The Art of Covering a Model Airplane in Silk

This document/CD created in November 2007
by Charlie Reich

Preface

by Ol' Charlie

This CD contains several different authors procedures for covering a model airplane in Silk. Many are similar in application, yet deviate slightly in their methods. For those new to the procedure it would behoove you to review each authors procedure to select the one best suited to your needs.

The silk and dope materials and procedure has remained similar ever since the concept was introduced on early full size aeroplanes back in the early 1900's. Some of the materials used have changed slightly since the early days, nitrate dope being one of them, due to environmental and hazardous concerns. Pure Japanese Silk in itself has become very expensive in the 21st century, especially the high quality, lightweight material used on our model airplanes.

Silk: Originally most all modeling silk was imported from Japan. The good stuff was provided by a company known as Esaki and is still in business as this document is written. Sig is one of the modeling companies that offers Esaki silk in standard and lightweight versions, and several colors. A search of the modeling vendors on the Internet should also offer several providers of high quality modeling silk. The lightweight Esaki silk of 2.5 momme is (according to Sig) 9.2 grams (.325 ounce) per square yard. The regular Esaki silk is 3.75 momme and weighs 13.6 grams (.480 ounce)per square yard. Due to the lightweight and excellent quality Esaki is the silk (and tissue) of choice for competitive modelers

Another vendor and importer/distributor of exotic fabrics and silks is Thai Silk. The problem becomes selecting pure silk from the many silk-poly blends offered, as the blended fabric does not work well on our model applications. Thai offers inexpensive white and colored Habotai brand silks made in China. Modelers report their colored silk is much heavier than Esaki and a tighter weave. Some favorable modelers reports have been received for Thai's white #021F Habotai 5mm weighing 18.1 grams (.638 ounce) per square yard and comes in a 36" width. Thai's white #021G Habotai 6mm weighs 21.7 grams (.765 ounce) per square yard and comes in a 45" width. Thai also offers 51 colors of #026A Habotai 8mm weighing 29 grams (1 ounce) per square yard and comes in a 45" width. Thai is very good at supplying silk samples to modelers for their review and testing before placing an order. Due to the changing fabric market it is suggested that you obtain Thai's samples of your interests and make your own fabric tests for weight, purity and to insure shrinkage with dope application before placing a large order.

Silk mm description is a weight measure...not millimeter.

Momme is a Japanese weight measure for silk equal to 3.75 grams which is applied to a piece of fabric measuring 25 yards by 1.49 square inches (an area of 1.035 yards). Thus a 1 momme silk would weigh 3.62 grams (.128 ounce) per square yard.

How to Identify pure Silk

Apart from the look and feel, pure silk can be distinguished from polyester and other artificial fabrics by testing it with fire. One can quickly pass a flame under silk material about five times and it will not burn. On the other hand polyester will melt after one second. When burning silk fibers they will remain separate and smell like human hair, whereas polyester threads will just melt together and become sticky and hard.

Dope

It is important to realize that Nitrate dope is available in two versions: tautening and non-tautening. The tautening dope is the stuff to use as it shrinks the silk as it dries, removing wrinkles and sagging in your covering. After the silk is applied and a couple of base coats applied you can switch to the non-tautening Nitrate dope to finish filling in the weave.

When purchasing dope insure that the can reads tautening, as there are some popular brands of model Dope on the market that are just marked Nitrate Dope - some of which are non-tautening. If in doubt check with the vendor and inquire what type it is. As an example Sig advises on their label that only states," Nitrate Dope", the fine print reads "Do not to use this dope for silk applications as it's non-tautening".

In this era we lament the loss of and scarcity of good Nitrate dope as the formula is now regulated by the Federal government. Nitrate dope is made from Nitro Cellulose, a material also used in making high explosives. Recently we also see the loss or the scarce availability of model cements, such as Ambroid, Sigment, Duco and others as they are also made from Nitrocellulose. The formulas are changing, they are thinner in texture and it just isn't the good old thick stuff we used to use. It doesn't even smell the same. Ahh for the good old days.

