

dark matter composites ltd

Composite Course Schedule 2012

We provide the most extensive and comprehensive range of composites courses available. These courses have been developed over a number of years and are continually kept up to date with current theory, practices and materials. Our tutors are industry experts, our facilities set the standards others follow and are specifically designed for composite training courses. Delegates regularly attend our courses from all industry sectors worldwide.

Our standard suite of courses is aimed at all personnel including support staff, technicians, engineers, designers and managers. These courses are in-depth, wide ranging and follow industry practices throughout. They are designed to give personnel the understanding and skills to develop and apply in the workplace. These are suitable for individuals and small companies through to tier one suppliers and OEMs. Course fees are typically £990.00 per delegate, plus UK VAT at 20%.

Course Code	Title	Provisional Course Dates
DMSC50	Introduction to Composite Materials & Processes	30 Jan – 3 Feb 2012 10-14 Sep 2012
DMSC51	Wet Lay-Up Laminating	14-18 May 2012
DMSC52	Spray Lay-Up Laminating	21-25 May 2012
DMSC53	Resin Infusion Laminating & Light RTM	20-24 Feb 2012 17-21 Sep 2012
DMSC54	Pre-Preg Laminating – Stage 1	27 Feb – 2 Mar 2012 12–16 Nov 2012
DMSC55	Pre-Preg Laminating – Stage 2	5-9 Mar 2012 19-23 Nov 2012
DMSC56 *	Pre-Preg Mould Making	9-13 July 2012
DMSC58 *	Trimming of Composites	16-20 Jul 2012
DMSC59 *	Repair of Composites	16-20 Apr 2012 1-5 Oct 2012
DMSC59A *	Advanced Composite Repair Techniques	23-27 Apr 2012 8-12 Oct 2012
DMSC60	Producing Your Own Composite Parts	12-16 Mar 2012 3-7 Sep 2012
DMSC61	Composite Materials & Processes for Engineers & Designers	6-10 Feb 2012 11-15 Jun 2012 22-26 Oct 2012
DMSC62	Laminate & Tooling Design	18-22 Jun 2012 26-30 Nov 2012
DMSC63	Wind Turbine Blade Construction & Maintenance	25-29 Jun 2012

New Course

New Course

New Course

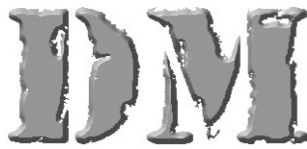
* Course fees £1,150.00 per delegate, plus UK VAT at 20% (due to additional preparation and materials)

Approval

Our courses are approved by the UK composites trade association 'Composites UK' for all sectors of the composites industry. Members of Composites UK are entitled to a 5% discount of our standard courses.

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. Pricing is dependant on location, delegates and course content. Please contact us to discuss your needs.



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Composite Course Information

Entry Requirements

No qualifications or previous experience is required unless otherwise stated on the specific course information sheet.

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 (please note that the payment request will be sent after the booking/enrolment is received)
- 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 31st December 2011.
- 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 approx. 6pm. Attendance level is expected to be 100%.

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

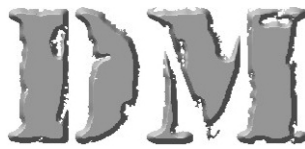
Assessment activities are built into our courses, to give feedback on the achievement and potential of delegates. Delegates are assessed on their attendance, quality of practical work completed and a written test. Assessment marks are printed on the course certificates and kept on record.

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 Title: Introduction to Composite Materials & Processes

Course Code: DMSC50

Course Fees: £990.00 per delegate, plus UK VAT

Structure: 30% theory, 70% practical, 12 delegates maximum, no experience required

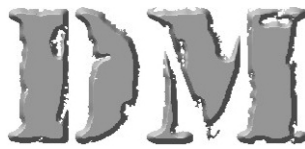
Summary

This course provides a good overview of composites in terms of materials, processes, typical applications, advantages/disadvantages and limitations.

The course is suitable for support staff who need an awareness of composites and understanding of terminology used, typically quality, sales, purchasing, HR and administration roles.

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 & Safety</u> <u>Theory</u> Composites history Composites theory	<u>Theory</u> Matrix materials Reinforcing materials Fabric types Laminate theory Process overview	<u>Theory</u> Wet lay-up laminating overview & simple resin calculations <u>Demo & Practical</u> Wet lay-up laminating of a mould including material preparation and dispensing, gel coating, wetting out & consolidation using brush application	
Tuesday	<u>Practical</u> Completion of wet lay-up mould lamination using roller application	<u>Theory</u> Pre-preg laminating overview <u>Theory, Demo & Practical</u> Pre-preg templating & material preparation	<u>Demo & Practical</u> Laminate first skins of the pre-preg part Vacuum debulk	<u>Theory</u> Sandwich panel theory Core materials <u>Demo & Practical</u> Prepare core for pre-preg part
Wednesday	<u>Practical</u> Laminate core & closing skins of pre-preg part	<u>Theory</u> Vacuum bagging materials & methods <u>Demo & Practical</u> Vacuum bagging of pre-preg part	<u>Theory & Practical</u> Matrix curing & post-curing Cure pre-preg part <u>Theory & Demos</u> Trimming, finishing & inspection of composites	<u>Demo & Practical</u> Breakout wet lay-up mould tool Trim & finish mould ready for use Post-cure mould
Thursday	<u>Theory</u> Tooling care & preparation Release & adhesion Release agent types <u>Demo & Practical</u> Release GRP mould for use	<u>Theory</u> Resin infusion laminating overview <u>Demo & Practical</u> Laminate resin infusion part using a range of materials and methods	<u>Demo & Practical</u> Vacuum bagging of infusion parts Final infusion and curing of resin infusion parts	<u>Theory, Videos & Discussion</u> Resin transfer moulding Hot press moulding Filament winding Pultrusion Automated tape laying & fibre placement
Friday	<u>Practical</u> Breakout, trim & finish resin infusion and pre-preg composite parts		<u>Practical & Discussion</u> Inspection of parts & identifying defects <u>Written test</u> (30 minutes)	<u>Equipment return</u> <u>Reinstate Workshop</u> <u>Summary / Feedback</u>



