# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2021

DateRun: 02/07/2021

Experimenters: Justin Kiander

ClientType: Metal Working

ProjectNumber: Project #1

Substrates: Aluminum

PartType: Part

Contaminants: Buffing/Polishing Compounds

Cleaning Methods: Immersion/Soak

Analytical Methods: Visual

Purpose: The purpose of this experiment was to determine the effectiveness of alternative solutions against DGreeze 500 LO

Experimental Procedure: Cleaners were prepared to the following concentrations: DGreeze 500 LO 100%, Dimethyl Glutarate 100%, Propylene Carbonate 100%. One mirror polished aluminum part provided by the company was obtained for each of the cleaners being tested. An initial white glove test was conducted by wiping a finger against the part to reveal presence of the contaminant. Parts were then submerged into their cleaners for 10 minutes at room temperature. After 10 minutes had passed, parts were dried with a heat gun at the ambient setting for 10 minutes. Following the drying step another white glove test was conducted to determine if the contaminant was still present. Effectiveness of the cleaners was determined.

Results: By the white glove test, DGreeze 500 LO did outperform Dimethyl Glutarate and Propylene Carbonate. However, the company claims DGreeze 500 LO completely cleans their parts by this method, but when tested in lab buffing soil remained on all three pieces. Pictures of the white glove test will be provided.

DGreeze 500 LO was also the only cleaner to dry within the required 10-minute time frame under ambient air. However, in the initial trial drying was split between all three parts within 10 minutes. A secondary trial was conducted to determine if parts could fully dry in 10 minutes under direct ambient air in individual dry steps. DGreeze 500 LO was the only cleaner to dry in the 10-minute time frame. Propylene Carbonate had almost fully dried. Considering the company has better drying equipment, testing a sample of Propylene Carbonate in house could be beneficial. Dimethyl Glutarate does not meet the needs of the client as the solvent needs more time, or even heat, to fully dry.

Summary:

| **Substrates:** | Aluminum | | | | |
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| **Contaminants:** | Buffing/Polishing Compounds | | | | |
| **Company Name:** | **Product Name:** | **Conc.:** | **Efficiency:** | **Effective:** | **Observations:** |
| Transene Company, Inc. | D Greeze 500 LO | 100% | 0.00 | ☑ | Did remove some buffing soil, but contaminant remained. Dried within the required 10 minutes in ambient air. |
| Fisher Scientific | Dimethyl glutarate (CAS: 1119-40-0) | 100% | 0.00 | ☐ | Some buffing compound remained after cleaning. Did not dry within the required time frame. Would require more time or heat to fully dry. |
| Fisher Scientific | Propylene carbonate 99.5% (CAS: 108-32-7) | 100% | 0.00 | ☑ | Some buffing compound remained after cleaning. Almost fully dried under the required conditions. Testing a sample in-house could be beneficial for the company. |

Conclusion: Upon completion of testing, it was determined that Propylene Carbonate could potentially replace DGreeze 500 LO as an effective alternative. The cleaner did almost dry under the required conditions, and testing with in-house equipment and process could be beneficial. A white glove test revealed all three cleaners did not fully removing the buffing soil from company provided parts. However, parts were not damaged by the cleaning process. Dimethyl Glutarate is not a suitable alternative as it would need more time or heat than the required drying period of the company.