Also be aware, for those of you using glow fuel, that Nitrate dope is not fuel proof. A coat of clear fuel proofer or Butyrate dope over your final coat of nitrate dope will be necessary.

Butyrate dope is a high shrinkage dope. Some modelers are using Butyrate for attachment and installation of silk. Because of its high shrinkage Sig recommends applying Sig Lite-Coat Butyrate for the top finishing coats to avoid excess shrinkage and warping of surfaces.

Tips and comments...some gleaned from the Internet

Dope Application

Caution: Don't dope in an unventilated room!

Unlike the old days when we applied dope with a camel hair brush, which had to be used with care to avoid overdoping, causing the dope to blob and run inside the silk covered surfaces, a new procedure is now recommended.

The smaller camel hair brushes are still good to use the silk attachment process. For the doping of the overall silk surfaces after attachment use a sponge paint brush. These can be obtained at any paint store, craft shop or Dollar Store in several different widths. The use the smaller 1" or 1 ½" width brush offers better control over the application.

Comments and suggestions from renowned modeler and master builder Dave Platt:
(From the Internet 2005)

"Some years ago I had written a whole article for the VRCS journal on silk covering. Herewith is the condensed version of my findings ---

After the usual procedure for getting the covering on and watershrunk, and using tautening nitrate dope thinned 50-50, proceed as follows :

1. Use ONLY a foam brush -- 1-1/2" seems to work well. (The reason a foam brush avoids the inside-droplets problem is that its sponge action means it is always sucking as well as applying).

2. First coat you should only lightly apply the dope with no attempt at complete coverage.

3. Likewise second coat. With the 3rd coat you can start to gingerly fill in the dry spots.

4. CRITICAL --- apply only one coat in any 24-hr timeframe. An even longer wait is good! You MUST let the dope gas-off between coats!

5. After 5 days or more, and 5 coats, you have a silk job to be proud of.

That's my 2 cents (or twopence, if you prefer).

Dave Platt”

Tips and comments…some gleaned from the Internet continued

Avoiding the blobs…

Quoting Jim Bonnema (From the Internet 2005)

“We used this technique back in the day. The first few coats of dope on raw silk tend to run through and accumulate as unsightly blobs on the inside of the silk. If you hold the wing or other silked part over your head and brush on the initial coats from underneath, then the blobs form on the outside where you can spread them out. Use a sponge brush as it also helps soak up the excess dope. It also helps to use very thin dope for these first coats so that any unwanted accumulation is minimal after it dries.”

Keeping the Peace…

Repeat - Don’t dope in the house or an unventilated room!

To us oldtime modelers the smell of Ambroid glue and Nitrate dope is an ambrosia that sends us dreaming of our finished model floating high in the sky...to the wife and family those same fumes and odor causes a very negative reaction...need I say more? Do your doping out in your remote workshop or outbuilding and you can continue to have a warm supper awaiting in your house. Be aware that humidity can cause dope to blush. It’s best not to apply dope on a rainy day.

One fellow that lives in a cold climate used the warm laundry room in the following manner…

“We have a separate little room that has the clothes washer and dryer in it. I close the door and turn the dryer to "air" so it does not use heat, yet takes some of the fumes out the dryer vent. Then I put paper on the dryer do my painting with dope there. This can be done in the colder parts of the year where you cannot go outside. It also works in high humidity times.”

(Editor: Remember fellows if those fumes leak in the house...you didn’t read these tips here!)

Vendors

as of year 2007

Larry Davidson: Larry is a Society of Antique Modelers (SAM) Grand Champion winning top awards in r/c assist and free flight events. He is a supplier of high quality Esaki Japanese Silk in several colors. He also supplies many of the special SAM needs such as; PolySpan and PolySpan-Lite covering, a video “How To” on applying PolySpan, spark plugs, high tension leads both for free flight and r/c (with resistor), Model ignition coils, solid state ignition units, and many other items necessary to build and get a SAM model airborn. SASE for complete list.

