Basic principles of composite repair

All EFC courses comply SAE-CACRC, FAA, CAA and EASA standards.
This is a Training 'level 1-2' composite repair course. It is our most "Basic" composite course designed to meet the requirements of a wide range of participants/technicians from beginner to intermediate technician who want to have a better understanding of advanced composites.

EFC Course ID : TECH-001 - Nr. of days: 5

Find the most up to date price @ www.efcomposites.com


You can find our total portfolio @ www.efcomposites.com

Visit the online course info @ www.efcomposites.com

Advised pre-requisites

"None Required"
This composite course is a prerequisite for other EFC courses such as the TECH-010 Intermediate, TECH-020 Advanced Repair course and Tooling and fabricating courses
Pleas do

Participants

Personnel of technical departments having no prior experience or training with Fiber Reinforced Composites and wanting to gain a better understanding of advanced composite materials and processes such as lay-up, laminate different materials, vacuum bagging, fabrication and repair.
Personnel with some composite fabrication & repair experience are also welcome to participate in this basic course.
Participants must be able to, understand speak read and write technical English!

Number of participants

Minimum required 5 and maximum 10 per course. The course will be confirmed as running by EFC as soon as sufficient applications are received!

Earth & Flight Composites
info@efcomposites.com
+31 (0) 23 888 18 15
+31 (0) 6 250 80 254

Sjoukje Dijkstralaan 27
2134 CN Hoofddorp
The Netherlands

Objectives

To provide participants with the theoretical knowledge and practical Hands-On skills necessary to carry out basic fabrication and repair.

At the end of the course the participants:

- Must be able to work independently with minimum supervision
- Must be attentive to details
- Can work according to Safety regulations find material properties in Safety Data Sheets (MSDS) and recognize hazardous situations & materials and can handle it accordingly
- Knows how to find material properties and is familiar and can with “Handling & Storage” of frozen materials
- Can work safely with pre-pregs like UNI Carbon tape material and is familiar with the effects of orientation and ‘Balance’ and ‘symmetry’ in a laminate
- Knows how to work with dry glass fabric and liquid Epoxy resin to impregnate wet in wet "Wet Lay-Up" (WLU)
- Can apply fundamental vacuum bagging, bleeder & breather concepts and apply leak checks
- Can taper sand various taper ratios as required by OEM
- Fabricate Carbon and Glass fibre single curved panels with Nomex® honeycomb core
- Performs a basic ‘Wet Lay Up’ repair

Course content theory

- Health and Safety (MSDS)
- History of composites, recent developments and terminology
- Handling & Storage of Frozen materials
- Material Forms: dry cloth and wet resins vs. pre-preg, weave styles
- Fundamentals of Fabrication: dry cloth and pre-preg handling, ply orientation, layup procedures, vacuum bagging techniques
- Introduction to advanced composite materials/structures
- Resin, adhesive systems: thermosets vs. thermoplastics, mix ratios, viscosity, service temperature limits, cold storage requirements/shelf life limits, mix ratios pot life, etc.
- Material Data Sheet (MDS) reading to determine Open time, Shelf life, and material Cure cycles
- Composite awareness & reporting damage incidents
- Minor Damage assessment, and reporting dents scratches and others
- Sanding techniques, scarf angels, ratios and step repairs, ply cutting

Earth & Flight Composites
info@efcomposites.com
+31 (0) 23 888 18 15
+31 (0) 6 250 80 254

Sjoukje Dijkstralaan 27
2134 CN Hoofddorp
The Netherlands

Workshop Exercises

Participants will be daily intensively, individually monitored and evaluated by the instructor while fabricating and repairing their individual parts!

SAEA-CACRC ARP Documents
During the practical, the participant has access to all necessary SAE-CACRC ARP's (Aerospace Recommended Practices) documents used during this course

- Calculate Epoxy Resin-Hardener mix ratios by weighing
- Laminate panel by wet lay-up using dry fibreglass warp directions and resin bleed out by using various bleeder breather schemes in layup taken out surplus resin.
- Lean practices how to taper sand on existing hand-out 4 ply panel with various sanding grids
- Cutting an existing (Room temp cured) glass panel in half, taper sand by ratio and extend panel by wet lay-up repair and cure
- Learn how thaw pre-preg material is taken out of the freezer and how to fill in a freezer storage form, and make kit-cuts out of a roll and seal.
- Panel Lay up a Carbon UD pre-preg carbon using warp clock layups
- Sandwich panels layup using pre-preg glass and Aramid fiber with Nomex® Honeycomb and other core materials.
- Debulking of plies according to standard practice
- Perform Vacuum bagging with Non-autoclave bleeder/breather materials using various types of pleats, avoid bridging and perform leak using leak checking forms solve leaks
- Damage removal, scarf preparation for repair using a Wet Lay-Up and pre-preg repair process.
- Work with oven cures Ramp-up soak and cool down
- Demonstration "How to use Hot Bond repair consoles" and their equipment like heat blankets, thermocouple placement and mapping.
- Work with the oven and Hot bond Heat console during the practical repair
- Assessment activities are built into our courses, to give feedback on the achievement, personal potential and kept a record in a personal logbook per student.

