

Welcome

The Future is **HERE** with Stewart Systems
Waterborne Paints & Covering System



Marty Feehan
Stewart Systems
Instructor/ Trainer
EAA member



Just a Short History

Stewart Aircraft Finishing Systems

STC'd for Certified Aircraft

Aircraft Finishes of the Future Today!



Stewart Systems provides a complete line of environmentally friendly Aircraft Finishing Products for fabric, metal and composite aircraft.



Stewart Aircraft Finishing Systems

5500 Sullivan St., Cashmere, WA 98815 • 1-888-356-7659 • (1-888-EKO-POLY)

www.stewartsystems.aero

The Latest in Waterborne Technology for the
Aerospace Industry

Why use



- * Waterborne coatings are the FUTURE
- * Non Toxic
- * Non Flammable
- * Easy to use
- * Long lasting and durable finish
- * Easy to repair
- * Tested and Certified to FAR part 23 standards
- * Certified to repair any STC'd fabric system
- * Outstanding customer support

Prep before painting

- * Aluminum Aircraft and parts
- * Steel Tube and Fabric

Aluminum Prep

- * Aluminum needs to be cleaned first with EkoClean and then etched with EkoEtch
- * DO NOT etch assemblies
- * Rinse and then *Rinse Again*
- * Blow off parts to remove water from holes or rivet lines and lap joints
- * Let dry 12 hrs minimum before priming

EkoClean

- * Clean with EkoClean before application of etch or primer to remove contamination
- * 15:1 water to EkoClean
- * Use a lint free towel or sponge
- * Rinse with clean water and a clean sponge

Fabric Covering

- * Repair, sandblast or strip, and prep all surfaces
- * Prime all surfaces followed by EkoPoly
- * Attach fabric using EkoBond as per manual

EkoBond

- * Water based, non hazardous, non flammable
- * Works like a contact cement
- * Heat workable
- * Very high tensile strength, 1” overlap minimum
- * No sewn seams required
- * Wash coat of EkoBond applied prior to EkoFill

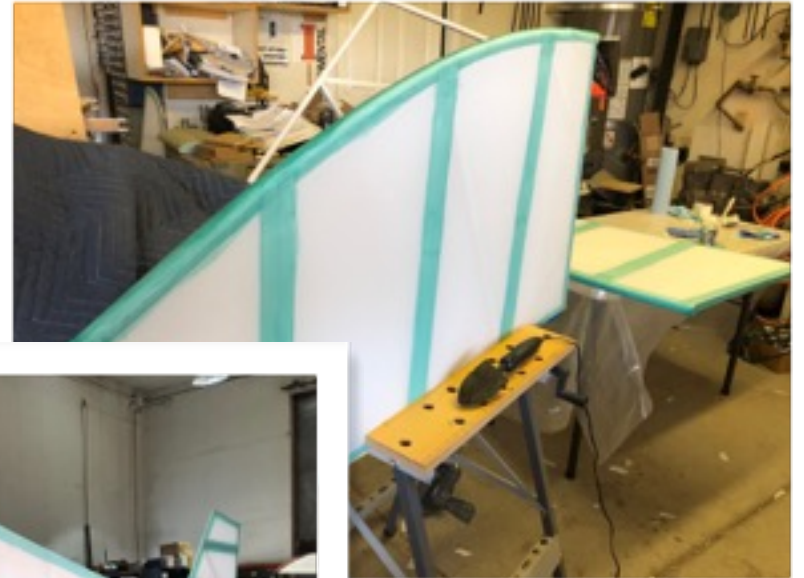
Kid Friendly



House Friendly



Shop Friendly



EkoFill

- * UV Protection
- * Flame retardant
- * Primer for top coat
- * 3 cross coats minimum for certified aircraft
- * Additional coats can be used to fill and sand
- * Can be sprayed, brushed, or rolled

EkoFill Application

Paint mix: Ready to shoot from can but check for 20-21 seconds with viscosity cup. Thin with Distilled Water as needed.

