

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 1995  
 DateRun: 06/14/1995  
 Experimenters: Donald Garlotta, Jay Jankauskas  
 ClientType: Biomedical Device Manufacturer  
 ProjectNumber: Project #1  
 Substrates: Plastic  
 PartType: Part  
 Contaminants: Cutting/Tapping Fluids, Lubricating/Lapping Oils, Fingerprints, Oil  
 Cleaning Methods: Ultrasonics  
 Analytical Methods: Gravimetric, Waterbreak  
 Purpose: Evaluate effectiveness of Innovative Organics SC11

Experimental Procedure: The SC 11 was dilute to the highest and lowest recommended concentrations (2% and 5%). Cleaning was performed in a Crest ultrasonic unit for 15 minutes at 140 F. The parts were then rinsed in a tap water bath and a DI water bath, both rinses were for 2 minutes at 140 F. The parts were then dried under air knives for 2 minutes and under a heat gun for 5 minutes. All parts were analyzed gravimetrically to determine a percentage of the oil removed. They were also inspected visually for any spotting or oil residue.

## CLEANING CONDITIONS:

|                                     | Temperature |             |             |
|-------------------------------------|-------------|-------------|-------------|
|                                     | time (min)  | 2% solution | 5% solution |
| Crest Ultrasonics                   | 15          | 130         | 139         |
| #1 RINSE/TAP H <sub>2</sub> O       | 2           | 144         | 144         |
| #2 RINSE/DEIONIZED H <sub>2</sub> O | 2           | 80          | 80          |
| DRY air knives                      | 2           | room        | room        |
| DRY heat gun                        | 2           | 180         | 180         |
| COOL DOWN                           | overnight   | room        | room        |

## Results:

### GRAVIMETRIC ANALYSIS

#### 2% Innovative Organics SC11

| sample # and substrate | clean mass (g) | mass with contamination (g) | mass after cleaning (g) | contaminant removed (g) | Percent Removal |
|------------------------|----------------|-----------------------------|-------------------------|-------------------------|-----------------|
| #1- Clear PC           | 12.2447        | 12.2614                     | 12.2462                 | 0.0152                  | 91.02%          |
| #2- Clear PC           | 12.3846        | 12.3914                     | 12.3860                 | 0.0054                  | 79.41%          |
| #1- Clear ABS          | 11.1069        | 11.1225                     | 11.1111                 | 0.0114                  | 73.08%          |
| #1- White PC           | 12.8904        | 12.9270                     | 12.8926                 | 0.0344                  | 93.99%          |

#### 5% Innovative Organics SC11

| sample # and substrate | clean mass (g) | mass with contamination (g) | mass after cleaning (g) | contaminant removed (g) | Percent Removal |
|------------------------|----------------|-----------------------------|-------------------------|-------------------------|-----------------|
| #3- Clear PC           | 11.6793        | 11.6836                     | 11.6813                 | 0.0023                  | 53.49%          |
| #4- Clear PC           | 14.0436        | 14.0543                     | 14.0457                 | 0.0086                  | 80.37%          |

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|              |         |         |         |         |        |
|--------------|---------|---------|---------|---------|--------|
| #2-Clear ABS | 11.7887 | 11.7925 | 11.7927 | -0.0002 | -5.26% |
| #2-White PC  | 13.2548 | 13.2963 | 13.2576 | 0.0387  | 93.25% |

Quite a bit of oil was still left on most of the parts. Gravimetric analysis shows that there was a lousy removal on most parts and water beaded up on surface of the parts indicating oil buildup. On a brighter note, there were no water spots on the parts after drying it appears that the cold DI rinse solved the problem of spotting that was encountered in previous trials.

Summary:

|                         |                      |   |                    |                          |                      |
|-------------------------|----------------------|---|--------------------|--------------------------|----------------------|
| <b>Substrates:</b>      |                      | Plastic   |                    |                          |                      |
| <b>Contaminants:</b>    |                      | Cutting/Tapping Fluids, Lubricating/Lapping Oils, Fingerprints, Oil |                    |                          |                      |
| <b>Company Name:</b>    | <b>Product Name:</b> | <b>Conc.:</b>   | <b>Efficiency:</b> | <b>Effective:</b>        | <b>Observations:</b> |
| Innovative Organics Inc | Amberclean SC 11     | 2   | 84.00              | <input type="checkbox"/> |                      |
| Innovative Organics Inc | Amberclean SC 11     | 5   | 75.00              | <input type="checkbox"/> |                      |

Conclusion:

Innovative Organics is ineffective and shouldn't be considered by Biomedical Device Manufacture