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ARLON Silicones Technology

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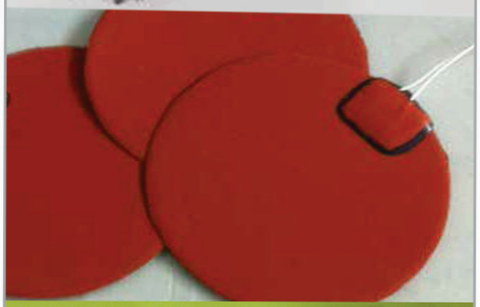


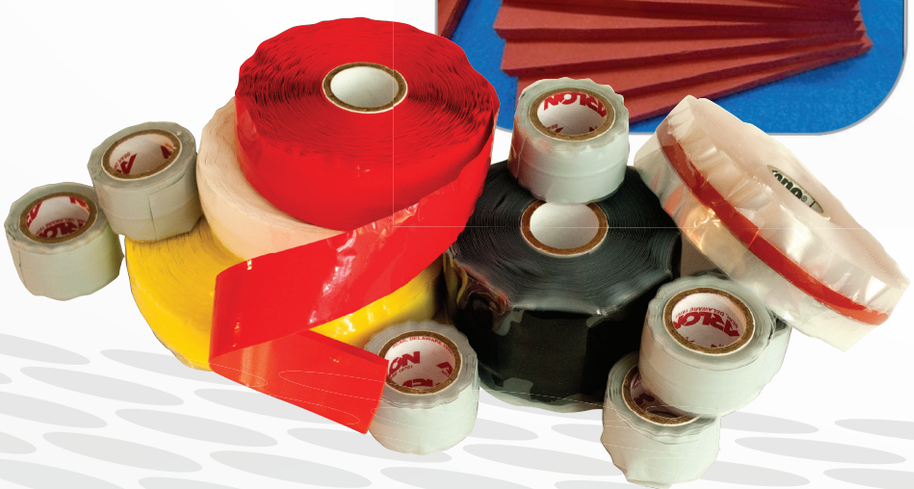

For over 60 years, Arlon has been the industry leader in innovation for calendered and extruded silicone, creating over 6,000 products for a variety of applications and industries. Customers continue to look to Arlon for solutions to their complex issues.

## Self-Fusing Silicone Tape

ARLON® and MOX-TAPE® products are trusted brands of silicone self-fusing tape. With over 30 years of in-service use and over 20 specification qualifications, these tapes are used in industrial, military and aerospace applications.

ARLON and MOX-TAPE tapes bond irreversibly to themselves to provide an insulating barrier that is resistant to moisture, oxygen, ozone and corona over a wide temperature range.

With a wide variety of customization options, including unreinforced, reinforced, rectangular and triangular profiles the ARLON and MOX-TAPE silicone self-fusing tapes can be adapted to a variety of requirements.



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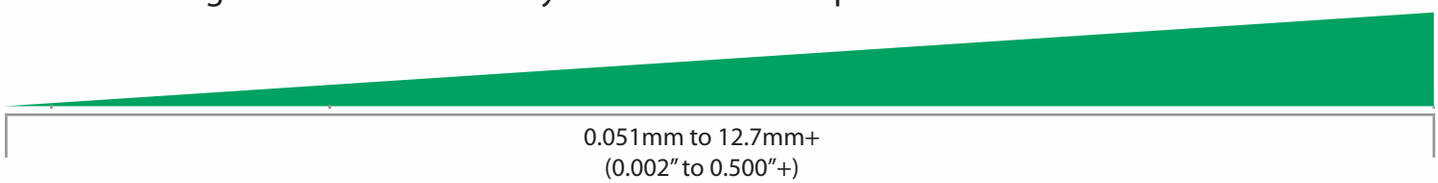
# Precision-Calendered Products

From 0.05mm (0.002") to over 12.7mm (0.5" ) thick, Rogers' expertise in calendering silicone onto a variety of substrates is unparalleled.