Surface prep: Clean first with Ekoclean diluted 15:1. Finish clean with 91% Isopropyl Alcohol on damp synthetic shop towel from Auto body supply store. Use waterborn paint tack cloth followed by final light wipe with alcohol. Alcohol will eliminate static and help repel dust.

Gun: DeVilbiss Finishline 4

Tip: 1.5mm

Pressure: 58-60psi feed at regulator; 23psi at gun. Air needs to be dry, preferably through a dryer set up. Use multiple water traps and 3/8" fittings. Only disconnect should be at gun.

Gun Settings: Fan open wide; volume 1 turn for cross coats; adjust for semi wet coat without heavy wet gloss.

EkoFill Application continued

Spray test pattern before spraying aircraft parts. Use tag board or fabric test panel for testing. Spray edges first followed by one cross coat coats followed by additional coat on edges; 7" above surface. Let dry 2 hours or until able to sand to dust. If sanding results in balling of Ekofill the surface needs dry longer. Lightly iron all tapes with iron at 225 degrees. Follow with two additional cross coats. Each cross coat needs to dry to no gloss and no transfer of Ekofill when touched with knuckle. Each cross coat is one horizontal followed by one vertical.

Typical issues when spraying Ekofill are a dry coat. Dry coat is caused by pressure too high and/or distance too far from surface. Lower pressure and move in closer.

Runs and sags: distance too close and speed of application too slow. Practice on tag board to sag and run to determine what speed is necessary for proper application with specific gun and compressor setting.

EkoFill application



Composite Prep

- * Wipe with solvent to remove the mold release wax
- * Wash with EkoClean
- * **DO NOT** sand before cleaning

EkoPrime and EkoPoxy

EkoPrime is a single part primer
EkoPoxy is a 2 part epoxy primer
Both are available in the same 4 colors
EkoPoxy has a 5-6hr pot life
EkoPoxy is MEK solvent resistant,
EkoPrime is not solvent resistant
EkoPrime can be used on fabric over
the top of EkoFill or other paint
systems as a primer for re-paints
EkoFill is sealer, UV Protection, filler
and primer for fabric

* EkoFill should not be used on bare metal.



Surface prep prior to top coats

- * Maximum cleanliness must be achieved
- * Use tack rags designed for waterborne paints
- * Double check surface before painting
- * Sand, wipe & blow, & tack rag
- * Wipe surface with Isopropyl Alcohol (90% not 70%)
- * Do not wipe with water or anything containing water
- * Final wipe with tack rag prior to spraying finish coat
- * Use low angle light to see residue

Application of Top Coats

- * EkoPoly vs EkoCrylic
- * Equipment needed
- * Shop requirements
- * Application

EkoPoly Premium / EkoCrylic

- * Waterborne catalyzed top coat paint



- * High performance coating
- * EkoPoly Premium: Used on fabric and metal for exact match between parts
- * EkoCrylic: Used only on metal aircraft and parts
- * Easy application
- * 3 hour pot life
- * Fog coats to achieve tack/Wet coat
- * Cleans up with water

Follow our Recommended Procedures



SURFACE PREP PRIOR TO PAINTING

Proper cleaning **mandatory**

It is very important to properly remove sanding residue from the surface prior to painting or adding trim colors. After sanding the last coat of primer you must wipe the surface with a tac-rag designed for waterborne paints and then wipe the surface again lightly with a damp surface prep towel using 90% or stronger isopropyl Alcohol. Let dry 10 min prior to painting. **DO NOT SCRUB THE DOWELL WITH ALCOHOL IT WILL REMOVE IT. WIPE LIGHTLY TO REMOVE RESIDUE.**

WHEN RE-PAINTING OR ADDING TRIM COLORS ALWAYS CLEAN WITH ALCOHOL FIRST, THEN SAND & TAC-RAG CLEAN, THEN CLEAN AGAIN WITH ALCOHOL BEFORE RE-PAINTING OR ADDING TRIM COLORS FOR MAX ADHESION.

