Mangrove

EXECUTIVE BROCHURE / POLYMER JOINING EXPERTS

Plastic welding training & expert consultancy.

Stop losing time to weak joints and failed validations. Mangrove International helps you choose the right process, troubleshoot defects, and build lasting welding capability inside your team.

01 — WHAT WE SOLVE

Uncertainty in process selection, failed validations, and inconsistent weld quality cost time and money.

We help you choose the right process, troubleshoot defects, and train your team to manage plastic welding internally.

CHOOSE	TROUBLESHOOT	TRAIN
The right process for your parts	Defects diagnosed and corrected	Capability built into your team

02 — THREE ROUTES

Expert Support & Skill Transfer

01	**Expert Consultancy**	Hands-on support for process selection, parameter development, and critical failure analysis.
02	**In-House & Online Training**	Structured learning paths designed to build real, lasting capability in advanced plastic welding.
03	**Startup Mentorship**	Deep polymer joining expertise for early-stage hardware — structured around equity, milestones, or whatever fits your runway.

EXPERT CONSULTANCY

Solve complex welding challenges.

Get direct access to specialized expertise when your team is stuck. We provide definitive answers for process, tooling, and validation.

FIVE FRONTS WHERE THE RIGHT EXPERTISE CHANGES THE OUTCOME

01	**Troubleshooting & Failure Analysis**	Rapid root-cause analysis and correction for weak welds, flash, or aesthetic defects — engineered corrections, not symptomatic fixes.
02	**Process Selection**	Match your material and part design with the most reliable welding technology — ultrasonic, laser, vibration, hot-plate, or spin.
03	**Parameter Development**	Establish robust processing windows for maximum weld strength and repeatability, built on Design of Experiments and statistical analysis.
04	**Validation & Testing**	Define testing protocols that prove joint integrity and satisfy strict industry standards — IQ/OQ/PQ, burst, tensile, and leak testing.
05	**Design for Weldability**	Engineer parts correctly from the concept phase — CAD-stage joint geometry review that eliminates downstream defects.

Moving from prototype to production?

Scale-up support smooths the transition from early prototype welding to high-volume production.

IN-HOUSE & ONLINE TRAINING

Build internal welding capability.

Move from trial-and-error to structured capability. Equip your engineers with the exact skills to design and validate reliable plastic welds.

THE CATALOG — COURSES, BY DEPTH

Fundamentals of Plastic Welding	A complete grounding in polymer joining principles and equipment operation.	NEW ENGINEERS & QUALITY TEAMS
Ultrasonic Masterclass	Deep-dive instruction on optimizing and troubleshooting ultrasonic weld parameters.	PROCESS ENGINEERS & TOOLING DESIGNERS
Laser Welding for MedTech	Specialized training on precision laser welding for critical medical components.	MEDICAL DEVICE R&D & MANUFACTURING LEADERS
Weld Quality & NDT	Practical methods for inspecting, testing, and validating plastic joint integrity.	QUALITY ASSURANCE & COMPLIANCE TEAMS

Custom In-Plant Training

Tailored, hands-on instruction using your specific parts and production equipment.

HANDS-ON · YOUR PARTS, YOUR EQUIPMENT

Structured Online Paths

Robust remote learning frameworks that build real capability without pulling your team off the production floor.

REMOTE · NO FLOOR DISRUPTION

STARTUP MENTORSHIP

Senior welding expertise, on startup terms.

Early-stage hardware lives or dies on whether the joints hold. Get direct access to deep polymer joining expertise — structured around equity, milestones, or whatever fits a young company's reality.

HOW WE ENGAGE — FLEXIBLE BY DESIGN

01	**Equity Exchange**	Trade a measured slice of equity for senior welding expertise when cash is the real constraint.
02	**Performance-Based**	Engagements tied to milestones, so you're paying as the work moves your product forward.
03	**Hands-On Mentorship**	Direct, ongoing access to guidance as your design, process, and team mature.

WHERE WE HELP — FROM FIRST WELD TO FIRST PRODUCTION RUN

- ✓ Selecting the right joining process for your prototype
- ✓ Developing parameters that survive the jump to volume
- ✓ Designing parts that are actually weldable
- ✓ Diagnosing failures before they reach a customer
- ✓ Getting ready for validation and your first production run
- ✓ Building the in-house know-how to keep going without us

DOCTORATE

PhD, Polymer Engineering

EXPERIENCE

20+ years in the field

TRUSTED

By major industries

EXPERTISE

Global polymer welding

PRINCIPAL CONSULTANT

Meet Miranda Marcus, PhD

One of the few global experts in polymer joining, dedicated to solving your toughest weld failures.

Miranda Marcus works entirely at the difficult edge of polymer joining — where a weld either holds under scrutiny or it doesn't. Her work spans the full arc: choosing the right process, developing robust parameters, diagnosing failures, and validating that the result meets the standard.

What sets the practice apart is the translation. She turns complex joining science — ultrasonic, laser, and beyond — into practical, repeatable capability your engineers can own, rather than recommendations they can't act on.

PUBLISHED RESEARCH & RECORDED SESSIONS ON PROCESS SELECTION, WELD FAILURE ANALYSIS, AND VALIDATION — MANGROVE-INTL.COM

Mangrove

BEGIN

Stop guessing on plastic welds.

Get the expert insight you need to fix your production and upskill your team. Let's discuss your current challenge.

BOOK A 20-MINUTE DISCOVERY CALL

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MANGROVE INTERNATIONAL SUNBURY, OHIO, USA MIRANDA@MANGROVE-INTL.COM