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Course Title: Wet Lay-Up Laminating

Course Code: DMSC51

Course Fees: £990.00 per delegate, plus UK VAT

Structure: 30% theory, 70% practical, 12 delegates maximum, no experience required

Summary

Wet lay-up is considered to be the most basic and widely used laminating process. We use a structured approach, with a large range of materials, tools and laminating techniques which gives delegates a level of practical competence during the course.

This course is suitable for the full training of wet lay up laminators, as well as engineers who need a complete understanding of the process and design aspects of this laminating technique.

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 & Safety</u> <u>Theory</u> Introduction to composites theory, matrix, reinforcing & fabric materials	<u>Theory & Demo</u> Wet lay-up processing Lay-up specifications Exotherm and controlling risk Controlling styrene emissions Resin calculations	<u>Theory, Demo & Practical</u> Tooling care, preparation & release agents <u>Demo & Practical</u> Material preparation & resin dispensing Gel coat application	<u>Practical</u> Laminate convex & concave shapes using draping methods with a range of reinforcements, fabrics & polyester resins Brush & small roller application methods
Tuesday	<u>Theory, Demo & Practical</u> Storing, handling & templating of fabrics Ply orientation, nesting & kitting	<u>Theory, Demo & Practical</u> Storage, handling & safe dispensing of gel coats, pigments, accelerators & catalysts	<u>Practical</u> Epoxy gel coat application Laminating of internal, external, acute & radius corners, feathered, butt & overlap joins, using placement methods with a range of reinforcements, fabrics & epoxy resins	
Wednesday	<u>Theory & Demo</u> Preparation of multi part tooling <u>Practical</u> Prepare loose tooling, nett edges, return edges & split moulds	<u>Theory & Demo</u> Continuous laminating over large areas Sequence planning <u>Practical</u> Large area laminating of nett edges, return edges, vertical surfaces & green trimming	<u>Theory & Demo</u> Sandwich structures Core materials <u>Practical</u> Preparation of core materials Laminate preparation	<u>Practical</u> Large area laminating incorporating core materials on horizontal and vertical surfaces
Thursday	<u>Theory, Demo & Practical</u> Bonding and joining techniques Use of peel plies Fitting inserts and ancillaries	<u>Theory, Demo & Practical</u> De-bag & de-mould parts Safe edge parts produced	<u>Theory & Discussion</u> Process control & inspection Causes of & identifying defects	<u>Assessment of Competency</u> Planning of laminating operations, tooling & material preparation for the assessment task
Friday	<u>Assessment of Competency</u> Laminate split closed mould assessment part start to finish including gel coating, laminating plies, inserts and core materials and joining of mould halves			<u>Written test</u> <u>Equipment return</u> <u>Reinstate Workshop</u> <u>Summary / Feedback</u>



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Course Title: Spray Lay-Up Laminating

Course Code: DMSC52

Course Fees: £990.00 per delegate, plus UK VAT

Structure: 25% theory, 75% practical, 6 delegates maximum, no experience required

Summary

Spray lay-up is a process that is suited to medium to large mouldings. It is a relatively simple process that is highly dependant on operator skill in setting up and using the specialised spray equipment in the proper manner to obtain consistent results.

This course is suitable for the training of spray lay up laminators, as well as engineers who need a complete understanding of the process and design aspects of this laminating technique.

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 & Safety</u> <u>Theory</u> Introduction to composites theory, matrix, reinforcing & fabric materials	<u>Theory</u> Wet lay-up & spray lay-up processes Lay-up specifications <u>Theory, Demo & Practical</u> Tooling care, preparation & release agents	<u>Theory, Demo & Practical</u> Set up, use and cleaning of gel coat gun Controlling styrene emissions Spray patterns & gun/body articulation Polyester gel coat application to concave & convex shapes, controlling & checking coating thickness	
Tuesday	<u>Theory & Demo</u> Storing, handling & preparation of gel coats, pigments, accelerators & catalysts Exotherm and controlling risk <u>Theory, Demo & Practical</u> Set up, use and cleaning of chopper gun Developing spray patterns, correlating resin/fibre delivery, roving entry and distribution into the resin stream		<u>Demo & Practical</u> Spray lay-up of concave & convex shapes, application & brush/roller consolidating using polyester resins Spray patterns, overlaps, gun & body articulation Controlling & checking coating thickness	
Wednesday	<u>Theory, Demo & Practical</u> Use and fitting of masks and containment flanges	<u>Demo & Practical</u> Brush application of gel coats & tissue plies	<u>Demo & Practical</u> Preparation & spray lay-up of male tool, including external, acute & radius corners, horizontal, vertical & angular surfaces and green trimming using epoxy resins	
Thursday	<u>Theory & Demo</u> Preparation of multi part tooling <u>Practical</u> Prepare loose tooling, nett edges, return edges & split moulds	<u>Theory & Demo</u> Sandwich structures Core materials <u>Practical</u> Preparation of core materials Laminate preparation	<u>Demo & Practical</u> Preparation & spray lay-up of detailed female tool, including internal, acute & radius corners, angular surfaces, return & nett edges Fitting & over laminating of core materials	
Friday	<u>Theory, Demo & Practical</u> Bonding and joining techniques Fitting inserts and ancillaries	<u>Demo & Practical</u> De-mould & comparison of parts Safe edge parts produced	<u>Theory & Discussion</u> Causes of & identifying defects <u>Written test</u> (30 minutes)	<u>Equipment return</u> <u>Reinstate Workshop</u> <u>Summary / Feedback</u>



