Placement options for effective plant lighting

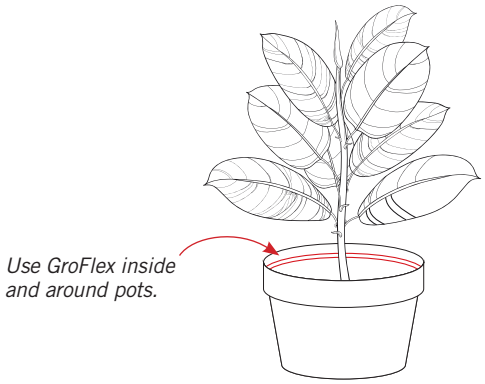
The efficient nature and low heat loss of GroFlex allows for a wider variety of mounting and placement options than high-output, overhead grow lighting. Indoor horticulturists must rely on available space, and GroFlex is designed to perfectly conform to your unique growing area.

GroFlex can maximize your plant's growth by providing light where overhead grow lights don't reach. Use it to create arrays of GroFlex on a backing wall, or a line of light on the inside lip of your planter or pot. You can even hang GroFlex from overhead to follow the stalk of the plant beneath the canopy. Any of these methods will provide more plant-tuned light energy that could not come from traditional fixtures.

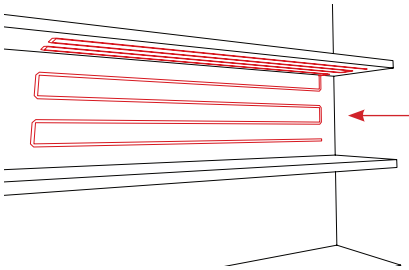
The ability to make tight turns also makes GroFlex perfect for creating custom patterns. Use a zig-zag or spiral pattern to create a concentrated array that fits your space. While every species is different, in general, plants cannot receive too much light. The more GroFlex that can be directed towards your plants – and the closer it is – the more they will benefit.

GroFlex can supplement more powerful, but limited-application, overhead grow lights or fill in for reduced sunlight in shaded windows or during winter. To use GroFlex by itself to grow plants, it's important to understand the light requirements of what you want to grow.

Visit armacostlighting.com/groflex for more information about specific plant light requirements.

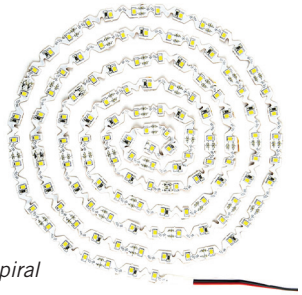


Use GroFlex inside and around pots.

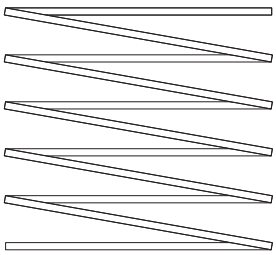


GroFlex conforms perfectly to your growing spaces.

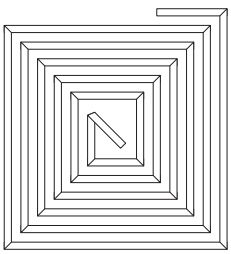
Use an array to create a custom grow light ideally sized for your space.



Spiral



Zig-zag



Square

Troubleshooting

GroFlex LEDs do not light:

- Make sure your LED power supply is receiving 120-volt power.
- Confirm you have maintained correct polarity (+ to + and – to –) when joining strips of GroFlex and when connecting to the 12-volt power supply.
- Check all GroFlex connections and any switch connections from the power supply to the GroFlex strip. Consider testing with a multimeter to ensure light strip is receiving 12-volt power.

Only part of the LED tape light strip is lit:

- Check connections to the part of the GroFlex strip that is not lit.
- Confirm that you have maintained correct polarity to the unlit section.
- GroFlex is made with three LEDs connected as one series. If you experience a partial failure, you can carefully cut out the damaged section and splice in a new section as needed to repair.

LED tape lights blink on and off:

- Your power supply is not adequate for the length of GroFlex you are powering. Install a higher wattage power supply or reduce watts used by shortening the lengths of your GroFlex.

LEDs farthest from the power supply are noticeably dimmer:

- This is the result of voltage drop. Decrease the length of the 12-volt power feed wires or use thicker power feed wires between the 12-volt power supply and the GroFlex lighting.
- Use shorter lengths of GroFlex. Refer to **Power Supply Size** in these guidelines. Consider a different configuration.

Visit armacostlighting.com/installation for additional installation tips and FAQs.

