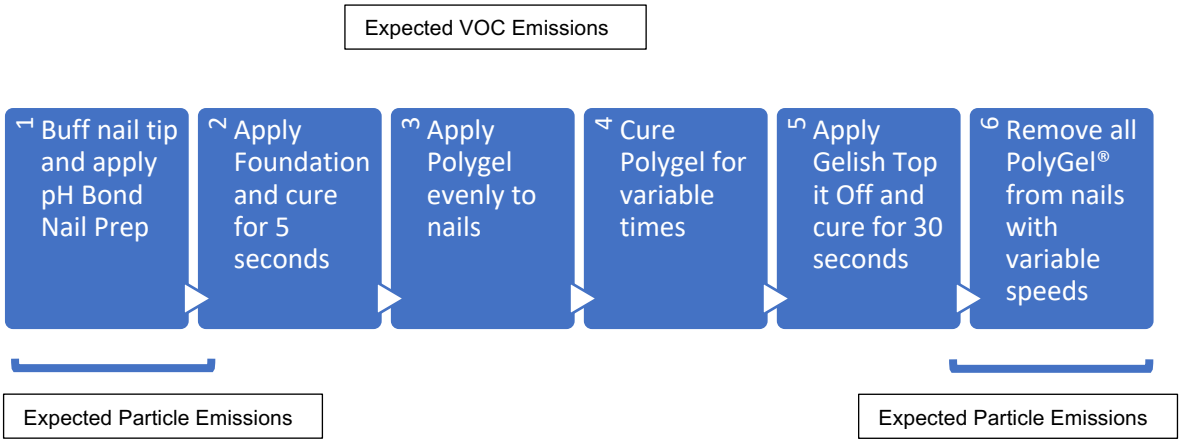

Figure 3. The application and removal process of PolyGel® with expected VOC and Particle Emissions. However, both VOC and Particle Emissions were measured throughout each simulation.

Statistical Analysis

Statistical analysis of the data collected from the application and removal of PolyGel® process events was conducted using both R and JASP statistical software. The VOC and particle concentrations were tabulated after adjusting for background deduction. The geometric mean diameter of particles was not adjusted to the background. Statistical analysis using R included a multiple linear regression followed by two-way ANOVA. The data was then split by activity into application and removal. As both application and removal must occur during the PolyGel®

process, it is suitable to differentiate this variable to run a further two-way ANOVA. Then statistical analysis using JASP included a comparison of means in the form of two-way ANOVA's for both the application and removal activities. For those significant values, a post-hoc test was run to compare which variable conditions were ascribed to the significance. A *p*-value of less than 0.05 was determined to be significant for analysis performed in both R and JASP.

RESULTS

VOC Concentration

The descriptive statistics were split by activity into application and removal. The mean, standard deviation, and population sizes of VOC concentration for application and removal are found in Tables 1 and 2, respectively. For all filing speeds during application, the cure time of 30 seconds had the highest mean VOC concentrations. During removal, this is also true aside from the fast-filing speed where 120 seconds had the highest mean VOC concentration. VOC concentrations were higher during removal compared to application for all unique file speed and cure time combinations. The highest mean VOC concentration overall was 1026.73 ppb during removal with a fast-filing speed and a cure time of 120 seconds. The highest VOC measurement for a one-minute period was 2020.8 ppb and was after removal with a fast file speed and 30 seconds curing. The lowest mean VOC concentration was 36.84 ppb during application with a medium filing speed and 60 seconds cure time. In both Table 1 and 2, N represents the number of one-minute measurements taken. N varied by the number of minutes taken to complete either application or removal under the specific variables.

Table 1. VOC (ppb) Concentration during Application

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	325.47	298.52	55
	30 sec.	326.11	351.52	47
	60 sec.	233.53	197.33	52
Medium	120 sec.	123.98	227.58	48
	30 sec.	197.91	374.20	42
	60 sec.	36.84	32.30	47
Slow	120 sec.	71.58	58.29	51
	30 sec.	301.32	356.59	47
	60 sec.	70.28	77.56	50

Table 2. VOC (ppb) Concentration during Removal

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	1026.73	395.28	33
	30 sec.	966.55	625.85	30
	60 sec.	676.70	318.96	29
Medium	120 sec.	268.03	435.63	39
	30 sec.	427.61	641.88	36
	60 sec.	100.86	28.36	36
Slow	120 sec.	190.88	43.45	73
	30 sec.	717.43	568.64	70
	60 sec.	223.59	148.92	68

A multiple linear regression model showed there was a statistically significant correlation between VOC concentration and file speed, cure time, and activity. After the data was split by activity, the distribution is shown on the box plots in Figure 4 and 5 for application and removal, respectively. The ANOVA showed there were significant differences between each of the file speeds, slow, medium, and fast. There were also significant differences between the cure times, 30 seconds, 60 seconds, and 120 seconds. There were significant differences between each activity: application, removal, and after removal. After splitting the data by activity, posthoc tests revealed that there was a significant difference between fast and medium and fast and slow speeds during application as well as between 120 seconds and 30 seconds and 30 seconds and 60 seconds. During removal, there was a significant difference between all combinations of file speeds but the least significant difference between slow and medium speeds. There were also significant differences during removal between all cure times with the least significant difference between 60 and 120 seconds. Negative adjusted VOC measurements are due to substantial and variable but not significant background levels.

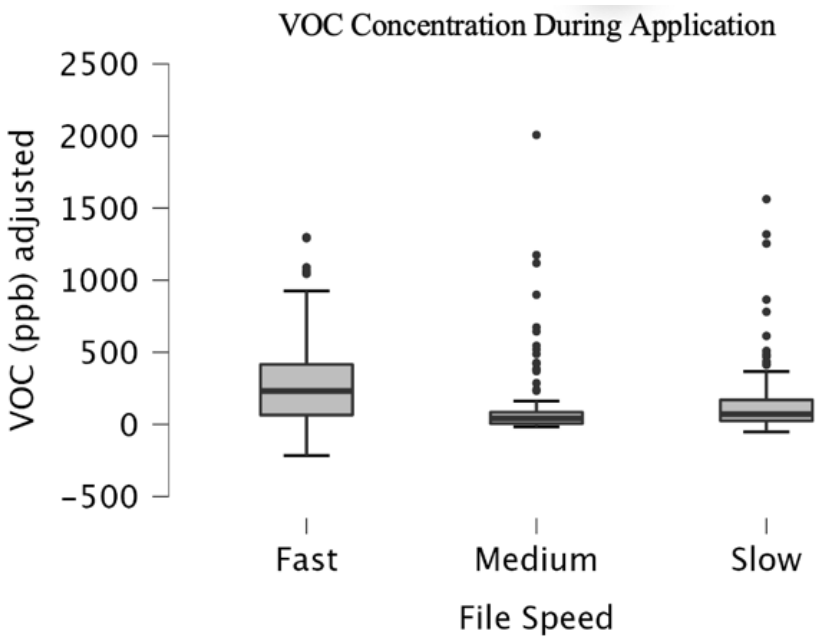

Figure 4. Box plot of VOC concentration during application.

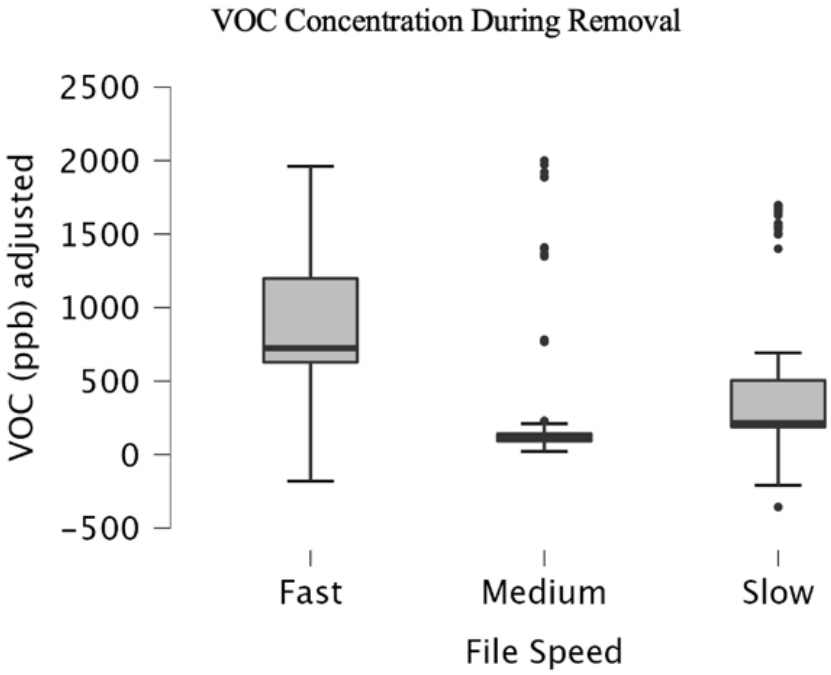

Figure 5. Box plot of VOC concentration during removal.

Micron Particle Geometric Mean Diameter (GMD)

The particle GMD will be discussed first from the data collected from the optical particle sizer followed by the data collected from the nanoparticle sizer. The descriptive statistics were split by activity into application and removal. The mean, standard deviation, and population size of particle GMD between 0.3 and 10 microns for application and removal can be found in Tables 3 and 4, respectively. The average GMD was greater during removal than it was during application. Generally, the average GMD increased as the speed decreases. There was not much variability in the average GMD between cure times within each file speed. The greatest overall average GMD was 1.33 microns during removal with a slow file speed and a cure time of 120 seconds. The lowest average GMD was 0.39 microns during removal with medium speed and 60 seconds cure time.

Table 3. GMD of Particles from OPS during Application

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	0.39	0.03	55
	30 sec.	0.40	0.03	47
	60 sec.	0.41	0.05	52
Medium	120 sec.	0.45	0.12	48
	30 sec.	0.43	0.05	42
	60 sec.	0.39	0.03	47
Slow	120 sec.	0.53	0.11	51
	30 sec.	0.44	0.14	47
	60 sec.	0.51	0.12	50

Table 4. GMD of Particles from OPS during Removal

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	0.64	0.16	33
	30 sec.	0.63	0.15	30
	60 sec.	0.68	0.21	29
Medium	120 sec.	0.84	0.34	39
	30 sec.	0.71	0.22	36
	60 sec.	0.66	0.17	36
Slow	120 sec.	1.33	0.53	73
	30 sec.	0.80	0.65	70
	60 sec.	1.25	0.53	68

A multiple linear regression model showed there was a statistically significant correlation between the GMD of particles between 0.3 and 10 microns and file speed, cure time, and activity. After the data was split by activity, the distribution is shown on the box plots in Figure 6 and 7 for application and removal, respectively. The ANOVA showed there were significant differences between each of the file speeds, cure times, and activities. After splitting the data by activity, post-hoc tests revealed that there was a significant difference between fast and slow speeds and medium and slow speeds during application. There was also a significant difference between 120 seconds cure time and 30 seconds during application. During removal, there was a significant difference between fast and slow speed and medium and slow speed. There was also a significant difference between 120 seconds and 30 seconds, as well as 30 seconds and 60 seconds of cure time during removal.

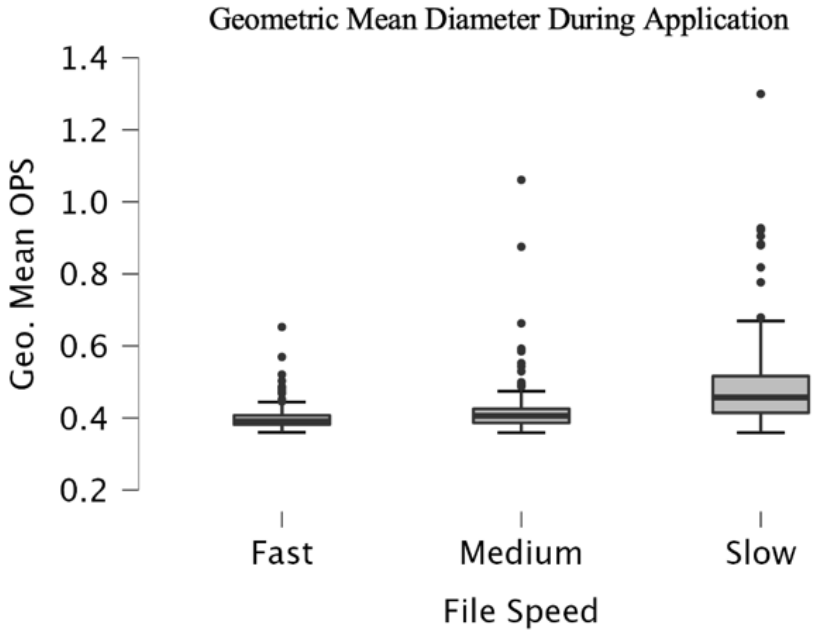

Figure 6. Box plot of geometric mean diameter of particles between 0.3 and 10 microns during application.

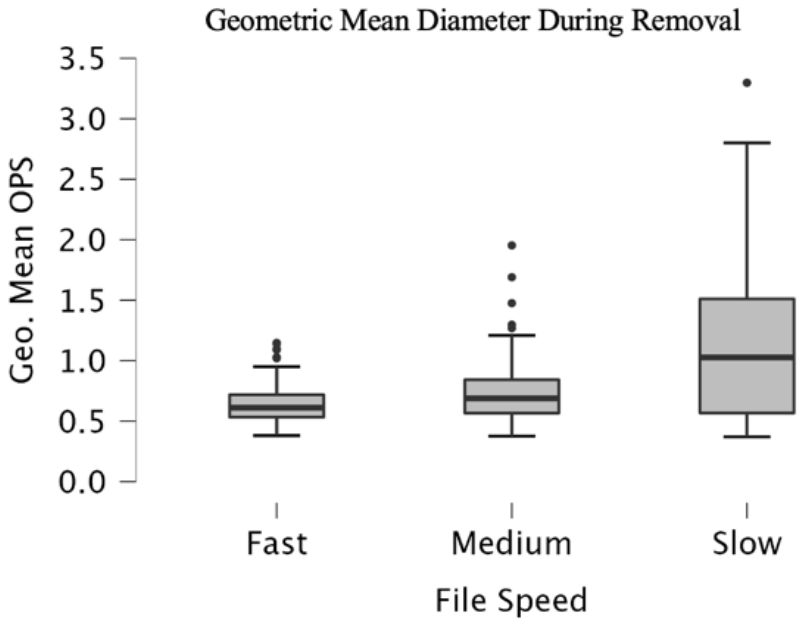

Figure 7. Box plot of geometric mean diameter of particles between 0.3 and 10 microns during removal.

Nanometer Particle Geometric Mean Diameter (GMD)

Similarly, the results from the nanoparticle sizer (NS) descriptive statistics were split by activity into application and removal. The mean, standard deviation, and population size of Geometric Mean Diameter of particles up to 420 nm for application and removal can be found in Tables 5 and 6, respectively. The average GMD generally was smaller during removal versus during application. This change in average GMD was more noticeable for the fast file speed than the slow file speed. There was more variation in average GMD between cure times seems at slower file speeds compared to faster file speeds. For the slow file speed, the 30 second cure times had the greatest average GMDs. Overall, the greatest average GMD was 72.82 nm, during application with a medium file speed and 60 second cure time. The smallest average GMD was 33.12 nm, during removal with a fast file speed and 60 second cure time.

Table 5. GMD (nm) of Particles from NS during Application

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	67.49	14.71	55
	30 sec.	68.13	10.82	47
	60 sec.	68.23	9.29	52
Medium	120 sec.	61.45	7.26	48
	30 sec.	59.60	12.33	42
	60 sec.	72.82	8.28	47
Slow	120 sec.	47.78	6.42	51
	30 sec.	69.85	13.87	47
	60 sec.	51.84	6.00	50

Table 6. GMD (nm) of Particles from NS during Removal

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	39.81	16.32	33
	30 sec.	38.89	15.16	30
	60 sec.	33.12	5.04	29
Medium	120 sec.	40.54	12.10	39
	30 sec.	37.84	11.01	36
	60 sec.	43.87	12.90	36
Slow	120 sec.	47.99	6.72	73
	30 sec.	70.51	14.00	70
	60 sec.	53.65	5.88	68

A multiple linear regression model showed there was a statistically significant correlation between the geometric mean diameter of particles up to 420 nm and file speed, cure time, and activity. After the data was split by activity, the distribution is shown on the box plots in Figure 8 and 9 for application and removal, respectively. The ANOVA showed there were significant differences between each of the file speeds, slow, medium, and fast. There were also significant differences between the cure times, 30 seconds, 60 seconds, and 120 seconds. There were significant differences between the activity between application, removal, and after removal. After splitting the data by activity, posthoc tests revealed that there was a significant difference between each combination of variable speeds during application with the least significant being between fast and medium speeds. There were also significant differences between 120 seconds and 30 seconds and 120 seconds and 60 seconds curing time during application. During removal,

there was a significant difference between fast and slow and medium and slow speeds as well as between 120 seconds and 30 seconds and 30 seconds and 60 seconds of cure time.

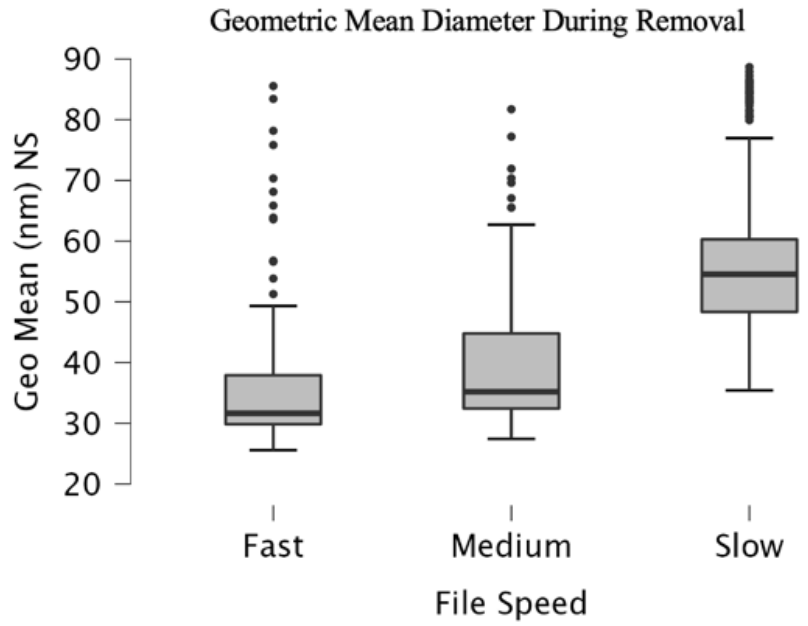

Figure 8. Box plot of geometric mean diameter of particles up to 420 nm during application.