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Course Title: Resin Infusion Laminating & Light RTM

Course Code: DMSC53

Course Fees: £990.00 per delegate, plus UK VAT

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

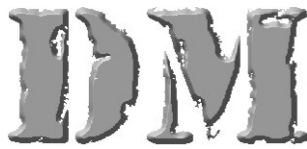
Summary

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 suits 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 & Safety</u> <u>Theory</u> Introduction to composites theory, matrix, reinforcing & fabric materials	<u>Theory & Discussion</u> Resin flow infusion External distribution & infusion media & flow fronts <u>Theory & Discussion</u> Sandwich panels Infusion core materials	<u>Theory & Demo</u> Trial panels Effects of temperature, viscosity, permeability, flow channels & pressure dams Vacuum bagging Vacuum bag materials & methods Leak detection	<u>Practical</u> Resin flow infusion trial panels using a range of laminate combinations, core materials, external distribution & infusion media
Tuesday	<u>Theory & Practical</u> Using trial panel information Designing infusion layout for parts Resin calculations for parts	<u>Theory, Demo & 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 & Practical</u> Predicting flow fronts & infusion times Final resin flow infusions of parts with external media
Wednesday	<u>Theory</u> Reusable silicon vacuum bags Semi-rigid closed moulds Creating seals, connections and resin channels	<u>Practical</u> Resin flow infusions with a range of internal media, reusable silicon vacuum bags & semi-rigid closed moulds	<u>Theory</u> Light resin transfer moulding (light RTM) Reinforcing fabrics & core materials <u>Demo & Practical</u> Closed mould trial panels & evaluation	<u>Theory, Demo & Practical</u> Design of mould seals, injection & vent points Application of calibration wax, injection & vent point connections & profiles
Thursday	<u>Theory, Demo & Practical</u> Resin film infusion Material life, storing, defrosting, handling, templating & application	<u>Practical</u> Resin film laminate a semi-rigid closing mould for use with light RTM moulding	<u>Demos & Practical</u> Envelope vacuum bagging <u>Theory & Practical</u> Curing resin films Temperature profiles	<u>Demo & Practical</u> Break out parts Prepare & release semi-rigid closing mould for use
Friday	<u>Practical</u> Gel coat and apply reinforcement materials for closed mould Light RTM part	<u>Guided Practical</u> Set up Light RTM equipment Injection of resin into the mould cavity	<u>Practical</u> Break out infused parts <u>Theory & Discussion</u> Infusion causes of & identifying defects & relate to parts produced	<u>Written test</u> <u>Reinstate Workshop</u> <u>Equipment return</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title: Pre-Preg Laminating – Stage 1

Course Code: DMSC54

Course Fees: £990.00 per delegate, plus UK VAT

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

Summary

This course follows the complex production processes associated with using pre-preg materials, by breaking them down into simple progressive steps. It covers a wide range of materials, processing methods and application techniques applied solely to pre-preg laminates. This is considered the foundation course for a number of high end industry sectors using these materials, including Formula 1 and OEM/Tier 1 Aerospace.

This course is suitable for anyone involved with processing pre-preg materials, including pre-preg laminators, 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
Monday	<u>Introduction</u> <u>Equipment issue</u> <u>Health & Safety</u> <u>Theory</u> Introduction to composites theory, matrix, reinforcing & fabric materials	<u>Theory</u> Pre-preg materials Pre-preg processing Lay-up specifications <u>Theory, Demo & Practical</u> Tooling care & preparation Release agents	<u>Practical</u> Prepare tooling Laminate convex shapes using draping methods with a range of reinforcements and fabrics	<u>Theory, Demo & Practical</u> Vacuum bagging Vacuum bagging materials Application methods & leak detection Surface bagging Oven cure part
Tuesday	<u>Theory, Demo & Practical</u> Material life, storing & defrosting Laminate features & datums Material templating	<u>Theory, Demo & Practical</u> Clean rooms Ply orientation Standard orientation notations & variations Nesting & kitting	<u>Theory & Demo</u> Material application & consolidation <u>Practical</u> Laminating internal, external corners, acute & radius corners, butt & overlap joints, ply dropping, using placement & draping methods	
Wednesday	<u>Demo & Practical</u> Fully templated envelope bagging of part Autoclave cure part	<u>Theory, Demo & Practical</u> Pre-preg curing Temperature & pressure profiles Exotherm Post curing Tg points	<u>Theory & Demo</u> Vacuum debulks Caul plates <u>Practical</u> Preparation & laminating of a female tool incorporating loose, joggle & nett details	<u>Theory & Demo</u> Hard pads & inserts <u>Practical</u> Laminating of a female tool incorporating, loose, nett edge, return & joggle detail, hard pads & inserts
Thursday	<u>Practical</u> Envelope bagging & autoclave cure part <u>Theory, Demo & Practical</u> De-moulding parts	<u>Theory & Discussion</u> Process control & inspection Causes of & identifying defects	<u>Assessed Practical</u> Laminate assessment part start to finish including tooling preparation, material preparation, templating, split tooling, debulking	
Friday	<u>Assessed Practical</u> Completion of assessed practical Through aperture envelope bagging & autoclave curing of part		<u>Theory & Video</u> Automated tape laying and fibre placement <u>Practical</u> Safe edge parts produced	<u>Written test</u> <u>Equipment return</u> <u>Reinstate Workshop</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title: Pre-Preg Laminating – Stage 2