SPECIFICATIONS

Input voltage	12-volt DC
PPFD	About 170 µmol/m2/s*
Cuttable	Approx. every 2 in. (50 mm)
Beam angle	120°
LED light source	Tailored-spectrum SMD 2835
LED count	60 LEDs per meter
Country of origin	China

*PPFD measurement taken with one meter of GroFlex in a 10 cm diameter spiral at distance of 10 cm. PPFD values vary according to the length of GroFlex used and the distance from the top of the plant. Voltage drop can affect PPFD output for longer lengths.

Visit armacostlighting.com/groflex for more information about specific plant light requirements.

Limited three-year warranty

Improper installation, abuse, or failure to use this product for its intended purpose will void warranty. This warranty only applies when all components, including LED power supplies, have been provided by or approved for use by Armacost Lighting. The warranty does not cover labor or any other costs or expense to remove or install any defective, repaired, or replaced products.

Armacost LIGHTING

Baltimore, Maryland

armacostlighting.com

C US 254684 Conforms to UL Standard 8750

american lighting association

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Please read completely before installing.

These guidelines explain how GroFlex LED Grow Lighting works and how it can be configured, cut to size, connected, and installed, so you can properly design your GroFlex layout.

Installing GroFlex is an easy DIY project. However, basic wiring skills and tools for stripping, splicing, and connecting wires are required. For questions or installation advice, please contact support@armacostlighting.com.

IMPORTANT

- Use only with low-voltage, 12-volt DC, constant voltage power supplies. *Never connect GroFlex directly to 120-volt household power.*
- Do not power GroFlex while coiled on reel, as the LEDs will overheat. *The mounting surface will act as a heat sink to dissipate heat.*
- Do not look directly at GroFlex LEDs when illuminated.
- Never connect more than one power supply to a length of GroFlex.
- Do not install GroFlex where it can become immersed in water. The integrated coating will protect it from light sprays and mists generated by watering systems.
- Use only insulated staples and plastic clips to secure cords and wires.
- Route and secure wires so they will not become pinched or damaged.
- Use certified CL2 or better cabling for wire runs inside walls.
- Do not install 12-volt DC wiring in the same runs as 120-volt AC power.

All wiring must be in accordance with national and local electrical codes. GroFlex uses a low-voltage Class 2 circuit. If you are unclear as to how to install and wire this product, consult a qualified professional.

Planning

The unique profile of GroFlex LED lighting allows you to create custom fixtures or conform GroFlex to your growing space to maximize plant growth. Installation location, mounting angles, and reflection off walls, surfaces, and objects will affect the amount of light reaching your plants. Subtle adjustments to the positioning and angle of the GroFlex tape can affect the overall light output, and each GroFlex installation will be different.

Visit armacostlighting.com/groflex for application ideas and inspiration.

Installation considerations

- How will you switch your GroFlex on and off?
- What is the best layout configuration for your installation?
- What are the best ways to mount GroFlex?
- How will you cut and connect the wires to your GroFlex?

Choosing a power supply

Power supplies come in various sizes with different wattages and are often referred to as transformers, AC/DC adaptors, or LED drivers. GroFlex LED tape operates on low voltage and requires a power supply to convert 120-volt household AC power to 12-volt DC power.

- Never connect GroFlex LED tape lighting directly to 120-volt household power.
- Only use GroFlex with Armacost Lighting-approved LED drivers and power supplies. Using other power supplies will void warranty.

While GroFlex LED grow lighting is fully dimmable, Armacost Lighting recommends using this product only at full brightness for best results.

For on/off control

Items 940000 and 714425

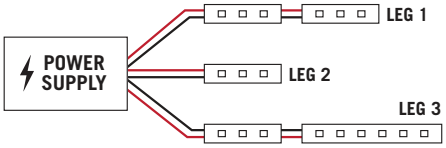
If an AC outlet controlled by a wall switch is not available for your power supply, use an Armacost Lighting Wireless Switch. This device adds switched outlet convenience without running any new wires. Alternatively, consider Armacost Lighting's Dual Wireless Wi-Fi Controller, which has a built-in scheduling function for effortless control of your plant lighting. Your 12-volt power supply can also be switched on and off with a simple timed outlet.

Power supply size

Determining your wattage requirements

GroFlex power requirements are stated in watts and are based on several factors, including your design configuration. GroFlex can be installed in a series (strips connected or wired end-to-end) or in an array (multiple legs of LED strips or series of strips wired directly to a single power supply).

An array uses two or more legs of various lengths wired to a power supply in a parallel connection. You will need to calculate total wattage used in an array to guard against overloading the power supply.



