

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2016  
 DateRun: 09/22/2016  
 Experimenters: Carla De La Cruz  
 ClientType: Jewelry Mfr  
 ProjectNumber: Project #3  
 Substrates: Aluminum  
 PartType: Coupon  
 Contaminants: Oil  
 Cleaning Methods: Immersion/Soak  
 Analytical Methods: Gravimetric, Visual

Purpose: To find the best fit product for cleaning Leach Garner's XXAluminum #19 from copper and stainless steel surfaces meant to resemble the cleaning of precious metals.

Experimental Procedure: Coupons of stainless steel and copper were selected and arranged on trays, so that each cleaner had an assigned set of each surface. Before taking initial weights coupons were wiped down with Kimwipes. After taking weights the coupons were promptly soiled and reweighed. All cleaners were gathered in respective bottles and beakers. A stir bar was used in conjunction with a heating plate equipped to stir the solutions. The coupons were added to the beakers three of a kind at one time, and then allowed to sit in the stirred solution at room temperature for 5 minutes while observations were taken. Finally, clean weights were taken at the end of all the testing.

| Cleaner      | Initial wt of cont. | Final wt of cont. | %Cont Removed |
|--------------|---------------------|-------------------|---------------|
| FluoSolv CX  | 0.0328              | 0.0027            | 91.77         |
|              | 0.0337              | 0.0026            | 92.28         |
|              | 0.0479              | 0.0007            | 98.54         |
| FluoSolv NC  | 0.0361              | 0.0115            | 68.14         |
|              | 0.0497              | 0.0106            | 78.67         |
|              | 0.0347              | 0.0095            | 72.62         |
| Vertrel Sion | 0.0242              | 0.0035            | 85.54         |
|              | 0.0200              | 0.0043            | 78.50         |
|              | 0.0388              | 0.0044            | 88.66         |
| Solstice PF  | 0.0447              | 0.0020            | 95.53         |
|              | 0.0329              | 0.0030            | 90.88         |
|              | 0.0285              | 0.0029            | 89.82         |

| Summary:                       |  | <b>Substrates:</b> Aluminum |        |             |                                     |               |
|--------------------------------|--|-----------------------------|--------|-------------|-------------------------------------|---------------|
|                                |  | <b>Contaminants:</b> Oil    |        |             |                                     |               |
| Company Name:                  |  | Product Name:               | Conc.: | Efficiency: | Effective:                          | Observations: |
| NuGeneration Technologies, LLC |  | FluoSolv CX                 | 100    | 94.20       | <input checked="" type="checkbox"/> |               |
| NuGeneration Technologies, LLC |  | FluoSolv NC 786             | 100    | 73.15       | <input type="checkbox"/>            |               |
| DuPont                         |  | Vertrel Sion                | 100    | 84.23       | <input checked="" type="checkbox"/> |               |
| Honeywell                      |  | Solstice PF with N2         | 100    | 92.08       | <input checked="" type="checkbox"/> |               |

Conclusion: The testing of various cleaners on aluminum, concluded that FluoSolv CX was the best cleaner, followed by the Honeywell Solstice PF product. The oil was very lightweight and thus came off quite easily. There were some cleaners which removed the cleaner but left behind some residue or film on the coupons. Unlike with other testing, the DuPont product did not perform as well as it usually does.