Workshop wood

Dear users of this “workshop wood,” power point,

There are more words in some slights than usual, it is because that some of the instructors are not completely familiar with the inscribed techniques. That means if you understands what the pp. means, you can make text shorter, or use your own wordings, you also can translate it in you own language.

If you leave the pp. in the original form, please leave the VGC logo on it. We ask you to do this, because, specially in the future, you know that the pp. comes from the VGC. You are free to put on your own logo as well.

If you want to use an other technic than described, just delete the slights you don’t need and make your own. But than you can’t use the VGC logo, put your own logo on it if you wanted.

We tend to make a update now and then, this is version E-I February 2019

Welcome

Workshop part II-II fabric & paint

Part I-II Woodwork

Version E-II February 2019

Vereniging Historische Zweefvliegtuigen

Vintage Glider Club of The Netherlands

Welcome

Workshop wood

This workshop program is original developed by the “Vereniging Historische Zweefvliegtuigen” (vintage glider club of the Netherlands). We understood that there is need for education of “the wood skills”. Clubs and privet owners are losing more and more the craftsmanship. After 4 years of workshops we understand that this power-point is a very useful tool for instructing people for woodwork on gliders / planes. The good thing is that the work masters who are experienced inspectors and woodworkers, learn every year more and more how to educate people, and we integrate this in the power-point, that means it is always up to date.

It is a lot of work to make a workshop like this and it is a shame that we only use it in the Netherlands, that’s why we wanted to chair it with you.

Have fun transferring knowledge like we have.

DISCLAIMER

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Workshop for:

- (club)Inspectors,
- Glider owners,
- People with any interest in repairing, restoration and (re)building wooden gliders,
- Ultra-light builders / owners

Introduction workshop instructor(s)

One day (date):

Sunday

* 10.00 - opening + coffee
* 10.30 - theory part II fabrics & paint
* 11.30 - practise fabrics
* 13.00 - lunch
* 13.45 - practice fabrics
* 15.30 - follow up practically proficient / evaluation
* 17.00 - closing and hand out certificate of participation

Theory programe:

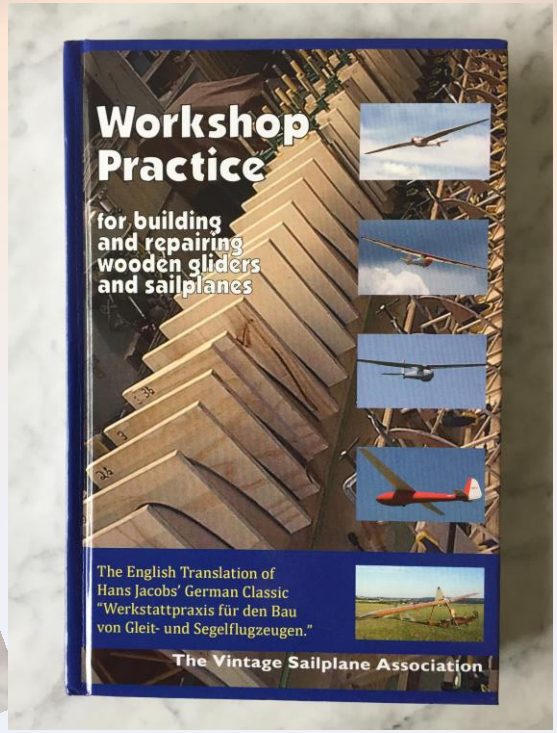
* **Part II** (name instructor)
  - Fabrics; cotton / polyester / adhesive lacquer and dope
  - Temporary fabric repair; cotton – polyester – finish off
  - Paint scheme; masking tape – primer – paint –conservation metal
  - Special tools / devices