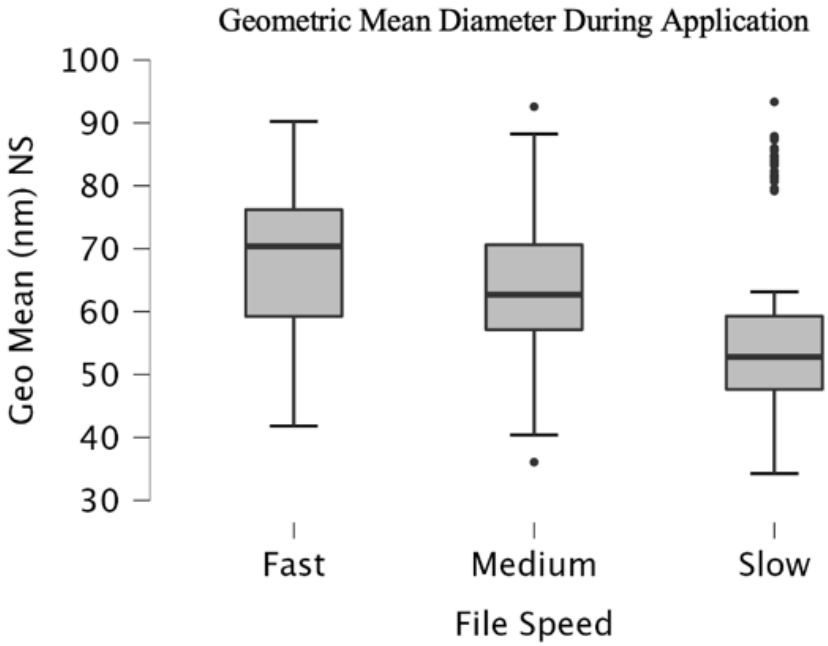

Figure 9. Box plot of geometric mean diameter of particles up to 420 nm during application.

Micron Particle Concentration

The descriptive statistics were split by activity into application and removal. The mean, standard deviation, and population size of the concentration of particles between 0.3 and 10 microns for application and removal can be found in Tables 7 and 8, respectively. The mean concentration was greater during removal than it was during application. There was a larger difference in concentration as the file speed increased. During removal, the concentration decreased as cure time increased for fast filing speeds. During application, there seemed to be less variation of the concentration between the unique variable combinations compared to during removal. The greatest mean concentration was 8.93 particles per cubic centimeter during removal with a fast file speed and 30 seconds curing time. The lowest mean concentration was 0.53 particles per cubic centimeter during application with medium file speed and 60 seconds curing time.

Table 7. Particle Concentration (#/cm^3) from OPS during Application

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	1.20	2.70	55
	30 sec.	1.03	2.27	47
	60 sec.	1.24	2.60	52
Medium	120 sec.	0.93	2.23	48
	30 sec.	0.83	1.02	42
	60 sec.	0.53	2.28	47
Slow	120 sec.	0.82	0.47	51
	30 sec.	0.63	1.54	47
	60 sec.	0.91	0.65	50

Table 8. Particle Concentration (#/cm^3) from OPS during Removal

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	5.57	2.89	33
	30 sec.	8.93	3.86	30
	60 sec.	6.69	1.68	29
Medium	120 sec.	4.05	2.07	39
	30 sec.	5.63	2.73	36
	60 sec.	5.67	4.03	36
Slow	120 sec.	2.16	1.19	73
	30 sec.	0.98	3.17	70
	60 sec.	2.48	1.29	68

A multiple linear regression model showed there was a statistically significant correlation between the concentration of particles between 0.3 and 10 microns and file speed and activity but not cure time. After the data was split by activity, the distribution is shown on the box plots in Figure 10 and 11 for application and removal, respectively. The ANOVA showed there were no significant differences between file speed and cure time during application. On the other hand, there were significant differences between both file speed and cure time during removal. After splitting the data by activity, posthoc tests revealed that during removal, there was a significant difference between each combination of variable speeds. There were also significant differences between 120 seconds and 30 seconds and a less but significant difference between 120 seconds and 60 seconds curing time during removal.

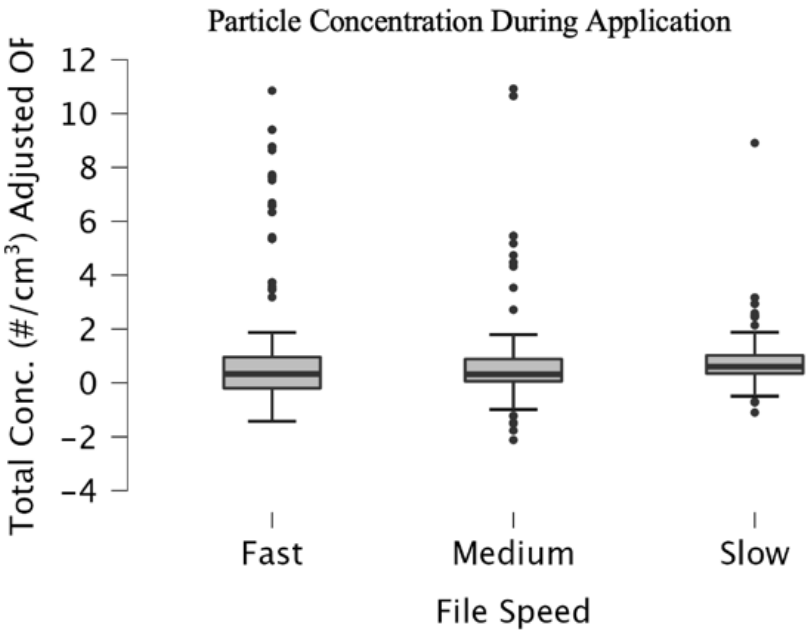

Figure 10. Box plot of particle concentration for particles between 0.3 and 10 microns during application

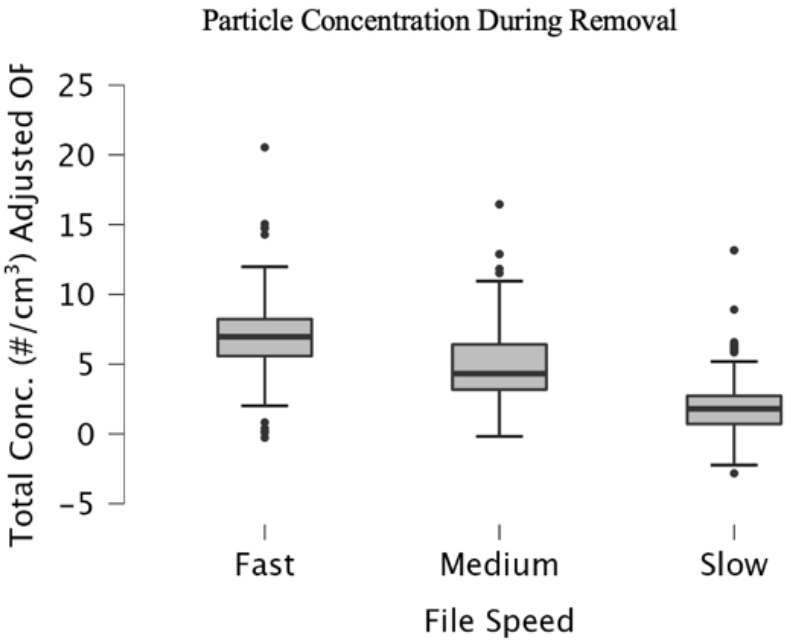

Figure 11. Box plot of particle concentration for particles between 0.3 and 10 microns during removal

Nanometer Particle Concentration

The descriptive statistics were split by activity into application and removal. The mean, standard deviation, and population size of the concentration of particles up to 420 nm for application and removal can be found in Tables 9 and 10, respectively. The mean concentration was greater during removal than during application except for at a slow speed. The difference in mean concentration between application and removal was much greater for the fast file speed than the medium file speed. At fast and medium file speeds during removal, a cure time of 30 seconds had the highest mean concentrations however, fast, and medium speeds during application a cure time of 30 seconds had the lowest mean concentrations. This was not surprising as file speed was not expected to play an influential role in either micron or nanosized particle concentration during application because the electric file was only used for buffing during the application process. The lowest mean concentration was 79.67 particles per cubic centimeter during application with a slow file speed and 60 seconds cure time. The greatest mean

concentration was 13374.08 particles per cubic centimeter during removal with a fast file speed and 30 seconds cure time.

Table 9. Particle Concentration (#/cm^3) from NS during Application

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	382.158	850.053	55
	30 sec.	169.695	591.940	47
	60 sec.	255.283	563.879	52
Medium	120 sec.	125.642	435.116	48
	30 sec.	99.124	411.973	42
	60 sec.	175.277	500.651	47
Slow	120 sec.	195.305	389.147	51
	30 sec.	101.139	341.501	47
	60 sec.	79.668	202.577	50

Table 10. Particle Concentration (#/cm^3) from NS during Removal

File Speed	Cure Time	Mean	SD	N
Fast	120 sec.	12307.318	8081.375	33
	30 sec.	13374.077	10251.248	30
	60 sec.	12162.138	7333.188	29
Medium	120 sec.	2920.391	2013.480	39
	30 sec.	4461.669	3448.973	36
	60 sec.	3593.340	2389.029	36
Slow	120 sec.	156.240	285.012	73
	30 sec.	95.474	388.753	70
	60 sec.	227.437	229.202	68

Finally, a multiple linear regression model showed there was a statistically significant correlation between the concentration of particles up to 420 nm and file speed and activity but not cure time. The distribution is shown on the box plots in Figure 12 and 13 for application and removal, respectively. The ANOVA showed there were significant differences correlated with file speed and activity. After separating the data by activity, there were no significant differences between each of the file speeds or cure times during application. However, during removal, there were significant differences correlated with file speed. After splitting the data by activity, posthoc tests revealed that there was a significant difference between each of the variable speeds during removal. The particle concentration by speed during removal can be seen in the plot in Figure 14.

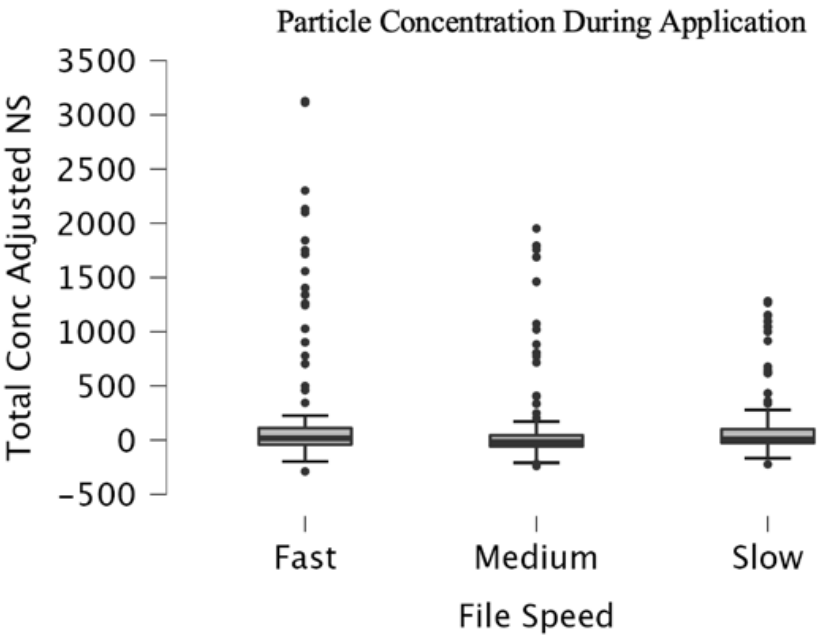

Figure 12. Box plot of particle concentration (#/cm^3) for particles up to 420 nm during application.

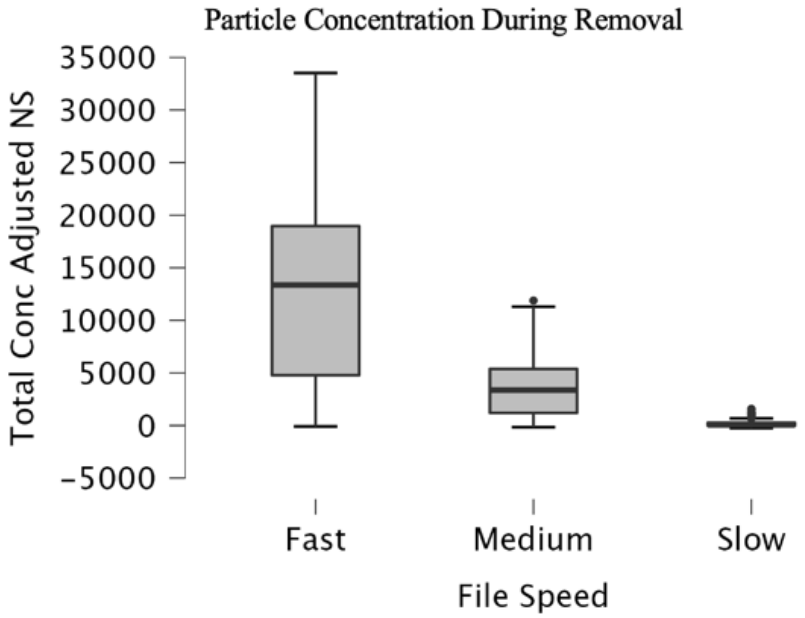

Figure 13. Box plot of particle concentration (#/cm^3) for particles up to 420 nm during application.

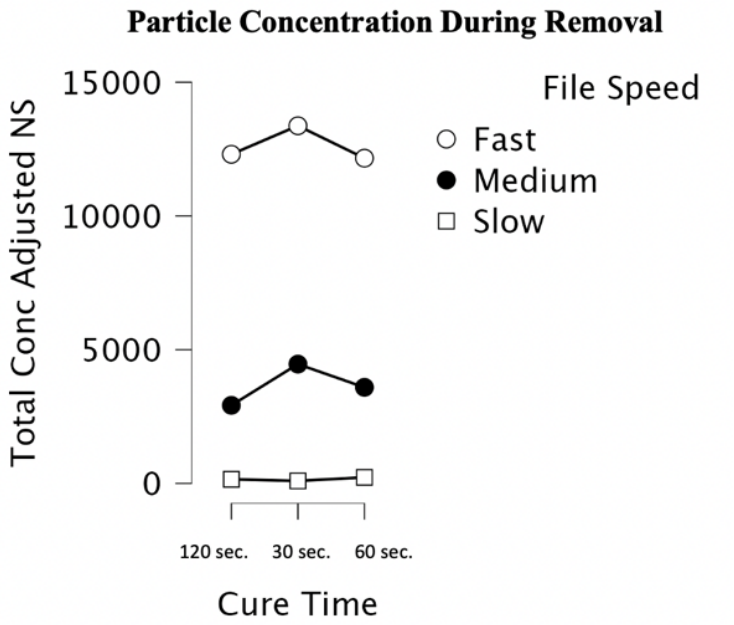

Figure 14. Plot of average particle concentration (#/cm^3)by file speed and cure time during removal for particles up to 420 nm

DISCUSSION

VOC Concentration

VOCs were detected throughout the application, removal, and after removal of PolyGel® and were higher than the background levels. This supports H_1 that VOCs were present during both application and removal There was a correlation with activity and a weaker correlation with file speed and cure time. To ensure the least possible VOC emission, the lowest possible speed and a 60 second cure time should be used.

The highest VOC level throughout all samples was 2020.8 ppb for one minute after the removal with fast file speed and 30-seconds cure time. The highest average VOC concentration was 1026.73 ppb during removal with fast file speed and 120 seconds cure time. The overall average VOC concentration during application and removal respectively was 187.45 ppb and 510.93 ppb. To compare the VOC concentrations in this study, a molar mass of 110 g/mol was used making the conversion factor of 1 ppb of VOC to 4.5 $\mu g/m^3$ as given by Sensirion[8]. After this conversion, the highest concentration (based on 2020.8 ppb) was 9093.6 $\mu g/m^3$ and the highest mean VOC concentration was 4620.29 $\mu g/m^3$. Further, the average VOC concentration was 843.53 $\mu g/m^3$ and 2299.19 $\mu g/m^3$ for application and removal, respectively.

Although total VOCs do not have an Occupational Safety and Health Administration (OSHA) exposure limit, the USEPA used the Maximum Allowable Air Concentration of less than 200 $\mu g/m^3$ for total volatile organic compounds as a limit for their own buildings[9]. This allowable concentration is much lower than the average concentrations found in this study during both application and removal. High concentrations of total VOC exposure can cause eye, nose, and throat irritation, headaches, loss of coordination, nausea, damage to the liver, kidney, and central nervous system, and some VOCs are suspected to cause cancer[10]. As total VOCs do not

have an occupational exposure limit, determining the concentration of individual volatile organic compounds such as formaldehyde, ethyl acetate, and butyl acetate would be important moving forward. The OSHA permissible exposure limit (PEL) for formaldehyde is an eight-hour time-weighted average of 0.5 ppm[11]. The OSHA PEL for ethyl acetate is 400 ppm and for butyl acetate is 150 ppm[11]. If the assumption was made that all detected VOCs were one of these three compounds in entirety, the only OSHA PEL that would be exceeded would be formaldehyde for those measurements exceeding 500 ppb. Further, the OSHA short term exposure limit (15-minutes) for formaldehyde is 2 ppm which is exceeded in this study at the highest measurement collected of 2020.8 ppb[11]. However, the percent of formaldehyde concentrations in our study are unknown. Determining concentrations of individual VOCs would help determine if the PolyGel® process would exceed occupational exposure limits as it emits VOCs throughout the process.