Course Code: DMSC55

Course Fees: £990.00 per delegate, plus UK VAT

Structure: 25% theory, 75% practical, 12 delegates maximum

Pre-requisite: Prior completion of course DMSC54, Pre-preg Laminating – Stage 1

Summary

This is a progression course and follows the full range of single and multi-stage techniques associated with using a range of core materials to produce sandwich structures with pre-preg materials.

This course is suitable for anyone involved with processing pre-preg materials, including pre-preg laminators, 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
Monday	<u>Introduction</u> <u>Equipment issue</u> <u>Theory & Demos</u> Refresh of composite theory & materials Sandwich panel theory Core materials	<u>Theory</u> Peel plies Two/double stage processing <u>Practical</u> Laminate first skin, for 2 stage lay-up including peel ply, vacuum bagging & curing	<u>Theory & Demo</u> One/single stage processing Preparation of nomex & aluminium honeycomb core materials Resin film application Core splicing	<u>Practical</u> Laminate one/single stage core lay-up on curved tool, including honeycomb materials, de-bulking, core splicing, vacuum bagging & curing
Tuesday	<u>Theory, Demo & Practical</u> Processing foam and syntactic core materials Thermoforming foam <u>Demo & Practical</u> De-bag & preparation of first skin	<u>Practical</u> Preparation and fitment of honeycomb, foam, syntactic core and core splicing over internal, external, acute & radius corners	<u>Theory & Demo</u> Inserts, hard points & caul plates with core processing <u>Practical</u> Processing hard pads & inserts into sandwich panels	<u>Practical</u> Laminating of closing skins for two/double stage lay-up Vacuum bag & cure
Wednesday	<u>Theory</u> Three/triple stage processing <u>Practical</u> Laminate, vacuum bag & cure outer skin for three/triple stage lay-up	<u>Practical</u> Laminate, vacuum bag & cure inner skin for three/triple stage lay-up	<u>Practical</u> Prepare outer & inner skins, laminate resin film, fit & splice core, fit and pot inserts for a closed mould three/triple stage lay-up Vacuum bag and autoclave cure for closed mould three/triple stage lay-up	
Thursday	<u>Demo & Practical</u> De-bag & de-mould parts	<u>Theory</u> Process control & inspection <u>Theory & Discussion</u> Causes of & identifying defects	<u>Assessed Practical</u> Laminate complete part including material preparation, multi-stage laminating and processing, split tooling, inserts, various core materials & vacuum de-bulking	
Friday	<u>Assessed Practical</u> Complete assessed practical, vacuum bagging, autoclave loading & curing		<u>Practical</u> Safe edge parts produced <u>Written test</u> (30 minutes)	<u>Equipment return</u> <u>Reinstate Workshop</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title: Pre-Preg Mould Making

Course Code: DMSC56

Course Fees: £1,150.00 per delegate, plus UK VAT

Structure: 30% theory, 70% practical, 12 delegates maximum, no experience required

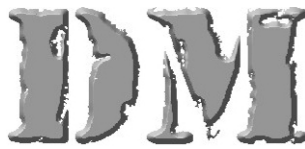
Summary

The course provides comprehensive training, understanding and application of low temperature pre-preg materials to produce composite tooling. Emphasis is on producing mould tools with complex geometry that are self supporting with no distortion.

This course is suitable for anyone involved with processing pre-preg moulds, including pre-preg laminators, technicians, supervisors, engineers & designers.