Each leg should not exceed 8.2 ft. (2.5 m)

Choosing a higher wattage power supply does not necessarily mean you can run longer lengths of GroFlex. However, it will allow for more lighting legs in an array design. Exceeding the lengths in the following chart will cause the end of GroFlex farthest from the power supply to lose brightness due to voltage drop. Using a higher wattage power supply will not reduce the effect of voltage drop.

Maximum recommended tape length Model GFS2835060, 60 LEDs/meter	
Straight run configuration	8.2 ft. (2.5 LEDs/m) – will use approximately 14.3 watts
Center feed / Split T configuration	16.4 ft. (5 LEDs/m) – will use approximately 28.6 watts
Array configuration	Varies based on layout and max wattage of power supply

How to calculate total wattage required in lighting system

Using the chart below, determine the watts used in each leg of GroFlex. A straight run is considered one leg. A center feed or "split T" is two equal length legs. An array can have many legs. Include only the lengths of GroFlex in your calculation, not the connecting wires.

Add together the watts used in each leg of GroFlex to get total watts required.

Approximate watts used per meter at full brightness GroFlex Model GF2835060 – 60 LEDs per meter					
Meters	0.5	1	1.5	2	2.5
Feet	1.6	3.3	4.9	6.6	8.2
Watts used	**5.5**	**9.1**	**12.7**	**14.5**	**16.8**

- Watts used is the power consumed by your GroFlex lighting, not the watt rating of a power supply.
- Always choose a power supply rated at or greater than your needs.
- Due to voltage drop, longer lengths of GroFlex will average fewer watts per foot than shorter lengths.
- To accurately measure watts used by your GroFlex system, use a multimeter.

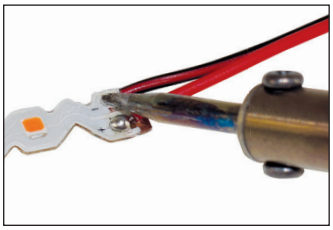
Power supply location and voltage drop

The shorter the wire leads between the power supply and the GroFlex strip, the more even your plant lighting will be – do not coil excess wire. If the LEDs farthest from the power supply appear dimmer, it is probably due to voltage drop. If voltage drop appears to be an issue, use thicker, heavier gauge wires or divide strips into smaller segments (see array configuration). To learn more, visit armacostlighting.com/voltagedrop for an easy-to-use online voltage drop calculator.

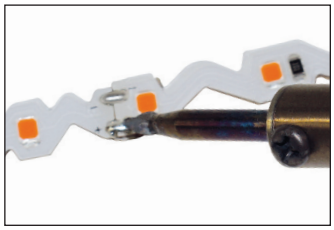
Cutting, connecting, and wiring

There are two methods for connecting power wires and splicing together two pieces of LED tape lighting: soldering or using Armacost Lighting WireGrip Connectors, sold separately.

Soldering is a sure method for making strong, reliable electrical connections. Due to the protective coating on GroFlex tape lighting, the copper pads require preparation before soldering. Use a sharp blade to carefully strip away as much coating as possible, taking care to not cut into the tape itself. Remove the final layer of adhesive by gently rubbing the copper pads with a cloth soaked in denatured alcohol. After verifying your connection, cover solder joints in a clear, silicone based adhesive sealer to maintain water resistance. For tips on how to solder GroFlex, visit armacostlighting.com/installation. Please note that this same preparation is required when using the SureLock family of connectors.



Wire Lead Connection

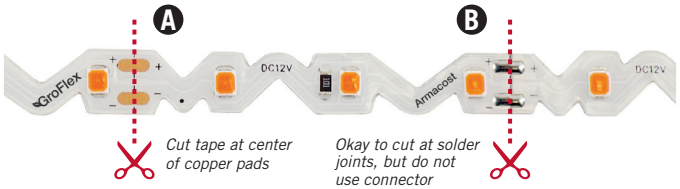


Splice Connection

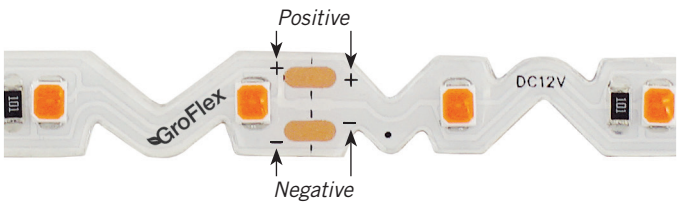
Wherever possible, it is recommended that you connect any needed 12-volt power wires to your GroFlex before installing. This GroFlex model can be cut every three LEDs, or about every 2 in.

How to cut GroFlex

- Whether you are soldering wires or using connectors, cut GroFlex with scissors directly in the center of the copper pad as shown in position “A” below.
- You can also cut the tape at position “B,” but do not use connectors on these tape light joints. You can solder wires to these joints.