For comparison, the median sum of VOCs from personal air sampling among many Boston area salons was 2750 $\mu g/m^3$ and area concentrations of total VOCs were 1970 $\mu g/m^3$ [12]. The personal air sampling results from the Boston study are similar to the removal levels from this study. This supports the conclusion that the VOC concentrations during PolyGel® services are similar to concentrations during other nail services. Further, VOC emissions from common office devices can range on average from 347 $\mu g/m^3$ to 1235 $\mu g/m^3$ [13]. The concentrations of VOCs during this study were relatively higher than those of office equipment. Further, conventional paints create maximum aerosolized VOC concentrations of 120,000 $\mu g/m^3$ determined in test chambers at ambient conditions[14]. The maximum VOC concentrations from PolyGel® application and removal are much lower than that of solvent-based paints which are an industry of concern when it comes to VOC exposure.

Geometric Mean Diameter

The average GMD during application is lower than during removal for particles between 0.3 and 10 microns. However, the average GMD is lower during removal versus application for particles up to 420 nm. For particles measured during removal with both the Optical Particle Sizer and the NanoScan, the particle size decreased as electric file speeds increased. The range of average geometric mean diameter measured by the Optical Particle Sizer was between 0.39 μm and 1.33 μm. For the NanoScan the range of the average geometric mean diameter was between 33.12 nm and 72.82 nm which corresponds to 0.0331 μm and 0.0728 μm. A particle diameter of between 0.5 μm and 5 μm allows the particles to reach the bronchioles and alveoli in the lungs. Particles with an average diameter of 5 μm may enter the bronchioles and particles with an average diameter of less than 2 μm may enter the alveoli[15]. Although all particles under this size may enter the alveoli, the deposited fraction of the particles varies further by the size of the particles. All particles measured by the Optical Particle Sizer were $PM_{2.5}$ and all those measured by the NanoScan were $PM_{0.1}$ according to the average GMDs. $PM_{2.5}$ and $PM_{0.1}$ are particles with a diameter of less than 2.5 um and 0.1 um, respectively.

The average geometric mean diameters from both the Optical Particle Sizer and the NanoScan for all unique variable combinations were less than the average diameter necessary to enter the alveoli. These small particles can deposit into the alveoli of the lungs and could cause damage to the alveolar walls and create permanent scarring of the lungs. These particles could also potentially be absorbed into the bloodstream through the alveoli. Length of exposure to inhalable aerosols can play a part in the risk of adverse health effects. Particles that can travel all the way to the alveoli are at considerable risk for inhalation hazards[16]. More studies about the

specific components of the aerosol generated during the PolyGel® process are necessary to determine the specific effects of inhalation.

Particle Concentration

As stated in the results, there is a 52.13% R-squared value which supports that there is a relationship between both activity and file speed and particle concentration in those particles up to 420 nm. During both application and removal, the particle concentration of particles between 0.3 μm and 10 um as well as those under 420 nm increased as file speed increased. There was also a significant difference in particle concentration between application and removal of PolyGel®. However, there was not a significant relationship between cure time and particle concentration for those particles up to 420 nm.

These results support only part of the third hypothesis, H_3, which was evaluated with this study. The particle concentration increased as the file speed increased. However, cure time did not play a strong role in particle concentration measured from either the Optical Particle Sizer or the NanoScan. To reiterate all particles averaged in size fell under the size of $PM_{2.5}$ which is any particles under 2.5 μm in diameter and those measured by the NanoScan all averaged in size under $PM_{0.1}$ and considered ultrafine particles. The concentrations of ultrafine particles in this study ranged between 79.668 particles per cubic centimeter and 12307.318 particles per cubic centimeter.

These ultrafine particles have an even higher risk of entering the lungs and causing cough and asthma compared to $PM_{2.5}$[17]. They also cause more pulmonary inflammation and toxicity is increased from ultrafine particles. There is an immense potential for ultrafine particles to cause adverse health effects. Ambient air in a rural setting can have an ultrafine particle number concentration of 2610 particles per cubic centimeter, whereas the concentration next to a road

can be 48,180 particles per cubic centimeter. The highest concentration of ultrafine particles is found in occupations that involve metalworking, welding, and traffic-related occupations. Ultrafine particle concentrations in these areas can be between 700,000 particles and 4,700,000 particles per cubic centimeter. The concentrations of ultrafine particles in this study are about half of the concentrations found next to a road and far less than in the most exposed occupational areas.

However, there are still elevated concentrations of ultrafine particles created during the application and removal process of PolyGel® These as well as $PM_{2.5}$ particles could be reduced through increased ventilation. For nail salons, OSHA suggests that opening doors and windows and running the HVAC system during work hours will lower the level of aerosols in the salon[1]. Fans could also be placed to allow airflow through the salon. Portable and table ventilation such as a nail vacuum dust collector could also be used at each nail station to pull the aerosols generated in the nail technique away from the technician and the client. The filers in these products must be maintained to ensure that they are used appropriately.

Limitations

As each unique combination of file speed and cure time only has six samples, a small sample size is a limitation of this study. The number of measurements taken for each sample were determined by the amount of time it took for application or removal of the designated cure time and file speed. There are also very large standard deviations in the data which show a large variability in the data set. A larger sample size could provide stronger correlations in the statistical analysis as well as a more normal data set with stronger homoscedasticity. This would lead to more confidence in the results and data analysis of this study.

Next, this study design did not intend to account for the variability in application techniques and client nail size of this service when it is performed in nail salons. The study did not allow for the exact measurement of the amount of PolyGel® used on each nail. Each received a pea-sized amount, this is not a precise measurement. This could have had an impact on the results of the study. However, the variability of nail size and shape in clients receiving this service in a nail salon will also lead to this variation in the amount of PolyGel® used.

Additionally, VOCs were measured using a Flow-2 by Plume Labs. The Flow-2 is a portable air quality monitor which calibrates over time using a compensation algorithm. As more samples were taken, the VOC concentrations decreased. This could be a confounding variable in the measured VOC concentrations as samples were taken in general from fast to slow nail file speed and the data from this study should be taken lightly. In future studies, the samples should be randomized by both file speed and cure time.

Further, this study was conducted by complete removal of each nail from thumb to pinky. This is not entirely practical as the continuous removal of PolyGel® from one area creates heat which could harm the client so moving around the hand is a frequent practice in electric nail filing. Furthermore, the high speeds utilized in this study could not practically be used for the entirety of removal as closer to the nail the heat could be painful. The filing speeds used are typically variable throughout the removal process. This study also only utilized one mannequin hand which is half of the typical PolyGel® process performed in salons.

Also, this study only looked at PolyGel® and not in combination with other manicure and pedicure products. When gel polish or regular polish is painted over PolyGel®, this may get filed in the removal process as well. These other products may impact the geometric mean diameter as well as the concentration of the aerosols generated in the study.

Finally, this study did not consider the mitigation strategies that some nail salons use to mitigate aerosol exposure. Nail dust vacuums are often used to collect aerosols before they can be further distributed in the salon. These vacuums should be used in the case of electric filing of any type of product.

CONCLUSION

This study determined that throughout the application and removal of the novel nail technology PolyGel®, VOCs were detected in similar concentrations to popular nail techniques. Furthermore, the geometric mean diameter of particle emissions was weakly related to nail filing speed and cure time of PolyGel®. The particle concentration was significantly higher during the removal of PolyGel® versus application. Additionally, the particle concentration of particles up to 420 nm increased significantly as file speed increased. High concentrations of VOCs and aerosol particles can lead to adverse health effects. Moreover, particles that are smaller than 2-5 um, such as those measured in this study, can deposit into the bronchioles and alveoli and are at considerable risk of causing adverse health effects.

In this study VOC concentration, geometric mean diameter, and particle concentration were determined by measurements taken with the Flow-2, Optical Particle Sizer, and NanoScan. After determining the effects of nail filing speed and curing time, these measurements suggest that a nail technician should utilize the lowest possible nail filing speed to decrease the risk of adverse health effects. Further, curing time is a less principal factor compared to nail filing speed in terms of increasing VOC and particle concentrations. Therefore, the suggested 60 second cure time given by Gelish should be used in the application of PolyGel®. Finally, ventilation and nail dust vacuums should be utilized in nail salons, especially during the removal process of PolyGel® to mitigate the concentration of aerosols exposed to the nail technicians.

Further studies are necessary to strengthen the results found in this study. Intra-study statistics are weak possibly due to the small sample size. These studies may also identify the specific components of the generated aerosols from the application and removal of PolyGel® to better understand the health effects of exposure. Finally, further ergonomic studies could be

conducted to determine the effects of the technician's posture on aerosol exposure as well as the technician's exposure to vibration while utilizing an electric nail file.

Considering the limitations of this study, the results still provide new findings of the application and removal of this novel nail technology. Utilizing a low nail filing speed should be considered by nail technicians when removing PolyGel® to mitigate aerosol exposure. Ventilation techniques and nail dust collectors should be used in nail salons to decrease particle and VOC concentrations. Finally, this study provides a starting point for many future studies which seek to create a safer working environment for those working in nail salons.

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APPENDIX

Appendix A: Raw Data Table

FileSpeed	CureTime	Activity	VOC	GeoMeanOPS	ConcOPS	ConcNS	GeoMeanNS
Fast	120 sec	Application	3.428571429	0.364752	-0.179124286	-16.81764286	67.9655
Fast	120 sec	Application	14.42857143	0.486717	0.961885714	175.9210571	71.9707
Fast	120 sec	Application	265.4285714	0.408576	-0.415234286	203.8459571	73.4427
Fast	120 sec	Application	477.4285714	0.408189	-0.836474286	225.5986571	68.5304
Fast	120 sec	Application	925.4285714	0.401544	-0.042994286	67.31885714	65.9749
Fast	120 sec	Application	1043.428571	0.415379	-0.900504286	203.0244571	79.7266
Fast	120 sec	Application	1295.428571	0.402207	-0.471274286	72.22015714	63.6708
Fast	120 sec	Application	320.5714286	0.412529	3.583214286	777.7425429	72.0297
Fast	120 sec	Removal	320.5714286	0.389449	3.583214286	777.7425429	65.8504
Fast	120 sec	Removal	1628.428571	0.410651	0.093135714	-42.42554286	70.3288
Fast	120 sec	Removal	1662.428571	0.808344	3.279405714	7242.450257	34.1428
Fast	120 sec	Removal	1697.428571	0.831716	8.330885714	13333.25746	30.3564
Fast	120 sec	Removal	1701.428571	0.950276	8.956185714	10517.25746	28.1897
Fast	120 sec	Removal	1728.428571	0.888449	9.654185714	19353.25746	30.9673
Fast	120 sec	Removal	1728.428571	0.791758	8.519185714	18503.25746	28.3919
Fast	120 sec	After	1748.428571	0.678887	6.545385714	19755.25746	28.0003
Fast	120 sec	After	1732.428571	0.603676	5.727215714	19746.25746	27.9672
Fast	120 sec	After	1772.428571	0.550155	5.119845714	19082.25746	28.1961
Fast	120 sec	After	1719.428571	0.512823	4.667925714	18334.25746	28.0434
Fast	120 sec	After	1719.428571	0.488324	3.900545714	17277.25746	28.3506
Fast	120 sec	After	1727.428571	0.473389	3.359735714	16582.25746	28.3507
Fast	60 sec	Application	1	0.37633	-0.0126018	58.47364	53.6516
Fast	60 sec	Application	-7	0.652468	0.7515872	82.64094	52.3061
Fast	60 sec	Application	13	0.470804	0.5145072	1.93314	53.2841
Fast	60 sec	Application	329	0.43504	0.3504672	102.11354	58.9603
Fast	60 sec	Application	422	0.440992	0.4334872	172.61114	53.4331
Fast	60 sec	Application	484	0.428616	0.4864972	499.19194	47.8319
Fast	60 sec	Application	708	0.42459	0.4894972	344.14004	41.8086
Fast	60 sec	Application	325	0.407125	0.7466528	703.90376	42.7851
Fast	60 sec	Application	325	0.484082	0.7466528	703.90376	42.1086
Fast	60 sec	Removal	1143	1.09716	4.8083472	1271.71854	34.8583
Fast	60 sec	Removal	1186	1.1469	8.2056972	10969.09624	27.6075

Fast	60 sec	Removal	1192	1.14037	10.8480472	19386.09624	28.6219
Fast	60 sec	Removal	1222	1.09097	8.1135772	23048.09624	28.1214
Fast	60 sec	Removal	1215	0.941827	6.4166472	25197.09624	29.1248
Fast	60 sec	After	1242	0.835951	5.1654472	24200.09624	29.1999
Fast	60 sec	After	1239	0.744596	4.0790072	23658.09624	29.2334
Fast	60 sec	After	1251	0.678419	3.6605272	22702.09624	29.0326
Fast	60 sec	After	1254	0.659563	3.1500372	21982.09624	28.8335
Slow	30 sec	Application	48	0.402518	0.120094	-7.87524	58.7571
Slow	30 sec	Application	47	0.430377	0.110114	56.48206	59.5969
Slow	30 sec	Application	413	0.402137	-0.004976	-61.44574	60.1819
Slow	30 sec	Application	486	0.391345	0.139104	105.82516	62.3007
Slow	30 sec	Application	781	0.396125	0.090074	-37.98664	56.6269
Slow	30 sec	Application	1254	0.395141	0.508364	-35.83064	61.7239
Slow	30 sec	Application	1318	0.388776	0.150104	-120.65924	57.2243
Slow	30 sec	Application	209	0.385018	3.164966	1281.56074	63.1495
Slow	30 sec	Application	209	0.402502	3.164966	1281.56074	61.7773
Slow	30 sec	Application	1562	0.415797	-0.088006	-223.14504	62.8017
Slow	30 sec	Removal	1572	0.448787	0.026084	-189.33654	62.2533
Slow	30 sec	Removal	1629	0.495997	0.056144	-149.66564	62.2495
Slow	30 sec	Removal	1661	0.580726	0.292384	-177.19024	60.7526
Slow	30 sec	Removal	1646	0.682163	0.336544	-241.84324	58.8211
Slow	30 sec	Removal	1683	0.682448	0.316514	-163.53864	62.9622
Slow	30 sec	Removal	1697	0.655771	0.240434	37.02756	56.8643
Slow	30 sec	Removal	1671	0.639708	0.075254	15.64586	57.91
Slow	30 sec	Removal	-209	0.552539	-0.132956	43.37966	52.8926
Slow	30 sec	Removal	1693	0.601108	0.008184	-39.98514	56.4618
Slow	30 sec	Removal	1670	0.523087	-0.451156	-15.66944	55.1547
Slow	30 sec	Removal	1692	0.49325	-0.310086	-34.82604	55.4097
Slow	30 sec	After	1685	0.422478	-0.483246	30.62716	56.3995
Slow	30 sec	After	1692	0.409804	-0.442216	-123.19724	54.6726
Slow	30 sec	After	1725	0.399793	-0.402196	-172.30074	55.1203
Slow	30 sec	After	1666	0.392253	-0.513256	-137.39524	56.2343
Slow	30 sec	After	1721	0.390248	-0.513276	-174.05004	58.6546
Slow	30 sec	After	1706	0.38601	-0.666356	-228.92394	57.8182
Slow	30 sec	Application	2.2	0.46916	0.27918	-45.95846	57.8059
Slow	30 sec	Application	109.2	0.415701	0.42024	101.54954	56.8808
Slow	30 sec	Application	311.2	0.409809	0.27917	-24.79336	59.0991
Slow	30 sec	Application	415.2	0.407862	0.10007	21.91134	56.7736
Slow	30 sec	Application	470.2	0.393563	0.10407	79.14484	60.0725
Slow	30 sec	Application	613.2	0.394511	0.19111	36.81534	55.1795

Slow	30 sec	Application	865.2	0.397354	-0.036	10.46614	58.6868
Slow	30 sec	Application	356.8	0.392228	2.48359	1000.64796	59.2032
Slow	30 sec	Removal	356.8	0.39346	2.48359	1000.64796	60.3624
Slow	30 sec	Removal	1400.2	0.408198	0.08106	29.27334	60.717
Slow	30 sec	Removal	-356.8	0.422638	-0.063	35.31294	59.4257
Slow	30 sec	Removal	1498.2	0.537414	0.16317	18.54954	60.3633
Slow	30 sec	Removal	1502.2	0.880804	1.08204	49.81554	60.3176
Slow	30 sec	Removal	1501.2	0.97906	1.27423	86.70804	61.5308
Slow	30 sec	Removal	1545.2	0.917257	1.2001	75.95574	63.1928
Slow	30 sec	Removal	1568.2	0.747002	0.59352	49.38704	57.6175
Slow	30 sec	Removal	1534.2	0.729376	0.96982	82.17204	55.7987
Slow	30 sec	Removal	1548.2	0.683434	0.71959	36.22284	56.7807
Slow	30 sec	After	1556.2	0.523926	0.01908	6.63164	56.1388
Slow	30 sec	After	1567.2	0.487822	-0.088	17.99864	56.8675
Slow	30 sec	After	1529.2	0.459089	-0.24208	9.80574	54.7758
Slow	30 sec	After	1555.2	0.44716	-0.34413	10.78644	56.869
Slow	30 sec	After	1547.2	0.422682	-0.38315	17.19204	57.0916
Slow	30 sec	After	1529.2	0.413738	-0.44418	-11.75876	58.3512
Fast	120 sec	Application	-0.6	0.372624	-0.15175	-139.65086	49.187
Fast	120 sec	Application	1.4	0.451788	0.87457	-80.49776	46.9766
Fast	120 sec	Application	286.4	0.394276	0.18665	137.88854	47.7137
Fast	120 sec	Application	353.4	0.391691	-0.25481	36.40734	47.0044
Fast	120 sec	Application	408.4	0.390209	0.19365	135.28654	47.8194
Fast	120 sec	Application	636.4	0.386587	-0.31788	205.15144	49.5086
Fast	120 sec	Application	850.4	0.39235	-0.19174	86.19824	47.2944
Fast	120 sec	Application	307.6	0.38585	5.3464	3112.74736	46.7035
Fast	120 sec	Application	307.6	0.381405	5.3464	3112.74736	46.8359
Fast	120 sec	Application	1089.4	0.385935	-0.45403	460.11374	47.3754
Fast	120 sec	Removal	1162.4	0.479118	0.1568	669.97664	45.984
Fast	120 sec	Removal	1182.4	0.905458	5.4742	13489.25264	31.8747
Fast	120 sec	Removal	1226.4	0.857802	7.4161	15172.25264	30.4598
Fast	120 sec	Removal	1223.4	0.74731	7.8257	20992.25264	29.0807
Fast	120 sec	Removal	1241.4	0.599388	5.2563	21948.25264	28.7162
Fast	120 sec	After	1240.4	0.552434	4.00315	21386.25264	28.8593
Fast	120 sec	After	1249.4	0.506487	2.83771	20266.25264	29.1294
Fast	120 sec	After	1240.4	0.492582	2.24868	19411.25264	29.0638
Fast	120 sec	After	1237.4	0.463401	1.79895	18772.25264	28.859
Fast	120 sec	After	-307.6	0.457843	1.23011	18394.25264	29.2506
Fast	120 sec	Application	5.8	0.371149	-0.248174	-63.3489	47.7487
Fast	120 sec	Application	5.8	0.439787	0.395396	-50.2568	49.0745