* **Closing**
  hand out certificate of participation

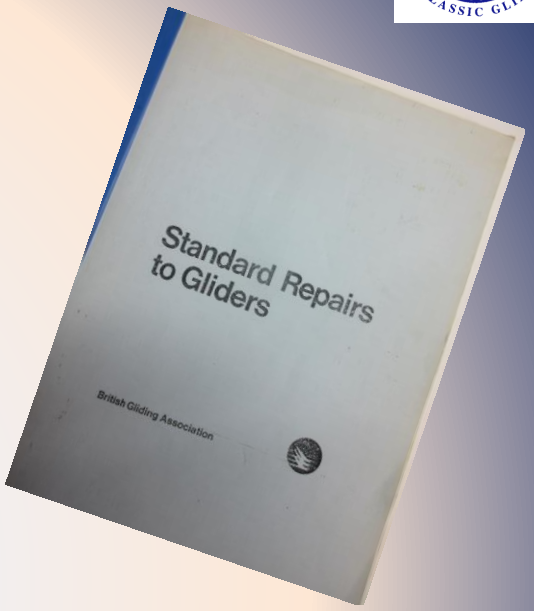
Practice program:

- Working in teams of 2 people
- The teams are coached by a work master
- Who is doing what is the responsibility of the team
- Submit your work plan with the work master before doing the job
- Observe during the days also they other teams it will give more insight

Theorie books



Workshop wood



Repair planning 1

Work clean and safe

Clean

- Clean out the place where are you working.
- If it is an isolated place you work on, mark it with mask tape and cover the rest of the object.
- Clean at least grease from hands and tools.

Safety

- Wear a dust mask and safety glasses when you are using sandpaper, dope or paint.

For working with thinners a carbon mask. Thinner is a lungs killer!

Repair planning 2

- Trestles / tables; stable trestles in the right height, remember our back. workbench, or table to work on and to lay out your tools

- Materials like wood, glue, fabric, paint, brushes, sandpaper and mask tape. Also empty cans, jars

- Tools, make it easy and display them so that they are for the taking like they do for a medical operation

At least for bigger repairs make a planning on paper including a list of tools and materials you need.

Fabrics 1

Cotton:

- No trade name, suppliers are companies that sell aircraft parts, or textile traders.

- Using cotton to keep the glider original.

- Cotton, weft and warp the same number and size of yarn, min. 30 yarn / cm. Density 100gr / m2. The cotton is not bleached.

- When the cotton is affixed to the wood, folds go away by spraying lukewarm water on it. Let it dry at least 24 hours before doping.

- Paint will more attach firmly on the cotton surface than on polyester.

Fabrics 2

Polyester: **Ceconite**, type C-102-3 the only polyester factory who still exist.

- Lighter than cotton, less influence by humidity and more expensive than cotton.

- Made from polyester, weft and warp the same size of yarn.

- Disadvantage; there are factory stamps on the fabric with there name, that means to let the fabric natural / clear finished is a challenge.

- Tightening and folds go away by using an iron, 80 -100°C.

- Paint does not stick very well on the polyester. Primer they use for spraying plastic parts of cars can give some help.

Fabrics 3

Polyester: Oratex,

- a polyester product that is already composed, airtight and pre coloured.

- It's a water-borne glue, it means no thinners, tightening by using an iron.

- More expensive, only some colours, not shiny but mat.

- For colour combination or striping you can spray it or fix a different fabric colour on it.

https://.oracover.de/fabric/oratex

Fabrics 4

polyester: **Superflite 102.**

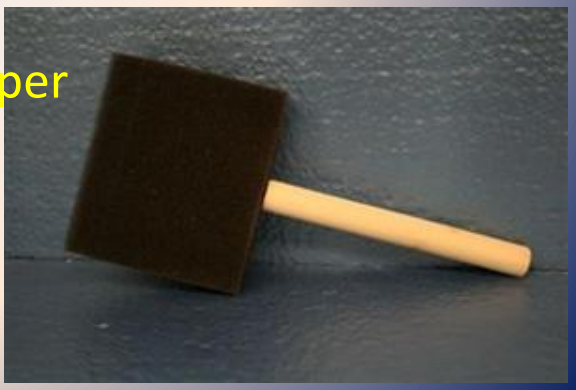
- 91gram / m2 = ligter than cotton and Seconite.
- Ekobond, glue on water base.
- Ekofill-UV, primer and filler on water base.
- Using a sponge pad, to put on the primer and filler; “scraper”.
- There are only production marks on they outer sides

https://superflite.com/

Ekobond

Ekofill-UV

Scraper



Fabrics 4

polyester: Superflite 102.

Fabrics; why re-fabric?