PULL YOUR FINELINE MASKING TAPE ABOUT 30-60 MIN AFTER PAINTING FOR THE BEST LOOKING TRANSITION BETWEEN COLORS

Make sure to look at all the information sent out with your paint

Follow our recommendations for the best results

Download the manual from our web site

Use Waterborne Tack-Rags





Isopropyl Alcohol

- * Use 90% not 70%
- * Allow 5-10 min dry time
- * **Do not** scrub EkoFill --- Wipe lightly !
- * Use lint free surface prep towel
- * Improves adhesion
- * Helps remove static
- * Wipe, sand, wipe, tack-rag, paint

Painting Equipment

- * We have formulated our paint for use with modern spray guns
- * *Clean, dry air* is mandatory to avoid defects
- * You're going to need a BIG compressor
- * Check out the information in the support section of our website for more information on equipment recommendations
- * Don't try to cut corners

.01 micron filtration



High Flow connector



Big Air Compressor

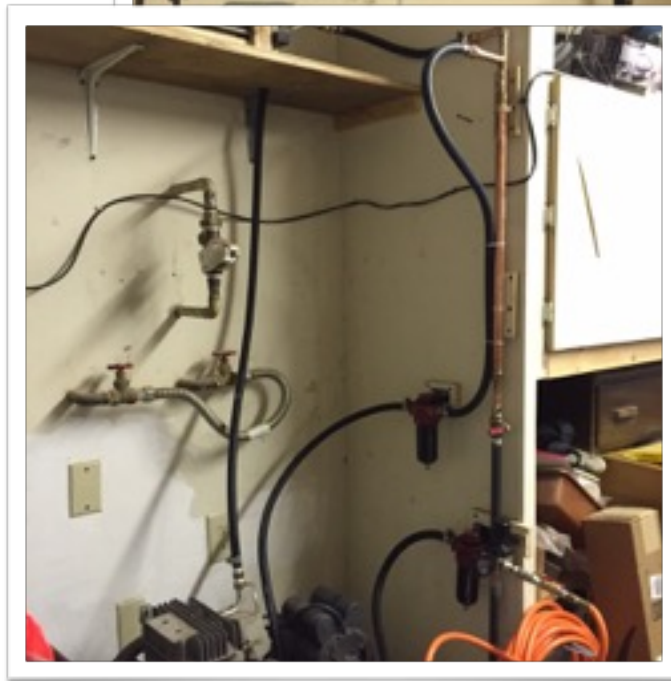
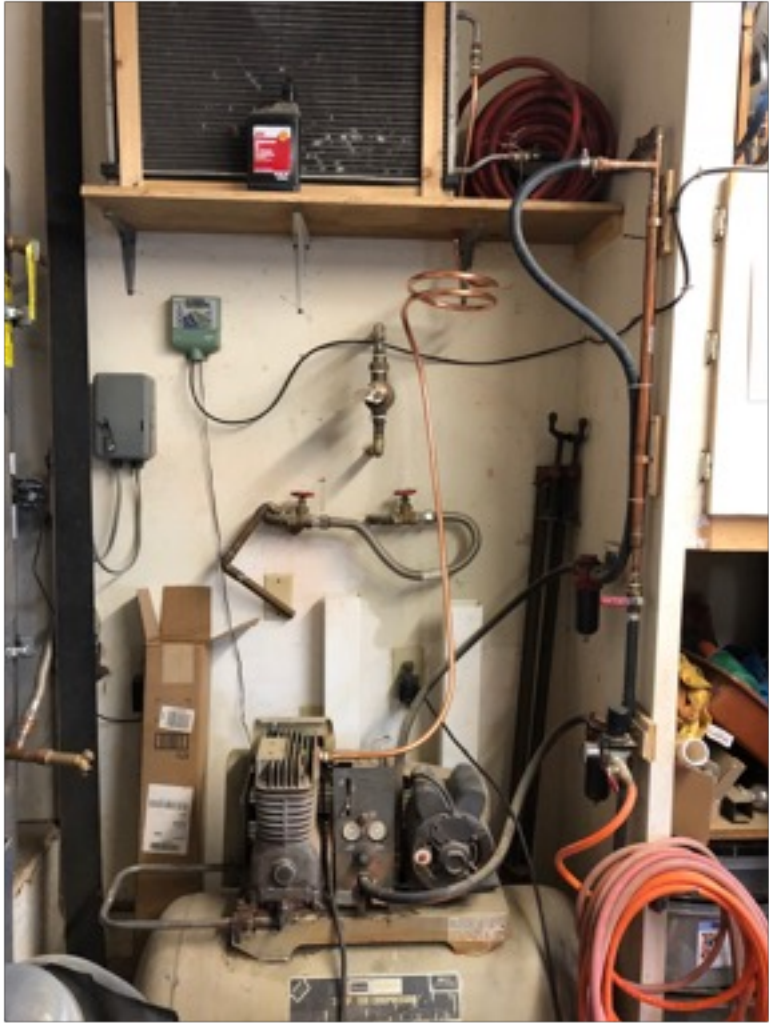