Fast	120 sec	Application	197.8	0.394978	0.111116	-16.7811	49.9092
Fast	120 sec	Application	265.8	0.385981	0.502396	16.013	49.6978
Fast	120 sec	Application	323.8	0.387197	0.477366	-83.3739	50.902
Fast	120 sec	Application	479.8	0.402581	0.398376	-149.822	49.4263
Fast	120 sec	Application	780.8	0.390785	0.679576	-80.6378	46.6459
Fast	120 sec	Application	391.2	0.389933	3.733344	3126.6776	50.3492
Fast	120 sec	Application	391.2	0.386869	3.733344	3126.6776	49.7776
Fast	120 sec	Removal	1077.8	0.381344	0.400326	192.4491	53.8381
Fast	120 sec	Removal	1103.8	0.488952	4.954716	3080.1746	68.1197
Fast	120 sec	Removal	1130.8	0.682829	8.303756	13337.3224	25.5801
Fast	120 sec	Removal	1138.8	0.600273	7.231356	22513.3224	35.0196
Fast	120 sec	Removal	1156.8	0.602753	7.135056	17491.3224	29.9252
Fast	120 sec	Removal	1165.8	0.534572	7.524556	27635.3224	30.7026
Fast	120 sec	After	1147.8	0.489401	5.579866	27984.3224	30.4084
Fast	120 sec	After	1180.8	0.458974	4.905376	26918.3224	30.3974
Fast	120 sec	After	1162.8	0.44067	4.054816	26135.3224	30.5912
Fast	120 sec	After	1180.8	0.436935	3.560086	25961.3224	30.8717
Fast	120 sec	After	1176.8	0.421494	3.318676	24891.3224	30.7495
Fast	30 sec	Application	-6.2	0.403604	0.102298	-82.24084	52.6891
Fast	30 sec	Application	135.8	0.477357	1.222358	-1.33904	52.2476
Fast	30 sec	Application	557.8	0.426635	0.615728	27.48396	55.4833
Fast	30 sec	Application	676.8	0.432119	0.457598	-1.89224	54.2158
Fast	30 sec	Application	774.8	0.419642	0.517628	-34.73654	52.7679
Fast	30 sec	Application	1049.8	0.413532	0.332468	-48.16944	53.4931
Fast	30 sec	Application	1298.8	0.420112	0.588698	-24.21544	55.2332
Fast	30 sec	Application	307.2	0.401738	3.456952	1715.45174	53.9013
Fast	30 sec	Removal	307.2	0.436795	3.456952	1715.45174	56.6085
Fast	30 sec	Removal	1717.8	0.79895	8.313548	1034.99066	47.895
Fast	30 sec	Removal	1761.8	1.02088	15.054348	5411.71866	32.8868
Fast	30 sec	Removal	1785.8	1.02848	20.540448	11290.54826	28.4286
Fast	30 sec	Removal	1789.8	0.887612	14.774848	13554.54826	29.1568
Fast	30 sec	After	1772.8	0.774936	10.936648	14564.54826	28.4193
Fast	30 sec	After	1768.8	0.659473	8.370848	13879.54826	28.2368
Fast	30 sec	After	1780.8	0.612614	7.153348	13428.54826	28.6677
Fast	30 sec	After	1784.8	0.56116	5.984658	12961.54826	28.1621
Fast	30 sec	After	1804.8	0.533118	5.183978	12614.54826	28.3528
Fast	30 sec	Application	4.8	0.520604	0.758088	171.56984	66.0081
Fast	30 sec	Application	12.8	0.424	0.382728	58.95074	63.7062
Fast	30 sec	Application	384.8	0.40769	0.603888	78.79794	63.1825
Fast	30 sec	Application	505.8	0.402301	0.344678	35.48054	61.8117

Fast	30 sec	Application	640.8	0.410108	0.185568	33.59254	61.926
Fast	30 sec	Application	1065.8	0.410842	0.584878	-110.90216	59.0599
Fast	30 sec	Application	1290.8	0.403878	0.394718	-17.13656	62.0665
Fast	30 sec	Application	403.2	0.395476	3.489762	1557.64546	61.9499
Fast	30 sec	Removal	403.2	0.560874	3.489762	1557.64546	27.6462
Fast	30 sec	Removal	1805.8	0.713776	9.710838	13382.35454	56.7682
Fast	30 sec	Removal	1938.8	0.691566	9.721538	13487.35454	30.6348
Fast	30 sec	Removal	1951.8	0.685171	10.692538	17605.35454	30.4978
Fast	30 sec	Removal	1960.8	0.568375	7.875538	18302.35454	29.4181
Fast	30 sec	After	1969.8	0.517288	6.394698	17639.35454	29.339
Fast	30 sec	After	2006.8	0.495671	5.613988	17119.35454	29.4644
Fast	30 sec	After	2020.8	0.481862	4.801438	16218.35454	29.2767
Fast	30 sec	After	1982.8	0.457463	4.392688	16027.35454	29.3857
Medium	30 sec	Application	2.2	0.409381	0.143764	-158.68716	58.5913
Medium	30 sec	Application	5.2	0.426339	0.500144	158.08124	56.73
Medium	30 sec	Application	240.2	0.393682	0.294894	-97.10116	59.4552
Medium	30 sec	Application	488.2	0.392203	-0.111466	-132.21976	60.2004
Medium	30 sec	Application	545.2	0.390314	0.052684	-32.56466	63.2534
Medium	30 sec	Application	1174.2	0.392747	0.053674	-135.17726	60.6421
Medium	30 sec	Application	2007.2	0.390242	0.365954	-239.51096	58.8835
Medium	30 sec	Application	422.8	0.386718	4.471306	1792.85556	59.5835
Medium	30 sec	Application	422.8	0.4142	4.471306	1792.85556	58.5215
Medium	30 sec	Removal	1886.2	0.658561	3.220404	1199.28784	35.3974
Medium	30 sec	Removal	1890.2	0.819399	7.983094	5860.60214	30.9198
Medium	30 sec	Removal	1921.2	0.771223	5.792794	6089.05724	34.4493
Medium	30 sec	Removal	2000.2	0.902846	8.457094	9383.14444	34.2235
Medium	30 sec	Removal	1972.2	0.689346	6.133394	8159.42374	29.8103
Medium	30 sec	After	1986.2	0.62044	4.212934	7995.92884	29.257
Medium	30 sec	After	1990.2	0.565588	3.626634	7699.84264	29.5157
Medium	30 sec	After	1994.2	0.518665	2.924334	7531.64834	29.245
Medium	30 sec	After	1994.2	0.497543	2.497674	7189.93834	29.2643
Medium	120 sec	Application	-16.8	0.361589	0.1763	-159.05328	57.0681
Medium	120 sec	Application	12.2	0.411318	3.5332	11.84042	57.9863
Medium	120 sec	Application	286.2	0.388198	0.9433	-11.97438	55.1002
Medium	120 sec	Application	369.2	0.385055	0.2217	-159.00908	55.912
Medium	120 sec	Application	673.2	0.382389	0.1926	-104.95388	57.4969
Medium	120 sec	Application	899.2	0.382724	0.4453	-209.57248	55.6821
Medium	120 sec	Application	1118.2	0.383284	-0.70911	-218.14328	56.1735
Medium	120 sec	Application	382.8	0.377055	10.6538	1461.19008	53.0096
Medium	120 sec	Application	382.8	0.375531	10.6538	1461.19008	58.2248

Medium	120 sec	Removal	1348.2	0.379631	0.1595	-160.04718	59.7639
Medium	120 sec	Removal	1365.2	0.431487	-0.1796	-113.07218	53.9133
Medium	120 sec	Removal	1399.2	0.52972	2.837	5419.16992	31.5593
Medium	120 sec	Removal	1402.2	0.616518	6.8269	7140.37172	29.7884
Medium	120 sec	Removal	1409.2	0.566672	5.8644	7834.39942	29.1395
Medium	120 sec	After	1405.2	0.479983	3.409	7266.69062	29.3637
Medium	120 sec	After	1412.2	0.456646	2.6943	7078.07942	29.4173
Medium	120 sec	After	1384.2	0.434072	1.6855	6951.06902	29.6731
Medium	120 sec	After	1391.2	0.420821	1.0487	6819.40842	29.5732
Medium	120 sec	After	-382.8	0.410453	0.4183	6388.45722	29.5894
Medium	120 sec	After	1391.2	0.407051	-0.3324	6202.62002	29.4928
Fast	30 sec	Application	-216.2	0.414278	1.872336	28.93246	59.7823
Fast	30 sec	Application	16.8	0.397891	0.513036	-117.01524	58.8088
Fast	30 sec	Application	204.8	0.390602	0.018836	-179.09244	58.9593
Fast	30 sec	Application	264.8	0.384425	0.048836	-54.68434	64.5043
Fast	30 sec	Application	529.8	0.382638	-0.283764	-106.53284	64.227
Fast	30 sec	Application	633.8	0.386154	-0.093264	-197.55704	64.5149
Fast	30 sec	Application	782.8	0.385706	1.807036	-288.76204	65.2701
Fast	30 sec	Application	216.2	0.380979	10.849664	2301.46494	66.9836
Fast	30 sec	Removal	216.2	0.388524	10.849664	2301.46494	63.5977
Fast	30 sec	Removal	1245.8	0.565144	7.322936	1966.97256	37.8628
Fast	30 sec	Removal	1303.8	0.759179	11.974136	19111.53506	29.2653
Fast	30 sec	Removal	1361.8	0.698866	14.280936	32392.53506	32.3657
Fast	30 sec	Removal	1388.8	0.620663	14.725836	32735.53506	29.8603
Fast	30 sec	After	1420.8	0.513042	10.417836	35074.53506	29.7021
Fast	30 sec	After	1433.8	0.482618	8.554236	33067.53506	29.8038
Fast	30 sec	After	1478.8	0.462684	7.042136	32098.53506	29.721
Fast	30 sec	After	1535.8	0.442359	6.020036	30732.53506	29.8039
Fast	30 sec	After	1538.8	0.429709	5.364436	29380.53506	30.1279
Fast	30 sec	After	1580.8	0.419936	4.354136	28447.53506	30.0836
Fast	30 sec	Application	6.4	0.362766	-1.42616	-85.67818	64.538
Fast	30 sec	Application	-0.6	0.502766	1.21797	81.36132	68.1167
Fast	30 sec	Application	21.4	0.387474	0.68731	-86.68318	65.6122
Fast	30 sec	Application	127.4	0.388143	-0.14707	-7.80698	69.663
Fast	30 sec	Application	185.4	0.383009	-0.35643	-127.84798	64.7691
Fast	30 sec	Application	272.4	0.381598	-0.91727	-65.00998	70.3516
Fast	30 sec	Application	415.4	0.377158	-0.11203	72.87932	72.8625
Fast	30 sec	Application	271.6	0.377559	8.64003	1751.50228	68.1361
Fast	30 sec	Removal	271.6	0.531444	8.64003	1751.50228	25.6303
Fast	30 sec	Removal	588.4	0.627582	3.38907	33514.49772	78.1649

Fast	30 sec	Removal	614.4	0.667195	6.87847	17765.49772	31.2914
Fast	30 sec	Removal	638.4	0.638218	6.75437	18565.49772	31.2011
Fast	30 sec	Removal	636.4	0.585127	7.83147	22777.49772	30.4492
Fast	30 sec	Removal	634.4	0.529924	5.65757	23222.49772	30.1225
Fast	30 sec	After	634.4	0.495593	4.97017	22278.49772	30.1451
Fast	30 sec	After	645.4	0.475587	3.39887	21699.49772	29.7158
Fast	30 sec	After	648.4	0.451863	3.50277	20640.49772	29.5826
Fast	30 sec	After	645.4	0.430062	2.42507	19889.49772	29.7865
Fast	30 sec	After	652.4	0.418391	2.01307	19289.49772	29.5711
Fast	30 sec	Application	0.6	0.361465	-0.649482	-132.14824	82.3156
Fast	30 sec	Application	-1.4	0.444052	1.707768	76.80506	88.7586
Fast	30 sec	Application	12.6	0.392902	0.944568	-52.82464	81.2364
Fast	30 sec	Application	173.6	0.383377	1.467148	-78.39714	84.9048
Fast	30 sec	Application	224.6	0.384305	0.973508	47.09906	90.2328
Fast	30 sec	Application	326.6	0.38202	0.652098	7.80256	85.8125
Fast	30 sec	Application	465.6	0.375058	1.036578	42.56236	88.2151
Fast	30 sec	Removal	178.4	0.396455	6.016182	1483.63234	85.5331
Fast	30 sec	Removal	178.4	0.596372	6.016182	1483.63234	49.3319
Fast	30 sec	Removal	707.6	0.666987	8.830818	8549.36766	34.6274
Fast	30 sec	Removal	737.6	0.585286	8.609318	8488.52326	31.1263
Fast	30 sec	Removal	735.6	0.525825	7.888418	11269.36766	31.13
Fast	30 sec	After	729.6	0.489247	6.644518	10993.36766	31.4791
Fast	30 sec	After	733.6	0.477359	6.283318	10636.36766	31.7046
Fast	30 sec	After	753.6	0.45968	5.562418	10229.36766	31.5194
Fast	30 sec	After	762.6	0.440157	4.715418	9868.36766	31.5142
Fast	30 sec	After	776.6	0.436581	3.949778	9654.36766	31.3159
Fast	30 sec	Application	2	0.361653	-0.46916	-28.75052	76.1736
Fast	30 sec	Application	0	0.410206	-0.20268	-18.07332	77.6654
Fast	30 sec	Application	31	0.394297	0.23286	48.98618	79.1748
Fast	30 sec	Application	148	0.389394	0.14471	23.03008	78.9313
Fast	30 sec	Application	203	0.386279	-0.2148	-1.87082	79.894
Fast	30 sec	Application	266	0.389771	-0.17571	14.65728	79.7633
Fast	30 sec	Application	408	0.381598	-0.12869	-92.79382	76.5321
Fast	30 sec	Application	231	0.379379	6.68676	1841.78952	75.784
Fast	30 sec	Removal	231	0.425848	6.68676	1841.78952	43.7342
Fast	30 sec	Removal	627	0.574572	8.08684	27106.21048	36.3045
Fast	30 sec	Removal	633	0.602934	6.93644	18099.21048	34.4375
Fast	30 sec	Removal	645	0.603905	6.99264	19453.21048	30.7589
Fast	30 sec	After	660	0.542523	5.44894	21606.21048	31.3947
Fast	30 sec	After	669	0.500292	4.30084	21456.21048	31.652

Fast	30 sec	After	683	0.474356	3.77644	20851.21048	31.9161
Fast	30 sec	After	669	0.456141	3.10695	19918.21048	31.3189
Fast	60 sec	Application	-5	0.366735	-0.459602	-93.62958	72.1377
Fast	60 sec	Application	147	0.569418	3.181018	141.19772	67.6356
Fast	60 sec	Application	236	0.400805	0.644208	17.77952	74.7313
Fast	60 sec	Application	278	0.393717	-0.235162	37.52642	75.4682
Fast	60 sec	Application	350	0.387913	-0.430462	-55.00768	71.3391
Fast	60 sec	Application	471	0.386383	-0.453502	-15.47618	75.1347
Fast	60 sec	Application	572	0.377808	0.032148	-140.88058	72.5171
Fast	60 sec	Application	205	0.373406	7.730482	2099.42948	75.8418
Fast	60 sec	Removal	205	0.418189	7.730482	2099.42948	41.6045
Fast	60 sec	Removal	669	0.511699	5.566218	5180.09142	35.3975
Fast	60 sec	Removal	680	0.587115	7.132618	9314.57052	34.4165
Fast	60 sec	Removal	687	0.618916	7.592418	10717.57052	32.2532
Fast	60 sec	After	680	0.525779	5.496918	13514.57052	31.8424
Fast	60 sec	After	698	0.490835	4.300418	13634.57052	32.2121
Fast	60 sec	After	701	0.473118	3.826118	13277.57052	32.0332
Fast	60 sec	After	706	0.452085	2.976018	12905.57052	32.2132
Fast	60 sec	After	696	0.431343	2.255358	12478.57052	32.469
Fast	60 sec	Application	-1.4	0.364428	-0.200256	-161.02632	74.334
Fast	60 sec	Application	-8.4	0.432967	1.313434	-44.67442	70.412
Fast	60 sec	Application	48.6	0.392039	1.122944	-13.54322	75.0514
Fast	60 sec	Application	142.6	0.387123	-0.074926	-7.26802	75.627
Fast	60 sec	Application	239.6	0.379026	0.317584	41.21078	76.9392
Fast	60 sec	Application	415.6	0.379686	-0.183136	52.82938	76.2352
Fast	60 sec	Application	590.6	0.378445	-0.140086	-113.09452	75.0359
Fast	60 sec	Application	210.4	0.398041	7.525176	2131.80072	77.1354
Fast	60 sec	Removal	210.4	0.481132	7.525176	2131.80072	51.2806
Fast	60 sec	Removal	725.6	0.663176	5.726524	4467.89368	38.0797
Fast	60 sec	Removal	742.6	0.636528	6.495624	7503.79608	34.8269
Fast	60 sec	Removal	753.6	0.578464	7.215224	10131.19928	33.5766
Fast	60 sec	Removal	751.6	0.517634	6.839324	13603.19928	32.3261
Fast	60 sec	After	757.6	0.476107	5.432924	13507.19928	32.0355
Fast	60 sec	After	756.6	0.448426	4.374924	13162.19928	32.4716
Fast	60 sec	After	754.6	0.434812	3.648124	12784.19928	32.3887
Fast	60 sec	After	754.6	0.423454	3.229124	12411.19928	32.2443
Fast	60 sec	After	756.6	0.409153	2.695924	12173.19928	32.4663
Fast	60 sec	Application	2.2	0.365861	-0.469962	13.10288	73.1857
Fast	60 sec	Application	-1.8	0.386052	0.374158	-8.86842	71.4376
Fast	60 sec	Application	4.2	0.400898	0.348128	21.49478	67.5648