Rogers manufactures simple composites of solid and cellular silicone rubber by combining cured and uncured layers with fabrics, films, and foils.

### Flexible Heater Substrates

The global leader in flexible heater substrates, including silicone and polyimide, these UL-certified materials are available in a range of thicknesses, configurations, and cure states to meet the demands of both wire-wound and etched-foil constructions.

### Flexible Heater Thermal Insulation

A robust thermal insulation product specifically designed to work with the ARLON flexible heater substrates. Allowing excellent adhesion in demanding applications and increased design flexibility, these silicone sponge blankets provide thermal insulation for whatever your design needs require in your flexible heater construction.

### Coil Insulation

A leading supplier of coil insulation for primary field coil, the numerous specification approvals reflect a commitment to quality and reliability.

### UltraPad® Press Pads

The material of choice for heat press operations, ARLON UltraPad Press Pads deliver unsurpassed savings in running costs. Expert formulation and construction provide exceptional longevity compared to disposable products and other silicone press pads on the market.

### Thermabond® Adhesives

Silicone based thermoset adhesives deliver improved reliability by decoupling stress created by mismatched coefficients of thermal expansion. Used in mission-critical military and aerospace applications, Thermabond adhesives are the choice of design engineers for the most demanding applications.

### Secure® Thermal Management Materials

Design-changing technology combines thermal conductivity and fastening of sensitive electronic components to a substrate. The unique Secure technology provides design engineers greater flexibility in designing smaller and hotter boards.

Product Sell Sheet

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# ARLON® Self-Fusing Tapes for Animal Damage Mitigation on Utility Equipment

## KEY BENEFITS:

- UL 94 V-0 (Black color only)
  - Highest flame resistant tape in the market
- Two year shelf life
- Excellent environmental resistance
- Electrically insulating
  - 12.5 KV phase to ground at 30 mil (0.76 mm )
- Only adheres to itself
- Removes cleanly and easily

## PRODUCT OFFERING:

- Thickness ranging from 10 to 60 mil (0.25 to 1.52 mm)
- Widths ranging from 0.5 to 36 inches (12.7 to 914.4 mm)
- Colors: Any (black and gray are common)

ARLON® silicone self-fusing tape is ideal for insulating and protecting various utility equipment components such as electrical connectors, expansion joints, flexible cables and harnesses from damage caused by wildlife animals.

Animal contact with energized utility equipment is a major source of equipment damage, power outages and wild fires. The equipment damage from animal contact can be very costly while the power outages can lead to significant economic and financial burdens for the affected communities.

ARLON tapes are produced from specially formulated silicone rubber. They bond irreversibly to provide an insulative barrier that is resistant to moisture, oxygen, ozone, UV and corona over a wide temperature range -60°F up to 400°F (-51°C up to 204°C). These products provide superior electrical insulation with a dielectric strength of 400 VPM minimum at 356°F (180°C).

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Product Data Sheet

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# FR (Flame Resistant) Self-Fusing Silicone Tapes

Rogers offers a fire-resistant self-fusing tape (SFT) in **BLACK**.

- Composed of UL V-0 recognized silicone rubber compound
- Available in four thicknesses: 10, 20, 30, & 40 mil
- Meets the UL Recognized A-A-59163A specification
- Reach and RoHS compliant
- Electrically insulating
- Fuses only to itself
- Chemically activated upon stretching