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 & Safety</u> <u>Theory</u> Introduction to composites theory, matrix, reinforcing & fabric materials	<u>Theory</u> Pre-preg materials Pre-preg processing Low temperature tooling pre-preg <u>Theory, Demo & Practical</u> Pattern checking & preparation Release agents	<u>Theory</u> Production of pre-preg moulds using the tile method <u>Demo & Practical</u> Handling, preparation & application of low temperature pre-preg Lay-up first ply of a single part tool using tiled materials	<u>Theory</u> Vacuum bagging Materials & application methods Leak detection Vacuum debulking <u>Demo & Practical</u> De-bulk first ply of single part tool
Tuesday	<u>Practical</u> Complete lay-up of single part tool including orientated & tiled plies, double curvature, internal corners, draping, vacuum debulks and balancing final ply Vacuum bagging for autoclave curing		<u>Theory, Demo & Practical</u> Low temperature pre-preg curing Temperature & pressure profiles Cure single part mould	<u>Theory</u> Tooling and component design principles Pattern & mould materials Laminate & mould features & stiffening Thermal expansion Spring back & distortion
Wednesday	<u>Demo & Practical</u> Preparation of a two part pattern Fitting pattern split/joint boards, shaped locators and bush locating dowels Release pattern	<u>Theory & Demos</u> Templated, balanced, orientated plies & ply joins for tooling <u>Practical</u> Template plies for first mould half	<u>Demo & Practical</u> Production of first part of a two part pre-preg mould, including application of templated, orientated and balanced plies, fitting drill/bolting bushes, vacuum debulks & cure vacuum bag	
Thursday	<u>Demo & Practical</u> Remove split board and prepare pattern for second stage of multi part tool	<u>Demo & Practical</u> Lay-up second stage of a multi part tool using alternative pre-preg tooling systems, bushes, dowels, vacuum bagging & autoclave curing		<u>Theory, Demo & Practical</u> De-bag & break out moulds Cleaning & assembly of mould tools Post-curing of moulds Tg points
Friday	<u>Theory, Demo & Practical</u> Safe edging, flash removal and surface finishing of moulds Sealing & release moulds produced	<u>Theory, Demo & Practical</u> Tooling modifications Loose tooling Return & nett edge tooling	<u>Practical & Discussion</u> Case studies for tooling and component design <u>Written test</u> (30 minutes)	<u>Equipment return</u> <u>Reinstate Workshop</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title: Trimming of Composite Materials

Course Code: DMSC58

Course Fees: £1,150.00 per delegate, plus UK VAT

Structure: 30% theory, 70% practical, 8 delegates maximum, no experience required

Summary

This course provides comprehensive training, understanding and application of a full range of trimming, finishing and assembly techniques associated with composite parts. Emphasis is on the safe and effective use of a range of hand, power and bench tools applied to a range of matrix, reinforcement and core materials and a range of features.

This course is suitable for anyone involved with trimming, finishing and assembly of composite parts, including 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
Monday	<u>Introduction</u> <u>Equipment issue</u> <u>Health & Safety</u> <u>Theory</u> Introduction to composites theory, materials & processes	<u>Theory</u> Types, uses & control of engineering sketches & drawings <u>Practical</u> Interpreting & extracting information from engineering sketches & drawings	<u>Theory & Demos</u> Identifying materials and processes used for composite parts Safe handling of unfinished parts <u>Theory & Demos</u> Measuring & marking out composite parts	<u>Practical</u> Measure & mark a range of features on a range of composite parts/materials using surface tables, height gauges, scribes, rules & jigs
Tuesday	<u>Theory & Demo</u> Trimming, sanding & finishing overview Cutting & abrasive materials & grades Planning operation sequences	<u>Theory & Demo</u> Safe use of air and electrical power tools Dust generation, control & extraction Defects caused by trimming activities	<u>Theory & Demos</u> Cutting composite materials Edge damage and de-lamination <u>Practical</u> Cut a range of profiles in a range of composite parts/materials using band saws, disc cutters, routers, saws & trim jigs	
Wednesday	<u>Theory & Demos</u> Drilling & boring composite materials Break through, laminate support and back drilling <u>Practical</u> Drill & bore a range of hole features in a range of composite parts/materials including small/large holes, counter sinks, counter bores, inserts, carbide & diamond tips, hand & pillar drills, drill jigs		<u>Theory & Demos</u> Filing & sanding composite materials Edge & surface finishing & resin flash removal <u>Practical</u> Final shaping and surface finishing of a range of features in a range of composite materials using disc sanders, liners, die grinders, belt sanders, orbital sanders & hand pads	
Thursday	<u>Theory, Demos & Practical</u> Cleaning & polishing composite materials using compounds, abrasives & polishers	<u>Theory, Demos & Practical</u> Composite assemblies Adhesive bonding Surface preparation Peel plies Adhesive curing	<u>Theory, Demos & Practical</u> Assembly of fixtures & fittings Clearing of integrated fasteners	<u>Discussion & Practical</u> Inspection, evaluation and review of all activities completed Destructive testing of adhesive joints
Friday	<u>Assessed Practical</u> Fully trim, drill, finish and assemble a range of test components accurately to drawings Including planning operations, selection of correct tools, cutting heads & abrasives, effective techniques & final assembly of the parts			<u>Reinstate Workshop</u> <u>Written test</u> <u>Equipment return</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title: Repair of Composites

Course Code: DMSC59

Course Fees: £1,150.00 per delegate, plus UK VAT

Structure: 30% theory, 70% practical, 8 delegates maximum, no experience required

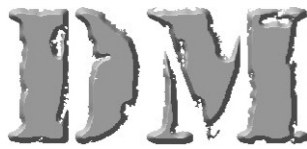
Summary

This course provides comprehensive training, understanding and application of a full range of repair techniques to composite mouldings, from cosmetic through to structural repairs. Emphasis is on understanding failure modes, recognising materials and production process, and correct use of tools, abrasives and dust extraction in order to apply effective repairs.