Fast	60 sec	Application	61.2	0.3932	-0.367802	-35.00762	70.7002
Fast	60 sec	Application	135.2	0.387763	-0.184562	-37.80452	69.9105
Fast	60 sec	Application	211.2	0.395848	0.131898	-53.32672	70.0401
Fast	60 sec	Application	464.2	0.40717	-0.074302	-52.77372	69.9992
Fast	60 sec	Application	180.8	0.391146	6.340252	1402.99062	69.4698
Fast	60 sec	Application	180.8	0.386897	6.340252	1402.99062	71.8722
Fast	60 sec	Application	637.2	0.401914	0.788798	-118.74772	71.4044
Fast	60 sec	Removal	653.2	0.5854	3.856348	2574.45948	38.5269
Fast	60 sec	Removal	674.2	0.776315	7.690248	10505.00938	29.3463
Fast	60 sec	Removal	679.2	0.657983	9.300748	22174.00938	29.8263
Fast	60 sec	Removal	681.2	0.596415	7.447948	20354.00938	29.3904
Fast	60 sec	Removal	-180.8	0.528146	6.236848	21819.00938	30.3063
Fast	60 sec	After	689.2	0.473774	4.782548	21626.00938	30.29
Fast	60 sec	After	698.2	0.4488	3.903448	20902.00938	30.3214
Fast	60 sec	After	696.2	0.438228	3.029628	19966.00938	30.5184
Fast	60 sec	After	690.2	0.432051	2.959458	19400.00938	30.4646
Fast	60 sec	After	702.2	0.418212	2.270128	18769.00938	30.31
Fast	60 sec	Application	-0.2	0.380564	0.24187	-42.01258	74.4909
Fast	60 sec	Application	31.8	0.427545	1.3464	82.99402	69.4716
Fast	60 sec	Application	137.8	0.421386	0.67951	-28.23398	68.9801
Fast	60 sec	Application	183.8	0.409268	0.67546	35.86782	74.8815
Fast	60 sec	Application	324.8	0.399291	0.28201	82.86892	73.626
Fast	60 sec	Application	450.8	0.395148	0.37709	17.47902	69.9527
Fast	60 sec	Application	496.8	0.387251	0.41411	-20.88388	74.1247
Fast	60 sec	Application	149.2	0.388518	5.41519	1243.20578	72.4179
Fast	60 sec	Removal	149.2	0.560311	5.41519	1243.20578	28.6399
Fast	60 sec	Removal	565.8	0.731905	6.75541	13528.79422	35.0017
Fast	60 sec	Removal	568.8	0.769596	6.22501	13244.79422	31.0386
Fast	60 sec	Removal	581.8	0.697019	8.33521	16615.79422	29.5912
Fast	60 sec	Removal	575.8	0.675498	6.69501	21819.79422	30.5897
Fast	60 sec	After	592.8	0.561648	4.82431	22255.79422	30.1351
Fast	60 sec	After	579.8	0.51233	4.29588	21820.79422	30.4517
Fast	60 sec	After	580.8	0.489436	3.47905	21338.79422	30.6099
Fast	60 sec	After	599.8	0.478306	2.97012	20830.79422	30.6043
Fast	60 sec	After	599.8	0.453175	2.55431	20097.79422	30.7465
Fast	60 sec	Application	3	0.429733	0.081196	-103.03914	69.6612
Fast	60 sec	Application	7	0.394605	0.232366	59.76316	68.0963
Fast	60 sec	Application	178	0.395527	-0.108294	82.20576	71.8503
Fast	60 sec	Application	247	0.386839	-0.469044	76.50566	72.6335
Fast	60 sec	Application	291	0.385346	-0.188484	35.00786	69.3846

Fast	60 sec	Application	436	0.39489	-0.246544	5.66136	70.0724
Fast	60 sec	Application	520	0.382564	-0.506134	-13.30954	71.4844
Fast	60 sec	Application	160	0.380121	9.399774	1340.25034	71.9851
Fast	60 sec	Application	160	0.395693	9.399774	1340.25034	67.7274
Fast	60 sec	Removal	628	0.516879	2.013126	4881.48356	39.8687
Fast	60 sec	Removal	647	0.548366	4.705926	10934.74966	32.0736
Fast	60 sec	Removal	666	0.562922	6.257426	13784.74966	31.7562
Fast	60 sec	Removal	673	0.503851	7.327226	16540.74966	30.4886
Fast	60 sec	Removal	679	0.456517	5.580426	17659.74966	31.8441
Fast	60 sec	After	681	0.427572	4.224926	18039.74966	31.7423
Fast	60 sec	After	677	0.420777	3.258426	17658.74966	32.1885
Fast	60 sec	After	675	0.409371	2.695826	17039.74966	31.988
Fast	60 sec	After	670	0.401813	2.102326	16515.74966	32.0814
Fast	60 sec	After	677	0.394181	1.764326	16187.74966	32.1262
Fast	120 sec	Application	-4.4	0.360031	-0.624858	36.29778	75.6258
Fast	120 sec	Application	76.6	0.415655	1.606412	-9.91102	76.059
Fast	120 sec	Application	148.6	0.382522	0.178652	4.48618	73.1182
Fast	120 sec	Application	175.6	0.375058	-0.755918	14.93078	74.0611
Fast	120 sec	Application	270.6	0.375876	-0.309188	-2.03442	78.0219
Fast	120 sec	Application	400.6	0.385011	0.127592	-6.88792	77.8289
Fast	120 sec	Application	507.6	0.375936	-0.436378	-73.73822	75.1058
Fast	120 sec	Application	172.4	0.36977	8.767988	1259.96852	73.459
Fast	120 sec	Application	172.4	0.371128	8.767988	1259.96852	76.6877
Fast	120 sec	Removal	601.6	0.38481	-0.279108	-85.04092	75.8218
Fast	120 sec	Removal	621.6	0.465475	2.611412	590.35778	63.8694
Fast	120 sec	Removal	626.6	0.61986	5.295912	10433.03148	30.1744
Fast	120 sec	Removal	624.6	0.66575	6.232512	14901.03148	29.8305
Fast	120 sec	Removal	638.6	0.623543	6.877712	18918.03148	29.7839
Fast	120 sec	After	646.6	0.549868	5.185112	22056.03148	30.5893
Fast	120 sec	After	636.6	0.501048	3.763612	21418.03148	30.6242
Fast	120 sec	After	630.6	0.47558	2.932112	20972.03148	30.7779
Fast	120 sec	After	-172.4	0.448769	2.260412	20632.03148	30.8035
Fast	120 sec	After	630.6	0.429292	1.451512	19869.03148	31.0376
Fast	120 sec	Application	3.6	0.363401	-0.320186	42.31798	81.5391
Fast	120 sec	Application	-4.4	0.445608	1.391904	46.02538	77.1425
Fast	120 sec	Application	95.6	0.394061	0.331884	-24.18432	81.9545
Fast	120 sec	Application	232.6	0.381055	-0.638546	-34.52382	81.5194
Fast	120 sec	Application	286.6	0.37918	-0.555446	17.27418	80.293
Fast	120 sec	Application	385.6	0.380712	-0.556436	-18.51012	76.6588
Fast	120 sec	Application	509.6	0.38016	-0.538386	-16.41292	80.5748

Fast	120 sec	Application	163.4	0.372702	7.646186	1027.44482	83.4899
Fast	120 sec	Application	163.4	0.374296	7.646186	1027.44482	83.8964
Fast	120 sec	Application	709.6	0.371922	-1.273376	-118.46852	77.9792
Fast	120 sec	Removal	747.6	0.536161	6.086514	8825.70178	38.9134
Fast	120 sec	Removal	800.6	0.806994	7.348814	12756.55518	27.7923
Fast	120 sec	Removal	792.6	0.694891	7.307714	16777.55518	30.816
Fast	120 sec	Removal	807.6	0.655163	10.067714	16760.55518	31.5323
Fast	120 sec	Removal	811.6	0.533676	6.239814	19289.55518	31.9646
Fast	120 sec	After	811.6	0.497413	4.865414	19656.55518	32.3178
Fast	120 sec	After	792.6	0.469722	4.066114	19812.55518	32.5643
Fast	120 sec	After	799.6	0.446167	3.064514	18806.55518	32.4691
Fast	120 sec	After	811.6	0.434625	2.238734	18356.55518	32.4587
Fast	120 sec	After	824.6	0.423475	1.761654	18314.55518	32.7278
Fast	120 sec	Application	-2	0.373983	0.344872	-15.55288	83.1692
Fast	120 sec	Application	99	0.46845	1.027202	114.68402	78.3806
Fast	120 sec	Application	150	0.403869	0.027602	-51.17878	79.9701
Fast	120 sec	Application	186	0.397829	-0.080558	61.00842	83.2836
Fast	120 sec	Application	302	0.394898	-0.342898	61.03682	86.3857
Fast	120 sec	Application	400	0.395655	-0.546118	61.81922	84.2705
Fast	120 sec	Application	526	0.386632	-0.258788	-50.24628	81.2807
Fast	120 sec	Application	173	0.385075	6.580598	902.62438	80.3777
Fast	120 sec	Application	173	0.381685	6.580598	902.62438	86.5837
Fast	120 sec	Removal	685	0.444005	0.822932	-60.44608	83.4199
Fast	120 sec	Removal	707	0.595662	3.312322	5585.78732	44.5833
Fast	120 sec	Removal	692	0.748516	6.505702	19169.37562	34.3974
Fast	120 sec	Removal	724	0.689611	5.289602	15073.37562	30.4566
Fast	120 sec	Removal	724	0.635286	6.098402	20999.37562	32.8278
Fast	120 sec	After	721	0.550325	4.518602	23819.37562	31.8528
Fast	120 sec	After	719	0.51248	3.638402	24004.37562	31.87
Fast	120 sec	After	731	0.474219	3.041912	23185.37562	31.9564
Fast	120 sec	After	733	0.454899	2.231242	22740.37562	32.0584
Fast	120 sec	After	706	0.443242	1.975762	22479.37562	32.4295
Slow	30 sec	Application	-0.8	0.359975	-1.0998	-56.58104	83.7448
Slow	30 sec	Application	-5.8	0.389922	0.7382	34.75386	83.9297
Slow	30 sec	Application	7.2	0.378597	0.0362	113.96496	85.5648
Slow	30 sec	Application	155.2	0.376295	-0.7267	-130.95064	81.2187
Slow	30 sec	Application	201.2	0.371986	-0.6957	-128.01024	84.0617
Slow	30 sec	Application	318.2	0.40557	0.3676	13.22666	84.7216
Slow	30 sec	Application	476.2	0.372703	0.1052	162.55586	93.3361
Slow	30 sec	Removal	197.8	0.370384	13.1605	1566.91024	81.5164

Slow	30 sec	Removal	197.8	0.371819	13.1605	1566.91024	80.5045
Slow	30 sec	Removal	608.2	0.375917	-1.3573	-171.32634	83.6812
Slow	30 sec	Removal	635.2	0.386184	-1.9003	-191.09554	83.417
Slow	30 sec	Removal	645.2	0.397293	-2.0305	-171.08914	83.0489
Slow	30 sec	Removal	661.2	0.413347	-1.8099	-143.67454	86.5967
Slow	30 sec	Removal	648.2	0.465667	-1.1655	-194.94404	86.0339
Slow	30 sec	Removal	661.2	0.463674	-1.5334	-120.79074	85.2921
Slow	30 sec	Removal	656.2	0.496924	-1.3887	-211.34574	84.692
Slow	30 sec	Removal	651.2	0.492206	-1.5552	-123.16514	76.9576
Slow	30 sec	Removal	675.2	0.439214	-2.0501	-242.08374	80.5012
Slow	30 sec	Removal	654.2	0.437115	-2.2335	-161.89074	84.3468
Slow	30 sec	Removal	692.2	0.461918	-2.2332	-211.23074	81.0031
Slow	30 sec	Removal	676.2	0.433384	-2.8298	-223.58514	80.4991
Slow	30 sec	Removal	671.2	0.424192	-2.1604	-208.79864	79.9195
Slow	30 sec	After	677.2	0.40208	-2.4593	-200.64554	78.5274
Slow	30 sec	After	669.2	0.394135	-2.803	-171.97174	77.6185
Slow	30 sec	After	662.2	0.3877	-2.9213	-234.80494	79.7922
Slow	30 sec	After	654.2	0.383285	-2.8794	-292.58584	79.5071
Slow	30 sec	After	658.2	0.381638	-3.0257	-251.24874	79.0701
Slow	30 sec	Application	0.6	0.359378	-0.708662	-69.40116	84.5603
Slow	30 sec	Application	-5.4	0.436037	1.791428	68.31984	83.2394
Slow	30 sec	Application	72.6	0.396378	0.750128	-0.29126	86.0205
Slow	30 sec	Application	147.6	0.389607	-0.032312	-17.04766	82.325
Slow	30 sec	Application	200.6	0.384238	-0.439002	-62.66386	81.4223
Slow	30 sec	Application	309.6	0.382774	-0.219692	62.82884	84.789
Slow	30 sec	Application	435.6	0.377278	-0.493152	-70.09876	81.7114
Slow	30 sec	Application	187.4	0.378215	8.907872	1145.74866	87.8936
Slow	30 sec	Removal	187.4	0.380432	8.907872	1145.74866	83.1212
Slow	30 sec	Removal	521.6	0.390251	-1.040982	-29.22096	85.5522
Slow	30 sec	Removal	546.6	0.391276	-1.252272	-8.28176	84.651
Slow	30 sec	Removal	530.6	0.454824	-0.700092	12.38204	88.6623
Slow	30 sec	Removal	-187.4	0.461295	-0.690042	-67.70566	86.267
Slow	30 sec	Removal	540.6	0.452523	-1.203902	-41.94806	84.4987
Slow	30 sec	Removal	550.6	0.51242	-0.725812	-21.04986	83.7715
Slow	30 sec	Removal	550.6	0.435764	-1.187962	-107.13776	82.8011
Slow	30 sec	Removal	550.6	0.427514	-0.991712	-124.45356	82.7252
Slow	30 sec	Removal	539.6	0.441639	-1.164892	-62.98336	86.313
Slow	30 sec	Removal	556.6	0.42092	-0.779372	16.27284	85.1705
Slow	30 sec	Removal	543.6	0.401773	-1.448482	-95.30606	84.5353
Slow	30 sec	After	548.6	0.396201	-1.705902	-95.32326	83.1619

Slow	30 sec	After	538.6	0.390489	-1.543702	-127.04556	85.2329
Slow	30 sec	After	544.6	0.385263	-1.810082	-166.77846	82.7388
Slow	30 sec	After	544.6	0.384245	-1.944242	-112.62126	83.5378
Slow	30 sec	Application	1.4	0.508549	1.797486	23.49772	87.6738
Slow	30 sec	Application	24.4	0.407357	0.631396	38.48412	79.595
Slow	30 sec	Application	173.4	0.402897	0.328976	58.02792	83.4667
Slow	30 sec	Application	234.4	0.388451	0.251836	48.70802	79.1773
Slow	30 sec	Application	366.4	0.386492	0.229806	22.08572	80.6789
Slow	30 sec	Application	429.4	0.38986	-0.008474	100.85012	87.3182
Slow	30 sec	Application	509.4	0.37927	0.179706	-58.19078	81.6026
Slow	30 sec	Removal	180.6	0.507406	6.395374	971.87168	81.4919
Slow	30 sec	Removal	180.6	0.501422	6.395374	971.87168	87.2382
Slow	30 sec	Removal	630.4	0.53009	0.818266	17.97402	87.8994
Slow	30 sec	Removal	630.4	0.509398	0.288356	-17.51138	84.259
Slow	30 sec	Removal	644.4	0.501525	0.138126	-39.74408	82.2759
Slow	30 sec	Removal	652.4	0.554476	0.537856	39.16372	85.8066
Slow	30 sec	Removal	646.4	0.692146	1.553036	-5.70438	84.7326
Slow	30 sec	Removal	633.4	0.491172	0.243176	13.75402	84.3102
Slow	30 sec	After	652.4	0.451333	-0.161524	-10.64588	81.4113
Slow	30 sec	After	652.4	0.41607	-0.403884	-67.37698	82.9495
Slow	30 sec	After	648.4	0.403855	-0.630214	-76.52808	81.5798
Slow	30 sec	After	645.4	0.393729	-0.909514	-28.65788	86.2694
Slow	30 sec	After	650.4	0.381616	-1.055724	-134.38038	83.0462
Medium	30 sec	Application	-1.2	0.457154	0.985922	204.276	92.5807
Medium	30 sec	Application	48.8	0.410627	1.330382	144.7597	84.9029
Medium	30 sec	Application	161.8	0.397231	0.306482	43.3689	82.7127
Medium	30 sec	Application	232.8	0.39634	0.247402	18.9908	83.6453
Medium	30 sec	Application	426.8	0.38792	-0.118188	31.7967	83.0466
Medium	30 sec	Application	519.8	0.390965	0.017072	7.8711	84.144
Medium	30 sec	Application	644.8	0.385738	-0.328488	1.9864	81.7738
Medium	30 sec	Removal	228.2	0.465522	8.028128	1033.8016	81.718
Medium	30 sec	Removal	228.2	0.670713	8.028128	1033.8016	38.6107
Medium	30 sec	Removal	768.8	0.617784	7.656072	2492.9145	35.8289
Medium	30 sec	Removal	766.8	0.621284	5.788272	4017.8735	32.4098
Medium	30 sec	Removal	781.8	0.509714	3.576172	3997.6652	32.0116
Medium	30 sec	After	805.8	0.480937	2.724872	4008.5911	33.0701
Medium	30 sec	After	803.8	0.455485	2.384872	3844.4169	32.8069
Medium	30 sec	After	803.8	0.437858	1.528062	3765.2974	33.1685
Medium	30 sec	After	809.8	0.4353	1.405742	3611.9526	32.8658
Slow	60 sec	Application	0.8	0.776694	2.587284	-9.00722	59.4938