**Typical Physical Properties**

| | Units | Fire-Resistant Self Fusing Tapes | | | |
|---|---|---|---|---|---|
| Product Name | | 910-10BxxFR-P1 | 920-10BxxFR-P1 | 930-10BxxFR-P1 | 940-10BxxFR-P1 |
| Thickness | mm (mil) | 0.25 (10) | 0.51 (20) | 0.76 (30) | 1.02 (40) |
| Width | mm (in) | 25.4 (1.0) | | | |
| Flammability Rating | | UL94 V-0 | | | |
| Durometer | Shore A Points | 60 | | | |
| Elongation | % | 567 | 400 | 420 | 628 |
| Dielectric Strength | kV/mm (V/mil) | 35.7 (906) | 38.4 (976) | 33.0 (838) | 19.4 (493) |
| Bond Strength | N/m (lbf/in) | 508 (2.9) | | | |
| Water Absorption | % | 0.90 | | | |
| Specific Gravity | | 1.29 | | | |
| Tensile Strength | kPa (psi) | 7930 (1150) | 8100 (1175) | 8370 (1215) | 8620 (1250) |
| Volume Resistivity | Ω-cm | $1.6x10^{15}$ | | | |
| Temperature Range | °C (°F) | -51° to 204° (-65° to 400°) | | | |
| Color | | Black | | | |

All metric conversions are approximate.
Typical values should not be used for specification limits.
Additional Technical information is available.

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Product Sell Sheet

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# Self-Fusing Silicone Tapes

ARLON® and MOX-Tape® silicone tapes are produced from specially formulated silicone rubber. They bond irreversibly to provide an insulative barrier that is resistant to moisture, oxygen, ozone, and corona over a wide temperature range -54°C up to +260°C (-65°F up to +500°F). These products provide superior electrical insulation with a dielectric strength of 300 VPM minimum at 180°C (356°F).

**Applications:**

**Mechanical**
- Wire Harness and Bundling Wrap
- Emergency Pipe and Hose Repair
- Pipe Identification
- Air Duct Sealing
- Coolant Line Repairs
- Traction and Protection for Rollers

**Electrical**
- Insulation for Splicing and Terminating Wire and Cable
- Coil Insulation in Motors
- Insulating and Sealing of Electrical Connections
- Motor Connection Wrapping
- Cable Management
- Weatherproofing

**Extreme Environments**
- Space and Aviation
- Heated Transfer Lines
- Radioactive Environments
- Riggings and Power Systems in Marine
- Underwater

| Properties | |
|---|---|
| Temperature Range | -54°C to +260°C (-65°F to +500°F) |
| Volume Resistivity | $10^{13}$ ohm-cm min. (ASTM D257) |
| Self Adhesion | 2 p.p.i min. (3.5 N/cm) (ASTM D2240) |
| Hardness | 50± 10 Shore A (ASTM D2240) |
| Moisture Absorption | 0.9% - 46 hrs. in $H_20$ @ 21°C (70°F) |

| Performance Advantages |
|---|
| No Adhesive: Chemically bonds to itself at room temperature within 24 hours |
| Remains non-tacky to the touch and does not adhere to other substrates or surfaces |
| Removes cleanly and easily |
| Insulates with a single wrap reducing labor time and cost |
| Resists moisture, oxygen and ozone to ensure continuous high insulation values |
| Available in flame retardant options with UL-V0 rated compound |
| Resists heat, mechanical shock, corona and dampens vibration |
| Conforms smoothly when wrapped around complex forms |
| All tapes are protected by a special interleaved liner |

Note: The above properties are published as a guide only and should not be used for specification development without testing in your own laboratory.

ARLON and MOX-Tape self-fusing silicone tapes have a 24 month shelf life* from the date of manufacture when stored at 21°C +/-3°C (70°F +/- 5°F) unless stated otherwise in product specific literature, labels, or certificates of conformance.

* Not including ARLON 10 mil Rectangle which has a shelf life of 12 months.

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Product Sell Sheet

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# Self-Fusing Silicone Tapes

### ARLON and Mox Tape Rectangular Tape

Rectangular tape is of uniform thickness and is ideal for applications where a smooth, even layer of tape is not required.

Tape Cross Section

Bonded Cross Section

### ARLON and MOX Tape Fiberglass Reinforced Tape

These self-fusing silicone tapes incorporate a sinusoidal fiberglass fabric that gives a controlled elongation and increased tear resistance. 15% and 25% controlled elongation fabrics are available.

