"POWER SCOUR"

For Natural Fibre Scouring of Raw, Greasy Wool, Waxy Mohair & fine Luxury Fibres

EARTH FRIENDLY – BIODEGRADABLE

COMMERCIAL-MILL GRADE 11/15/2008

We have completed our testing and analysis for raw fibre scouring operations and can make the following recommendations:

"Power Scour" was designed and tested to achieve optimum cleaning with minimal fibre damage during processing. In addition, we have formulated the product to be **environmentally safe** and perform not only as well but better than typical alcohol ethhoxylates while using cooler water temperatures.

The composition is an optimum blend of both nonionic and anionic surfactants combined with a natural source alkalinity package to provide a buffered bath pH for fibre care and moderate bath life. **The products should be used at about one-half to one-third of initial charge concentrations and make-up rates as that currently being employed in fibre scour processing arrangements.** It should also be recognized that **water quality, quantity and bulk fibre cleaning rates will also play a role in the initial charge concentration** and subsequent make-up rates. A certain amount of trial and error should be expected during start-up to avoid over or under use of the products.

Due to the rigor of current scouring processes, along with temperatures exceeding 70ºC (158ºF), a certain amount of inter-tangling and stress can be imparted to natural fibre, especially to high-end luxury fibre with little wax, i.e., alpaca, cashmere, qiviut, bison, angora. This invariably leads to matting/felting, breaks and frays resulting in damaged fibres and consequent reduced fibre yield. To improve the end quality of the scoured fibre we sought to achieve cleaning at the lowest possible bowl temperature**. Our studies indicate that excellent cleaning for wool and mohair can be achieved in the temperature range of 60ºC (140ºF) and for the non-oily/waxy fibres in the temperature range of 50° C (122°F) Lower temperatures for less oily/waxy fibre – upper range for heavier oily/waxy fibre.**

In the course of our research and formulation work we discovered a potential need for a rinse additive during fibre scouring. We found it beneficial, during the last rinse step, to add a processing aid – **"Unicorn Fibre Rinse**". This particular product helps relax the fibre resulting in easier handling and potential higher through-put as well as a higher end-quality fibre bundle.

"Power Scour" and "**Unicorn Fibre Rinse"** can be used with existing scour lines typically employed for fibre cleaning. The following example will illustrate the application for a four to six wash tank/bowl cleaning operation:

(Patent Pending)

Suggested Start-up Conditions
Unicorn POWER SCOUR and Unicorn Fibre Rinse
For Raw, Greasy Sheep Wool, Waxy Mohair,
and for less oily/ waxy luxury Fibre

Step #1 – Initial Wash: First mix Unicorn Power Scour, and then dose the **Unicorn Power Scour** at an initial working concentration of 2-3% of the Fibre weight. For example: to scour 100 lbs. (45.4kg) of fibre, use 2-3 lbs. (.9 -1.4kg) or approx. 32 - 48 fluid oz. (.95L -1.42L) of Unicorn Power Scour. Use lower dosage percentages for less oily/waxy fibres and higher percentages for oily/waxy fibres.

Note: For small fibre batch cleaning, use a "small batch" volume of water or increase the Power Scour dosage for maximum effectiveness. **Note: Using too much water for small batch cleaning dilutes cleaning power and should be adjusted accordingly**.

Depending on fibre characteristics, working temperatures for scouring oily/waxy wool and mohair with **Unicorn Power Scour** should be in the range of 60ºC (140ºF) and for less oily/waxy Fibres like alpaca, bison, and cashmere temperatures should be in the range of 50°C (122°F.) Cleaning performance will be optimal in this range – and problematic fibre damage/tangling should be improved. In addition, operations will be improved due to the lower energy costs in maintaining these temperatures.

In situations where raw, exceptionally greasy fleece is to be scoured, consider a pre-soak for 20-30 minutes in 60° C (140° F) water with Power Scour before the first scouring wash. If Water hardness exceeds about 17 grains (100 ppm Ca/Mg) a higher concentrate level may be required. When large amounts of calcium and magnesium salts, from direct water sources or from the fibre itself, results in water hardness, a pre-soak will help to release amounts of water soluble minerals. Note that soaking in hot water alone may further bind grease to the fibres.

Step #2-- **Additional Washes**: Follow identical conditions to that of Step#1 – except use 1-2% of Power Scour. For example: for every 100 lbs. (45.4kg) of fleece use approx. 16 to 32 fluid oz. (.45kg - .9kg or .47L -.95L.) Again use lower percentage dosage for less oily/waxy fibres and higher percentage for oily/waxy fibres. Exceptionally greasy/waxy fibres may require an additional wash.

Step #3 --**Rinses:** Use 45-50°C (113° - 122°F) water for **Non-greasy** fibre and 50-60°C (122°-140°F) water for **greasy, waxy fibre**. Oily/waxy fibres may require an additional rinse.

Step #4 -- **Final Rinse**: Here we recommend the use of **Unicorn Fibre Rinse.** This product will help strengthen the fibre, ease the final processing steps and maximize ease of handling. Depending on fibre type, this product would be added to the bowl at approximately 2% of the fibre weight. For example: to rinse 100 lbs. (45.4kg) of fibre use 2 lbs. or 32 fluid oz. (.9kg or .95L) of Unicorn Fibre Rinse.

Note: 1-To maximize the adherence of **color dyes** to fibre that might receive such post treatments, we suggest conditioning with Unicorn Fibre Rinse AFTER the dyeing process.

2-Each operation is expected to be slightly different and the above recommendation should be used as a starting point for final optimization**.**

3-Mix the product before use. **Store product in warm area, i.e. minimum temperature 70 degrees F. or 21 degrees** C. Product will turn cloudy white and will thicken when temperature falls below this range. If product thickened there is no adverse effect on the effectiveness. Just mix product in the water temperatures recommended above before adding fiber.

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