Slow	60 sec	Application	1.8	0.482039	1.755114	5.15998	53.0359
Slow	60 sec	Application	43.8	0.490467	0.788214	5.09438	51.0096
Slow	60 sec	Application	60.8	0.465363	0.692124	-35.71722	49.8308
Slow	60 sec	Application	71.8	0.454385	0.603054	2.30218	50.9528
Slow	60 sec	Application	132.8	0.436398	0.846214	-20.20182	51.8985
Slow	60 sec	Application	168.8	0.4234	0.593024	-58.42942	52.418
Slow	60 sec	Application	72.2	0.450869	2.939236	677.78912	56.5502
Slow	60 sec	Removal	72.2	0.754499	2.939236	677.78912	54.9219
Slow	60 sec	Removal	200.8	0.590231	0.877404	22.55388	52.6837
Slow	60 sec	Removal	203.8	0.730112	1.869474	185.14048	57.3088
Slow	60 sec	Removal	208.8	0.842442	1.863514	334.15818	59.97
Slow	60 sec	Removal	209.8	0.87307	1.972674	346.36098	63.8109
Slow	60 sec	Removal	207.8	0.969564	2.628784	312.96818	58.2288
Slow	60 sec	Removal	211.8	0.920522	2.173034	356.39448	56.8816
Slow	60 sec	Removal	211.8	0.88403	1.867534	310.50858	59.409
Slow	60 sec	Removal	206.8	0.7437	1.855434	299.80608	60.2618
Slow	60 sec	Removal	202.8	0.601181	1.424874	295.11678	55.5037
Slow	60 sec	After	210.8	0.559984	1.202604	278.01608	56.2724
Slow	60 sec	After	209.8	0.522571	0.975364	290.26568	55.6149
Slow	60 sec	After	204.8	0.491677	0.796204	227.78248	55.6249
Slow	60 sec	After	211.8	0.48781	0.573034	236.62458	55.1323
Slow	60 sec	After	206.8	0.470761	0.539004	284.01768	55.1788
Slow	60 sec	Application	0.8	0.625292	1.878912	-4.31288	51.3664
Slow	60 sec	Application	-0.2	0.472756	1.411292	114.83482	43.8234
Slow	60 sec	Application	8.8	0.452719	1.171082	101.20692	47.6254
Slow	60 sec	Application	57.8	0.449113	0.831812	-7.56628	49.2356
Slow	60 sec	Application	70.8	0.445735	0.872842	38.93532	50.5319
Slow	60 sec	Application	93.8	0.4366	0.909872	24.75112	46.7742
Slow	60 sec	Application	155.8	0.415735	0.937882	6.39232	51.7
Slow	60 sec	Removal	61.2	0.429087	2.924628	718.84438	52.2389
Slow	60 sec	Removal	61.2	0.512877	2.924628	718.84438	49.3783
Slow	60 sec	Removal	-61.2	0.62497	1.383522	63.45702	52.0348
Slow	60 sec	Removal	219.8	0.847979	2.068432	123.85832	48.6347
Slow	60 sec	Removal	231.8	1.3922	3.753402	185.83172	48.8888
Slow	60 sec	Removal	231.8	1.44289	4.582292	247.63582	58.1875
Slow	60 sec	Removal	227.8	1.38672	6.057642	169.25042	52.0025
Slow	60 sec	Removal	231.8	1.6658	5.913322	187.28942	50.881
Slow	60 sec	Removal	232.8	1.28267	3.981612	186.54352	50.906
Slow	60 sec	Removal	231.8	1.40719	4.065902	297.53892	43.3499
Slow	60 sec	Removal	233.8	1.00639	2.626202	247.86032	51.8861

Slow	60 sec	Removal	231.8	0.857039	2.725242	262.05132	47.1483
Slow	60 sec	Removal	234.8	0.623798	1.733762	189.87082	45.8045
Slow	60 sec	After	229.8	0.560493	1.249232	187.60822	49.2206
Slow	60 sec	After	233.8	0.527806	1.043032	153.57752	46.6087
Slow	60 sec	After	233.8	0.509889	0.840852	121.08422	45.3045
Slow	60 sec	After	232.8	0.507959	0.791812	124.40472	46.0783
Slow	60 sec	After	233.8	0.478525	0.618662	124.80772	47.718
Slow	60 sec	Application	13	0.393242	0.0820108	-11.1739	47.6381
Slow	60 sec	Application	13	0.879325	0.9432318	3.632	47.3867
Slow	60 sec	Application	29	0.631518	1.0162518	-38.2563	44.1288
Slow	60 sec	Application	184	0.581716	0.5831118	-2.7716	47.4895
Slow	60 sec	Application	217	0.572078	0.5190918	-54.0361	45.4887
Slow	60 sec	Application	260	0.501099	0.4700818	-33.855	46.3327
Slow	60 sec	Application	330	0.531735	0.5060918	-80.7393	46.7452
Slow	60 sec	Application	52	0.504088	0.5380282	617.188	45.8129
Slow	60 sec	Application	52	0.818175	0.5380282	617.188	45.878
Slow	60 sec	Removal	461	2.06847	2.1139918	-34.3381	48.5383
Slow	60 sec	Removal	472	2.52297	2.3221718	0.4384	50.9201
Slow	60 sec	Removal	483	1.35095	2.8725618	449.7949	73.7533
Slow	60 sec	Removal	484	1.57371	2.2800618	271.3411	54.648
Slow	60 sec	Removal	504	1.11948	1.5945518	712.5031	35.421
Slow	60 sec	Removal	506	1.29938	1.7776718	267.0675	51.0317
Slow	60 sec	Removal	501	1.30077	2.3770918	405.2023	45.9089
Slow	60 sec	Removal	517	1.34312	3.4080218	407.2563	50.654
Slow	60 sec	Removal	518	1.37124	3.0496618	1239.0762	41.2773
Slow	60 sec	Removal	518	1.02707	2.2509218	507.4288	43.9448
Slow	60 sec	Removal	525	1.14815	2.3720318	501.1357	47.6027
Slow	60 sec	Removal	520	0.692899	1.4093918	436.435	46.6557
Slow	60 sec	After	518	0.617648	1.2363118	380.7923	44.6173
Slow	60 sec	After	527	0.572078	1.0882518	424.5287	44.9419
Slow	60 sec	After	516	0.530301	0.9982118	363.1757	47.5273
Slow	60 sec	After	517	0.507506	0.9291918	346.7933	44.8713
Slow	60 sec	After	519	0.501801	0.8051518	359.9855	47.7852
Slow	60 sec	Application	1.6	0.376364	-0.0440054	-27.42442	47.7495
Slow	60 sec	Application	3.6	0.926976	2.9335136	110.66428	51.5091
Slow	60 sec	Application	84.6	0.529287	1.2163436	-3.79252	49.1404
Slow	60 sec	Application	82.6	0.511573	0.9262336	21.81988	47.9439
Slow	60 sec	Application	146.6	0.492486	1.4324436	0.16858	48.0801
Slow	60 sec	Application	203.6	0.497583	1.3974236	-24.71782	48.0857
Slow	60 sec	Application	244.6	0.457636	1.0362736	-35.15172	49.7025

Slow	60 sec	Application	71.4	0.454799	0.6980464	646.66182	56.0802
Slow	60 sec	Removal	71.4	0.98973	0.6980464	646.66182	49.6916
Slow	60 sec	Removal	249.6	1.86699	3.0999636	46.46168	55.9223
Slow	60 sec	Removal	254.6	1.33041	3.1239036	90.43618	52.3717
Slow	60 sec	Removal	254.6	2.41933	4.7813636	93.18368	51.5395
Slow	60 sec	Removal	260.6	2.08803	5.1860336	111.26178	51.0403
Slow	60 sec	Removal	267.6	2.38352	4.8303136	222.02108	54.5214
Slow	60 sec	Removal	261.6	1.91574	5.0394736	177.14918	55.3147
Slow	60 sec	Removal	260.6	1.59133	3.7245536	194.50288	51.5776
Slow	60 sec	Removal	267.6	1.53581	3.2820936	175.00138	51.1448
Slow	60 sec	Removal	262.6	1.00328	2.3931236	174.53468	51.6598
Slow	60 sec	Removal	263.6	0.758004	2.6272236	239.54068	51.4721
Slow	60 sec	After	258.6	0.619358	2.2188636	1038.56108	56.7455
Slow	60 sec	After	261.6	0.564496	1.8276236	833.40528	56.1534
Slow	60 sec	After	267.6	0.523635	1.6515236	724.30428	52.2473
Slow	60 sec	After	258.6	0.516405	1.5344636	726.11118	55.4147
Slow	60 sec	After	262.6	0.473645	1.4794336	705.21828	53.3932
Slow	30 sec	Application	0.6	1.29979	2.5057066	124.24324	56.8087
Slow	30 sec	Application	0.6	0.586969	0.9317966	15.19054	51.0112
Slow	30 sec	Application	4.6	0.545679	0.5076866	-8.58836	51.7817
Slow	30 sec	Application	60.6	0.544269	0.5276866	-16.89236	51.4699
Slow	30 sec	Application	71.6	0.519554	0.4846766	-23.93126	52.4328
Slow	30 sec	Application	131.6	0.510255	0.4486706	-30.63036	50.9816
Slow	30 sec	Application	183.6	0.667757	1.0948566	-23.94776	52.749
Slow	30 sec	Removal	48.4	1.27769	0.4954234	701.05906	54.4306
Slow	30 sec	Removal	48.4	1.4556	0.4954234	701.05906	52.8282
Slow	30 sec	Removal	270.6	1.20827	1.3089866	-24.26376	53.8057
Slow	30 sec	Removal	272.6	1.44809	1.6201566	35.30604	55.9927
Slow	30 sec	Removal	277.6	1.89867	2.6369166	3.01284	54.3643
Slow	30 sec	Removal	285.6	2.55512	3.4518666	16.73544	53.0956
Slow	30 sec	Removal	-48.4	3.29755	5.8397566	122.52854	74.1281
Slow	30 sec	Removal	284.6	2.71758	4.4171866	221.77204	59.1712
Slow	30 sec	Removal	287.6	2.55407	6.2050466	199.15064	55.5606
Slow	30 sec	Removal	284.6	2.24871	4.8505966	228.93444	51.1214
Slow	30 sec	Removal	284.6	2.03348	4.0764566	192.91094	54.538
Slow	30 sec	Removal	285.6	1.40058	3.1632866	143.75424	49.6716
Slow	30 sec	Removal	288.6	1.56982	2.9381166	179.09114	47.3529
Slow	30 sec	Removal	286.6	1.11598	1.9442966	87.30224	47.4308
Slow	30 sec	After	292.6	0.802384	1.3179366	107.70134	50.2824
Slow	30 sec	After	297.6	0.712134	1.0268266	122.26774	49.0846

Slow	30 sec	After	289.6	0.657804	1.0118166	46.63254	49.5282
Slow	30 sec	After	283.6	0.630765	0.8327666	159.51664	50.413
Slow	30 sec	After	282.6	0.577442	0.8137566	102.17374	50.1301
Slow	120 sec	Application	0.4	0.679096	0.5109064	77.0975	47.0374
Slow	120 sec	Application	1.4	0.540755	0.8390064	58.2848	45.7156
Slow	120 sec	Application	44.4	0.553156	0.4888964	57.7526	43.8166
Slow	120 sec	Application	67.4	0.507094	0.4688964	75.9777	45.4596
Slow	120 sec	Application	76.4	0.520318	0.5119064	70.0081	44.7167
Slow	120 sec	Application	106.4	0.518298	0.5419064	116.4625	43.9201
Slow	120 sec	Application	137.4	0.467365	0.4418864	78.0656	44.2718
Slow	120 sec	Application	56.6	0.452239	0.6772436	627.4975	42.5238
Slow	120 sec	Application	56.6	0.544546	0.6772436	627.4975	44.2971
Slow	120 sec	Removal	201.4	1.94634	2.7683364	111.1721	45.0528
Slow	120 sec	Removal	202.4	2.06513	2.6302664	247.5431	48.6044
Slow	120 sec	Removal	209.4	0.956175	1.7774964	322.3841	48.7472
Slow	120 sec	Removal	211.4	1.57565	2.1708064	324.8273	48.3612
Slow	120 sec	Removal	212.4	1.52144	2.7152864	345.7039	47.7499
Slow	120 sec	Removal	212.4	1.47161	2.2759164	403.0532	48.9018
Slow	120 sec	Removal	217.4	1.84666	2.5822664	455.414	50.7381
Slow	120 sec	Removal	215.4	1.74333	2.8815064	358.2976	48.3352
Slow	120 sec	Removal	214.4	1.88997	2.3430264	472.9482	47.9107
Slow	120 sec	Removal	213.4	1.1186	1.5453764	360.221	46.6953
Slow	120 sec	Removal	218.4	1.75909	2.5882164	278.9606	47.3564
Slow	120 sec	Removal	210.4	1.60657	2.0427764	321.2227	46.3014
Slow	120 sec	Removal	215.4	0.760219	0.8590264	260.3609	44.3475
Slow	120 sec	After	214.4	0.703459	0.6529564	216.1229	45.2724
Slow	120 sec	After	214.4	0.619764	0.6349364	247.627	46.6041
Slow	120 sec	After	213.4	0.590068	0.5129064	181.5272	45.2767
Slow	120 sec	After	217.4	0.564423	0.3248564	214.1964	44.9379
Slow	120 sec	After	214.4	0.526911	0.3608664	179.8874	46.015
Slow	120 sec	Application	-0.8	0.476437	0.1262158	-18.74764	41.8011
Slow	120 sec	Application	25.2	0.883203	2.4422158	278.36986	48.7502
Slow	120 sec	Application	66.2	0.612103	1.0864558	146.86836	40.7386
Slow	120 sec	Application	81.2	0.558588	0.8223658	164.52986	39.8243
Slow	120 sec	Application	128.2	0.594619	1.0974558	165.16246	43.1993
Slow	120 sec	Application	164.2	0.589406	1.0254258	132.54256	38.7505
Slow	120 sec	Application	179.2	0.543791	0.7443358	168.90006	40.0491
Slow	120 sec	Application	64.8	0.515646	0.5058242	915.35574	40.6774
Slow	120 sec	Removal	64.8	0.525777	0.5058242	915.35574	39.8171
Slow	120 sec	Removal	201.2	0.598821	0.6613158	202.55456	40.1469

Slow	120 sec	Removal	200.2	0.929475	0.9774258	174.70626	40.574
Slow	120 sec	Removal	-64.8	1.02898	1.1855158	282.90106	39.9388
Slow	120 sec	Removal	203.2	1.03155	1.1364958	259.31836	41.5544
Slow	120 sec	Removal	202.2	1.11266	1.2005258	230.19656	41.6615
Slow	120 sec	Removal	204.2	1.22534	1.2745558	214.33846	40.4491
Slow	120 sec	Removal	209.2	1.067	1.0904758	254.86986	39.5158
Slow	120 sec	Removal	207.2	1.0841	1.0814758	261.28096	40.6098
Slow	120 sec	Removal	205.2	1.21139	1.2555558	309.11826	40.7979
Slow	120 sec	Removal	206.2	1.13159	1.0354558	260.33786	40.0359
Slow	120 sec	Removal	207.2	1.24241	1.2145358	253.35456	41.4791
Slow	120 sec	After	210.2	1.00212	0.9754358	321.35616	40.2609
Slow	120 sec	After	204.2	0.854715	0.7673558	299.17596	39.3038
Slow	120 sec	After	210.2	0.787469	0.6233158	242.86766	41.8933
Slow	120 sec	After	209.2	0.70741	0.5022858	245.94606	39.7483
Slow	120 sec	After	207.2	0.645611	0.3922598	256.61076	41.618
Slow	120 sec	After	206.2	0.603779	0.4232648	236.19916	41.1548
Slow	120 sec	Application	1.4	0.456595	0.1466216	-80.47538	38.792
Slow	120 sec	Application	2.4	0.656673	1.0738816	-65.72898	40.9401
Slow	120 sec	Application	71.4	0.5187	0.5817116	-10.60258	41.9902
Slow	120 sec	Application	79.4	0.509902	0.3646616	-142.85078	38.3915
Slow	120 sec	Application	114.4	0.504813	0.3516636	-166.76698	40.3875
Slow	120 sec	Application	187.4	0.485015	0.3736616	-64.29388	40.6147
Slow	120 sec	Application	205.4	0.501144	0.2926496	-158.74298	40.0455
Slow	120 sec	Application	57.6	0.442436	0.6424384	1265.38678	38.5538
Slow	120 sec	Removal	57.6	0.532752	0.6424384	1265.38678	41.5847
Slow	120 sec	Removal	192.4	0.674461	0.5407116	-183.83178	40.9021
Slow	120 sec	Removal	195.4	0.84703	0.6907716	-207.86398	40.6141
Slow	120 sec	Removal	195.4	1.20983	1.0449216	-176.84308	39.7893
Slow	120 sec	Removal	194.4	1.66857	2.0805516	-147.10198	39.5661
Slow	120 sec	Removal	199.4	1.92229	2.2917516	-122.51028	41.4444
Slow	120 sec	Removal	196.4	2.70764	3.5971916	7.33832	43.5239
Slow	120 sec	Removal	195.4	1.60292	2.7551416	-54.48968	43.0507
Slow	120 sec	Removal	197.4	2.51466	3.7403216	-19.33928	42.9499
Slow	120 sec	Removal	195.4	2.23698	3.0023916	-73.08168	44.7688
Slow	120 sec	Removal	195.4	1.80157	2.6961016	-15.04328	44.6706
Slow	120 sec	Removal	197.4	1.64369	2.1926316	-115.75858	39.7312
Slow	120 sec	Removal	195.4	1.89979	2.6139816	-60.05688	42.1549
Slow	120 sec	Removal	199.4	1.2524	1.8173316	-128.39928	40.1754
Slow	120 sec	Removal	196.4	1.61718	2.3337216	-162.60118	41.0359
Slow	120 sec	Removal	195.4	1.1673	1.4160816	-164.90288	39.8039

