

Some Basic Instructions for Using Acid Dyes on Yarn

Acid dyes are suitable for protein-based animal fibres like wool, mohair and alpaca, for silks, and for some industrially-made fibres like the nylons and rayons that are commonly blended with wool to make sock yarns. They will also dye other animal-derived products like leather and feathers. Acid dyes won't work on plant-based fibres like cotton, linen, or hemp; you need reactive dyes for those.

These instructions and tips are very general in nature, and will apply to any acid dyes that you purchase from ACME Fibres - ACME SuperSet Acid Dyes and ACME Acid Dyes - or products you've purchased elsewhere like Jacquard Acid Dyes and Greener Shades Acid Dyes.

They're called acid dyes because you use a weak acid, like common household vinegar or citric acid, in order to get them to bond permanently with the yarn you're dyeing; the dyes themselves are not acidic, and they're non-toxic. But, like many other art and craft supplies, there are some basic safety practices you should observe.

Common Sense Safety Recommendations

- Use a dust mask when handling dye powders, and work in a well-ventilated area. The dye powder itself is non-toxic, but you should never breathe in super-fine powders of any kind.
- Use pots, pans, stirring tools, and equipment that you've designated for crafting use only. (This is standard kitchen hygiene – containers and utensils you use for food should never be used for non-food purposes).
- Use nitrile or latex gloves – dyes will stain your skin and fingernails, and may irritate your skin. You will be working with vinegar, near-boiling water, and steam – protect your hands and your eyes.
- Keep your work area neat and organized. Clean up spills promptly; dyes may stain unprotected surfaces and countertops.
- Children should be supervised when using these craft products. Keep dyes safely out of reach of small children, the same way you would store household cleaning supplies or other crafting materials.

Some Suggested Supplies and Tools

- Your personal protective equipment: including dust mask, gloves, and eye protection.
- Dye pots and/or pans: For high-water immersion dyeing on a stovetop or portable burner, you'll need a big dye pot that holds about 10 litres of water or so; it should be large enough for your skeins to float freely in. For low-water immersion dyeing, you can use a steam pan or large glass casserole dish or something similar. Your pots and pans should be made of a non-reactive material like stainless steel, or glass, or enamel-coated steel. A canning kettle works well, as long as there are no chips in the enamel coating (aluminum or iron can cause colour shifts in the dyes).
- Weighing equipment: You'll need a scale to weigh your yarn and dye stock solutions; it doesn't need to be too fancy, generally a digital kitchen scale that can measure to a tenth of a gram will do just fine. For weighing out dye powders, you might want to invest in a more accurate scale that measures out to hundredths of a gram; these are available quite cheaply from vendors online.
- Various yarn-handling utensils: things to stir, poke, and lift your hot yarn with - tongs, chopsticks, and stir sticks of metal or heat-resistant plastic. You may also want heat-proof silicone gloves for moving hot pots or handling hot pans. Glass measuring cups come in handy for mixing dyes and adding water.
- Liquid detergent for washing your yarns before and after dyeing - plain dish detergent works just fine for washing your skeins; you also might want to use Synthrapol after dyeing - it's formulated to clean out any unbonded dye particles.
- Your acid of choice: common household vinegar is very suitable and readily available in any grocery store. You can also use citric acid if you don't like the smell of hot vinegar; 5 grams of citric acid crystals dissolved in a litre of water will give you a similar acidity as regular vinegar.

Making a Stock Solution

A stock solution is just a specific weight of dye powder dissolved in a specific amount of water in order to make it easier to handle and measure. A 1% solution is suitable for most situations, and it makes the math easy when you're figuring out how much dye to use. You don't *have* to use stock solutions - you can just measure out your dye powders for each job - but pre-measured solutions can simplify your calculations, and can also help prevent getting dark splotches on your yarn from undissolved dye.

To mix a 1% stock solution, weigh out your dye powder as accurately as possible, then mix it with 99 times that weight of water (a ratio of 1 part dye to 99 parts water).