5hp - draws 23amps
220 volt

Two-Stage air pump
13-15 CFM @ 90psi
60-80 gallon tank

Avoid questionable used equipment
\$1000 + for new

My Shop Compressor



Water dryer



- * Condenser from Chevy Tahoe used to cool air between compressor storage tanks
- * Condenser will allow essential removal of water from air

Water Traps



- * First trap removes water before air enters storage tank
- * Second trap located with pressure regular at output to air hose

Paint guns

- * We stock and sell DeVilbiss Finishline IV and Pro-Lite paint guns.
- * Recommend an HVLP, RP, or HE type gun
- * In dry environments the RP or HE guns work better
- * **ALLWAYS SPRAY TEST PATTERNS FIRST!!** Learn how to use your equipment before painting your airplane

DeVilbiss Finishline 4



Detailed specifications for the FinishLine FLG-4:

- ✦ #3 Air Cap (HVLP)
- ✦ Comes with: 1.3mm, 1.5mm and 1.8mm fluid tips
- ✦ All basecoats (inc. waterborne), all clearcoats, all single-stage
- ✦ Input pressure: 23 PSI (to meet HVLP spec, at nozzle)
- ✦ 10 ½ inch spray pattern
- ✦ Air consumption: 13CFM
- ✦ Designed in USA, CNC machined stainless-steel components
- ✦ Part number: dev.803559

DeVilbiss Pro-Lite



Multiple air caps and nozzle combinations allow for more adaptability to your environment

Quick and easy clean up
“NON STICK” surface

This is a great high end paint gun with a lower price than SATA or IWATA

& ADJUSTING VALVES



AIR REGULATOR HARG-510

Diaphragm-relieving

Fits any professional spray gun

Lightweight design is comfortable for use by right - or left - handed painters

Precise air control at the gun for better color match capability

Swivel adapter for fast installation

Not for use with HVLP spray guns

AIR ADJUSTING VALVES HAV-500 (HAV-501 with gauge)

Fits any professional spray gun

Lightweight design is comfortable for use by right - or left - handed painters

Available with or without pressure gauge

Provides finer air control at the gun, enhancing color matching capability

Swivel top allows for easy and fast installation

Competitively priced

All DeVilbiss HVLP guns require the use of the HAV-501





Follow our Recommended Procedures



SURFACE PREP PRIOR TO PAINTING

Proper cleaning **mandatory**

It is very important to properly remove sanding residue from the surface prior to painting or adding trim colors. After sanding the last coat of primer you must wipe the surface with a tac-rag designed for waterborne paints and then wipe the surface again lightly with a damp surface prep towel using 90% or stronger isopropyl Alcohol. Let dry 10 min prior to painting. **DO NOT SCRUB THE DRYFIL WITH ALCOHOL IT WILL REMOVE IT. WIPE LIGHTLY TO REMOVE RESIDUE.**