Tape Cross Section

Sinusoidial Fabric, Controlled Stretch

15 or 25% Elongation

### ARLON and Mox-Tape Triangular Tape

The triangular tapes have a tapered edge and a colored guide line along the apex which makes wrapping with a 50% overlap simple and repeatable. These tapes are ideal for applications requiring a smooth, even layer of tape.

Tape Cross Section

Bonded Cross Section

### Product Nomenclature

A 2 0 2 0 – R 0 0 4 – 1 2

**Roll Length (in Linear Yards)**
12 — 12 Linear Yards (example)

**Width (in .0.25" increments)**
004 — 1.0" (4 x 0.25")

**Color***
R — Red
B — Black
W — White
X — Gray
*other colors available

**Thickness**
20 — 0.020" thick (example)

**Construction Type**
10 — Unsupported, Rectangular Profile
20 — Unsupported, Triangular Profile
30 — 25% controlled elongation fiberglass support, Rectangular Profile
40 — 15% controlled elongation fiberglass support, Rectangular Profile

**Silicone Tape Brand**
A — ARLON
T — MOX-Tape

### Certifications

Products can also be certified to many of the following specifications upon request.

MIL-I-46852C, Type 1 & Type 2
A-A-59163A, Type 1 & Type 2
MIL-I-22444C
Boeing DMS2186 Type 1 & Type 2
Lockheed Martin MMS J517
Lockheed Martin 5-00857
General Electric A50A493
General Electric A50E112
General Dynamics P5384
Rohr RMS315; Type 1, Type 2 & Type 3
FAR 25.853
UL V-0

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Product Data Sheet

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# ARLON Self-Fusing Tapes Data Sheet

| Unsupported and Supported Self-Fusing Tapes for Industrial Applications | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Property** | **Method** | **Unit** | **Method** | **A2020-R004-12** | **A2040-R004-12** | **A1010-R004-12** | **A1020-R004-12** | **A3020-R004-12** | **A3020-R12-12** |
| Profile | | --- | --- | Triangular | | Rectangular | | Rectangular | |
| Cross Section | | | |  | |  | |  | |
| Reinforcement | | --- | --- | None | | None | | Fiberglass | |
| Thickness[1] | ASTM D2148* | inch (mm) | SQA-TMS-012 | 0.020 (0.51) | 0.040 (1.02) | 0.010 (0.25) | 0.020 (0.51) | 0.020 (0.51) | 0.030 (0.76) |
| Width[1] | ASTM D2148* | inch (mm) | SQA-TMS-012 | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 1.00 (25.4) | 3.00 (76.2) |
| Color[2] | | --- | --- | Red | Red | Red | Red | Red | Black |
| Tensile Strength | ASTM D3759* | PSI (kPa) | SQA-TMS-009 | 1291 (8901) | 1308 (9018) | 1247 (8598) | 1401 (9660) | 3870 (26062) | 4153 (28633) |
| Break Strength | | lbf/in (N/cm) | --- | --- | --- | --- | --- | 78 (136.6) | 90 (157.6) |
| Elongation at Break | ASTM D3759* | % | SQA-TMS-009 | 515 | 536 | 559 | 534 | 30 | 40 |
| Adhesion Strength | ASTM D2148* | lbf/in (N/cm) | SQA-TMS-015 | 2.9 (5.1) | 3.6 (6.3) | 2.4 (4.2) | 3.4 (6.0) | 7.4 (13.0) | 8.9 (15.6) |
| Dielectric Strength | ASTM D149/D2148* | V/mil (kV/mm) | SQA-TMS-020 | 689 (271) | 504 (198) | 923 (363) | 816 (321) | 705 (278) | 761 (300) |
| Water Absorption | FED-STD-601* | %w/w | SQA-TMS-016 | 1 | 0.6 | 0.8 | 0.5 | 1.8 | 3 |
| Temperature Range | | | | -54ºC to +260ºC (-65ºF to +500ºF) | | | | | |
| Volume Resistivity | | | ASTM D257 | 10^13 ohm-cm min. | | | | | |
| Self Adhesion | | | ASTM D2240 | 2 p.p.i. min. (3.5 N/cm) | | | | | |
| Hardness | | | ASTM D2240 | 50 Shore A | | | | | |

1. Available in a variety of thicknesses and widths as illustrated on reverse. Consult your Sales Engineer or Customer Service for Availability.
2. Available colors include; red (red iron oxide), black, white, gray, blue, green, orange, yellow, vibrant red, and translucent. Custom colors available.
* Fiberglass reinforced tape tested as per Mil-1-22444C Specification.