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
Monday	<u>Introduction</u> <u>Equipment issue</u> <u>Health & Safety</u> <u>Theory</u> Introduction to composites theory, materials & processes	<u>Theory & Discussion</u> Damage detection Repair of composites overview <u>Theory & Discussion</u> Trimming, sanding & finishing Dust generation, control & extraction	<u>Demo</u> Trimming, sanding & finishing techniques Dust generation, control & extraction <u>Theory, Demo & Practical</u> Cosmetic & temporary repairs	<u>Theory, Demo & Practical</u> Wet lay-up laminating Matrix preparation, application, curing & exotherm control Cosmetic gel coat repairs Temporary repairs
Tuesday	<u>Theory & Discussion</u> Failures modes & predicting failure <u>Practical & Discussion</u> Impacts & assessment of damage	<u>Theory, Demo & Practical</u> Minor and major structural laminate repairs Preparation of tapered/scarf surfaces Removal of temporary repair & preparation of single sided repair	<u>Theory, Demo & Practical</u> Temporary backing structures Preparation of double sided repair	<u>Theory, Demo & Practical</u> Process & material matching & preparation Wet lay up single & double sided, minor & major structural repairs
Wednesday	<u>Theory & Demo</u> Structural sandwich panel repairs Core preparation & splicing	<u>Practical</u> Preparation of type A, B & C structural sandwich panel repairs in infused & pre-preg panels	<u>Theory & Demo</u> Vacuum bagging & materials Caul plates <u>Demo & Practical</u> Wet lay-up vacuum bagged repairs	<u>Demo & Practical</u> Laminate pre-preg repairs <u>Theory & Practical</u> Curing pre-preg repairs Temperature & pressure profiles Tg points
Thursday	<u>Theory, Demo & Practical</u> Mould release Production of a repair splash / temporary mould	<u>Theory, Demo & Practical</u> Pre-cured graft repairs Graft & panel preparation Bonding of graft	<u>Discussion & Practical</u> Inspection, evaluation and review of repairs completed Destructive testing of repairs	<u>Assessed Practical</u> Assessment of damage Complete a repair strategy Preparation of repairs
Friday	<u>Assessed Practical</u> Completion of repairs to a range of test piece components, including step sanded surface preparation, identification of laminate plies, preparation & application of orientated materials, vacuum bagging, curing, surface finishing, blending and polishing			<u>Reinstate Workshop</u> <u>Written test</u> <u>Equipment return</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title: Advanced Composite Repair Techniques

Course Code: DMSC59A

Course Fees: £1,150.00 per delegate, plus UK VAT

Structure: 25% theory, 75% practical, 8 delegates maximum

Pre-requisite: Prior completion of course DMSC59

Summary

This progression course addresses more advanced composite repair techniques and issues applied to a range of more structural and extensive repairs.

Practical work is progressed from the use of dust extraction benches through to on-tool extraction and effective localised extraction on large structures.

Preparation of the repair surface is progressed from manual techniques through to the use of routing jigs to address tapered, step sanded and sandwich panel repairs.

Laminate and sandwich panel repairs are progressed to the lay-up and use of pre-made pre-preg and core repair packs and alternative curing methods. Graft/pre-cured repairs are progressed to sandwich panels.

Emphasis is on refinement of the repair techniques and methodologies and recording of repair operations.

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

This course is currently under development and full details will be released in October 2011. Please contact us directly to register your interest in this course and we will send you information as soon as it is available.



dark matter composites ltd

Course Title: Producing Your Own Composite Parts

Course Code: DMSC60

Course Fees: £990.00 per delegate, plus UK VAT

Structure: 25% theory, 75% practical, 8 delegates maximum, no experience required

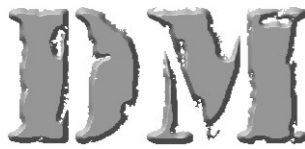
Summary

This course covers producing a part from a sketch through to a pattern, mould and component using a range of cost effective methods and materials to achieve good results. It includes how to set up a basic workshop environment for the processes and cost effective investment.

This course is suitable for enthusiasts and small companies who want to make their own composite parts, and want to know how to do so under expert guidance.

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 & Safety</u> <u>Theory</u> Introduction to composites theory, materials & processes	<u>Theory & Demos</u> Tooling and component design principles Pattern making & materials Mould making & materials Laminate features	<u>Demo & Practical</u> Production of a pattern using tooling board, including shaping, filling, surfacing, blocking up & final surface finishing using a range of bench tools and hand tools	
Tuesday	<u>Theory, Demo & Practical</u> Pattern preparation & release agents Surface seal & release patterns	<u>Theory & Demos</u> Wet lay-up laminating Wet lay-up calculations Material storage, dispensing, preparation & application Fume & exotherm control	<u>Practical</u> Wet lay-up laminating of a mould including material preparation, dispensing, gel coating, wetting out & consolidation of glass fibre chopped strand matt, brush & roller application methods	
Wednesday	<u>Theory, Demo & Practical</u> Resin infusion laminating Trial panels & evaluation Designing infusion layout for parts Resin calculations	<u>Practical</u> Laminating a part for resin flow infused part including gel coating, application of cosmetic carbon fabric & structural glass fabric, application of distribution & infusion media	<u>Theory, Demo & Practical</u> Vacuum bagging & materials Surface bagging of infusion parts Leak detection <u>Practical</u> Resin infusion of parts	<u>Demo & Practical</u> Break out wet lay-up moulds <u>Theory, Demo & Practical</u> Trimming & finishing composites Trim & post-cure wet lay-up moulds
Thursday	<u>Practical</u> Surface finish & release wet lay-up moulds for use <u>Theory</u> Pre-preg laminating	<u>Theory, Demo & Practical</u> Pre-preg life, storing, defrosting, templating, ply orientation, nesting & kitting	<u>Demo & Practical</u> Pre-preg application & laminating of first skins cosmetic skins of a carbon fibre part	<u>Theory, Demo & Practical</u> Sandwich structures Core materials Core preparation
Friday	<u>Practical</u> Laminate structural core & closing skins of a pre-preg part <u>Demo & Practical</u> Envelope vacuum bagging of pre-preg part	<u>Theory & Practical</u> Curing pre-preg parts Basic ovens <u>Practical</u> Trim & finish composite parts produced	<u>Practical & Discussion</u> Inspection of parts & identifying defects <u>Theory & Discussion</u> Delegate case studies & guidance	<u>Reinstate Workshop</u> <u>Written test</u> <u>Equipment return</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title:	Composite Materials & Processes for Engineers & Designers
Course Code:	DMSC61
Course Fees:	£990.00 per delegate, plus UK VAT
Structure:	60% theory, 40% practical, 12 delegates maximum, no experience required
Pre-requisite:	This is a high end course and delegates will need to have a sound technical background in materials, engineering or design, or have relevant experience

