

# CLEANING LABORATORY EVALUATION SUMMARY

SCL #: 2025  
 DateRun: 05/05/2025  
 Experimenters: Amelia Wagner  
 ClientType: Cleaner Manufacturer  
 ProjectNumber: Project #1  
 Substrates: Textile  
 PartType: Coupon  
 Contaminants: Clay  
 Cleaning Methods: Mechanical Agitation  
 Analytical Methods: Colorimeter

Purpose: To re-test the efficacy of the best performing reformulation (4% enzyme mix) in comparison to the efficacy of the baseline product on removing clay from polyester at 105-125F

Experimental Procedure: Prep: 20 total 5x5 inch blue polyester fabric swatches were used for testing (10 per cleaner). Each fabric swatch was measured for reflectance, redness/greenness, and yellowness/blueness with a colorimeter 5 times in 3 separate areas (0.5x0.5) where the fabric would eventually be stained. The three areas were treated as individual coupons. The 5 measurements for each area were averaged together and used as the representative measurements of the specified area/coupon. Each area was stained with the clay and left to air dry for 24 hours. Colorimeter measurements of each stain were then recorded.

Washing procedure: The fabric swatches were washed in a washing machine with 45 mL of Liquid Laundry Detergent and 6.5 gallons of water on a normal washing cycle set for a medium load. The water used has a water hardness level of 63 PPM mg/L. The washing cycle consisted of a wash step (~12 mins), a rinse step (~14 mins), and a spin step (~5 mins). The fabric swatches were washed heated with a temperature range of 105F-125F in their respective cleaners. The fabric swatches were then left to air dry. After drying, the colorimeter was used to re measure the 3 staining areas on each fabric swatch.

## Analysis:

Detergency: Unadjusted measure of the percentage the cleaned fabric was returned to its original state (uses only L values/measures of lightness)

$$\% \text{ Detergency} = 100X((L_{\text{clean}} - L_{\text{dirty}}) / (L_{\text{initial}} - L_{\text{dirty}}))$$

Where:

L=reflectance (0 black - 100 White)

Results:

| Cleaner                | L Initial | L Dirty | L Clean | % DET | AVG % DET |
|------------------------|-----------|---------|---------|-------|-----------|
| MS LLD                 | 59.84     | 85.86   | 60.29   | 98.3  | 98.59%    |
|                        | 59.72     | 85.74   | 60.05   | 98.73 |           |
|                        | 59.78     | 85.1    | 60.1    | 98.74 |           |
|                        | 59.97     | 85.4    | 60.29   | 98.74 |           |
|                        | 60.12     | 85.92   | 60.43   | 98.8  |           |
|                        | 59.99     | 85.78   | 60.34   | 98.64 |           |
|                        | 59.87     | 83.08   | 60.18   | 98.66 |           |
|                        | 60.22     | 84.16   | 60.47   | 98.96 |           |
|                        | 59.68     | 85.96   | 60.14   | 98.25 |           |
|                        | 59.9      | 85.98   | 60.4    | 98.1  |           |
| Chemtrax 4% enzyme mix | 59.92     | 85.97   | 60.3    | 98.54 | 98.63%    |
|                        | 59.66     | 85.82   | 60.1    | 98.32 |           |
|                        | 59.83     | 86.16   | 60.29   | 98.25 |           |
|                        | 59.75     | 86.03   | 60.23   | 98.17 |           |
|                        | 59.89     | 85.6    | 60.27   | 98.52 |           |
|                        | 60.07     | 86.05   | 60.35   | 98.92 |           |
|                        | 60.02     | 85.9    | 60.23   | 99.19 |           |
|                        | 59.96     | 84.29   | 60.28   | 98.68 |           |
|                        | 59.93     | 85.46   | 60.12   | 99.26 |           |
|                        | 59.77     | 85.95   | 60.18   | 98.43 |           |

Summary:

Conclusion:

## **CLEANING LABORATORY EVALUATION SUMMARY**

On average the Chemtrax 4% enzyme mix performs better than the MS LLD in removing clay from polyester with the utilization of heat.