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Product Data Sheet

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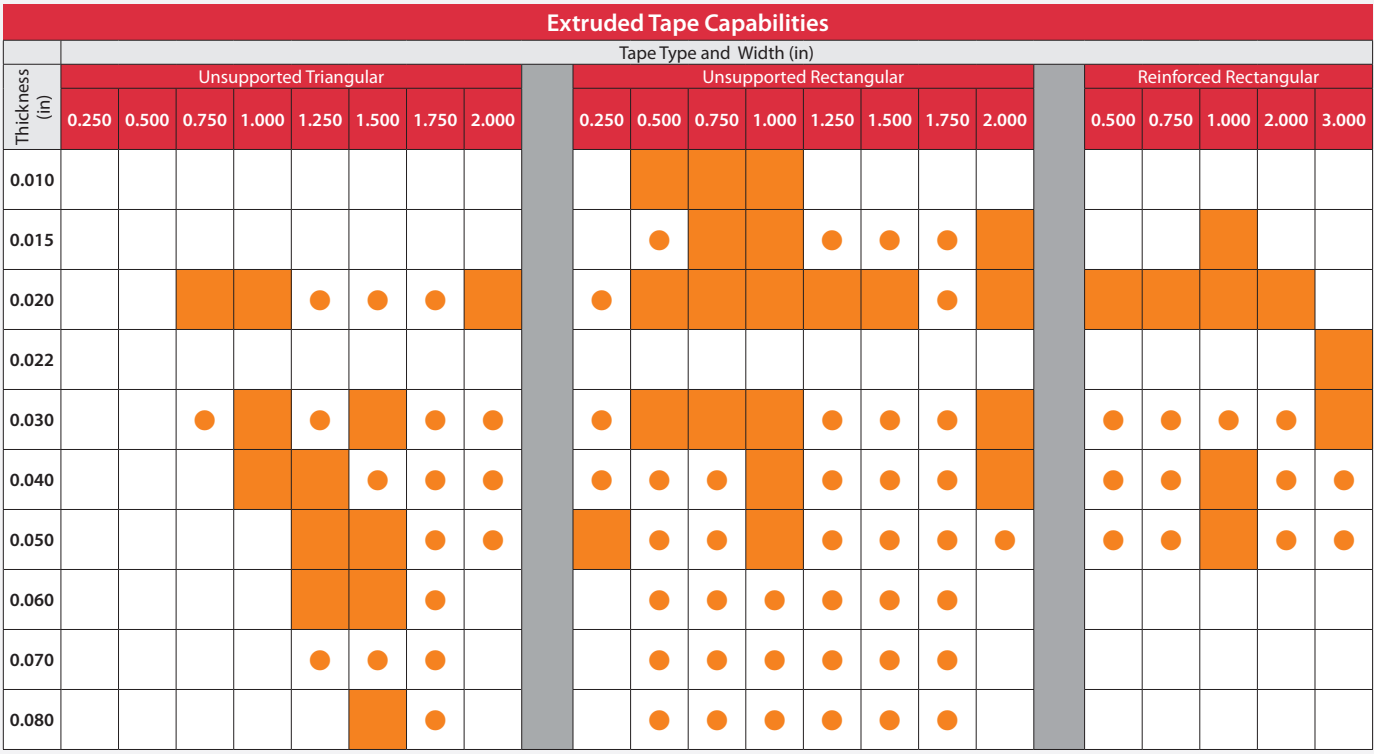
# ARLON Self-Fusing Tapes Data Sheet