Some examples:

- *To get a half-litre of 1% stock solution, mix a 5 gram Mini-Pack of dye powder with 495 grams of water.*
- *To get 1 litre of 1% stock solution, mix 10 grams of dye powder with 990 grams of water.*

A few colours can be difficult to mix with water; they tend to clump up (some reds are notorious for this). Try “pasting up” your dye first: put your measured amount of dye powder into a glass measuring cup, add a few drops of near-boiling water and mash it into a thick paste. Thoroughly wetting all of the dye particles before adding more hot water will help them mix better. (Remember: always add liquid to powder, not powder to liquid.)

The container you store your stock solution in must be absolutely clean to avoid contamination and bacterial growth during storage. Pre-mixed stock solutions can be stored for several weeks in a cool dark place; remember to shake well before using, as some of the dye particles may have settled out to the bottom of your container.

FOR YOUR SAFETY: If you reuse a container that originally held a food or drink product (like soda pop or bottled water) make sure to remove the original label and re-label it clearly so that your dye stock solution can't be mistaken for something drinkable. Do not store your stock solutions anywhere near food or drink products.

Two Basic Methods of Dyeing Your Yarn

(Finally we get to the part you came here for.)

There are many ways to apply dye to yarn in order to get the effects you're looking for, but we'll just cover two of the more simple ones here: high-water immersion dyeing for smooth solid colours, and low-water immersion (kettle dyeing) for multi-tonal single colours and/or multiple colours. There is a wealth of information out there in blog posts, video tutorials, magazine articles and books - you are encouraged to seek out more information, and find techniques that help you make the beautiful yarn that you're imagining.

To dye yarn, you need to use water to make a pathway for the dye molecules to travel over to reach the fibres of the yarn, and you need to add acid and heat to get the dye molecules to bond permanently with the yarn. The different ways in which you do these things will give you different results, but they're really just variations on the same basic theme.

No matter what dyeing technique you plan to use, the first few steps in the process are always the same:

1. Weigh your yarn while it's dry, and make a note of the weight. You need to know how much yarn you're starting with because the amount of dye you're going to use will depend on the dry weight of your goods.
2. Wash your yarn. Make sure your skein is tied loosely in 3 or 4 places with figure-8 ties to reduce tangling. Give it a good soak in very hot soapy water to remove any oils or sizing used in the spinning process. Plain dishwashing detergent like Dawn or Sunlight will do just fine for this, or you could use a specialty detergent like Synthrapol. After your yarn has had a sudsy bath, rinse it thoroughly in hot clear water. Your yarn should be absolutely clean and wetted completely through - you will want to let it soak for a while to make sure the water has penetrated all the way to the core of the strands of yarn. (This is especially important with silk and silk blend yarns - silk always needs a very long soak before it's completely wetted through.)
3. Choose the dye colour you're going to use, and calculate how much dye you're going to need in order to get the shade of colour you want. For a medium Depth of Shade (DOS) of your chosen colour, you'll probably want to use the equivalent weight of 1 gram of dye powder for each 100 grams of dry yarn. This is where it's very convenient to have pre-mixed 1% stock solutions: for a medium Depth of Shade, you will use an equal weight of your pre-mixed stock solution as the dry weight of your yarn! Your calculations are very simplified, and mistakes are less likely.

The amount of dye you will use is always calculated based on the dry weight of the yarn you are dyeing.

Some examples:

- *To get a medium Depth Of Shade (1% DOS), you would use 115 grams of your 1% stock solution on a 115 gram skein of yarn.*
- *To get a darker shade (2% DOS), you would use 230 grams of your 1% stock solution on 115 grams of yarn (115 x 2).*
- *To get a lighter shade (0.5% DOS), you would use 57.5 grams of 1% stock solution on 115 grams of yarn (115 x 0.5).*
- *To get a very, very pale shade (0.1% DOS) you would use 11.5 grams of your 1% stock solution on 115 grams of yarn (115 x 0.1).*

4. When you're ready to start dyeing, take your yarn out of its clean rinse water and remove as much water from the skein as you can, by either squeezing it out in a rolled-up towel or spinning it out using the spin cycle on your washing machine. For best dye penetration, your yarn should be just barely damp; any excess water left in the skein can act as a resist and prevent the dye from striking evenly.

