



## dark matter composites ltd

<b>Course Title:</b>	<b>Composite Repair – Stage 2</b>
<b>Course Code:</b>	<b>DMSC59</b>
<b>Course Fees:</b>	£1,450.00 course fee plus £290.00 UK VAT (£1,740.00 per delegate)
<b>Structure:</b>	25% theory, 75% practical, 12 delegates maximum
<b>Pre-requisite:</b>	Prior completion of course DMSC58 (previously DMSC59, Repair of Composites)

### Summary

This progression course addresses more advanced composite repair techniques and issues in respect to more extensive and complex structural repairs. Repairs are conducted on solid laminates and sandwich panels using temporary repair tooling, step sanding routers and jigs, standard repair patches and more extensive range of curing methods. Emphasis is on refinement of the repair techniques and working with on-tool dust extraction.

This course is suitable for anyone involved with repairs to composite materials, including repair technicians, supervisors, engineers, designers, researchers and managers.

### Course Content

	09:00 – 11:00	11:15 – 13:15	13:45 – 15:45	16:00 – 18:00
<b>Monday</b>	<u>Introduction</u>  <u>Equipment issue</u>  <u>Theory &amp; Discussion</u> Advanced composite repairs  Co-bonding & secondary bonding structural repairs  Structural repair design and processes	<u>Theory, Demo &amp; Practical</u>  Refresh of composite materials & processes  On tool extraction, dust containment and capture strategies  Advanced dust control & dust free material removal	<u>Theory, Demo &amp; Practical</u>  Pre-preg material life, storing & defrosting  Ply orientation standards, notations & variations  Spring back, distortion, balanced & un-balanced orientated plies  Nesting & kitting	<u>Theory, Demo &amp; Practical</u>  Adhesion & release  Release agents  Adhesive Bonding  Peel plies  <u>Demo &amp; Practical</u> Production of a pre-preg panel to production documentation
<b>Tuesday</b>	<u>Theory, Demo &amp; Practical</u> Sandwich panels & multistage processing  Core materials & tracer films  Preparation & application of honeycomb core  Second stage curing of pre-preg panel	<u>Theory &amp; Discussion</u> Human Factors  Damage inspection & evaluation  Damage reporting  Structural repair design considerations	<u>Theory, Demo &amp; Practical</u> NDT inspection overview & techniques  Setting up and using NDT equipment  NDT inspection of undamaged parts	<u>Practical</u> NDT Inspection of damaged parts  Production of inspection report  Design of a standard step sanded repair scheme
<b>Wednesday</b>	<u>Theory, Demo &amp; Practical</u> Conducting laminate discovery activities using 'Step Sanding Tool Kit'  Plan repair activity  Fibre, fabric, orientation & thickness records	<u>Theory, Demo &amp; Practical</u> Prepare step sanded repair surface for type B wet lay-up part using Step Sanding Tool Kit		<u>Theory, Demo &amp; Practical</u> Fibre to resin ratios  Ply thickness calculations and variation  De-bulk factors  Bleed variation  Calculation of bleed plies
<b>Thursday</b>	<u>Theory, Demo &amp; Practical</u> Prepare and apply materials to the repair surface  Wet lay-up laminate repair using double membrane vacuum bag with bleeder plies	<u>Theory, Demo &amp; Practical</u> Tg point of parts  Using infra-red lamps & temporary ovens for curing  Positioning of thermocouples  Recording of cure profile	<u>Theory, Demo &amp; Practical</u> Producing and using standard repair patches  Pressure de-bulk of repair patch	<u>Practical</u> Prepare step sanded repair surface for type A pre-preg part using Step Sanding Tool Kit
<b>Friday</b>	<u>Theory, Demo &amp; Practical</u> Selection and sequence of vacuum bagging consumables  <u>Practical</u> Apply standard repair patch & vacuum bag	<u>Theory, Demo &amp; Practical</u> Using hot bonders & heat mats, for on part curing  Positioning of thermocouples  Determination & monitoring of cure profile	<u>Discussion &amp; Practical</u> Inspection, evaluation and review of repairs completed  Completion of repair reports  Destructive testing and inspection of repairs completed	<u>Reinstate Workshop</u>  <u>Written test</u>  <u>Equipment return</u>  <u>Summary / Feedback</u>



**dark matter composites Ltd**

## **Composite Course Schedule 2019-20**

We provide the most comprehensive range of composite training courses available. Delegates regularly attend our courses from all industry sectors worldwide which are suitable for individuals and small companies through to tier one suppliers and OEMs.

We are continually involved in training industry personnel for the next generation of composite parts. Our courses are recognised as demanding, rewarding and representative of current best practice and processes and are continually updated. Our tutors are industry experts and our facilities set the standards for best practice and are specifically designed for delivery of composite training courses.

