Welcome to

Advanced Textiles EXPO®

ORGANIZED BY ATA



Industrial Fabric Welding Solutions for Marine, Truck Tarpaulins and Tents Markets

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Before we turn on the welder, let's understand what the machine is actually trying to accomplish.

Fundamentals first → live welding demonstration



Start with the material — not the machine

The first question is whether the surfaces are actually weldable and compatible.

PVC-coated fabrics

Common across tarps, covers, awnings and many flexible fabricated products.

TPU / PU-coated

Used in specialty flexible products where coating chemistry and construction matter.

PE / PP systems

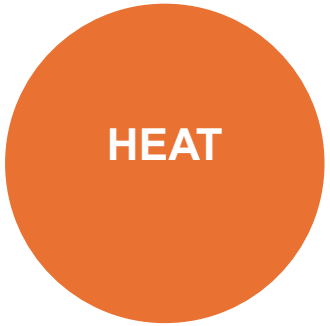
Used in selected covers, liners and industrial textile applications.

Thermoplastics soften with heat and can be joined when compatible mating surfaces are brought together under controlled conditions.

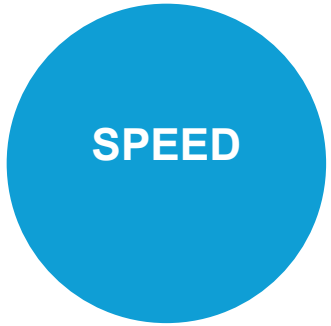


What makes a thermal weld?

Heat the surfaces • bring them together • consolidate the joint



Soften the mating surfaces. With hot air, temperature and airflow both affect heat input.



Controls dwell time — how long the material sees the heat.



Brings the softened surfaces into intimate contact and consolidates the seam.

A repeatable weld is a balance — change one variable and the others may need to change.

Hot-air welding: temperature is only part of the story

Heat delivery is a system.

TEMPERATURE

How hot the delivered air is.

AIRFLOW

How much heated air reaches the weld zone.

NOZZLE POSITION

Where and how evenly the heat is delivered.

TRAVEL SPEED

How long the material is exposed to heat.

Copying someone else's temperature setting is only a starting point.



Two common ways to deliver heat

Both can make excellent welds when matched to the material and process.

NON-CONTACT
HOT AIR

Heated air is directed between the layers.

- No heated tool touches the coating
- Fast adjustment when materials or jobs change
- Temperature and airflow are process controls
- Useful across many coated-fabric applications

CONTACT HEATING
WEDGE

A heated surface transfers energy by direct contact.

- Efficient heat transfer
- Stable heating once established
- Can suit some thicker or difficult materials
- Contact surfaces require condition and cleanliness checks

The heating method does not replace good setup, testing or process control.



Preparation sets the weld up for success

Control the basics before touching the settings.

- Clean weld zone — remove dirt, oil, dust, moisture and contamination.
- Flat and aligned material — avoid wrinkles or tension fighting the overlap.
- Consistent overlap — maintain the seam geometry needed for the product.
- Test first — use scrap from the actual material whenever possible.

Good setup removes variables before troubleshooting begins.

Find the welding window

The right recipe sits between not enough energy and too much energy.

TOO COLD / TOO FAST

Poor bond
Easy peel
Little surface interaction

GOOD WINDOW

Uniform bond
Consistent appearance
Strong, repeatable seam

TOO HOT / TOO SLOW

Distortion
Gloss or color change
Coating damage

Adjust one variable at a time → make a sample → inspect → test → save the working recipe.



Verify the weld — then make it repeatable

A seam can look good and still be weak.

1. **LOOK** — Straight seam • no skips • no obvious heat damage
2. **FEEL** — Consistent edge and pressure track
3. **PEEL / TEST** — Try to separate the layers and observe the failure
4. **REPEAT** — Confirm the process is stable across more than one sample

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Repeatability comes from controlling setup + recording the working recipe + rechecking when the material or environment changes.



Thermally welded vs. sewn seams

The goal is to recognize where welding provides a production benefit—benefiting production times, product longevity, and overall performance.

THERMALLY WELDED

Compatible thermoplastic surfaces are fused into a continuous seam.

- No needle holes through the weld zone
- No thread in the welded joint
- Continuous bonded seam
- Machine settings can be recorded and repeated
- Can reduce some secondary sealing operations

TRADITIONALLY SEWN

Materials are mechanically joined with thread and needle penetration.

- Familiar and flexible fabrication method
- Works with materials that cannot be thermally welded
- Useful for assemblies where stitching is preferred
- Thread, stitch pattern and needle holes become part of seam design

The right joining method depends on the material, product design, performance requirement and production process.

Where welding can change production

Look for repeatable seam operations where a continuous thermoplastic bond can replace or complement stitching.

MARINE

Covers and enclosures
Long panel seams
Hems and edge work
Reinforcement patches
Water-management details

TRUCK TARPS

Long straight seams
Panel joining
Hems and edges
Reinforcement strips
Attachment details

TENTS / AWNINGS

Panel seams
Hems
Reinforcement areas
Edges and overlaps
Weather-exposed details

Potential production benefits

Fewer needle penetrations • repeatable machine-controlled settings • continuous seams • opportunities to reduce secondary sealing steps



Equipment used for today’s demonstration

Leister UNIPLAN 510 — portable automatic hot-air welding

As we move into the live demonstration, watch the same process variables we have discussed throughout this session:

TEMPERATURE	Controls air temperature
AIRFLOW	Adjusts the volume of heated air
SPEED	Controls dwell time along the seam
NOZZLE / PRESSURE	Controls heat placement and seam consolidation

UNIPLAN 510

Automatic hot-air welder • adjustable airflow • digital HMI • 1–16 m/min (3.28–52.49 ft/min)



Now let’s make a weld

Watch the fundamentals become a repeatable process.



Material preparation

Machine / nozzle setup

Heat + airflow

Travel speed + pressure

Inspection + peel check

On the UNIPLAN 510, watch how temperature, airflow, travel speed, nozzle position and pressure work together to create the welding window.

Heat the surfaces. Bring them together. Apply pressure. Let the joint consolidate. Then verify the weld.

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Thank you for attending

Maya Innis
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we know how

See you next year!

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