- End of lifespan; When you press with your finger hard on the fabric it can rip easily, and/or the dent will not come back in the old position and/or the paint will crack and even letting go off from the fabric, specially by polyester.

- To many paint cracks (polyester), specially on the rib sides.

- Fungus (cotton); you will smell it, like a damp garden shed, and there can be grey spots; it means fungus, on the back side of the fabric (that is the fungus). After some time it will weaken the cotton.

- For checking the woodwork or metal tubes inside the glider like Ka8, Ka7, Ka13, specially at the bottom of the fuselage, that's the most humid place, inside the glider.

- After a repair / restoration

You can test the condition of the fabric also with a Moull tester

Fabrics: useful materials, excluding fabrics and dope

Number	Name	Size/form
1	Sharp scissors (no cartel scissors)	200mm min
1	Holder with operation knife, it means sharp	Point and sphere
3	Small / medium brushes for adhesive lacquer and medium and bigger for dope	6, 40, 80 mm
50	Wooden clotespins	-
1	Hardwood stick for fairing	20x70x80
6	Balast bags (cotton cover plastick bag inside with sand) using as balast on the fabrick that it does not shift.	Long 500mm round 100mm
1	Measuring stick (make markings on it to make it easy dilution the dope)	5-10mm x 30mm
-	Some sticks to mix the dope	
-	Sandpaper different numbers	-
1	Soft, dry and clean hand brush	-
1	Vacuum cleaner	-
1	Carboon mask **for every person who is in the room where you working, thinner will kill your longs, use a special mask!**	-
1	Iron (when working with polyester)	-
1	Soldering iron (when working with polyester) for making the water drains	-
1	Plant spray (when working with cotton)	-

Fabric: Materials you need for one glider (15mtr span, ex fuselage)

It means clothe for the whole glider, inclusive the wood, this will give protection on the wood and when you do the next overhaul you don't have to take off all the paint = damaging the wood.

Wings	29 mtrs.
Rudder	1 mtrs.
Tail plane / elevator	3 mtrs.
Spare (including weaving errors)	10 mtrs.
Total	43 mtrs.

One role is 60 mtrs. possibly cheaper to bay one roll.

Adhesive (nitro)	5 - 7 kg
Dope (nitro)	12 - 15 kg
Nitro thinner	8 - 16 ltrs.

De-watering rings (only working with cotton) Teflon, Astralon, Cellon, plywood, round 25mm opening at least 6 mm

Fabric: if you want it!

- Cartel belt (not necessary if you do a nice job by cutting the fabric strait).
- Yarn, waxed (only necessary by very hollow profiles).

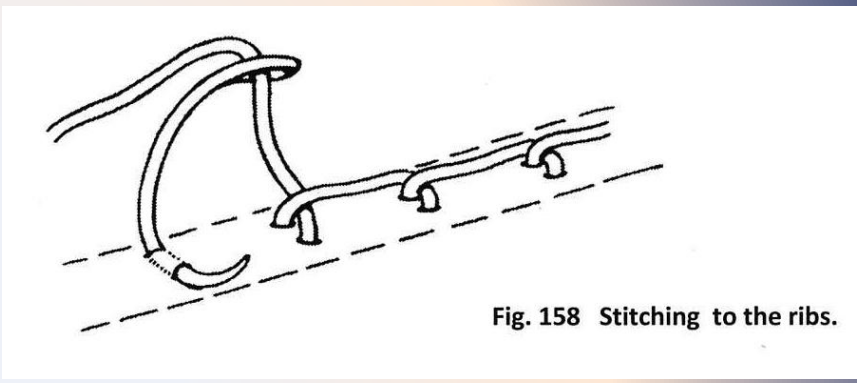


Fig. 158 Stitching to the ribs.

- By a small repair or changing a hinge, than you can use a round or square frame of Plexiglas. Just glue it under the repair, cut the fabric out on the inside and you have a nice stable opening to work in. It makes it easier to take the paint of later en the re-fabricing. The frame will stay on the glider after the repair.

Fabric: Fixing on the wood.

1 Apply on all the parts you will fabric adhesive.

- With a small brush on the ribs and a bigger one on the more solid wood.