<b>Course Code</b>	<b>Title</b>	<b>Price per Delegate (incl. 20% UK VAT)</b>	<b>Course Dates</b>
DMSC50	Introduction to Composite Materials & Processes	£1,500.00	1-5 Jun 2020
DMSC51	Wet Lay-Up Laminating	£1,500.00	6-10 Jul 2020
DMSC52	Spray Lay-Up Laminating	£1,500.00	13-17 Jul 2020
DMSC53	Resin Infusion Laminating & Light RTM	£1,500.00	11-15 May 2020
DMSC54	Pre-Preg Laminating – Stage 1	£1,500.00	14-18 Oct 2019 24-28 Feb 2020 12-16 Oct 2020
DMSC55	Pre-Preg Laminating – Stage 2	£1,500.00	21-25 Oct 2019 19-23 Oct 2020
DMSC56	Pre-Preg Mould Making	£1,740.00	5-9 Oct 2020
DMSC57	Trimming, Finishing & Assembly of Composites	£1,740.00	15-19 Jun 2020
DMSC58	Composite Repair – Stage 1	£1,740.00	18-22 Nov 2019 16-20 Mar 2020 16-20 Nov 2020
DMSC59	Composite Repair – Stage 2	£1,740.00	25-29 Nov 2019 23-27 Mar 2020 23-27 Nov 2020
DMSC60	Producing Your Own Composite Parts	£1,500.00	27 Apr – 1 May 2020
DMSC61	Composites for Engineers & Designers Stage 1 - Materials & Processes	£1,500.00	3-7 Feb 2020 7-11 Sep 2020
DMSC62	Composites for Engineers & Designers Stage 2 - Advanced Design	£1,500.00	14-18 Sep 2020

### **Bespoke Training Courses**

If you cannot find a course to suit your needs, bespoke courses can also be provided for individuals through to full company training programmes, worldwide at the customers' own facilities or at our premises. Pricing is dependent on location, delegates and course content. Please contact us to discuss your needs.

t/f +44 (0)1582 791001 [www.darkmattercomposites.com](http://www.darkmattercomposites.com)

Unit 8 Redbourn Industrial Estate, High Street, Redbourn, Hertfordshire, AL3 7LG, UK

Registered in England & Wales No: 5395870



**dark matter composites Ltd**

## ***Composite Course Information***

### **Entry Requirements**

No qualifications or previous experience is required unless otherwise stated on the specific course information sheet. If you are unsure please contact us.

### **Enrolments**

- Enrolments are taken on a first come, first served basis. We require either an on-line booking or a completed enrolment form and full payment.
- On receipt of your booking/enrolment form, we will process your payment if there are places available on the course and issue a full course confirmation.
- If the course is full, your payment will not be processed and you will be advised accordingly.
- Please note that we do not take provisional bookings or hold any places. Course confirmations are only sent if places are available and full payment has been received into our account.

### **Payment**

We accept the following forms of payment and can provide companies with pro-forma invoices where required:

- Credit and Debit cards including Mastercard, Visa, Maestro, Solo and American Express
- Personal or Company cheques payable to 'Dark Matter Composites Ltd'
- Paypal
- BACS, CHAPS or IBAN bank transfers

### **Course Fees**

- The fees are stated on the individual course information sheets and are per delegate per course.
- Course fees stated are in pounds sterling and are subject to UK VAT at the current rate (20%).
- EU companies can reclaim VAT through their local VAT system. Non EU delegates cannot reclaim the VAT as the course is a service provided in the UK and not an exported product.
- The fees stated are valid until 31<sup>st</sup> December 2019.
- All fees stated include: provision of all materials, tools, equipment and protective clothing (except footwear, see below); lunch, tea & coffee for each day of the course; and course handouts.
- All course fees must be paid prior to the start of the course.
- Items produced by delegates can be taken away at the end of the course.

### **Location**

Our courses are run at our dedicated training facilities in Redbourn, Hertfordshire, United Kingdom. We are close to London with good travel links to Central London and all London Airports, with London Luton Airport just 8 miles away. There are good transport links to the M1/M25 motorways and train links at the local towns of Hemel Hempstead, St Albans, Harpenden and Luton.

### **Times & Attendance**

Each day starts promptly at 9am and finishes at approximately 6pm, Monday to Friday.

### **Clothing, tools and equipment**

- Delegates must wear full-length trousers and closed leather shoes or safety boots (no trainers) during the course.
- All other tools, equipment and personal protective equipment are included in the course fee.

### **Course Assessment**

Assessment activities are built into our courses, to give feedback on the achievement and potential of delegates. Delegates are assessed on their attendance, quality of practical work completed and a written test. Assessment marks are printed on the course certificates and kept on record.

### **Exclusions**

Travel, accommodation and general sustenance expenses incurred by delegates are excluded from the course prices (except where otherwise stated).

### **Accommodation**

Please note that we have an accommodation list that is available on our website or upon request.



dark matter composites ltd

COURSE ENROLMENT FORM

Please complete the form in BLOCK letters

Course Code, Course Title, Course Date, Course Fee
Where did you find out about the course?