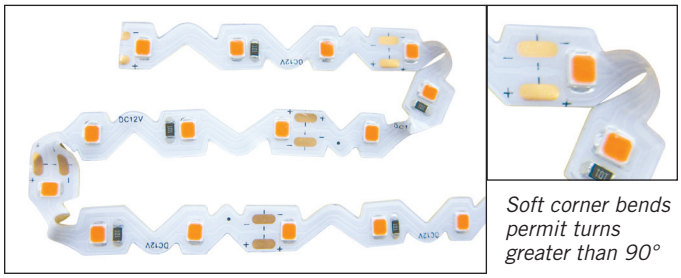


IMPORTANT: Always use the + / – indicators printed on the tape light to maintain the same polarity (+ to + and – to –).



Creating bends with GroFlex

The unique form of GroFlex allows for gentle bending to turn corners up to 180 degrees. When doing so, a small portion of the tape may not sit flat at the bends. This is normal – do not try to force the tape completely flat at these points.



Soft corner bends permit turns greater than 90°

Using WireGrip Connectors (sold separately)

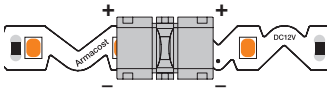
WireGrip connectors are used to make connections when bridging gaps between sections of GroFlex – no coating removal is necessary. WireGrip connectors are available for purchase separately, item number 569005.

Use one WireGrip in combination with the factory-soldered wire leads, or use two WireGrip connectors, connect one on each end of the tape. Measure the gap and cut a length of wire to span this distance. 22 to 18 gauge wire is generally recommended. Do not coil excess wire; shorter lengths and thicker wire will mean less voltage drop and higher brightness.

Be sure any wire splice connections are secure and sealed. Options include soldering, electrical tape, crimp connectors, terminal blocks, wire nuts, etc.

SpliceGrip Connectors (sold separately)

SpliceGrip Connectors are used to join two strips, creating a continuous run of GroFlex.



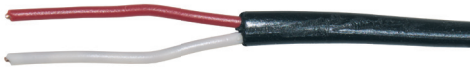
If the + / – marks do not line up, flip the tape and use the opposite end for proper alignment.

Installing connectors

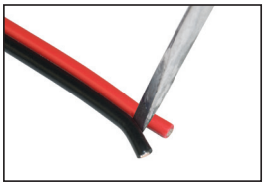
WireGrip and SpliceGrip connect to the copper pads on cut sections of GroFlex. Connect to clean copper pads. Do not use connectors on soldered joints.

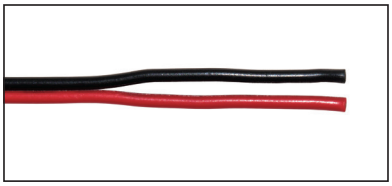
1. Prep the Wires

If your wire has an outer jacket, remove a portion to expose individual wires as shown.



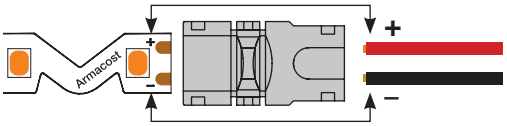
If your wire is the flat ribbon wire type, separate the ends of wires with a flathead screwdriver or razor knife to about 1 in. **Do not strip wire bare**.





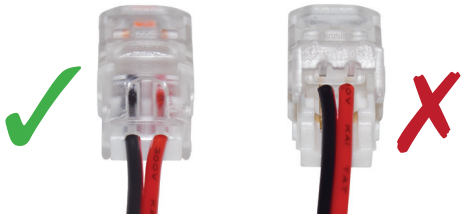
2. Plan your wire layout and maintain polarity

Check the polarity of your tape. Use the + and – markings printed on the tape light as a guide to maintain the same polarity with your power supply or color controller low-voltage outputs.



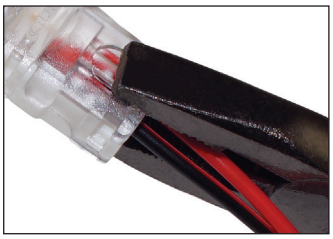
3. Insert wires into the WireGrip Connector

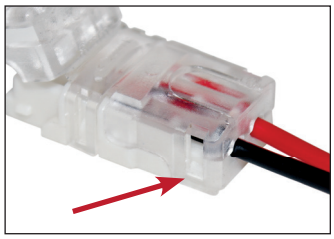
The wires go in the grooved side of the connector. Be sure the individual wires seat themselves in the receiving grooves.