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PULL YOUR FINELINE MASKING TAPE ABOUT 30-60 MIN AFTER PAINTING FOR THE BEST LOOKING TRANSITION BETWEEN COLORS

Make sure to look at all the information sent out with your paint

Follow our recommendations for the best results

Spray Booth

- * Can be simple, using fans from WallMart and furnace filters
- * Positive flow will decrease the amount of dust in the paint.
- * Fans should pressurize the booth with filtered air so any holes move dust out rather than sucking dust in.
- * Low Level lighting best to see spray pattern

Simple Spray Booth



EkoPoly and Eko Crylic application Application

Paint mix: 4:1:1 by weight; 20-21 seconds with viscosity cup; see specific mix Instructions on label. Paint needs to set 5 minutes after adding catalyst. When adding water, check viscosity before adding all water. Additional water up to 5% can be added to bring up to needed viscosity in hotter weather.

Surface prep: Clean with 91% Isopropyl Alcohol on damp synthetic shop towel from Auto body supply store. Use waterborn paint tack cloth followed by light wipe with alcohol. Alcohol will eliminate static and help repel dust.

Gun: DeVilbiss Finishline 4

Tip: 1.3mm

Pressure: 58-60psi feed at regulator; 23psi at gun. Air needs to be dry, preferably through a dryer set up. Use multiple water traps and 3/8" fittings. Only disconnect should be at gun.

EkoPoly and EkoCrylic Application Continued

Gun Settings: Fan open wide; volume 1/2 turn for fog coat; 3/4 for wet coat.

Application: Spray test pattern before spraying aircraft parts. Use tag board or fabric test panel for testing. Spray three or more fog cross coats to color saturation with fast application about 7-8" above surface. Do not allow fog coat to come up to gloss. Let tack between fog coats. Followed by semi wet coat with slower speed; 4-5". Second wet coat may be applied after tack. Wet coat only after color saturation. Build to color saturation with fog coats only to avoid runs and sags. Typical issues when painting are dry coats, orange peel, runs and sags.

Orange peel: Pressure set too low and paint too thick. Too high volume on gun and too far from surface also can cause orange peel.

Dry coat: Pressure too high and distance too far from surface. Lower pressure and move in closer.

Runs and sags: distance too close and speed of application too slow. Practice on tag board to sag and run to determine what speed is necessary for proper application with specific gun and compressor setting.

HOW DOES YOUR SPRAY GUN SHAPE UP?

No matter how experienced the sprayer, merely triggering and moving a gun in space will not reveal any of the performance characteristics vital to a top quality finish. A simple brief static spray pattern will immediately highlight any potential problems before the gun is used on the painstakingly prepared workpiece or vehicle.

Follow the procedure explained below and compare the pattern to our examples. If your result resembles examples 2-8 then look at the corrective measures before you apply paint to the workpiece.

1. Ensure that you have the correct air cap, fluid tip and needle set-up on the gun to match the material being applied.
2. Tape up a piece of brown paper—approx. 20' (1/2 m) square—onto the spray booth wall at shoulder height.
3. Having set the gun at the recommended inlet or atomizing air pressure, hold it at the correct target distance and spray at the paper WITHOUT MOVING THE GUN.

