Flocked Paper Installation Tips

ABOUT *ProtoStar* FLOCKED PAPER

ProtoStar flocked paper is specifically engineered as a light trap material (unlike some flocked materials that are just for decorative texturing). It is designed to have almost zero reflectivity at all angles of viewing. The name "flocked *paper*" is a bit misleading, as it is not a paper product at all. It is made from 100% synthetic materials, and is not damaged by normal dew and moisture. It will not shed fibers onto your optical surfaces under normal use. ***ProtoStar*** flocked paper weighs 0.8 ozs./ft^2 (0.25 kg/m^2) without the paper backing.

TESTING THE ADHESION STRENGTH TO YOUR TUBE

ProtoStar flocked paper is self-adhesive, but the adhesion strength varies depending on the surface it's applied to. In some cases, an auxiliary glue is necessary. Generally, the material sticks well to smooth surfaces like metal or plastic, as well as most cardboard telescope tubes if they have not been painted with flat black paint. If you are applying the material to a commercial telescope, the inside has probably already been painted flat black. It is likely some extra adhesive along the edges and seams will be necessary.

Before beginning the full installation, it's a good idea to perform an adhesion test with a small bandage sized piece of flocking (approx. 1" x 3"). Remove only *half* of the paper backing, and firmly press the exposed sticky side to the inside your tube. Let this set ten minutes or more, and then try to pull the strip off. It should come off with some difficulty, and it may even pull off some of the cardboard tube. If the test strip pulls off easily, you will need to use an auxiliary glue. Many adhesives work well, but a slow setting type like a silicone adhesive is easiest to work with.

INSTALLATION STRATEGIES

For all installation methods, it is necessary to remove all optical components, hardware, and accessories from the telescope. Decide on an installation method from **Figure 1**.

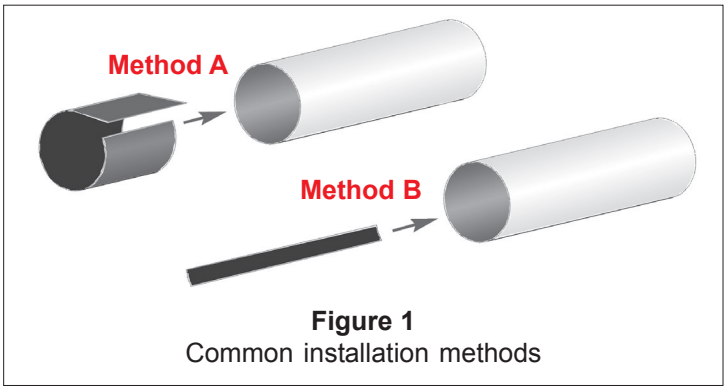

Figure 1
Common installation methods

Method A: Circumferential Installation

Installing one continuous piece around the inside circumference of the tube can be done for larger tubes, and it easier to do it in short sections. Begin with the middle of the tube, and work out to the ends. Don't worry about seams or overlapped sections, as installation flaws are virtually impossible to see once the job is complete. For small diameter tubes, wrapping the flocked paper around a wooden dowel or tube, and rolling it on is a proven method.

IMPORTANT: When using Method A, an important final step is to make longitudinal cuts every 3-4 inches with a razor knife as shown in **Figure 2**. This is necessary because the flocked paper will expand and contract with temperature changes more than the tube material

itself. Without these cuts the flocked material will shrink in cool temperatures, and pull itself away from the tube wall. Reach in as far as you can from each end of the tube and slice the material. (It is not important the slices meet at the middle of the tube.) These longitudinal cuts will act as expansion joints. They will be invisible, so no harm is done to an otherwise clean installation job.

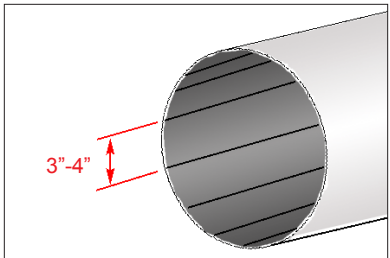

Figure 2
Slicing technique to create "expansion joints"

Method B: Applying Longitudinal Strips

Long and/or small diameter tubes can be difficult to work inside of. One good method for lining these tubes is to cut long strips that are individually applied along the length of the tube. Overlap adjoining strips as you progress around the circumference. Allow each strip to stick out beyond the tube by a small amount, and then trim them all at once with a razor knife when the tube is completely lined. (***Note***: When applying the material with this method, it is *not* necessary to longitudinally slice it as described for Method A.)

GENERAL TIPS FOR ALL METHODS

- Installation is made easier by installing smaller sections. Large pieces are more difficult to manage, and they have a bad habit of sticking to surfaces you'd rather they not. Don't worry about seams and overlapping edges, as even sloppy installations look just fine when the job is done.
- If you are applying the flocked paper to an existing telescope, go ahead and cover over the mounting holes in the process. The simplest way to restore the mounting holes is by piercing through the flocked paper with a pointed tool like a sharp pencil. *Do not try to drill through the paper*, as it can catch on the drill bit and tear out a large piece of the material.
- For most telescope sizes, application of flocked paper is much easier if you have a partner. Request assistance from a friend if possible.
- Leave 1/2" or so of extra material sticking out both ends of the tube during installation. Trim the ends with a razor knife when the installation is complete and the adhesives have set.
- If you are applying flocked paper over a cork lining (typically used in metal tubes), plan on gluing it in. While the adhesive backing is useful for positioning the flocking during installation, it cannot be relied upon to permanently hold the material in place when applying to cork.

OTHER USES FOR *ProtoStar* FLOCKED PAPER

Don't forget that scraps and small pieces of flocking can be used in other places for stray light suppression. Some of these applications include:

- The exposed edge of the secondary mirror (for glued-on mirrors).
- Exposed areas around the primary mirror cell.
- Lining Barlow lenses (do not remove the backing--just roll it into a small tube, and slip it in).
- Lining dew caps and tube extensions.
- Focuser drawtube baffle stops.

TECHNICAL ASSISTANCE

If you have a special application, or a question not covered in these instructions, feel free to call us for technical support at (614)-785-0245 (M-F 9:00 PM to 6:00 PM EST).

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