

Intermediate Level of Composite Damage Repair (Stage II)

All EFC courses comply SAE-AMS-CACRC, EASA standards.
This is a Training 'level 1-2' composite repair course. It is our "**Intermediate**" composite course as a follow up of our TECH-001 Basic course and designed to meet the requirements of a wide range of participants for the technician who have wanted to have a more in-depth understanding of different types composite repair.

EFC Course ID : TECH-010

Nr. of days: 5

Advised pre-requisites

"EFC [TECH-001](#) course is an advanced prerequisite for this course or an equivalent level. Please, if in doubt do contact us to assess your level of knowledge and skills prior to enrolling.

Participants must be able to, understand speak, read and write technical English!

Participants

Personnel of technical departments who want to become a more Hands-on in advanced Composite Repair technician who has a full understanding of Advanced Composite Repair and is able to repair several types of damage in composite panels in accordance with the OEM manual(s).

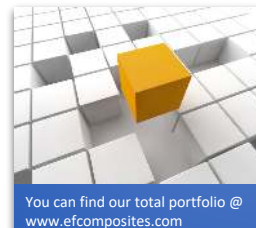
Number of participants

Minimum required 2 and maximum 10 per course. The course will be confirmed by EFC as soon as sufficient applications are received!

Objectives

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 and can recognize hazardous situations & materials (continued at the next page)



- Will have the expert in-depth understanding of vacuum bag techniques
- Can apply damage assessment and machining sequence
- Knows how to work in accordance with several OEM repair manuals
- Will be able to repair the damage of Glass, Carbon and Aramid composites
- Can taper sand excellently with various taper ratios and variations in overlaps as required by OEM
- Can work in teams and fabricate a Carbon and Glass and Aramid fiber double curved panel with Nomex® honeycomb and/or polyurethane foam core
- Can perform several damage repair methods including 'wet layup' and pre-preg repair
- Can perform a half and full dept core repair and whole through a panel and edge band repair
- Can drill holes in edge band of composite panels with drill bushings
- Must be able to understand criteria required in AIR 4838 (Latest revision)

Course content theory

- Get familiar with the several SAE-CACRC Aerospace Recommended Practices (ARPs) documents and its content for this course
- O.E.Ms. SRM comparison and other necessary manuals
- O.E.Ms. comparison of Advanced Ply Lay-Up Blueprint reading
- O.E.Ms. Additional Repair manual Repair Damage assessment, Find max. Allowable damage limits
- NDI visual inspection, hand tapping inspection and record keeping by documentation and photography
- Damage awareness, mapping, incident reporting, photographing and recording
- Cleaning, Surface prep & different Repair type assessments and Composite fastener removal
- Taper sand damages and compare ply direction found with OEM specific ply lay-up drawings
- Composite fastener holes, drilling, Reaming and Fastener Installation
- Use of Hot-Bonding equipment – ramp up, dwell setting, TC and heat blanket placement and Heatsink prevention
- Application of 'Felt technique' for damage area support
- Safety

Workshop exercises

(Level 2)

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

Participants will fill in their personal logbook daily which is signed off by the instructor(s)

Use SAE-CACRC ARP Documents

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

Taper sand with various taper ratios for variations in overlap as required by OEM.

(continued on the next page)



Perform the following skills on Composite Sandwich panels:

- A damage assessment by NDI, visual inspection/Tapping and photography
- Record keeping of damage found
- Application of 'Felt' Technique to support damaged area repair panels
- Performs Edge Band repair
- Find repair type of materials used per OEM chapter and findings printout and check relevant Material Data Sheets
- Surface prep and determination Repair steps /working order steps (plan the work and work as planned)
- Damage removal, by Scarf, sanding the damaged area
- Performing skin-core and edge band repair using pre-preg layup materials and processes film and foam adhesive
- Perform various repairs on a sandwich panel with half dept & septum and full dept core replacement
- Performs debulk during layup of film adhesives & plies
- OEM Lay-Up choice of vacuum materials and vacuum bag with sealant types pleats and vacuum leak checking with a vacuum gauge
- Curing with an oven and/or Hot-Bond repair equipment – use of ceramic heaters, heat blankets, IR lamps, Thermocouples, thermocouple welding
- Able to program, oven, Hot bond console, monitor, change of leading/lagging TC and knows how to abort cure cycles during running and prevent heatsinks

Examinations

- 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
- 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 practical 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.



Leipzig, Germany

This course can also be held on our new location nearby Leipzig Airport, Germany. Here we use classrooms and practical workshop in the HEICO Aircraft Maintenance Part 145 facility. We can run this course on a course start date of your choice.

Please contact our purchasing manager [Rolf Hovener](#) via his personal page on the website of Eart & Flight Composites: <https://www.efcomposites.com>.

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](#).





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 click-in holder

Visit our [webshop](#) for more information!

