How to Dye Acrylic using Exhaust Method

Acrylic has a Glass Transition Temperature (T_g) range of 160-190°F(71-88°C). This means that the fiber reaches a point where it begins to expand allowing for easier dye penetration. In the dyeing process, this temperature must be met or exceeded in order to promote dye penetration into the fiber. Once the fiber begins to accept the dye, just a small increase in temperature can double the rate of dye absorption. It is therefore very important to maintain control of a slow rate of temperature rise. Acrylic should also be cooled slowly to a temperature of 140°F(60°C) before the dyeing bath is dropped or quickly cooled in order to maintain structural stability. Time is also an important factor in dyeing acrylic. The longer the dyeing time, the greater the degree of penetration and exhaustion. In some situations where time and/or temperature is difficult to attain, benzyl alcohol is sometimes used to help swell the fiber to help increase dye penetration. This should be evaluated in the lab first to determine the compatibility in the dyeing process and how much should be used. Also, **Orcozine™** dyes with similar K-values should be used together in order to promote uniform strike rates. A general exhaust procedure for dyeing acrylic is as follows:

- Prescour goods in a bath @ 160°F (71°C) for 20 minutes containing:
  - 1.0% **Orconol CHSA Conc™** on weight of goods (owg)
  - 0.5% owg Tetrasodium Pyrophosphate(TSPP)
- Rinse goods well.
- In a new bath set @ 100°-120°F(38°-49°C) add:
  - 0.5% owg **Orconol CHSA Conc™**
  - 1.0-6.0% owg **Retarder**
    - For 0.1% **Orcozine™** dye, use 6.0% **Retarder**
    - 0.1-1.0% " 4.0% "
    - 1.0-3.0% " 2.0% "
    - 3.0-6.0% " 1.0% "
  - 10% owg Glauber's Salt
  - 25-0.5 % owg Sodium Acetate

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- Acetic Acid 56% to a pH of 4.5 – 5.5

- Enter goods and circulate for 10-15 minutes.
- Slowly add pre-dissolved **Orcozine**™ dyes with circulation and slowly raise temperature to 206°-212°F(97°–100°C).
- Run for 1-1.5 hours depending on depth of shade.
- Because of acrylic's sensitivity to rapid temperature changes, the dyebath should be cooled very slowly to at least 140°F(60°C) before dropping bath.
- Rinse well.
- For heavy shades, after-scour in a bath @ 160°F(71°C) for 20 minutes containing:
  - 1.0% owg **Orconol CHSA Conc**™
  - 0.5% owg Tetrasodium Pyrophosphate(TSPP)

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