Slow	120 sec	After	200.4	0.841981	1.1289216	-165.08538	40.2617
Slow	120 sec	After	196.4	0.83082	0.9248416	-171.88578	40.8731
Slow	120 sec	After	196.4	0.683608	0.7707716	-165.94068	38.9231
Slow	120 sec	After	196.4	0.654975	0.7077616	-170.76328	40.5068
Slow	120 sec	After	199.4	0.610813	0.6547316	-216.20078	39.622
Slow	120 sec	Application	-51.8	0.921578	1.709816	62.0363	52.8177
Slow	120 sec	Application	-0.8	0.50969	0.544166	11.8808	48.4019
Slow	120 sec	Application	9.2	0.473721	0.367106	-43.2757	48.3278
Slow	120 sec	Application	56.2	0.478595	0.545166	75.2127	48.6747
Slow	120 sec	Application	74.2	0.463597	0.735226	117.9793	51.3438
Slow	120 sec	Application	120.2	0.457545	0.692216	48.5411	49.597
Slow	120 sec	Application	139.2	0.447364	0.459136	-47.0158	48.3907
Slow	120 sec	Application	51.8	0.44049	1.084114	1095.5721	48.8617
Slow	120 sec	Application	51.8	0.904875	1.084114	1095.5721	45.9998
Slow	120 sec	Removal	180.2	1.07964	1.625796	115.84	49.4377
Slow	120 sec	Removal	187.2	2.15029	4.452276	523.6948	47.4147
Slow	120 sec	Removal	183.2	2.21671	4.980196	273.0061	49.1202
Slow	120 sec	Removal	191.2	2.41394	6.177486	598.5208	47.9476
Slow	120 sec	Removal	191.2	2.41682	6.579376	438.6137	46.2456
Slow	120 sec	Removal	193.2	1.8775	4.650496	468.2133	45.5847
Slow	120 sec	Removal	187.2	1.26652	2.545556	369.2063	46.3258
Slow	120 sec	Removal	197.2	0.960125	1.803866	330.0144	48.264
Slow	120 sec	After	195.2	0.805463	1.386576	265.693	46.7929
Slow	120 sec	After	198.2	0.722146	1.039386	286.8637	45.3266
Slow	120 sec	After	195.2	0.68278	0.892316	225.2329	45.5048
Slow	120 sec	After	197.2	0.602269	0.753246	217.8876	45.7186
Slow	120 sec	Application	2	0.545772	1.225744	2.9697	56.0686
Slow	120 sec	Application	38	0.502391	0.725484	8.7498	48.5868
Slow	120 sec	Application	45	0.461642	0.694454	-12.0463	51.9044
Slow	120 sec	Application	80	0.455697	0.606424	54.3036	54.8755
Slow	120 sec	Application	115	0.479378	0.885554	-26.3114	54.8975
Slow	120 sec	Application	145	0.443046	0.740484	-12.7392	52.2189
Slow	120 sec	Application	156	0.425585	0.657434	-32.6942	53.3772
Slow	120 sec	Application	66	0.429601	1.381986	1154.556	55.2346
Slow	120 sec	Removal	66	0.551621	1.381986	1154.556	54.261
Slow	120 sec	Removal	171	0.85748	1.425964	-12.9139	53.1311
Slow	120 sec	Removal	177	1.05781	1.591104	-73.6799	52.0695
Slow	120 sec	Removal	176	1.25414	2.306764	-9.9293	54.5194
Slow	120 sec	Removal	175	1.60615	3.183774	29.498	54.6098
Slow	120 sec	Removal	179	1.66893	3.437144	69.7037	54.9568

Slow	120 sec	Removal	176	1.3231	2.205654	26.2615	54.4929
Slow	120 sec	Removal	171	1.60841	2.980534	-9.7248	54.1274
Slow	120 sec	Removal	177	1.34058	2.437884	-76.4303	53.0234
Slow	120 sec	Removal	175	1.66031	2.887404	40.1427	55.574
Slow	120 sec	Removal	176	1.31825	2.352804	28.6056	53.9655
Slow	120 sec	Removal	175	1.26794	2.227704	26.384	53.0491
Slow	120 sec	After	175	0.72148	1.106694	9.254	53.5419
Slow	120 sec	After	179	0.615221	0.955594	-29.8791	53.091
Slow	120 sec	After	173	0.568419	0.802514	-27.1845	52.2391
Slow	120 sec	After	179	0.533816	0.612424	-48.7244	53.1734
Slow	120 sec	After	174	0.508413	0.516384	-51.9007	54.8193
Slow	120 sec	After	175	0.485603	0.454354	-49.6726	54.9609
Slow	120 sec	Application	2	0.669272	2.136892	1.09018	55.6581
Slow	120 sec	Application	1	0.522324	1.490352	-6.69132	54.5717
Slow	120 sec	Application	35	0.488175	0.933012	-46.58272	56.0537
Slow	120 sec	Application	71	0.458491	0.739912	25.69058	57.4215
Slow	120 sec	Application	74	0.459666	0.792932	-19.00682	57.8961
Slow	120 sec	Application	118	0.451748	1.010042	8.32498	56.6374
Slow	120 sec	Application	178	0.438115	0.835942	35.99418	57.2092
Slow	120 sec	Application	50	0.435025	1.545628	1045.45392	58.0225
Slow	120 sec	Application	50	0.43675	1.545628	1045.45392	58.2971
Slow	120 sec	Removal	211	0.49866	0.890992	-29.97192	61.0333
Slow	120 sec	Removal	213	0.718816	1.445392	-21.29072	57.5404
Slow	120 sec	Removal	219	0.788231	1.997862	-12.44302	57.5439
Slow	120 sec	Removal	217	1.30054	2.722752	69.41268	61.9775
Slow	120 sec	Removal	220	0.787746	1.936832	-48.20882	58.6144
Slow	120 sec	Removal	220	0.949732	2.312232	-27.26332	59.7647
Slow	120 sec	Removal	224	0.82168	2.101972	-40.61852	57.4517
Slow	120 sec	Removal	219	1.16453	2.406362	-14.58012	58.8609
Slow	120 sec	Removal	224	0.814045	1.610532	-58.86722	57.6923
Slow	120 sec	Removal	219	0.833994	1.901772	-37.89302	55.6767
Slow	120 sec	Removal	226	0.544447	0.916012	-120.17112	58.3348
Slow	120 sec	Removal	219	0.507702	0.731912	-83.53402	59.1285
Slow	120 sec	After	-50	0.487433	0.654872	-53.53602	59.6915
Slow	120 sec	After	222	0.47654	0.532812	-126.82972	56.9546
Slow	120 sec	After	217	0.444665	0.414762	-69.29812	59.8102
Slow	120 sec	After	225	0.44104	0.288702	-86.78242	58.0707
Slow	120 sec	After	224	0.430622	0.339722	-59.80702	59.6301
Medium	30 sec	Application	1.2	0.662667	1.438858	116.35032	59.8597
Medium	30 sec	Application	5.2	0.467352	0.466078	-34.62428	59.9004

Medium	30 sec	Application	42.2	0.461718	0.352028	-58.55808	57.671
Medium	30 sec	Application	71.2	0.448526	0.377028	-58.16038	58.7374
Medium	30 sec	Application	121.2	0.441042	0.649188	-81.45668	57.1181
Medium	30 sec	Removal	143.2	0.442052	0.571148	-80.08348	57.1161
Medium	30 sec	Removal	176.2	0.531728	2.151478	-82.22988	60.1785
Medium	30 sec	Removal	65.8	0.80346	2.374732	1177.58558	29.8355
Medium	30 sec	Removal	65.8	1.06496	2.374732	1177.58558	33.4866
Medium	30 sec	Removal	207.2	1.47548	11.515868	7234.67552	34.2852
Medium	30 sec	Removal	210.2	1.20887	11.828868	4797.10292	30.3085
Medium	30 sec	Removal	206.2	0.904238	5.772178	4624.41912	29.5733
Medium	30 sec	After	210.2	0.769516	4.584888	4245.85212	30.0531
Medium	30 sec	After	212.2	0.68501	3.562168	4313.01252	30.3264
Medium	30 sec	After	211.2	0.626727	2.959368	4120.40772	30.3717
Medium	30 sec	After	214.2	0.564792	2.465768	3875.78122	30.7624
Medium	30 sec	After	216.2	0.551787	2.176448	3788.39822	30.5378
Medium	30 sec	Application	-1.2	0.499117	1.335188	-31.20154	53.7257
Medium	30 sec	Application	2.8	0.474052	1.348228	64.80556	56.2643
Medium	30 sec	Application	7.8	0.461893	0.160358	-53.21814	54.9584
Medium	30 sec	Application	10.8	0.442118	0.107318	-51.88114	55.6951
Medium	30 sec	Application	20.8	0.44208	-0.093792	3.15196	51.9689
Medium	30 sec	Application	37.8	0.410893	0.991878	51.29896	63.4066
Medium	30 sec	Application	49.8	0.411537	0.094288	-20.24994	53.8529
Medium	30 sec	Application	109.2	0.395386	2.715502	772.73184	52.2776
Medium	30 sec	Removal	109.2	0.668918	2.715502	772.73184	60.1095
Medium	30 sec	Removal	67.8	0.688987	6.425108	6094.98266	34.5015
Medium	30 sec	Removal	69.8	0.669869	8.002498	8738.88106	33.0775
Medium	30 sec	Removal	70.8	0.612041	8.601698	9319.26816	33.9064
Medium	30 sec	Removal	72.8	0.53944	7.358398	9507.26816	33.1169
Medium	30 sec	After	69.8	0.508562	6.284008	9543.26816	33.2756
Medium	30 sec	After	75.8	0.492007	5.688768	9289.26816	32.9961
Medium	30 sec	After	68.8	0.468438	4.985518	9074.79896	32.9887
Medium	30 sec	After	70.8	0.453027	4.282488	8894.31416	33.1585
Medium	30 sec	After	68.8	0.43941	3.908898	8556.53906	33.3103
Medium	30 sec	After	70.8	0.427682	3.811688	8510.44526	33.3078
Medium	30 sec	Application	1.4	0.543269	1.246662	-60.47984	49.0197
Medium	30 sec	Application	0.4	0.552149	1.791202	140.27386	45.404
Medium	30 sec	Application	23.4	0.426763	1.039402	7.78746	47.381
Medium	30 sec	Application	35.4	0.424868	0.602062	12.98546	46.8504
Medium	30 sec	Application	89.4	0.432228	0.926312	43.96566	49.6505
Medium	30 sec	Application	127.4	0.417472	0.794192	29.78086	48.7966

Medium	30 sec	Removal	129.4	0.490196	1.127542	21.58076	46.3597
Medium	30 sec	Removal	55.6	0.609942	3.130328	1194.61234	39.7125
Medium	30 sec	Removal	55.6	0.996703	3.130328	1194.61234	31.9602
Medium	30 sec	Removal	141.4	0.721425	7.136672	8754.13116	32.0404
Medium	30 sec	Removal	147.4	0.777534	7.777572	11880.38766	32.2817
Medium	30 sec	Removal	148.4	0.681756	8.181272	10390.38766	31.7032
Medium	30 sec	After	147.4	0.565549	5.877382	10740.38766	30.7869
Medium	30 sec	After	149.4	0.499355	4.568792	10876.38766	31.2706
Medium	30 sec	After	152.4	0.478373	3.918762	10863.38766	31.6281
Medium	30 sec	After	150.4	0.460672	3.159632	10627.38766	31.8418
Medium	30 sec	After	148.4	0.438862	2.884252	10233.38766	31.6345
Medium	30 sec	Application	-0.2	0.390461	0.816922	56.41666	50.6331
Medium	30 sec	Application	0.8	0.414618	0.960152	-32.75314	49.0773
Medium	30 sec	Application	11.8	0.400074	0.363542	-113.38974	49.6184
Medium	30 sec	Application	21.8	0.40994	0.885102	-97.60304	54.0857
Medium	30 sec	Application	31.8	0.407375	0.722922	-33.23044	49.7582
Medium	30 sec	Application	65.8	0.410397	0.856072	171.25596	50.6039
Medium	30 sec	Application	82.8	0.393199	1.280432	17.60906	48.216
Medium	30 sec	Removal	50.2	0.431909	4.066378	1568.20634	48.8058
Medium	30 sec	Removal	50.2	0.562411	4.066378	1568.20634	40.1679
Medium	30 sec	Removal	111.8	0.608535	3.275572	1764.24116	36.9573
Medium	30 sec	Removal	114.8	0.583436	3.963622	3549.24556	35.8503
Medium	30 sec	Removal	121.8	0.616239	6.915622	4407.20596	34.3963
Medium	30 sec	Removal	117.8	0.727578	5.973122	5943.06566	32.1299
Medium	30 sec	Removal	118.8	0.677911	5.114002	5645.25956	33.0512
Medium	30 sec	Removal	121.8	0.561444	4.282002	6189.18296	31.938
Medium	30 sec	After	121.8	0.517201	3.211082	6211.90516	31.9791
Medium	30 sec	After	122.8	0.488022	2.582112	6215.66266	32.4667
Medium	30 sec	After	121.8	0.466973	2.119482	5833.04766	32.582
Medium	30 sec	After	122.8	0.450806	1.766032	5674.05416	32.5682
Medium	30 sec	After	122.8	0.443973	1.581812	5528.04806	32.25
Medium	60 sec	Application	0.4	0.494187	0.94286	-141.04958	52.7977
Medium	60 sec	Application	0.4	0.466516	1.09101	248.18522	56.1221
Medium	60 sec	Application	8.4	0.421882	0.35217	335.72602	59.7789
Medium	60 sec	Application	40.4	0.405901	0.47626	409.15942	62.6788
Medium	60 sec	Application	41.4	0.40845	0.39721	403.42262	60.1183
Medium	60 sec	Application	79.4	0.4108	0.34916	335.46452	59.7878
Medium	60 sec	Application	107.4	0.399223	0.96273	715.70702	61.1807
Medium	60 sec	Application	51.6	0.488874	4.32096	1951.66648	62.3341
Medium	60 sec	Removal	51.6	0.567511	4.32096	1951.66648	61.3859

Medium	60 sec	Removal	121.4	0.85587	5.5849	2821.35942	47.8105
Medium	60 sec	Removal	124.4	0.698574	5.13123	2524.68242	53.6487
Medium	60 sec	Removal	126.4	0.787228	5.35003	2722.10962	49.4603
Medium	60 sec	Removal	127.4	0.806733	7.65224	4432.70892	41.2529
Medium	60 sec	Removal	127.4	0.636633	5.52571	5345.90302	39.3935
Medium	60 sec	Removal	129.4	0.5099	3.34807	5434.68762	40.1982
Medium	60 sec	After	130.4	0.474692	2.75405	5423.68882	39.8522
Medium	60 sec	After	129.4	0.459056	2.61184	5166.35052	39.8664
Medium	60 sec	After	130.4	0.452897	2.05606	5109.72342	40.5956
Medium	60 sec	After	129.4	0.443034	2.05004	4896.94472	39.9665
Medium	60 sec	After	134.4	0.431602	1.47631	4715.09642	40.7217
Medium	60 sec	Application	0.4	0.36333	-0.273692	-24.81964	70.6347
Medium	60 sec	Application	0.4	0.425291	1.119078	-24.60454	70.3698
Medium	60 sec	Application	1.4	0.40173	0.525308	-45.99994	70.4596
Medium	60 sec	Application	10.4	0.396692	-0.068412	-53.54234	73.9731
Medium	60 sec	Application	51.4	0.391884	0.134798	-56.41404	70.4402
Medium	60 sec	Application	56.4	0.398886	0.086778	-82.78724	73.7082
Medium	60 sec	Application	61.4	0.396874	0.823648	-80.26934	70.2584
Medium	60 sec	Application	44.6	0.38633	5.456242	1688.18714	70.2329
Medium	60 sec	Application	44.6	0.381498	5.456242	1688.18714	67.8353
Medium	60 sec	Removal	99.4	0.631196	4.722558	1688.81276	65.5127
Medium	60 sec	Removal	105.4	0.691153	5.898958	872.75236	52.5751
Medium	60 sec	Removal	108.4	0.890676	9.129258	3171.78086	39.2634
Medium	60 sec	Removal	107.4	0.746465	6.957058	3467.39316	39.3167
Medium	60 sec	Removal	112.4	0.895019	7.429258	3221.69236	38.7454
Medium	60 sec	Removal	113.4	1.14782	8.690858	4805.27536	35.2968
Medium	60 sec	Removal	115.4	0.736509	5.043458	5073.41276	33.6355
Medium	60 sec	After	117.4	0.603998	3.501558	4718.65996	34.0281
Medium	60 sec	After	117.4	0.560678	2.714948	4548.89746	34.9413
Medium	60 sec	After	116.4	0.514202	1.977578	4223.97276	34.8316
Medium	60 sec	After	120.4	0.495081	1.605898	4089.64146	35.5736
Medium	60 sec	After	116.4	0.479738	1.177268	3958.70216	35.1311
Medium	60 sec	After	115.4	0.450448	0.687578	3728.03006	35.0461
Medium	60 sec	Application	0	0.391436	0.50816	-79.89152	81.4549
Medium	60 sec	Application	1	0.371333	-0.82024	-15.92912	78.0364
Medium	60 sec	Application	21	0.369759	-1.21614	64.77238	79.5796
Medium	60 sec	Application	28	0.368274	-1.51434	-98.73922	77.7953
Medium	60 sec	Application	38	0.366358	-1.47124	-75.58772	77.8967
Medium	60 sec	Application	73	0.366697	-1.77084	-71.31412	79.061
Medium	60 sec	Application	98	0.365407	-2.12114	-144.57482	79.3611

