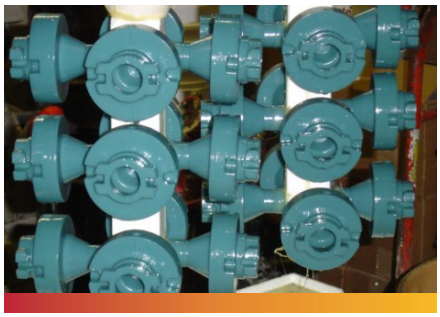
R&R® Wash-N-Etch pattern cleaner

Biodegradable Pattern Cleaner

R&R Wash-N-Etch pattern cleaner removes silicone oil or other release agents from wax patterns before the primary ceramic coat is applied. R&R Wash-N-Etch pattern cleaner, a biodegradable product, cleans wax patterns and contains naturally occurring d-limonene, derived from citrus fruits, as the active ingredient.



R&R Wash-N-Etch pattern cleaner also acts as an etching material for the wax pattern while it cleans off the release agent. This process allows for better slurry adhesion during application of primary coats. Better adhesion of the primary coats reduces opportunities for casting defects related to shell buckling or lifting.

Application Recommendations

Patterns cleaned in R&R Wash-N-Etch pattern cleaner can be dipped in water based primary slurries after they have dried.

After the wax patterns are cleaned and rinsed with water, an acclimation period of at least 1 hour is recommended in the primary slurry area of the shell room to ensure wax patterns are not expanding or contracting from changes in temperature.

R&R Wash-N-Etch pattern cleaner can be used full strength, as packaged, for difficult to release patterns that require a heavy coat of release agent. It may also be used full strength for patterns that have difficult part geometry.

R&R Wash-N-Etch pattern cleaner can be diluted to 75% concentration for normal use, making it more economical to use.

Typical Process Recommendation

1. Agitated immersion in R&R Wash-N-Etch pattern cleaner for 30 seconds.
   Note: this may vary depending on part geometry or amount of silicone to be removed.
2. Agitated immersion in room temperature water for 15 seconds in an overflow tank.
3. Agitated immersion in room temperature water for 15 seconds in a second overflow tank.

Depending on state EPA guidelines, overflow water rinse tanks may be arranged so that the second tank overflows into the first and the first overflows into a drain. Consult your local EPA before pouring liquids down the drain.

Perforated tubing or piping may be added to the bottom of the water rinse tanks. By pumping air through these lines during the rinse process, agitation will be enhanced.

Safety & Handling

This product is flammable. For safety and handling recommendations, you may request a copy of the Safety Data Sheet (SDS) at www.ransom-randolph.com.

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Recommended Testing Methods

Given the number of variables introduced into a cleaning tank (i.e., release agent variance, wax variance and volume variance), determining product life and product performance can be difficult. As a result, we recommend implementing a regular monitoring schedule on each cleaning tank.

The following tests can assist with monitoring the effectiveness of the cleaning material:

Wetting Test

1. Dip a clean wax bar or pattern into primary binder prewet to its mid-point.
2. Remove from binder and observe the surface.
   Good wetting indicators: uniform coat, no slurry breaks.
   Poor wetting indicators: wax peeks through the slurry coat, slurry breaks and forms holes

Styrofoam Cup Dissolution Test

1. Pour pattern cleaner into styrofoam cup.
2. Set styrofoam cup in a pan.
3. Record number of minutes it takes for cleaner to dissolve through cup.
   Note: baseline must be recorded with pattern cleaner before it is used in production. Test should be repeated using same size cup for accurate comparison. Record time at which the cleaner seeps through the styrofoam cup for consistent measure.

   Record on regular basis. We would anticipate it will take longer to dissolve the cup over the effective life of the cleaner.

   Historical record will allow for correlation of dissolution time with loss of effectiveness.

Typical Material Properties*

Appearance	Odor	pH	VOC (EPA-24)
Pale, Yellow Liquid (darkens with age – this is not an indicator of performance capability)	Citrus	9.0 - 10.0	3.5 lbs/gal (as received)

*These results are based on the testing methods, frequency and procedures of Ransom & Randolph or its approved suppliers. The levels referenced herein are only for general guidance and do not constitute a firm specification.

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