High-Water Immersion Dyeing (to get a smooth solid colour with not very much tonal variation in shade):

1. Fill your dyepot with enough cold water that your skein will be able to open up and move around easily in the dyebath. You're going to want to use lots of water - about 3 or 4 litres for a skein of yarn, depending on the size and shape of your dyepot.
2. Add the amount of dye that you've chosen to get the depth of shade you'd like on the weight of the yarn you're dyeing.
3. Add your acid to your dyebath. The amount of acid you use will depend on the amount of water in your dyebath - start with about 25 grams of vinegar per litre of water, you can always add more later if necessary. It's difficult to give an exact amount for your acid, as it will vary according to the characteristics of your particular tap water.

The amount of acid you will use is always based on the amount of water in your dyebath. More water = more acid; less water = less acid.

4. Lower your clean damp yarn into the cold dyebath and move it gently around until it's completely submerged.
5. Start heating the dyepot over low to medium heat, giving your yarn a swirl every so often so that all of the strands are equally exposed to the dye. Pay special attention to the areas under your skein ties, making sure to shift them around a bit so that the yarn isn't constricted and you don't get lighter spots. Move your yarn around carefully to reduce the chance of tangles (or felting, if you're not working with superwash yarn).
6. When your dyebath reaches a point just below boiling - about 95°C or 200°F - hold it there until the dye is pretty much all taken up and your bath is mostly clear. The amount of time this takes will vary depending on several factors, including how much dye you've used and what sort of yarn you're dyeing. If the dyebath doesn't seem to be exhausting after about 10 minutes or so, add some more acid and keep it hot a bit longer. The dyebath may still have a tint to it; that's fine, the last bit of the dye should be taken up during the cooling-off process.

7. When you're satisfied with the level of exhaustion in your dyebath, turn off the heat. For best results, let the yarn cool down gradually in its bath; you can leave it overnight if you like. The longer and slower the cooling-off period, the better the dye will fix to the yarn.
8. When your yarn is completely cool, wash it in warm soapy water to remove any unfixed dye. Synthrapol is recommended for this, as it's specially formulated to grab on to loose dye particles. Rinse in tepid water until the rinse water runs clear. Squeeze out (or spin out) the excess water and hang your yarn to dry.

Low-Water Immersion Dyeing, or Kettle Dyeing (for getting a range of shades in a single colour, or when you're using more than one colour of dye):

1. You will be using very little water in your large pan or dye pot - just enough that the yarn will be barely submerged after you've added your dye solution. You may wish to add some acid to the water that your yarn has been pre-soaking in before dyeing - this will acidify the yarn and encourage the dyes to strike swiftly. You could also use a spray bottle to spritz the yarn with vinegar when you arrange it in your pan.
2. Measure out the amount of dye stock solution(s) that you plan to use. Pour the dye over your yarn in whatever way you'd like in order to get the results you're looking for. Poke around between the strands if necessary to make sure the dye is reaching the bottom layers of the skein and anywhere else you want it to go.
3. Heat your pan or pot on the stovetop or in the oven until the yarn reaches 95°C or 200°F (just below the boiling point) and hold it there until you're satisfied with the level of exhaustion in your dyebath. It may not exhaust completely, depending on how much dye you've used in different areas of the yarn. Try not to move the yarn around too much or you'll get more mixing than you've planned.
4. Turn off the heat and leave your yarn undisturbed in its pan or pot until it's completely cool; it can be left overnight if you like.
5. When your yarn is completely cool, wash it in warm soapy water to remove any unfixed dye. Synthrapol is recommended for this, as it's specially formulated to grab on to loose dye particles. Rinse in tepid water until the rinse water runs clear. Squeeze out (or spin out) the excess water and hang your yarn to dry.

Enjoy your dyeing! We hope the supplies you get from ACME Fibres will help you make the beautiful things you are imagining.