- On the solid wood only the outline to stick fabric, on the midlle is no adhesive, later the dope will do the trick and fasten the fabric. By doping don't press the fabric down on hollow places, leave it straight, looks better after all.

- Make 3 layers of adhesive, the first 50% diluted with thinner, the other two with 10%.

2 Place the fabric on the object.

- Keep care that it fits and there is overlap on all the ends.

- Don't tightened it to much, just relax.

Fabric; Fixing on the wood.

There are two ways to stick the fabric on, the first “A”= old-fashioned is a lot of work and all the time you are working in the poisoned thinner air.
The second “B” is quicker, more easy and less in the poisoned air.

3A Take a brush and smear clear thinner on the place where the adhesive is.

- Take a clot and rub as long that the adhesive under need dissolves and when you are lucky the fabric will stick, otherwise you have to start with a new brush with thinner and do it again.

- Keep attention doing this on the ribs, because your fingers are wider than the ribs, the risk is that the fabric also will stick on the sides of the ribs.

Fabric: Fixing on the wood.

3B Make a mix 50% adhesive and 50% nitro-thinner, take a brush and smear / dabble it on to the place where you want to fix the fabric.

- You will see that the fabric darkened and get shiny it makes the wood visible.

- That's it, just go on.

- Take a small brush for the ribs and smear the adhesive in the middle of the rib. If you see the rib completely shiny you are finished.

- By hollow ribs, if the fabric does not stick in the first way, just press, carefully some seconds with the brush on the fabric.

- On the top side of the wing; fix the fabric only on the outer edges of the fabric. After this let it dry for at least 24 hours. When you start doping, you will see that the parts you did not fix with glue will do the rest. You will see the fabric becomes transparent and sticks to the wood.

- But before you doing this, after the 24 hour, iron the polyester, it will pull tight equal over the complete surface, start after this the doping process.

Fabric; stitching

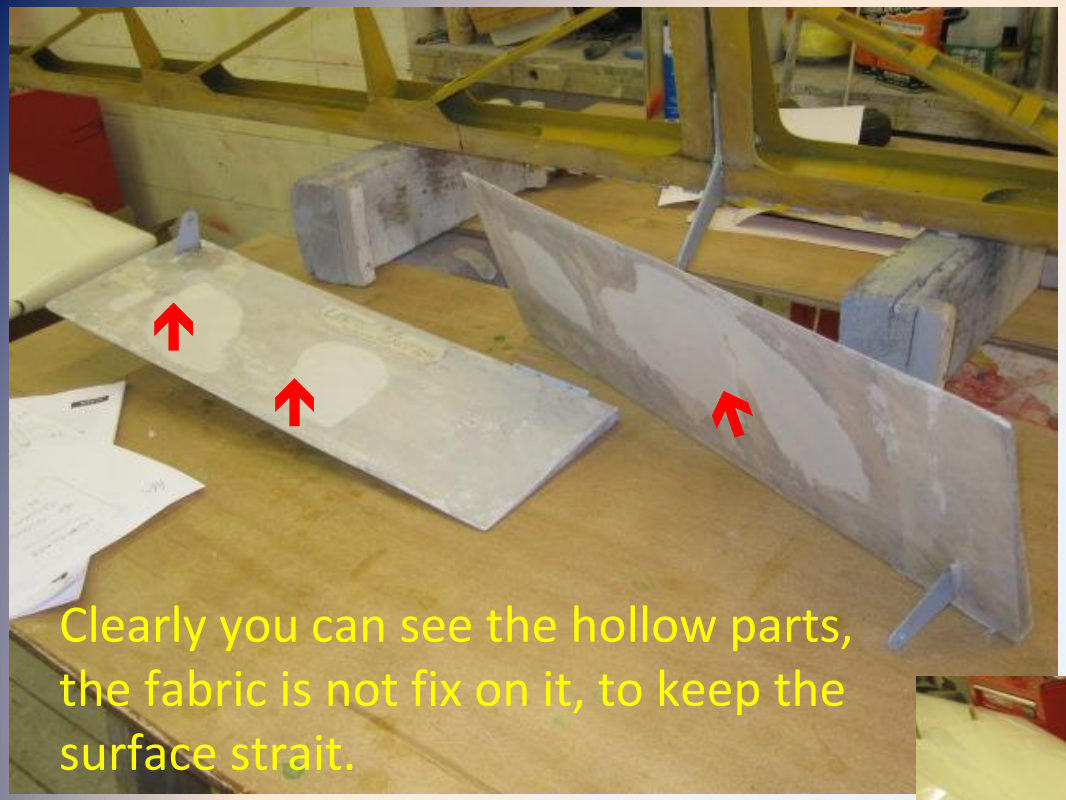
Stitching fabric on the hollow side of the wing. Working from two sides