Larry Davidson
66 Casa Mia Circle
Moneta, VA 24121-5307
(540) 721-4563
SamChamps@jetbroadband.Com

SIG: A supplier of all model building materials over the past 50 years. A large printed catalog is available in addition to a complete website catalog. They offer Japanese Silk in traditional light weight in many colors, and heavy duty weight silk in white only. Also in their covering materials offerings is the old-timer traditional Esaki brand tissue covering and Silk Span in three different weights.

SIG Manufacturing Company
401-7 South Front Street
Montezuma, Iowa 50171-0520
+1 (641) 623-5154
mail@sigmfg.com
www.sigmfg.com

Thai Silks: Supplier of exotic fabrics and Silk from China

Thai Silks
252 State Street
Los Altos, California 94022
(800) 722-7455
(650) 948-8611
http://www.thaisilks.com/
silks@thaisilks.com

Vendors

...continued
as of year 2007

Dope

There are many modeling suppliers and some local hobby shops that provide nitrate dope. Be aware you will be needing one that specifies non-tautening, also insure it's a clear dope as nitrate dope is also available with a blue tint. Randolph is an old time provider of paints for the full scale airplane industry that provides an excellent quality of Nitrate dope in both tautening and non-tautening types. It's available in quarts and gallons, as well as the matching thinner.

The Randolph website: http://www.randolphaircraft.com offers a listing of all their products, product applications and a listing of worldwide distributors of their products.

Aircraft Spruce and Speciality Co, offers a full line of aircraft supplies including the full line of Randolph products. They have distributors on both the east and west coasts. Check out their website at: http://www.aircraftspruce.com/ > Covering Material > Randolph Coatings

Aircraft Spruce EAST
452 Dividend Drive
Peachtree City, GA 30269
Tel: 770-487-2310

Aircraft Spruce WEST
Administrative Offices and Main Warehouse
225 Airport Circle
Corona, CA 92880
Tel: 951-372-9555

Customer Service: 800-861-3192
Email: info@aircraftspruce.com

Article Index

Silk Application to Model Airplanes
by Jim Adams

This article was written in 1980's, before the days of household computers. The then SAM (Society of Antique Modelers) President created this original document on a typewriter (gasp!) for new SAM members information or those unfamiliar with the process of silk application. The technique is basically the same as the other procedural articles that follow and is true to the original methods used back in the early 1900's and thereafter on full scale and model airplanes.

Covering Model Airplanes With Silk
by Robert H. Munn

✯ ✯ ✯ ✯ 4-star rating on this article ✯ ✯ ✯ ✯

AMA's Model Aviation's October 1993 issued magazine featuring an excellent silk article by Robert H. Munn. Robert primarily directed his article towards covering the oldtimer and vintage models, including covering techniques for undercambered and polyhedral wings.

Silking...a modeling art form
by Ward VanDuzer and Tom Hampshire

Flying Models magazine also featured an excellent "How To" silk article in October of 1993. I'm not sure how this happened that both magazines had a featured Silk article in the same month, but we're glad another writer offered his technical silk covering information to the modeling fraternity. It was about that time that the U-Control group had a revival and the boys wanted to replicate the Ukies from the 1940's onward, when silk was king. The procedures within the article are modernized and featured U-control models however the authors Silking procedures are applicable to all model airplanes. Also note the extra tips on silk dyeing, fade prevention and correcting warps with a teapot.

So now we have "How To's" with silking instructions for Oldtimer and Vintage free flight models as well as U-Controls...but read on there's more...

Covering With Silk The Easy Way
by Jack Jell'a

SAM Speaks, the magazine for The Society of Antique Modelers featured a really modernized procedure for silk application in their Jan/Feb 2005 edition. SAM member, Jack Jell'a, has perfected his procedure to simplify his methods for silk application. Jack

builds some beautiful models and his procedure sure works for him. It's another option worthy of a try.