4. Clamp the connector wire cover closed

Use pliers to apply gentle pressure evenly across the pressure door. Be sure that the small locks on both sides are fully engaged.

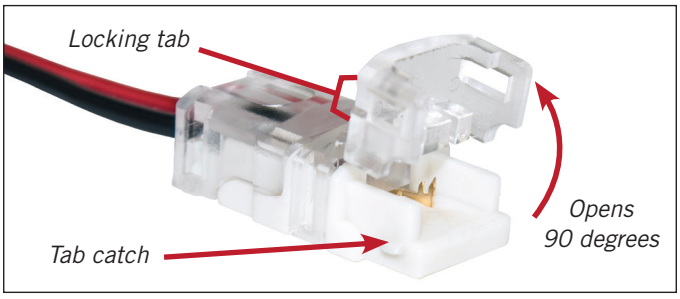


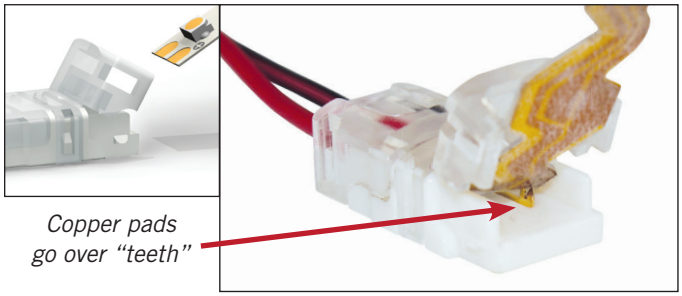


5. Insert the GroFlex tape into the connector

First: open the short door on the connector 90 degrees. Remove 1 in. of 3M paper backing and insert GroFlex face up.

IMPORTANT! Position tape light copper pads above the connector's copper teeth as shown.





Copper pads go over "teeth"

6. Close and lock down the tape light cover door

Using finger pressure, close the tape pressure door. If necessary, use pliers to gently secure the door closed until the locks are fully seated. Check mechanical and electrical connections on both sides by gently pulling up on the GroFlex and wiring, one at a time. The locks on either side of the connector should stay secure. Apply power before final installation to make sure your lights turn on.

Armacost Lighting WireGrip and SpliceGrip Connectors can be reused if necessary. Use a small flathead screwdriver to pry open the locking tabs on either side of the pressure door. The pressure pad door will break if flexed excessively – avoid rough use. For extra water resistance, complete your connections with heat-shrink tubing or a silicone based adhesive sealant.

To view an online video tutorial, visit armacostlighting.com/wiregrip.

Surface preparation and installation

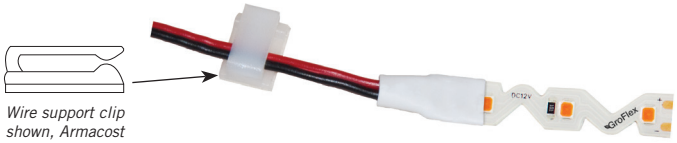
Before removing the 3M paper backing entirely, test the LED strip in the space you intend to light. Once the paper backing is removed and GroFlex is fully installed, you cannot reposition it or move it to another location. The tape may not stick securely.

Do not power GroFlex while coiled on reel, as the LEDs will overheat. It is normal for the tape to feel warm to the touch when holding it. Once installed, the mounting surface will act as a heat sink to dissipate heat.

Power the GroFlex and temporarily hold or tape it into position with painter's tape – do not remove the 3M paper backing. Do not stare directly into the LEDs.

Try various angles and positions to get the desired light coverage on your plants. Use GroFlex in close proximity to plants or under the canopy and within the foliage, where overhead lighting can't reach. The inherent low temperature of GroFlex means you can position the tape within inches of your target without adverse heat effects that can be damaging to plants.

- Mounting surfaces should be smooth, clean, completely dry, dust-free, and above 60ºF (15ºC) before installing/sticking the GroFlex strip in place. Thoroughly clean all mounting surfaces with isopropyl alcohol. Do not use common rubbing alcohol and household cleaners, which may leave behind residues.
- For best adhesion, lightly sand the surface where you will mount GroFlex with fine grit sandpaper (150–300 grit). Sand in a circular motion rather than a straight-line motion.
- When installing on painted surfaces, paint should be fully cured based on manufacturer's cure time.
- Be careful not to peel off the 3M adhesive from GroFlex; just remove the paper backing.
- 3M tape requires pressure to activate the adhesive. Working from one end to the other, firmly press the tape down with your fingers or a clean cloth, taking care not to press on the individual LEDs.
- Support power wire leads, especially when mounting under cabinets and shelves.



Wire support clip shown, Armacost item # 910100