Stitching fabric on the hollow side of the wing.
Glue cartel belt on the top of the rib after stitching.

Fabric; repair after damaging trailing edge

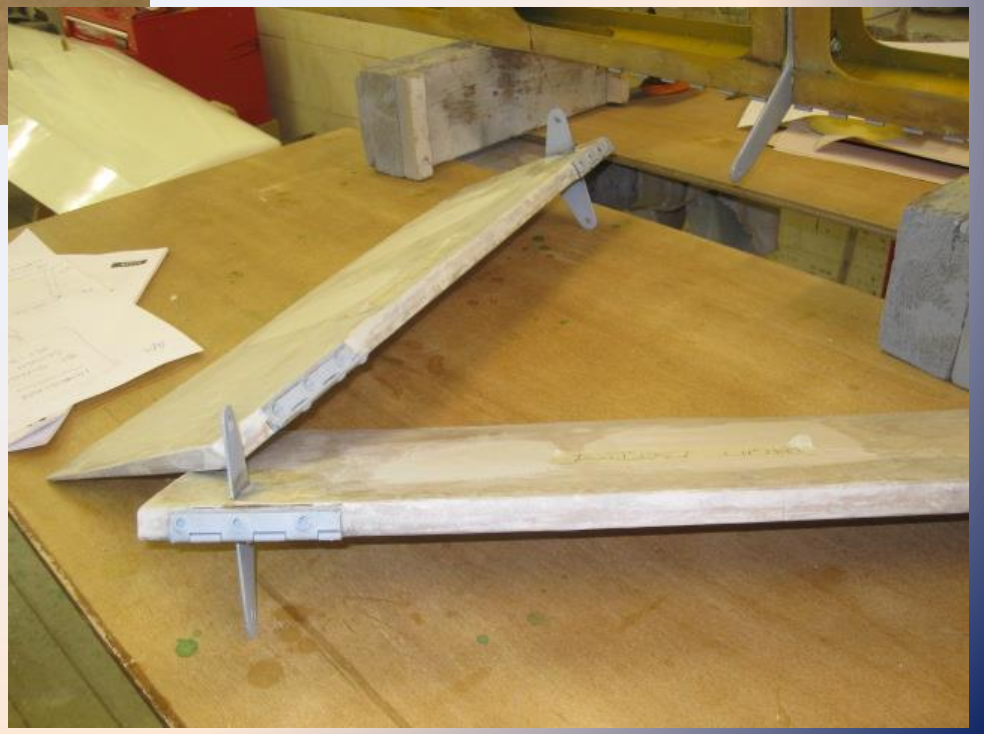
By repair; remove first al the paint and filler, before sticking the repair path on it

Fabric; rudders Fauvel



Clearly you can see the hollow parts, the fabric is not fix on it, to keep the surface strait.

Fabric on the wooden parts for better conservation



Painting: which paint can you use in combination with a filler

Specification paint type	Felexibility	Colourfast	Repair	Maintenance	Sprying	Brush	Roller	Dryness h
Acrylaat	Good	Good	Fair	Mediocre	Yes	Yes	Yes	1
Celuloze (thinner)	Good	Mediocre	Good	Mediocre	Yes	No	No	1
Synthetic	Good / fair	Good	Fair	Good	Yes	Yes	Yes	8
Two components	Fair / mediocre	Good	Mediocre	Good	Yes	No	No	4-6

CERTIFICATE of ATTENDANCE

This is to certify that

Name

has atended VGC training

A four day's wood-workshop, theoretical and practice: damage inspection, repairplanning, monoque and rib repairs, working with fabrics.

Held at *The Universe gliding Club*,
Date

Name and sighned Technical Officer