

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2016
 DateRun: 02/03/2016
 Experimenters: Alicia Melvin, Carla De La Cruz, Rhoda Gindi, Catherine York
 ClientType:
 ProjectNumber: Project #1
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Greases
 Cleaning Methods: Immersion/Soak
 Analytical Methods: Gravimetric
 Purpose: To conduct testing on possible drop in solvents for Dow grease.

Experimental Procedure: Stainless steel coupons were selected and arranged into rows of 3 coupons, a row per cleaner. Initial weights were taken, and coupons were soiled and reweighed. The lower third of the coupons were soiled. beakers with drop in solvent replacement solutions were set up on stirring plates equipped with a stir bar. The coupons were immersed for 5 minutes. Observations were taken during the cleaning process. The coupons were dried on a rack for 15 minutes. Final weights were recorded.

Results: Some drop in solvents were effective on the Dow Grease. Based on visual observations, the Solstice products seemed more effective cleaners.

| Cleaner | Initial wt. | Final wt. | %Removed |
|-----------------|-------------|-----------|----------|
| Solstice PF | | | |
| | 0.2787 | 0.1025 | 63.22 |
| | 0.2057 | 0.0034 | 98.35 |
| | 0.1692 | 0.0003 | 99.82 |
| Solstice PF-2A | | | |
| | 0.1879 | 0.0140 | 92.55 |
| | 0.1976 | 0.0187 | 90.54 |
| | 0.2125 | 0.0430 | 79.76 |
| Fluosolv CX | | | |
| | 0.4184 | 0.3682 | 12.00 |
| | 0.5053 | 0.4356 | 13.79 |
| | 0.4937 | 0.4097 | 17.01 |
| Fluosolv NC-786 | | | |
| | 0.4384 | 0.0588 | 86.59 |
| | 0.3859 | 0.0430 | 88.86 |
| | 0.5182 | 0.0060 | 98.84 |
| Ethyl 408 | | | |
| | 0.3499 | 0.0376 | 89.25 |
| | 0.3140 | 0.2973 | 5.32 |
| | 0.2145 | 0.2037 | 5.03 |
| Ethyl 408 | | | |
| | 0.3449 | 0.3734 | -8.26 |
| | 0.3140 | 0.3023 | 3.73 |
| | 0.2145 | 0.2106 | 1.82 |
| Methyl 408 | | | |
| | 0.1991 | 0.1956 | 1.76 |
| | 0.2049 | 0.2116 | -3.27 |
| | 0.1590 | 0.1456 | 8.43 |
| Solstice PF | | | |
| | 0.2787 | 0.1025 | 63.22 |
| | 0.2057 | 0.0034 | 98.35 |
| | 0.1692 | 0.0003 | 99.82 |
| Solsticel PF-2A | | | |

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| FluoSolv CX | | | |
| | 0.5053 | 0.4356 | 13.79 |
| | 0.4937 | 0.4097 | 17.01 |
| | 0.4384 | 0.0588 | 86.59 |
| FluoSolv NC - 786 | | | |
| | 0.3859 | 0.0430 | 88.86 |
| | 0.5182 | 0.0060 | 98.84 |
| | 0.4657 | 0.0680 | 85.40 |
| FluoSolv FR-110 | | | |
| | 0.6054 | 0.5919 | 2.23 |
| | 0.3813 | 0.3681 | 3.46 |
| | 0.4638 | 0.4355 | 6.10 |
| FluoSolv CX-500 | | | |
| | 0.5198 | 0.5109 | 1.71 |
| | 0.7304 | 0.7289 | 0.21 |
| | 0.7166 | 0.7103 | 0.88 |
| Vertrel Sion | | | |
| | 0.3530 | 0.1317 | 62.69 |
| | 0.4428 | 0.2205 | 50.20 |
| | 0.2691 | 0.1014 | 62.32 |

Summary:

| Substrates: | Stainless Steel | | | | |
|--------------------------------|------------------------|--------|-------------|-------------------------------------|--|
| Contaminants: | Greases | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| Honeywell | Solstice PF-2A with N2 | 100 | 87.62 | <input checked="" type="checkbox"/> | Results were streaky. |
| Honeywell | Solstice PF with N2 | 100 | 87.13 | <input checked="" type="checkbox"/> | Residue intensified during drying |
| NuGeneration Technologies, LLC | FluoSolv CX | 100 | 14.27 | <input type="checkbox"/> | White residue developed during drying |
| NuGeneration Technologies, LLC | FluoSolv NC 786 | 100 | 91.43 | <input checked="" type="checkbox"/> | White film developed during the drying period. |
| Xf Technologies | Methyl 408 | 100 | 2.31 | <input type="checkbox"/> | Clumping effect occurred. |
| Xf Technologies | Ethyl 408 | 100 | -0.90 | <input type="checkbox"/> | Clumping effect occurred. |
| DuPont | Vertrel Sion | 100 | 58.40 | <input type="checkbox"/> | |
| NuGeneration Technologies, LLC | Fluosolv FR-100 | 100 | 3.93 | <input type="checkbox"/> | |

Conclusion:

Honeywell Solstice PF-2A, Honeywell Solstice PF, and Ecolink Fluosolv NC 786 were most effective in removing Dow Corning Vacuum Grease.