



**dark matter composites ltd**

**Course Title: Resin Infusion Laminating & Light RTM**

**Course Code: DMSC53**

**Course Fees: £1,700.00 course fee plus £340.00 UK VAT (£2,040.00 per delegate)**

**Structure: 35% theory, 65% practical, 12 delegates maximum, no experience required**

**Summary**

Resin infusion laminating and light resin transfer moulding are covered in a single course due to the similar nature of the processes yet distinctive merits. This course covers a full range of materials and processing techniques, giving an in-depth and hands on approach to understanding how the processes work and how they can be applied successfully.

This course is suitable for lead technicians, supervisors, engineers, designers and researchers who are responsible for trials, development and tooling design associated with these processes.

**Course Content**

	09:00 – 11:00	11:15 – 13:15	13:45 – 15:45	16:00 – 18:00
Monday	<u>Introduction</u> <u>Equipment issue</u> <u>Health &amp; Safety</u> <u>Theory</u> Introduction to composites theory, matrix, reinforcing & fabric materials	<u>Theory &amp; Discussion</u> Resin flow infusion Darcy's Law and effects of permeability, flow channels, pressure dams, vacuum, temperature & viscosity External distribution & infusion media & flow fronts	<u>Theory, Demo &amp; Practical</u> Setting up & completing trial panels Resin calculations Vacuum bagging Vacuum bag materials & methods Leak detection & vacuum volume	<u>Demo &amp; Practical</u> Resin flow infusion trial panels using a range of laminate combinations, core materials, external distribution & infusion media  <u>Theory &amp; Discussion</u> Sandwich panels Infusion core materials
Tuesday	<u>Practical</u> Infuse sandwich trial panels  <u>Theory &amp; Practical</u> Using trial panel information Designing infusion layout for parts	<u>Theory, Demo &amp; Practical</u> Tooling care, preparation & release agents  <u>Practical</u> Lay-up a resin flow infusion part into a complex female tool including gel coat application, fabrics, core material, external distribution & infusion media, surface bagging & leak checking		<u>Discussion &amp; Practical</u> Resin calculations for parts Predicting flow fronts & infusion times Final resin flow infusions of parts with external media
Wednesday	<u>Theory</u> Internal infusion media and light resin transfer moulding (Light RTM) Reinforcing fabrics & core materials	<u>Practical</u> Resin flow infusions with a range of internal media, reusable silicon vacuum bags & semi-rigid closed moulds	<u>Theory</u> Reusable silicon vacuum bags Semi-rigid closed moulds Creating seals, connections and resin channels	<u>Theory, Demo &amp; Practical</u> Design of mould seals, injection & vent points Application of calibration wax, injection & vent point connections & profiles
Thursday	<u>Theory, Demo &amp; Practical</u> Resin film infusion Material life, storing, defrosting, handling, templating & application	<u>Practical</u> Use resin film laminating to produce a semi-rigid closed mould to be used for producing light RTM parts		<u>Demos &amp; Practical</u> Envelope vacuum bagging  <u>Theory &amp; Practical</u> Curing resin films Temperature profiles
Friday	<u>Demo &amp; Practical</u> Break out and prepare semi-rigid closed moulds for use	<u>Guided Practical</u> Apply gel coat and apply reinforcement materials Prepare & use Light RTM equipment to produce parts	<u>Practical</u> Break out parts  <u>Theory &amp; Discussion</u> Infusion causes of & identifying defects & relate to parts produced	<u>Reinstate Workshop</u>  <u>Written test</u>  <u>Equipment return</u>  <u>Summary / Feedback</u>



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## **Composite Course Schedule 2024**

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	£2,040.00	<i>please call/email us for further details</i>
DMSC51	Wet Lay-Up Laminating	£2,040.00	15-19 April 2024
DMSC52	Spray Lay-Up Laminating	£2,040.00	<i>please call/email us for further details</i>
DMSC53	Resin Infusion Laminating & Light RTM	£2,040.00	22-26 April 2024
DMSC54	Pre-Preg Laminating – Stage 1	£2,040.00	11-15 Mar 2024 11-15 Nov 2024
DMSC55	Pre-Preg Laminating – Stage 2	£2,040.00	18-22 Nov 2024
DMSC56	Pre-Preg Mould Making	£2,400.00	13-17 May 2024
DMSC57	Trimming, Finishing & Assembly of Composites	£2,400.00	10-14 Jun 2024
DMSC58	Composite Repair – Stage 1	£2,400.00	18-22 Mar 2024 14-18 Oct 2024
DMSC59	Composite Repair – Stage 2	£2,400.00	21-25 Oct 2024
DMSC60	Producing Your Own Composite Parts	£2,040.00	3-7 Jun 2024
DMSC61	Composites for Engineers & Designers Stage 1 - Materials & Processes	£2,040.00	29 Jan – 2 Feb 2024 9-13 Sep 2024
DMSC62	Composites for Engineers & Designers Stage 2 - Advanced Design	£2,040.00	16-20 Sep 2024

### **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.



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## *Composite Course Information*

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### **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 may be able to reclaim UK 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 2024.
- 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 fabric, perforated or open footwear) 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.

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



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**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? If 'Yes' please give details:			Yes / No

**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	MasterCard / Visa / Maestro (Switch) / Visa Electron / Solo / American Express											
Card Number												
Start Date						Expiry Date						
Security Number						Issue Number (switch only)						
Name on Card												
Card Billing Address												
	Postcode											

Please email completed forms to [info@darkmattercomposites.co.uk](mailto:info@darkmattercomposites.co.uk). On receipt, we will process your enrolment and payment. Full course confirmations shall only be sent once payment has cleared.



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## ***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. Bespoke courses will be confirmed on receipt of full course payment.
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 or fabric footwear) 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.

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