## Extruded Tape Capabilities




| Colors | | |
|---|---|---|
| ARLON | RapidBond | MOX-Tape |
| Red | Grey | Red |
| Black | | Black |
| Grey | | |
| White | | |
| Blue | | |
| Indigo | | |
| Yellow | | |
| Orange | | |
| Translucent | | |

| Interleaves | | |
|---|---|---|
| ARLON | RapidBond | MOX-Tape |
| PE | PE | PET |

| Key | |
|---|---|
| ■ | Within capability, tooling available |
| ● | Within capability |
| | Not capable on current equipment |

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## Product Design and Construction

| | | |
|---|---|---|
| Interleave/Carrier: | 0.064 mm | Polyethylene |
| Side 1: | 0.762 mm | Cured |
| Overall Product Thickness: | 0.762 mm | |
| Color: | Red | |


| Basic Physical Properties | Value | Units | Test Method |
|---|---|---|---|
| Durometer | 56 | Shore A Points | ASTM D2240 |
| Tensile Strength | 10556 | kPa | ASTM D412 |
| Elongation | 475 | % | ASTM D412 |
| Specific Gravity | 1.17 | N/A | Arlon SQA-TMS-024 |
| Dielectric Strength | 24.0 | kV/mm | ASTM D149 |
| Bond Strength | 0.543 | N/mm | ASTM XXXX |
| Width | 25.4 | mm | Arlon SQA-TMS-012 |

| Construction | Value | Units | Test Method |
|---|---|---|---|
| Construction Designation | Rectangular Unsupported | N/A | Code Definitions |
| Color | Red | N/A | N/A |

| Extended Physical Properties | Value | Units | Test Method |
|---|---|---|---|
| Water Absorption | 0.0 | % | N/A |

| Heat and Flame | Value | Units | Test Method |
|---|---|---|---|
| Min. Operating Temp. | -54° | °C | N/A |
| Max. Operating Temp. | 260° | °C | N/A |

| Processing and Packaging | Value | Units | Test Method |
|---|---|---|---|
| Shelf Life | 24 | Months | N/A |
| Shelf Life Storage Temp | 21°+/-2.6° | C | N/A |
| Interleave 1 | Polyethylene | N/A | N/A |
| Interleave 1 Thickness | 0.064 | mm | N/A |

*Note: Shelf life is defined as the duration of time for which the product will meet the physical characteristics outlined on this page. It does not guarantee the product's usefulness in all applications.*

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Helping **power, protect, connect** our world™

## ARLON Silicones

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## About Rogers Corporation

Rogers Corporation (NYSE:ROG) is a global leader in engineered materials to power, protect, and connect our world. With more than 180 years of materials science experience, Rogers delivers high-performance solutions that enable clean energy, internet connectivity, and safety and protection applications, as well as other technologies where reliability is critical. Rogers delivers Power Electronics Solutions for energy-efficient motor drives, vehicle electrification and alternative energy; Elastomeric Material Solutions for sealing, vibration management and impact protection in mobile devices, transportation interiors, industrial equipment and performance apparel; and Advanced Connectivity Solutions for wireless infrastructure, automotive safety and radar systems. Headquartered in Connecticut (USA), Rogers operates manufacturing facilities in the United States, China, Germany, Belgium, Hungary, and South Korea, with joint ventures and sales offices worldwide.

## ARLON Silicones

As an industry leader for over 60 years, Arlon has developed a reputation for quality, consistency, and innovation, and continues to provide solutions for the most demanding applications. Whether it's UL approval, military or aerospace specifications, Rogers has the industry knowledge and manufacturing expertise to meet most challenges.

## Product Lines

Flexible Heater Substrates
Coil Insulation
Self-Fusing Silicone Tapes
Secure® Thermal Management Materials
Ultrapad® Press Pads
Thermabond® Adhesives
Thermavac® Vacuum Bags
Polyimide Dielectrics