Personal Details

Title, First Name, Surname, Date of Birth
Address, Postcode
Telephone No., Mobile No., Email
Do you have any special dietary requirements or special needs? Yes / No
If 'Yes' please give details:

Employer or Emergency Contact Details

Company and/or Contact Name, Telephone No.
Address, Postcode

I confirm that I agree to the 'Course Enrolment Conditions' and that the information given above is correct. For applicants under 18 years old at the start of the course, I also confirm that I am a parent/legal guardian/employer (please delete as appropriate) of the applicant and give my consent for them to attend the course.

Name Signature Date

Payment

- Personal/Company cheque enclosed, payable to 'Dark Matter Composites Ltd'
UK Bank Transfer (payment details shall be provided upon enrolment receipt)
International Bank Transfer (payment details shall be provided upon enrolment receipt)
Paypal (we will send out a payment request on receipt of this application)
Credit Card

Card Type, Card Number, Start Date, Expiry Date, Security Number, Issue Number (switch only), Name on Card, Card Billing Address, Postcode

Please send completed forms to the address below. On receipt, we will process your enrolment and payment. Full course confirmations shall only be sent once payment has cleared.

t/f +44 (0)1582 791001 www.darkmattercomposites.com

Unit 8 Redbourn Industrial Estate, High Street, Redbourn, Hertfordshire, AL3 7LG, UK

Registered in England & Wales No: 5395870



**dark matter composites ltd**

## ***Course Enrolment Conditions***

1. These Course Enrolment Conditions apply to all training services provided by Dark Matter Composites Ltd (DMC). Customer's Terms & Conditions or deviations from these are not applicable unless agreed in writing.
2. It is the customers' responsibility to check that the course is suitable for its delegate(s) training needs. We shall advise on course content and anticipated outcome as requested.
3. Enrolments are taken on a first come, first served basis and shall only be confirmed on receipt of completed enrolment forms and receipt of full payment.
4. For company and group bookings, an enrolment form must be completed for each delegate.
5. Courses will be confirmed as running as soon as sufficient applications are received and no later than 2 weeks prior to the course start date.
6. All course fees are per delegate per course and include: provision of all materials, tools and protective clothing (except footwear, see below); lunch, tea & coffee for each day of the course; and course handouts.
7. Payment of course fees are due prior to the course start date. Prices stated are in pounds sterling.
8. Travel, accommodation and general sustenance expenses incurred by delegates are excluded from the course fees (except where otherwise stated).
9. Cancellations by delegates prior to the course will be refunded on the following basis: 14 calendar days or more 80%; less than 14 calendar days no refund. If a cancellation is unavoidable by DMC, an alternative date or full refund will be given.
10. Transferral of bookings applies to a change in course or course date and must be completed 14 calendar days prior to the start of the original course booking. Each transferred booking, will be subject to an administration and materials charge equivalent to 20% of the course fee. A maximum of two booking transfers will be processed. Outside of these transfer terms, cancellation terms will apply.
11. Delegates must advise DMC of any dietary requirements or special needs on enrolment.
12. The outcome and achievement of delegates is based upon the ability and attendance of the individual delegates.
13. DMC shall not be liable for any kind of damage arising directly or indirectly out of or in connection with the performance or non-performance of the training, unless such damages are caused by the gross negligence or intent of DMC or its employees.
14. Delegates attending DMC courses must comply with safety procedures covered at the start of and during each course. DMC seeks to achieve the highest standards in health, safety and the environment and anticipate that customers and their delegates will assist us in achieving these objectives.
15. Delegates must wear full-length trousers and closed leather shoes or safety boots (no trainers) during the course. Delegates who do not wear appropriate clothing and footwear will not be able to take a full part in practical sessions.
16. Marked tools and equipment shall be issued and checked with delegates at the start of the course. Delegates may be charged for tools and equipment not returned.
17. Copyrights on licensed material provided by DMC remain with DMC. Copyrights on third party licensed materials remain with identified third parties. Licensed materials include but are not limited to all course documentation, manuals and instructions in electronic or printed form. The Customer/Delegate shall not copy, make accessible or distribute licensed material to third parties without DMC's prior written consent.
18. The Customer/Delegate acknowledges and agrees that a breach of copyright cannot be compensated adequately by an award of damages or indemnity or other pecuniary remedy and DMC shall be entitled in the event of any such breach to the remedies of injunction specific performance or other equitable relief to redress any such breach.
19. DMC will treat any information about delegates and/or any internal business information of the Customer/Delegate as confidential.
20. The validity, construction and performance of these conditions shall be governed by the Laws of England.

**t/f +44 (0)1582 791001    [www.darkmattercomposites.com](http://www.darkmattercomposites.com)**

**Unit 8 Redbourn Industrial Estate, High Street, Redbourn, Hertfordshire, AL3 7LG, UK**

**Registered in England & Wales No: 5395870**