Medium	60 sec	Removal	48	0.375938	16.45834	1386.48332	77.2031
Medium	60 sec	Removal	48	0.47735	16.45834	1386.48332	39.3656
Medium	60 sec	Removal	101	0.566684	2.06266	5789.96218	35.0619
Medium	60 sec	Removal	101	0.5581	1.87266	6100.80928	32.4481
Medium	60 sec	Removal	103	0.580252	2.24046	8494.70718	33.4964
Medium	60 sec	Removal	104	0.532837	0.81506	11299.51668	32.6125
Medium	60 sec	After	105	0.471049	-0.55604	10391.51668	31.0593
Medium	60 sec	After	107	0.444328	-1.17734	10275.51668	31.7577
Medium	60 sec	After	105	0.420808	-2.29984	9919.51668	31.9592
Medium	60 sec	After	106	0.40916	-2.98064	9617.51668	31.6627
Medium	60 sec	After	-48	0.40256	-3.09824	9251.51668	31.4111
Medium	60 sec	Application	0.8	0.407066	0.74522	-41.08698	73.2967
Medium	60 sec	Application	1.8	0.378767	0.06102	-25.71638	75.0887
Medium	60 sec	Application	10.8	0.372426	0.05792	-2.63248	76.3883
Medium	60 sec	Application	30.8	0.382084	-0.01798	-45.11548	76.5354
Medium	60 sec	Application	64.8	0.37895	0.45922	-42.12428	77.6653
Medium	60 sec	Application	85.8	0.372528	-0.68568	-49.03458	78.287
Medium	60 sec	Application	97.8	0.382905	-0.82688	-67.08248	77.4624
Medium	60 sec	Removal	46.2	0.423098	12.88568	1275.79778	67.0679
Medium	60 sec	Removal	46.2	0.68626	12.88568	1275.79778	45.057
Medium	60 sec	Removal	122.8	0.596862	2.56862	1169.70632	44.3897
Medium	60 sec	Removal	124.8	0.592854	3.07662	1878.52072	37.1365
Medium	60 sec	Removal	128.8	0.47361	1.11792	1613.36532	41.0063
Medium	60 sec	After	128.8	0.45746	0.28852	1662.43822	40.2602
Medium	60 sec	After	130.8	0.431778	-0.19498	1578.92412	41.6787
Medium	60 sec	After	130.8	0.419889	-0.87168	1472.93212	41.0852
Medium	60 sec	After	130.8	0.410245	-1.43808	1383.22242	40.7078
Medium	60 sec	Application	0.2	0.382486	-0.00898	56.13746	88.2459
Medium	60 sec	Application	0.2	0.379684	-0.50998	20.79266	82.1787
Medium	60 sec	Application	34.2	0.374437	-0.58718	-6.40934	84.2451
Medium	60 sec	Application	37.2	0.371992	-0.92985	-71.99994	80.7584
Medium	60 sec	Application	45.2	0.375191	-0.96583	-59.09224	81.4927
Medium	60 sec	Application	77.2	0.377535	-0.98886	-21.61384	82.68
Medium	60 sec	Application	88.2	0.372146	-1.23533	-20.60694	85.5576
Medium	60 sec	Application	49.8	0.388279	10.92308	1020.00314	86.4016
Medium	60 sec	Removal	49.8	0.457593	10.92308	1020.00314	69.5884
Medium	60 sec	Removal	113.2	0.862066	5.65462	5533.01226	40.7874
Medium	60 sec	Removal	116.2	0.801994	4.43232	5025.54506	35.1624
Medium	60 sec	Removal	120.2	0.759164	5.06152	6512.44626	27.4341
Medium	60 sec	Removal	117.2	0.554714	1.23642	5483.18376	30.8269

Medium	60 sec	After	122.2	0.501142	-0.12728	5294.48436	31.5306
Medium	60 sec	After	119.2	0.458638	-0.63448	5306.78786	31.7288
Medium	60 sec	After	121.2	0.446936	-1.02142	5085.41366	31.5954
Medium	60 sec	After	120.2	0.426955	-1.65975	4857.85826	31.8505
Medium	60 sec	After	121.2	0.422091	-1.72794	4897.42606	31.7019
Medium	60 sec	After	121.2	0.414432	-2.12268	4570.85936	31.4599
Medium	60 sec	Application	-0.6	0.359318	-0.312286	-13.3065	69.5689
Medium	60 sec	Application	-0.6	0.426197	0.784034	-54.2674	68.6372
Medium	60 sec	Application	5.4	0.389823	0.086154	-64.1031	69.494
Medium	60 sec	Application	36.4	0.385759	-0.234176	-87.1537	67.0947
Medium	60 sec	Application	35.4	0.390262	0.393474	10.0889	68.6468
Medium	60 sec	Application	49.4	0.386077	-0.009916	-25.1048	70.4484
Medium	60 sec	Application	84.4	0.382393	-0.062006	-90.1449	69.1087
Medium	60 sec	Application	37.6	0.382459	5.176476	1072.6149	67.1946
Medium	60 sec	Removal	37.6	0.412238	5.176476	1072.6149	70.3509
Medium	60 sec	Removal	102.4	0.574886	1.074694	425.0811	49.2069
Medium	60 sec	Removal	105.4	0.819481	3.227824	3497.8148	34.1389
Medium	60 sec	Removal	106.4	0.759406	3.311954	2530.8225	36.4993
Medium	60 sec	Removal	108.4	0.701124	3.339754	3878.4094	32.1988
Medium	60 sec	Removal	110.4	0.656718	3.333534	5175.9085	30.6348
Medium	60 sec	After	108.4	0.570101	2.284374	5192.5492	31.9683
Medium	60 sec	After	109.4	0.539375	2.012934	5096.9195	31.5634
Medium	60 sec	After	110.4	0.49435	1.446034	4999.3633	31.3958
Medium	60 sec	After	109.4	0.462254	1.056414	4935.1928	31.685
Medium	60 sec	After	109.4	0.451346	0.795044	4654.4489	31.7544
Medium	120 sec	Application	14.6	0.584926	1.204564	-19.50118	73.8471
Medium	120 sec	Application	14.6	0.420475	0.403744	23.11482	70.1208
Medium	120 sec	Application	47.6	0.416596	0.039494	-22.57448	68.3145
Medium	120 sec	Application	55.6	0.40177	0.139544	-11.65798	67.082
Medium	120 sec	Application	60.6	0.409407	-0.082586	30.06542	70.5674
Medium	120 sec	Application	83.6	0.410781	0.146564	37.90572	71.4292
Medium	120 sec	Application	98.6	0.39353	-0.066606	9.47142	70.0902
Medium	120 sec	Removal	21.4	0.394856	3.469686	790.92988	71.9203
Medium	120 sec	Removal	21.4	0.434482	3.469686	790.92988	61.9554
Medium	120 sec	Removal	120.6	0.667141	1.980544	1149.63592	43.4329
Medium	120 sec	Removal	123.6	0.996725	4.509994	2162.36392	49.2352
Medium	120 sec	Removal	123.6	0.895739	3.824554	2664.66742	37.7738
Medium	120 sec	Removal	130.6	0.790665	4.311324	3106.39542	33.5212
Medium	120 sec	Removal	128.6	0.736148	3.638004	3548.97632	33.6109
Medium	120 sec	Removal	131.6	0.600324	2.740444	3514.54052	34.3608

Medium	120 sec	After	134.6	0.571355	2.178674	3553.11892	33.6385
Medium	120 sec	After	130.6	0.519198	1.539874	3559.71732	34.2588
Medium	120 sec	After	133.6	0.498649	1.071404	3563.78852	32.7501
Medium	120 sec	After	131.6	0.467147	0.861194	3377.30422	34.2819
Medium	120 sec	After	130.6	0.463557	0.726044	3288.55712	34.7262
Medium	120 sec	Application	1.2	0.487351	0.683598	36.58112	73.3309
Medium	120 sec	Application	3.2	0.436519	0.357298	34.54432	68.5466
Medium	120 sec	Application	37.2	0.423245	0.059098	31.74652	69.0762
Medium	120 sec	Application	35.2	0.410824	0.096118	63.86612	64.6996
Medium	120 sec	Application	59.2	0.420945	0.270248	20.31012	62.4844
Medium	120 sec	Application	111.2	0.409034	0.125148	75.17742	66.8102
Medium	120 sec	Application	132.2	0.409429	-0.173032	39.25122	60.5061
Medium	120 sec	Removal	34.8	0.449331	3.262952	854.91798	62.702
Medium	120 sec	Removal	34.8	0.589943	3.262952	854.91798	32.4154
Medium	120 sec	Removal	139.2	1.10288	3.801038	4297.51292	30.224
Medium	120 sec	Removal	142.2	1.07048	4.274938	3145.04682	35.1955
Medium	120 sec	Removal	143.2	0.997048	3.794948	4355.93622	34.8721
Medium	120 sec	Removal	143.2	0.875141	4.434868	5588.15752	31.4956
Medium	120 sec	After	142.2	0.860916	3.449188	5486.30102	32.0695
Medium	120 sec	After	141.2	0.697567	2.364458	5208.12152	31.6698
Medium	120 sec	After	144.2	0.634524	1.983958	5014.08862	31.3212
Medium	120 sec	After	143.2	0.584483	1.189098	5078.24182	32.0168
Medium	120 sec	After	-34.8	0.559002	1.067948	4861.92272	31.8236
Medium	120 sec	Application	0.6	0.468115	0.31533	-26.17834	62.552
Medium	120 sec	Application	2.6	0.422187	0.32033	-47.35044	57.1364
Medium	120 sec	Application	82.6	0.40513	0.14126	-29.27014	58.8809
Medium	120 sec	Application	76.6	0.39757	0.12425	-12.48684	62.0079
Medium	120 sec	Application	68.6	0.405163	0.17128	-89.22814	57.4316
Medium	120 sec	Application	91.6	0.419549	0.29333	-36.68954	60.5287
Medium	120 sec	Application	125.6	0.414911	1.6871	-90.42704	58.7986
Medium	120 sec	Application	42.4	0.41527	1.68605	883.16174	59.6079
Medium	120 sec	Removal	42.4	0.551884	1.68605	883.16174	58.8584
Medium	120 sec	Removal	135.6	0.74302	3.26979	615.98356	44.5459
Medium	120 sec	Removal	138.6	0.890485	4.29622	1995.49466	35.1978
Medium	120 sec	Removal	141.6	0.777451	4.18392	4840.97126	33.2447
Medium	120 sec	Removal	142.6	0.819394	4.76579	3416.61136	32.3762
Medium	120 sec	Removal	141.6	0.698194	3.94247	3944.61066	30.8265
Medium	120 sec	After	138.6	0.646438	3.32872	3928.55356	30.8036
Medium	120 sec	After	140.6	0.592345	2.9753	3751.46816	30.8337
Medium	120 sec	After	143.6	0.552334	2.50581	3671.96836	31.0498

Medium	120 sec	After	138.6	0.531421	2.1535	3640.93946	31.546
Medium	120 sec	After	-42.4	0.502767	2.07242	3480.78866	30.8387
Medium	120 sec	Application	0.8	0.592285	0.351904	-6.50782	59.3065
Medium	120 sec	Application	0.8	0.529321	0.402924	-42.68552	62.6899
Medium	120 sec	Application	1.8	0.464005	0.187854	-13.45562	55.7256
Medium	120 sec	Application	0.8	0.462861	0.173844	-40.16922	64.7069
Medium	120 sec	Application	24.8	0.463816	0.253874	-17.84612	58.395
Medium	120 sec	Application	58.8	0.44991	0.207854	-61.50222	58.8923
Medium	120 sec	Application	53.8	0.437678	0.128834	-32.12102	58.0432
Medium	120 sec	Application	35.2	0.43426	1.116316	804.17202	56.5263
Medium	120 sec	Application	35.2	0.875353	1.116316	804.17202	40.3954
Medium	120 sec	Application	138.8	1.06112	4.737934	1758.02728	36.0785
Medium	120 sec	Removal	125.8	1.29696	6.398944	3371.64138	35.5964
Medium	120 sec	Removal	122.8	1.9533	10.951284	5642.34918	35.5932
Medium	120 sec	Removal	128.8	1.26886	6.341774	5019.17258	30.1193
Medium	120 sec	Removal	127.8	0.982192	3.264944	4426.35988	30.4491
Medium	120 sec	Removal	131.8	0.839138	2.644284	4530.07708	31.0058
Medium	120 sec	After	131.8	0.755191	2.118844	4335.30088	30.6582
Medium	120 sec	After	130.8	0.707508	1.801614	4211.78288	30.97
Medium	120 sec	After	134.8	0.625466	1.429374	4017.34658	30.9423
Medium	120 sec	After	134.8	0.620307	1.223264	3962.50768	30.4137
Slow	60 sec	Application	0.4	0.405023	0.069824	-53.93886	52.1699
Slow	60 sec	Application	0.4	0.647435	1.183374	360.33974	34.2614
Slow	60 sec	Application	2.4	0.483628	0.480994	-15.73606	48.8474
Slow	60 sec	Application	23.4	0.505063	0.518014	-25.80416	53.4201
Slow	60 sec	Application	30.4	0.498897	0.836174	74.12434	62.8773
Slow	60 sec	Application	39.4	0.447662	0.615044	-26.51516	49.2722
Slow	60 sec	Application	68.4	0.4417	0.337934	-10.25076	56.0142
Slow	60 sec	Application	24.6	0.433705	1.506416	431.54916	53.1709
Slow	60 sec	Application	24.6	0.416909	1.506416	431.54916	58.0718
Slow	60 sec	Application	104.4	0.418559	0.428954	-39.04556	58.8836
Slow	60 sec	Removal	116.4	0.535357	0.467994	-38.71546	53.3613
Slow	60 sec	Removal	121.4	0.713321	0.812174	0.22064	56.0579
Slow	60 sec	Removal	125.4	1.50063	2.024274	40.25934	58.0674
Slow	60 sec	Removal	128.4	1.84253	2.726064	104.08854	60.5983
Slow	60 sec	Removal	127.4	1.8689	2.905394	82.81014	55.0995
Slow	60 sec	Removal	131.4	1.55322	2.217464	81.71234	56.3569
Slow	60 sec	Removal	130.4	1.46135	2.020234	46.57164	52.1357
Slow	60 sec	Removal	130.4	1.16133	1.340604	66.92254	52.202
Slow	60 sec	Removal	132.4	0.926806	1.204434	76.76134	57.2118

Slow	60 sec	Removal	133.4	0.871093	1.213434	99.32174	50.3638
Slow	60 sec	After	133.4	0.65625	0.581054	30.77274	52.227
Slow	60 sec	After	134.4	0.630779	0.457994	61.96104	51.6436
Slow	60 sec	After	132.4	0.573306	0.352944	43.97654	52.4054
Slow	60 sec	After	135.4	0.551076	0.240894	60.55404	54.1546
Slow	60 sec	After	133.4	0.500686	0.185874	42.94254	52.6353
Slow	60 sec	After	130.4	0.501649	0.043834	13.64824	48.6817
Slow	60 sec	Application	7.4	0.62798	0.514198	-30.39372	58.1245
Slow	60 sec	Application	6.4	0.507011	0.778308	35.01578	62.5807
Slow	60 sec	Application	29.4	0.458839	0.442158	12.79348	58.5556
Slow	60 sec	Application	31.4	0.445363	0.307108	-17.03972	63.075
Slow	60 sec	Application	37.4	0.438382	0.353118	-5.81822	61.7057
Slow	60 sec	Application	53.4	0.446202	0.386138	-10.16192	57.1327
Slow	60 sec	Application	73.4	0.447936	0.291098	-10.82942	62.612
Slow	60 sec	Application	27.6	0.426589	1.389182	336.91232	59.5238
Slow	60 sec	Removal	27.6	0.479161	1.389182	336.91232	61.3199
Slow	60 sec	Removal	-27.6	0.624399	0.451188	-6.54092	60.1254
Slow	60 sec	Removal	89.4	0.987	0.923448	-14.10412	58.7165
Slow	60 sec	Removal	91.4	1.1129	1.297708	11.80758	58.3263
Slow	60 sec	Removal	91.4	2.01442	3.061508	120.72238	65.7404
Slow	60 sec	Removal	93.4	1.26187	1.487828	33.55258	60.0579
Slow	60 sec	Removal	93.4	2.80081	4.595948	98.90338	56.0235
Slow	60 sec	Removal	95.4	1.64322	2.024358	90.54158	58.5731
Slow	60 sec	Removal	95.4	1.2772	1.319728	48.95528	56.4116
Slow	60 sec	Removal	95.4	1.27252	1.281678	37.09878	54.1768
Slow	60 sec	Removal	96.4	1.47026	1.607948	42.71108	55.0552
Slow	60 sec	Removal	96.4	1.15892	1.131568	31.43958	55.1291
Slow	60 sec	After	93.4	0.994366	0.735338	43.50548	55.2837
Slow	60 sec	After	97.4	0.853893	0.478208	107.91718	51.4893
Slow	60 sec	After	96.4	0.762905	0.367158	96.56298	50.6207
Slow	60 sec	After	95.4	0.648094	0.222098	96.64178	45.1105
Slow	60 sec	After	97.4	0.595977	0.128058	91.08428	46.4856
Medium	120 sec	Application	1	0.403233	0.095654	-42.69652	63.8693
Medium	120 sec	Application	3	0.412197	0.331754	95.96998	65.9044
Medium	120 sec	Application	21	0.401853	0.137654	-23.20192	66.7843
Medium	120 sec	Application	29	0.422287	0.458814	-59.68472	63.7844
Medium	120 sec	Application	56	0.421963	0.329754	-3.60062	65.777
Medium	120 sec	Application	64	0.415579	0.334754	-62.25692	66.4981
Medium	120 sec	Application	74	0.404942	0.284724	2.84158	65.5248
Medium	120 sec	Removal	36	0.39299	1.996776	1023.94092	65.5306

Medium	120 sec	Removal	36	0.846262	1.996776	1023.94092	48.4892
Medium	120 sec	Removal	88	1.11058	2.998384	67.01228	59.6736
Medium	120 sec	Removal	90	1.69001	5.972774	1693.52888	39.1283
Medium	120 sec	Removal	91	1.12655	5.881004	2674.11608	32.776
Medium	120 sec	Removal	93	0.737545	2.540524	1112.70048	40.416
Medium	120 sec	Removal	90	1.20889	8.604124	3197.26498	34.1573
Medium	120 sec	Removal	93	0.962034	5.189614	3991.22918	33.2893
Medium	120 sec	Removal	94	0.771083	4.682384	3479.34358	33.0647
Medium	120 sec	After	93	0.695413	3.804934	3604.12128	33.5173
Medium	120 sec	After	94	0.607325	2.930804	3362.52398	33.0039
Medium	120 sec	After	94	0.549065	2.570364	3423.83068	33.6523
Medium	120 sec	After	94	0.512105	1.992854	3165.27518	33.2479
Medium	120 sec	After	94	0.50243	1.629544	3103.04588	32.7895