	<p>Normal Pattern – Ready to Spray</p> <ul style="list-style-type: none"> • Good balance and uniformity • Symmetrical pattern shape • Good working height and width • Uniform distribution of material (Verify by horizontal spray out) 	<p>Intermittent Spray Fan or Fluttering</p> <ul style="list-style-type: none"> • Air in the fluid passageways • Insufficient paint in cup • Fluid tip loose • Fluid needle packing or packing screw loose • Cup vent hole clogged 	
	<p>Banana Pattern</p> <ul style="list-style-type: none"> • Air cap horn hole dirty or damaged • Test spray pattern, rotate 180° and test again to isolate horn hole location • Clean air cap thoroughly • Replace air cap if necessary 	<p>Heavy Top or Bottom Pattern</p> <ul style="list-style-type: none"> • Fluid tip or air cap dirty or damaged • Test spray pattern, rotate 180° and test again to isolate cause • Clean both items thoroughly • Replace fluid tip or air cap if necessary 	
	<p>Single Split Pattern</p> <ul style="list-style-type: none"> • Too much air for fluid quantity used • Reduce air pressure at regulator • Increase fluid flow by changing fluid tip size or opening needle control knob 	<p>Center Heavy Ellipse</p> <ul style="list-style-type: none"> • Bad air or paint setting • Viscosity too high – thin with solvents • Fluid flow too high – reduce • Air pressure too low – increase 	
	<p>Double Split Pattern</p> <ul style="list-style-type: none"> • Too much air for fluid quantity used • Reduce air pressure at regulator • Increase fluid flow by changing fluid tip size or opening needle control knob 	<p>Ball End Heavy Pattern</p> <ul style="list-style-type: none"> • Too much air flow • Change fluid tip for smaller size • Reduce flow using fluid needle control • Reduce fan size using fan control 	

STATIC PATTERN TEST

Having examined the vertical spray pattern for uniformity of shape and size, now turn the air cap through 90° and static spray a horizontal pattern making sure you trigger for long enough to load the shape with material. Then watch to see the formation of the run-outs of material across the full width of the sprayed pattern. This will highlight how well the material is distributed throughout the spray pattern. If run-out is more obvious at the center or at the ends then this indicates a problem.



THE THREE "C"s OF SPRAY GUN TROUBLESHOOTING—CONDITION, CAUSE, CORRECTION

The information below provides you with a simple and effective method of tracing problems with your gun if it proves troublesome.

Look down the left hand "CONDITION" column until you identify the problem and you will find the possible "CAUSE" and "CORRECTION" that needs to be taken.

EkoPoly Premium with a Roller



Paint defects

- * Dry or Rough finish on primers
- * Orange peel
- * Trash in paint
- * Solvent pop or Solvent entrapment
- * Fish eye
- * Runs
- * Adhesion between layers
- * Pin holes

YouTube, Internet, and Seminars

- * We add new videos to YouTube with updated information on the suggested application of our products.
- * There is a lot of good information on the internet about how to paint
- * Research before starting to find out how to avoid common mistakes
- * Check our website often for any updated information
- * Three day seminars available; our location or yours



The Latest in Waterborne Technology for the Aerospace Industry

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Welcome to Stewart Systems

Your single source for a complete line of revolutionary aircraft coatings that are **the Finest Finishes Available, People Safe and STC APPROVED!**

Solvent based products are facing scrutiny from the EPA and more regulations are predicted to come. We know there are health concerns using solvent based products. What if you could have an aircraft finishing product that provided excellent results AND was safe to use?

The wait is over: [Learn more about Stewart Systems revolutionary products...](#)

Available from Stewart Systems:

- ▶ FAR Part 23 and STC Approved and People-Safe Aircraft Fabric Covering process
- ▶ High Performance Catalyzed Waterborne Coatings for the Aerospace Industry
- ▶ EPA compliant, non-hazardous, and non-flammable, safe to use aircraft finishing products
- ▶ Stewart's Hangar 21 Bungee Buddy, Stewart Wing Tips, Piper parts, and more!

FEATURED PRODUCTS



EkoCrylic



EkoPoly Premium



EkoPrime Primer/Sealer

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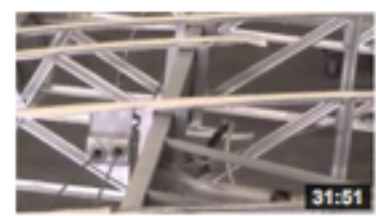
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Piper Wing Covering

Official Piper Wing Covering instructional video from Stewart Systems. See directory below to jump to any part of the demonstration. This playlist covers the material from Disks 1 & 2 of the Stewart Systems Instructional Video...



