dr sails

FLEXIBLE UNDERWATER FAST STRUCTURAL

Gel time: 5min @ 75F

Fixture time: 9min @ 75F

Curing time: 22min @ 75F

Durometer: (ASTM D2240) 63 Shore A

Shear strength: 8 to 20 MPa

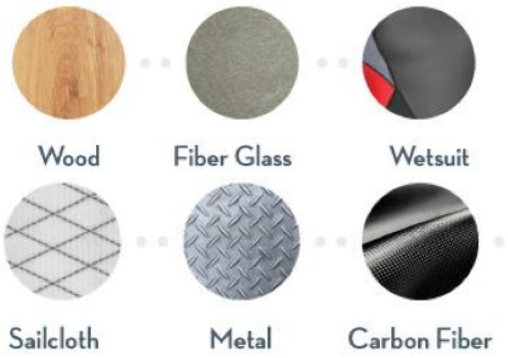
Ressonance frequency: up to 40Hz

Flexural Modulus: 108% @ elastic

Working temperature: 16F to 140F

Degradation temperature: 725F

Shelf life: 36 months @ 75F



SAIL REPAIR MANUAL

The Adhesives Technology

SAILING TECHNOLOGIES
R+D GROUP

Sail Repair Steps:

- Step 0: Identify target area and breakage type.
  - Target area: Body of the sail, Head points and Clews, Luff, Leech, Foot, Pocket and Battens.
  - Breakage type: tearing, detachment, worn fabric, and broken supports (head points and clews, leech, foot, and luff).

- Step 1: Patching process.
  - Identify patch type:
    - Size up overlap area:
      - Boat length (1cm of overlap for every 10 ft. of boat length) multiplied by the breakage length, plus 2cm on each side.
      - Breakage type: tearing (double overlap) / loosed or ripped fabric (single overlap).
      - Sail type: in high winds (+2 mm/cm overlap) / in slow winds (+0mm) from the breakage's symmetrical axis.
      - Breakage area: Body of the sail (+0mm) / leech (5mm) / foot and luff (2mm) from the breakage's symmetrical axis.
    - Choose patching material:

Target area	Area type	Patch type	Cloth type	Dr. Sails thickness
Head points / clews	Critical	Double	Same Substrate	n/a
Luff / Foot	Not critical	Simple	Flexible	Minimum *
Pocket / Battens	Critical	Simple	Flexible	Minimum*
Leech	Critical	Simple	Same Substrate	n/a
Sail	Not critical	Double	Same Substrate	n/a

* To ensure desired flexibility, the glue film thickness should be under 0.8mm. The ideal thickness would be 0.3mm.

  - Outline the patching area on the cloth.
  - Cut the area's perimeter and round the corners.

- Step 2: Patch cleaning and setup.

- Step 3: DrSails preparation.
  - Open the product container and balance out the components.

- Step 4: Apply DrSails directly over the patch of cloth.
  - Apply following a zigzag pattern at an angle of ±45° and a width equivalent to half the size of the patch.
  - Spread DrSails uniformly over the patch cloth using a spreader (or similar device).

- Step 5: Patch placement and sticking (see matrix below with examples).

Breakage type		Sail	Headpoint / Clew	Leech	Luff	Foot	Overlap
Tear	1 axis	Symmetry between patch and tearing	Symmetry between patch and tearing	Headpoint/Clew wrapping over tearing axis	Symmetry between patch and tearing	Symmetry between patch and tearing	Symmetry between patch and tearing
	2 axes	Symmetry between patch and each tearing axis	Symmetry between patch and each tearing axis	Headpoint/Clew wrapping over each tearing axis	Symmetry between patch and each tearing axis	Symmetry between patch and each tearing axis	Symmetry between patch and each tearing axis
Ripped	1 axis	Symmetry between patch and breakage	Symmetry between patch and breakage	Headpoint/Clew wrapping over tearing axis	Symmetry between patch and breakage	Symmetry between patch and breakage	Symmetry between patch and breakage
	2 axes	Symmetry between patch and each breakage axis	Symmetry between patch and each breakage axis	Headpoint/Clew wrapping over tearing axis	Symmetry between patch and each breakage axis	Symmetry between patch and each breakage axis	Symmetry between patch and each breakage axis
Detachment		Symmetry between patch and detached area	Symmetry between patch and detached area	Symmetry between patch and detached area	Symmetry between patch and detached area	Symmetry between patch and detached area	Symmetry between patch and detached area
Worn fabric		Symmetry between patch and worn fabric	Symmetry between patch and worn fabric	Symmetry between patch and worn fabric	Symmetry between patch and worn fabric	Symmetry between patch and worn fabric	Symmetry between patch and worn fabric