Summary

This is our most intensive and in-depth course covering current composite materials and processes. It provides an honest and open insight into working with composite materials. The sessions are informative, interactive and thought provoking. The key focus is on component design principles, production considerations and controls to form an intuitive and creative approach to composite engineering.

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 & Safety</u> Measures & Legislation <u>Theory & Discussion</u> Composites history Composites theory	<u>Theory & Discussion</u> Matrix materials Reinforcing materials Fabric types Laminate theory and ply orientation Lay-up specifications	<u>Theory & Discussion</u> Sandwich structures Core materials Processing composite materials <u>Theory & Practical</u> Tooling care and preparation Release agents	<u>Theory & Guided Practical</u> Wet lay up laminating Design a laminate to suit a load requirement Production of a wet lay-up part including calculations, gel coat & laminate application
Tuesday	<u>Theory</u> Resin flow & film infusion laminating External & internal media with vacuum bagged & closed moulding <u>Demo & Practical</u> Trial panels & evaluation	<u>Theory & Discussion</u> Vacuum bagging Bagging materials & methods Leak detection <u>Guided Practical</u> Design of distribution media for resin flow infused part	<u>Guided Practical</u> Gel coating, application of fabrics, external distribution and infusion media, surface vacuum bagging and leak detection of resin flow infusion part	<u>Practical & Discussion</u> Resin calculations Predicting flow fronts & infusion times Final resin flow infusion and evaluation of parts <u>Demonstration</u> Resin film infusion laminating
Wednesday	<u>Theory, Demo & Guided Practical</u> Pre-preg laminating Material templating, ply orientation, nesting & kitting Design a laminate to suit a load requirement	<u>Theory</u> Processing & preparation of core materials <u>Guided Practical</u> Pre-preg laminating of part with sandwich structure	<u>Demo & Practical</u> Envelope vacuum bag & cure pre-preg part <u>Theory</u> Matrix curing & post-curing, temperature & pressure profiles Tg points	<u>Theory & Videos</u> Resin transfer moulding Hot press moulding Filament winding Pultrusion Automated tape laying & fibre placement
Thursday	<u>Theory & Discussion</u> Causes of and identifying defects Manual & NDT inspection Production & quality controls In-service monitoring	<u>Theory, Demos & Practical</u> Breakout parts produced Trimming & finishing composites	<u>Theory & discussion</u> Adhesion & bonding methods <u>Theory & Demos</u> Failure modes Re-work & repair principles Repair techniques	<u>Guided Practical</u> GRP and pre-preg repairs including removal of damage, preparation of the repair surface & laminating of repairs <u>Reinstate Workshop</u>
Friday	<u>Theory & Discussion</u> Tooling and component design principles, types materials & life Re-cycling & environmental issues	<u>Practical & Discussion</u> Case studies for tooling and component designs & problem solving	<u>Theory & Discussion</u> Laminate calculations Finite element analysis Testing composites On-line resources	<u>Written test (1hour)</u> <u>Equipment return</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title: Laminate & Tooling Design

Course Code: DMSC62

Course Fees: £990.00 per delegate, plus UK VAT

Structure: 25% theory, 75% practical, 12 delegates maximum

Pre-requisite: Prior completion of course DMSC54, DMSC56 or DMSC61

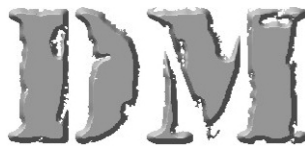
Summary

Delegates who have completed any of the pre-requisite courses will fully appreciate that this course is aimed at those who need to fully develop an integrated approach to production, laminate and tooling design. Emphasis is on the high end and efficient solutions that can be achieved with a range of materials and processes.

The course is aimed at lead hands, supervisors, engineers, designers, researchers, R&D & management.

