



# FLIGHTLINE GRAPHICS

**Paint Masks - Stencils - Dry Rub Decals - Waterslides**

Telephone: +44(0)7872 181119 (mobile)

Website: <http://www.flightlinegraphics.com>

email: [sales@flightlinegraphics.com](mailto:sales@flightlinegraphics.com)

## Doping natural fabrics on airframes

### **Introduction**

While building a 1/3 scale GTM Fokker D.VII I had the need to apply the GTM fabric to both wings. A number of people told me that it can be problematic and to be careful. Glenn Torrance has instructions that take you through stitching, laying out the panels, fixing to the frame, and concluding with the doping process which is where all the fun starts!

### **Preparing the fabric.**

When you receive your fabric lay it out to prevent creases. If you are short of space to do this hang it up over an open internal door as I did.

I was told by a few people who have used the fabric on their own models to wash the fabric before cutting and sewing together. I tried this with disastrous results as the fabric created in the wash it formed marble like lines when hung out to dry. As a result I had to purchase replacement fabric before I really got started!. My advise is to do nothing to the fabric except ironing. I do know some people have washed and had no problems, but as I found out later it was not necessary, so why take the risk!

Immediately prior to use the fabric should be ironed preferably with a steam iron to get rid of any creases before you start cutting and sewing the panels. Iron on both sides. Windsock Anthology books explain the factory layouts of the fabric so however you have built your wings be it as plan in one piece or as I did with a 3 piece top and a 2 piece lower there may be additional considerations while working out where seams will go. Only work on one side of the wing at a time, I worked on the lower surfaces first.

### **First things first.**

Once the fabric is on the airframe and you are ready to start doping it is recommended that you spray a heavy mist of water over all the fabric and allowed it to dry thoroughly before you start to use the dope. I allowed an overnight stand.

### **The doping procedure.**

I am convinced if you asked 10 people how they use dope on fabric you would probably get 11 different answers. It seems everyone has their own way of making it work for them. I rang dope suppliers, well respected model makers, and then finally I contacted [Vintage Fabrics](#) a company in the UK who cover and finish full size aircraft with natural and synthetic materials. A special thanks to Clive Denney for his help. And so here are a few pointers and practical tips gained while covering my model.

### **Heat is everything!**

Warm sunny summer days are OK but it does not have to be radiant heat from the Sun to work. I made a small tent in my garage from tarpaulin with a vent hole at the top and heater at the bottom. It would maintain a temperature of 30°C - 35°C in use. Remember all dope products are highly flammable so use appropriate heating equipment. Summer was coming to an end in the UK when I was wanting to do the doping so it made sense to use a controlled environment.

### **Which Dope.**

When working on natural fabric I was advised that Nitrate dopes are the best way. The strongest message I got was to avoid using Butyrate dopes to tighten natural fabric. Butyrate is fine on semi and fully synthetic materials but not for really for 100% natural threads. So whenever I use the work dope from now on I am always referring to Nitrate based material!

Another tip was to use a low tautening dope rather than a non tautening dope for the first coat but not compulsory. Once the fabric was fully tight it would be OK to finish with non tautening Butyrate if so desired but not recommended.



## **Application.**

I used a 1½" brush for application. I found it permitted a certain amount of control over the application, wider brushes would probably be better in later stages as the fabric tightens. It is important not apply more than one coat every 24 hours (preferably a little longer). I noticed the fabric does tighten up a little more for a few days after application. Patience is key.

## **Diluting the Dope.**

The first coat should be diluted with recommended thinners by 40% to 50%. As subsequent coats follow the dope can be progressively diluted with less thinners to 20% - 30%.

## **Using the heated tent.**

Before I applied any dope all wing panels were put in the heated tent for an hour. This applies to the first and every subsequent application of dope. Take a panel out of the tent immediately prior to doping, and return it straight away the moment you have finished. I didn't know how long to leave the panels at temperature so I decided to leave them for 6 hours. After that time I turned off the heating source and allowed them to cool for an hour before returning into my home. It worked so I stuck to this schedule. If you are able to heat a room to 30°C - 35°C and you are doping in the same room please use suitable forced air breathing equipment. Vapour masks will work for a while, but even with the latest and newest cartridges will become overwhelmed by the vapours very quickly in a small room.

## **First coat.**

The first coat of dope is going to use much more liquid compared to any subsequent coat as the fibres mop up the dope almost like a sponge. Your dope needs to be at it's thinnest to help it penetrate. I used a blend 25% tautening dope, 25% non tautening dope, and 50% in thinners. Apply the dope quickly and as evenly as possible *without adding too much pressure to the fabric*. Do *not* go back and touch up anything as it will slacken the fabric off even more.

The first coat will look rough, irregular and will not pull fully tight, in fact it will look awful. You have to keep the faith!

## **Subsequent coats.**

Use the same procedure as the first coat, but the dope should be thinned progressively less as the applications increase. When I was using this procedure the fabric went tight after 3 applications. I left the wing panels for a week before adding the rib tapes using non tautening dope. Once this was complete the panels were given one non tautening dope application with about 25% thinners.

## **Finishing notes.**

Well here is another set of tips to go with the ones you have from your friends and others who have built up wings covered in linen. They will most probably not be the same so take from here what you will. If you take just one tip let it be to use heated rooms for the panels to sit in after doping. I think that is the single most important point.

You can see pictures of what I did, the things that went wrong and the realisation of this set of guidelines for best results. My 1/3 scale GTM Fokker D.VII build can be seen here:-

[www.flightlinegraphics.com/projects/gtm/fokker.d.VII/dvii\\_main.htm](http://www.flightlinegraphics.com/projects/gtm/fokker.d.VII/dvii_main.htm)

Nigel Wagstaff

[www.flightlinegraphics.com](http://www.flightlinegraphics.com)