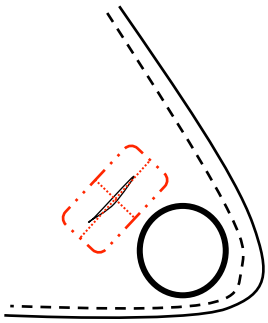
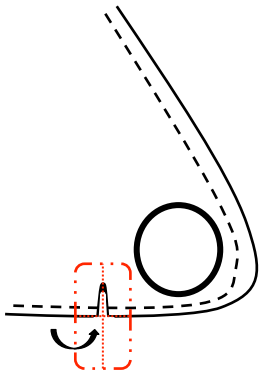
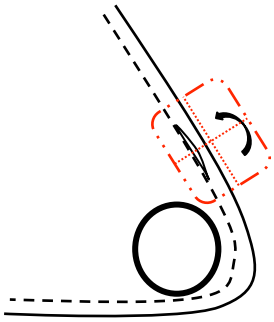
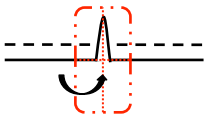
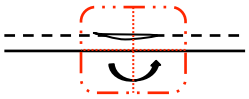
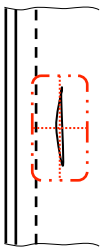
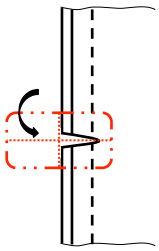
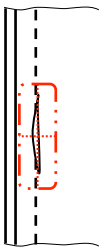
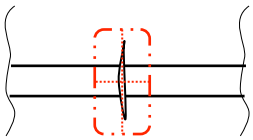
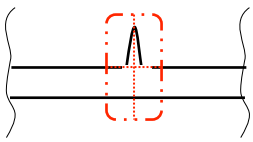
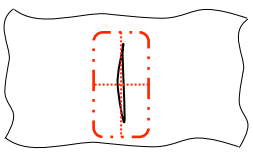
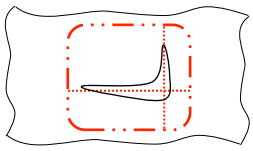
- Step 6: Apply direct pressure over the patch.
  - Ragged cloth: Apply pressure with a cloth (or similar material).
  - Smooth cloth: Apply pressure using a spreader to remove DrSails excess. Note: any excess should be placed on the paper tape.

- Step 7: Strengthen the patching borders.

Sail Repair Matrix Tips:

Sail position/condition		Patching area cleaning	Use Nozzle	Patching area setup	Time application delay	Application time	Pressure type	Overlap extra supports
Hoisted	Wet	n/a	No	n/a	5 minutes	8 minutes	Hands pressure	Perimeter closure with DrSails
	Dry	Acetone and cloth	No	Paper tape on the overlap border	5 minutes	8 minutes	Hands pressure	Dacron ® self-adhesive (round borders)
Over the deck	Wet	Acetone and cloth	Yes	n/a	0 minutes	15 minutes	Weight pressure	Perimeter closure with DrSails
	Dry	Acetone and cloth	Yes	Paper tape on the overlap border	0 minutes	15 minutes	Weight pressure	Dacron ® self-adhesive (round borders)

Sail Repair Matrix Graphs:

	Tearing / Ripped	Ripped	Detachment / Worn out
Clew (e.g. outhaul)			
Leech / Luff			
Foot			
Overlap			
Body of the sail