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>Theory & Demos</u> Refresh of composite theory, pre-preg materials & processes	<u>Theory & Discussion</u> Orientation standards, part & mould side definitions & handing issues Balanced & unbalanced laminates Distortion & springback	<u>Practical</u> Design a range of laminates using various materials to address balanced, unbalanced, semi-isotropic, distorted, undistorted, springback & handed issues	<u>Practical</u> Laminate pre-preg materials to the designs completed Identify further problems due to material application Vacuum bag & cure parts
Tuesday	<u>Theory & Discussion</u> Ply datums & placement Draping, distortion, deviation & sequences Joins, splices, darts, discontinuities & sequences Production of layup manuals	<u>Practical</u> Design of laminates over a range of shapes/features to address datums, placement, draping, distortion, deviation, joins, darts, discontinuities, & laminate sequence issues	<u>Discussion</u> Review of laminate designs and potential issues <u>Practical</u> Prepare pre-preg plies to the laminate designs completed	<u>Practical</u> Laminate pre-preg materials to the designs completed Identify, record & solve problems encountered due to material application Vacuum bag & cure parts
Wednesday	<u>Theory & Discussion</u> Metal verses composite tooling & thermal expansion issues Tooling & component features & design principles Tiled and templated laminating methods for composite tooling	<u>Practical</u> Design of a range of composite mould tooling over a range of shapes/features to address both laminate and production requirements	<u>Discussion</u> Review of mould tooling designs and potential issues <u>Guided Practical</u> Preparation of patterns including fitting split/joint boards, shaped locators & releasing	<u>Practical</u> Prepare pre-preg tooling materials to the tooling designs completed Laminating of 1 st stage of the pre-preg mould tool Vacuum bag & cure the mould tool
Thursday	<u>Guided Practical</u> Remove vacuum bags & split boards Prepare pattern/mould tool and materials for 2 nd stage of laminating	<u>Practical</u> Laminating of 2 nd stage of the pre-preg mould tool Vacuum bag & cure the mould tool	<u>Guided Practical</u> Breakout & prepare mould tooling for use Prepare pre-preg plies to laminate the part	<u>Practical</u> Laminate parts to the designs completed Identify, record & solve problems encountered Vacuum bag & cure parts
Friday	<u>Theory & Discussion</u> Structural laminate & ply loading requirements	<u>Practical</u> Design of mould split lines, laminate & ply sequence to meet structural requirements Full material preparation & application for structural pre-preg part, vacuum bag & cure Compilation of detailed lay-up manual in order to reproduce the parts consistently		<u>Written Test</u> <u>Reinstate Workshop</u> <u>Equipment return</u> <u>Summary / Feedback</u>



dark matter composites ltd

Course Title: Wind Turbine Blade Construction, Maintenance & Repair

Course Code: DMSC63

Course Fees: £990.00 per delegate, plus UK VAT

Structure: 25% theory, 75% practical, 8 delegates maximum, no experience required

Summary

This course provides an insight into the current and future wind turbine blade designs, materials, processes and constructions. In doing so, it allows for more informed approach to production, maintenance and repair activities.

This course is suitable for key personnel involved with the production, installation, operation and maintenance activities associated with wind turbine blades, including lead hands, supervisors and engineers.

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 & Safety</u> Measures & Legislation <u>Theory & Discussion</u> Composites theory	<u>Theory & Discussion</u> Matrix materials Reinforcing materials Fabric types Laminate theory and ply orientation Sandwich structures Core materials	<u>Theory & Discussion</u> Summary of composite processing methods <u>Theory & Discussion</u> Typical blade sections, associated construction & processing methods	<u>Theory & Discussion</u> Engineering principles applicable to blade design Aerodynamic principles of blade design Principles of laminate design to blades Re-cycling & environmental issues
Tuesday	<u>Theory & Demo</u> Resin infusion laminating <u>Theory, Demo & Practical</u> Tooling care and preparation Release agents	<u>Practical</u> Gel coating application, Application of fabrics, core materials distribution & infusion media	<u>Theory, Demo & Practical</u> Vacuum bagging Bagging materials & methods Surface vacuum bagging for resin infusion of blade section	<u>Practical & Discussion</u> Staged resin infusion and evaluation of blade sections
Wednesday	<u>Theory</u> Pre-preg laminating Automated tape laying and fibre placement Storing, handling material preparation	<u>Theory, Demo & Practical</u> Ply orientation, nesting & kitting Material application Prepreg laminating of blade section with core materials		<u>Theory, Demo & Practical</u> Vacuum bagging of pre-preg blade section Matrix curing & post-curing
Thursday	<u>Theory</u> Trimming & finishing composites <u>Demo & Practical</u> Breakout blade sections Trimming & finishing of blade sections	<u>Theory</u> Adhesion & bonding <u>Demo & Practical</u> Bond blade sections together	<u>Theory & Demos</u> Failure modes Re-work & repair principles Repair techniques	<u>Theory, Demo & Practical</u> Vacuum bagged wet lay up & pre-preg repairs Damage removal Preparation of the repair surface
Friday	<u>Demo & Practical</u> Completion of repairs including material application, vacuum bagging & heat mat curing	<u>Theory & Discussion</u> Causes of and identifying defects Manual & NDT inspection Production & quality controls	<u>Theory & Discussion</u> In-service monitoring & access Blade maintenance & inspection Reporting of blade damage	<u>Reinstate Workshop</u> <u>Written test</u> <u>Equipment return</u> <u>Summary / Feedback</u>



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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

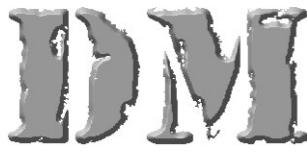
Payment

- 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 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.co.uk
Unit 8 Redbourn Industrial Estate, High Street, Redbourn, Hertfordshire, AL3 7LG, UK
Registered in England & Wales No: 5395870



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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.
6. All course fees are per delegate per course and include: provision of all materials, tools and protective clothing (except footwear, see below); lunch 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 and subject to UK VAT at the current rate of 20%.
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. Each transferred booking, will be subject to an administration and materials charge equivalent to 20% of the course fee.
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
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. DMC will treat any information about delegates and/or any internal business information of the Customer/Delegate as confidential.
21. The validity construction and performance of these conditions shall be governed by the Laws of England.