

CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2014
 DateRun: 04/16/2014
 Experimenters: Loc Nguyen
 ClientType: Cleaner Manufacturer
 ProjectNumber: Project #1
 Substrates: Stainless Steel
 PartType: Coupon
 Contaminants: Oil
 Cleaning Methods: Manual Wipe
 Analytical Methods: Gravimetric

Purpose: To evaluate second supplied product for Green Seal GS 34 degreasing standard.

Experimental Procedure: Two types of soils were prepared individually. The first soil, maintenance soil, consisted of 10 grams of carbon black, 10 grams iron oxide, 100 ml WD-40, 100 ml hydraulic oil, and 100 ml gear oil. Each component was placed in a 750 beaker and mixed for 20 minutes at room temperature using a magnetic stirrer. The second soil, production soil, was made by mixing 200 ml Quench Oil and 200 ml cutting oil for 20 minutes at room temperature using a magnetic stirrer in a second 750 ml beaker.

Approximately 100 mg of each soil was applied to a precleaned and preweighed stainless steel coupon onto one side only with a handheld swab. No soil was applied to the two control coupons. The maintenance soil for all three coupons was baked in an oven for 30 minutes at a temperature of 40° C (105 F). For the production soil, all three coupons were baked in an oven for thirty minutes at 105° C (220 F). The coupons were then allowed to cool to room temperature and weigh a second time (soiled mass = B).

Three coupons were placed into a Gardner Straight Line Washability unit. A Kimberly-Clark Wypal reinforced paper towel was attached to the cleaning sled and soaked with 1 spray of cleaning solution. Each coupon was sprayed 1 time with the same cleaning solution. The cleaning unit was run for 20 cycles (~33 seconds). At the end of the cleaning, coupons were wiped once with a dry paper towel. Final weights were recorded, efficiencies were calculated and recorded.

Results:

| Cleaner - Conc - Soil | Initial wt | Final wt | % Removed |
|-------------------------|------------|----------|-----------|
| SKW QUAB 5% Soil 1 | | | |
| | 0.0565 | 0.0096 | 83.01 |
| | 0.1060 | 0.0080 | 92.45 |
| | 0.0785 | 0.0108 | 86.24 |
| SKW QUAB 10% Soil 1 | | | |
| | 0.0318 | 0.0062 | 80.50 |
| | 0.0196 | 0.0073 | 62.76 |
| | 0.0838 | 0.0064 | 92.36 |
| SKW QUAB 15% Soil 1 | | | |
| | 0.0490 | 0.0059 | 87.96 |
| | 0.0613 | 0.0065 | 89.40 |
| | 0.0671 | 0.0063 | 90.61 |
| Purple Power 5% Soil 1 | | | |
| | 0.0384 | 0.0039 | 89.84 |
| | 0.0209 | 0.0042 | 79.90 |
| | 0.0349 | 0.0034 | 90.26 |
| Purple Power 10% Soil 1 | | | |
| | 0.0200 | 0.0020 | 90.00 |
| | 0.0343 | 0.0025 | 92.71 |
| | 0.0292 | 0.0027 | 90.75 |
| Purple Power 20% Soil 1 | | | |
| | 0.0433 | 0.0014 | 96.77 |

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|-------------------------------|--------|--------|--------|
| | 0.0192 | 0.0001 | 99.48 |
| | 0.0201 | 0.0006 | 97.01 |
| Biocircle CB100 20% Soil 1 | | | |
| | 0.0319 | 0.0008 | 97.49 |
| | 0.0198 | 0.0000 | 100.00 |
| | 0.0238 | 0.0018 | 92.44 |
| SKW QUAB 5% Soil 2 | | | |
| | 0.0809 | 0.0050 | 93.82 |
| | 0.0866 | 0.0050 | 94.23 |
| | 0.0907 | 0.0064 | 92.94 |
| SKW QUAB 10% Soil 2 | | | |
| | 0.0828 | 0.0040 | 95.17 |
| | 0.1100 | 0.0038 | 96.55 |
| | 0.0825 | 0.0028 | 96.61 |
| SKW QUAB 15% Soil 2 | | | |
| | 0.0872 | 0.0079 | 90.94 |
| | 0.0880 | 0.0065 | 92.61 |
| | 0.0970 | 0.0042 | 95.67 |
| Purple Power 5% Soil 2 | | | |
| | 0.0956 | 0.0046 | 95.19 |
| | 0.1092 | 0.0036 | 96.70 |
| | 0.0893 | 0.0018 | 97.98 |
| Purple Power 10% Soil 2 | | | |
| | 0.1035 | 0.0041 | 96.04 |
| | 0.1151 | 0.0030 | 97.39 |
| | 0.0981 | 0.0044 | 95.51 |
| Purple Power 20% Soil 2 | | | |
| | 0.1110 | 0.0033 | 97.03 |
| | 0.0862 | 0.0026 | 96.98 |
| | 0.0978 | 0.0034 | 96.52 |
| Biocircle CB100 20% Soil 1 | | | |
| | 0.1086 | 0.0190 | 82.50 |
| | 0.0826 | 0.0016 | 98.06 |
| | 0.0773 | 0.0015 | 98.06 |

Summary:

| Substrates: | Stainless Steel | | | | |
|-----------------------|-------------------|--------|-------------|-------------------------------------|---------------|
| Contaminants: | Oil | | | | |
| Company Name: | Product Name: | Conc.: | Efficiency: | Effective: | Observations: |
| SKW Quality Chemicals | SKW Quab | 5 | 90.45 | <input checked="" type="checkbox"/> | |
| SKW Quality Chemicals | SKW Quab | 10 | 87.33 | <input checked="" type="checkbox"/> | |
| SKW Quality Chemicals | SKW Quab | 15 | 91.20 | <input checked="" type="checkbox"/> | |
| Aiken Chemical Co. | Purple Power | 5 | 91.65 | <input checked="" type="checkbox"/> | |
| Aiken Chemical Co. | Purple Power | 10 | 93.73 | <input checked="" type="checkbox"/> | |
| J Walter Inc. | Bio Circle CB 100 | 20 | 97.24 | <input checked="" type="checkbox"/> | |
| Aiken Chemical Co. | Purple Power | 20 | 97.30 | <input checked="" type="checkbox"/> | |

Conclusion:

Each supplied cleaner worked to effective levels of cleaning for each soil. Purple Power at 20% demonstrated the most effective level of cleaning for each soil, followed by Biocircle at 20%. The SKW Quab at 15% was comparable to the Purple Power at 5%.