Piper Wing Covering Part 1
by stewartsystems
54 views • 1 week ago

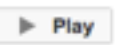


Piper Wing Covering Part 2
by stewartsystems
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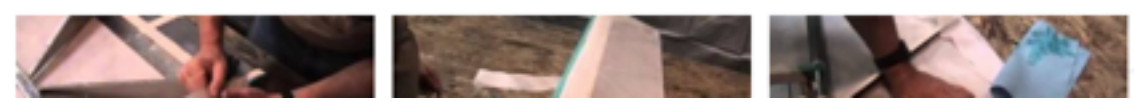


Piper Wing Covering Part 3
by stewartsystems
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Piper Covering Aileron/Elevator/Perimeter Tapes



Official Stewart Systems instructional videos for Piper covering. This playlist includes instruction for covering the aileron, the elevator, and application of perimeter tapes. This playlist covers the material from Disk 3 of the Stew...



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marty2plus2.com

Marty Feehan's Builder Log

Welcome to my Wag Aero 2+2 builders log and blog N367PS

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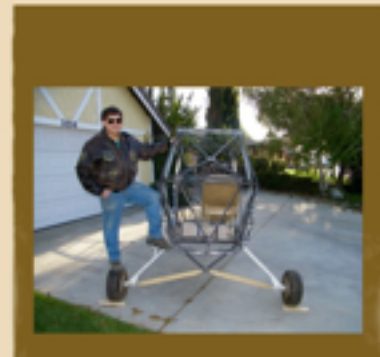
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[Fabric Covering Seminar](#)



Fabric Covering Seminar

Education and knowledge of any finishing system is the key to success. Our three day seminar is designed to prepare a builder to successfully prep, cover, and paint an aircraft. Using the Stewart Systems process, each seminar participant will complete the covering and finishing of a tube frame.



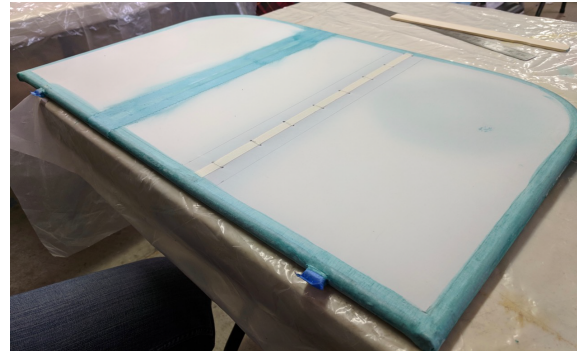
Fabric Covering and Finishing Seminar

October 26,27 and 28th, 2018



October 26, 27 & 28
2018
Nipomo, California

3 Day Fabric Covering and Finishing Seminar



Using the Stewart Systems process, each participant will complete the covering and finishing of a 16" x 26" tube frame representing a typical tube and fabric rudder assembly. The seminar will begin with basic fabric covering techniques followed by rib stitching, applying finishing tapes, and inspection rings. Reinforcing tapes and other aspects of fabriccovering will also be address during the seminar. After completing the fabric covering, each participant will prep, apply Ekofill, and finish the panel with EkoPoly Premium top coat. Slide show of recent seminars can be viewed at www.marty2plus2.com.

Upcoming Three Day Fabric seminar Date: October 26, 27, and 28 in Nipomo, California. The October seminar will be held in the home shop of the presenter Marty Feehan. Space is limited at this seminar to a minimum of just 4 participants and a maximum of 9. Pre-Registration deadlines apply. Please contact the instructor at MartyFeehan79@gmail.com for more information about the October seminar and future seminar dates.

Fabric covering for the 21st century!



Stewart
Systems