Examinations

- Multiple choice questions from each of the teachings Level 1-2
- Successful completion is 75% correct answers
- The examination will be closed book and can be conducted by a Part 147 approved Examiner upon request
- The practical mark will be the average of all marks gained from the practical exercises
- All grades will be recorded in the participant individual training records and kept on record at EFC for unlimited time (compliant with Reference EASA Commission Regulation (EU) No 1321/2014) and the GDPR rules

Earth & Flight Composites
info@efcomposites.com
+31 (0) 23 888 18 15
+31 (0) 6 250 80 254

Sjoukje Dijkstralaan 27
2134 CN Hoofddorp
The Netherlands

- A certificate of accomplishment is handed out to each participant
- Assessment activities are built into our courses, to give feedback on the achievement and personal potential and kept a record in their personal logbook.
- The final outcome of the participant's Examination, assessment document and logbook per student will be digitally sent to your company responsible manager or HR department.
- We also comply with the European GDPR rules as effective on May 25th, 2018 concerning storage of private information of participants who attended our courses.

Bicester, UK

This course can also be held at our facility in Bicester in the UK at the Bicester Banbury College. If you have a need for this, please contact our purchasing manager Rolf Hovener via his page.

Course run on site and at special request

- For your company to benefit, this course can be held 'On-Site' at your facility under certain conditions.
- Click on this link to the Onsite information webpage!
- Courses as noted on our course schedule page can be run on request to meet your required start and end date.

Course pricing

All listed course prices are **Excl VAT.** (Dutch VAT is 21%). EFC complies with Dutch tax laws. On request, companies can be sent an invoice instead of paying direct On-line with PayPal, IDEAL or credit card. Payment is securely arranged via Mollie.nl . More information can be found on the website of Mollie.

Mollie

Earth & Flight Composites
info@efcomposites.com
+31 (0) 23 888 18 15
+31 (0) 6 250 80 254

Sjoukje Dijkstralaan 27
2134 CN Hoofddorp
The Netherlands

- A certificate of accomplishment is handed out to each participant
- Assessment activities are built into our courses, to give feedback on the achievement and personal potential and kept a record in their personal logbook.
- The final outcome of the participant's Examination, assessment document and logbook per student will be digitally sent to your company responsible manager or HR department.
- We also comply with the European GDPR rules as effective on May 25th, 2018 concerning storage of private information of participants who attended our courses.

Bicester, UK

This course can also be held at our facility in Bicester in the UK at the Bicester Banbury College. If you have a need for this, please contact our purchasing manager Rolf Hovener via his page.

Course run on site and at special request

- For your company to benefit, this course can be held 'On-Site' at your facility under certain conditions.
- Click on this link to the Onsite information webpage!
- Courses as noted on our course schedule page can be run on request to meet your required start and end date.

Course pricing

All listed course prices are **Excl VAT.** (Dutch VAT is 21%). EFC complies with Dutch tax laws. On request, companies can be sent an invoice instead of paying direct On-line with PayPal, IDEAL or credit card. Payment is securely arranged via Mollie.nl . More information can be found on the website of Mollie.

Mollie

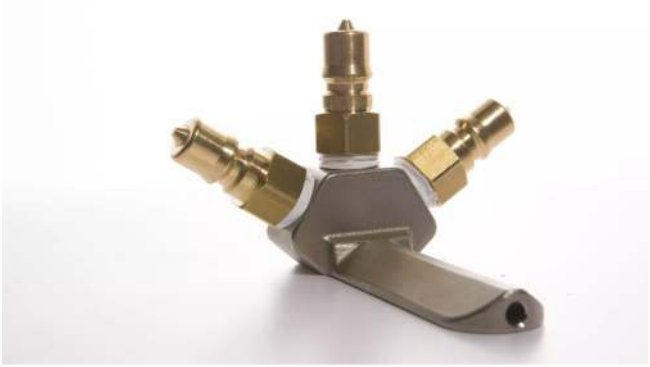
Earth & Flight Composites
info@efcomposites.com
+31 (0) 23 888 18 15
+31 (0) 6 250 80 254

Sjoukje Dijkstralaan 27
2134 CN Hoofddorp
The Netherlands

EARTH & FLIGHT COMPOSITES
TRAINING AND CONSULTANCY

Did you already visit our webshop?

Vacuum Valves/ Vacuum Sniffers



Smart vacuum Valve/Ports for a curved surface
In the images shown the vacuum valves/ports are fitted with standard quick connect couplings.

These quick connect standard couplings are not supplied with the vacuum valves/ports. They merely serve to show the connectivity options. These conventional couplings, male or female type, are available at many vacuum equipment suppliers. EFC can deliver them to you if required.

Contact us by email at info@efcomposites.com
These Vacuum ports/valves are specially designed and patented by EFC owner Bert Groenewoud
Tha can be used use with Hot bonders, in ovens, autoclaves on flat and curved surfaces.

Visit our webshop for more information!

B- Aluminium tap hammer

The B- Aluminium tap hammer, is used to detect delamination (separation of plies) and dis-bonds from the core in advanced composite structures.

This tap Hammer is a must have, for Composite Repair Technicians, Composites certifying staff Composite engineers and Quality inspectors to perform a correct damage assessment in thin laminates and metal bonded parts!

It is fabricated to OEM standard drawings and sizes and anodized for a better protection of the material. The material used is Alum type EN_AW_ 6082-T6
let us know if you want to order the B-tap hammer in larger quantities and ask us for a quotation
Coming soon; A tap-hammer lanyard with a B-tap-hammer plastic klick-in holder

Visit our webshop for more information!

Earth & Flight Composites
info@efcomposites.com
+31 (0) 23 888 18 15
+31 (0) 6 250 80 254

Sjoukje Dijkstralaan 27
2134 CN Hoofddorp
The Netherlands