LumaFilm® Light Emitter Installation Instructions

(Modifying Instructions)

These *Instructions* are intended to be used as an installation guide to be completed by, or under the direction of a qualified electricians in accordance with all national and local electrical codes as well as construction standards.

IMPORTANT – Please review prior to installation

Safety Notes:

- Always ensure the power is securely off prior to and during installation.
- LumaFilm Light Emitters [Sheets] (referred to as "LumaFilm" or "LumaFilm Sheets") must be powered by a UL recognized or listed Class 2, constant current, LED power supply. Please refer to the LumaFilm Power Supply Selection Guide (found later in these installation instructions) for the correct power supply to use. Please contact the Heilux Technical Team with any questions (techsupport@heilux.com).
- LumaFilm is not intended to be submerged in water.
- LumaFilm Sheets are low voltage electrical devices that can be damaged by electrostatic discharge. Always follow good industry practices for handling semiconductor devices when handling LumaFilm Sheets.

Handling Instructions:

- Avoid creasing or repeated bending of LumaFilm Sheets.
- LumaFilm Sheets are flexible. Do not bend LumaFilm Sheets to a diameter of less than one inch (25.4mm).
- Do not scrape or use excessive rubbing force.
- Clean LumaFilm with the power off by gently wiping with a soft damp cloth.

Modifying the Size of LumaFilm Light Emitters

LumaFilm is designed for ease of installation in the field. LumaFilm Sheets maybe trimmed by the installer to the appropriate size in the field to provide for such ease. LumaFilm Sheet sizes may vary based on the customer's needs, and any field trimming should follow these simple cutting/trimming guidelines:

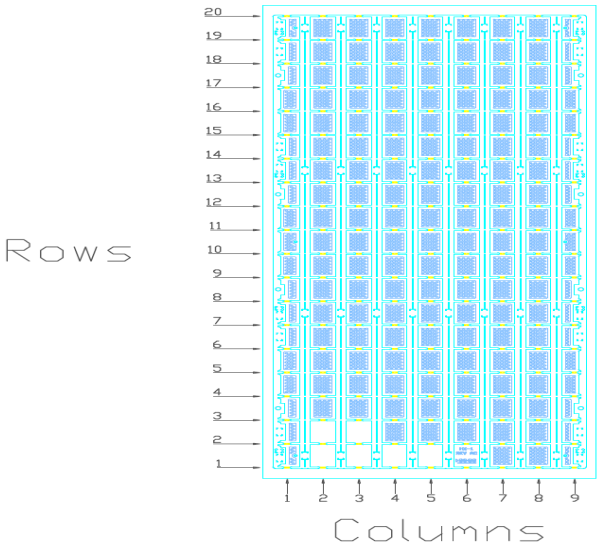
Prior to trimming any LumaFilm Sheet, you MUST understand your power supply needs. See LumaFilm Power Supply Selection Guide (page 4 of these instructions).

For LumaFilm Sheets (Standard pitch of 27mm) with 5 rows or less, note that only rows may be cut or trimmed off. DO NOT CUT or TRIM COLUMNS. Trimming or cutting must take place between the LEDs only.

For LumaFilm Sheets (Standard pitch of 27mm) with more than 5 rows, one can field modified by cutting or trimming either the rows, columns, or both. Trimming or cutting must take place between the LEDs only.

For LumaFilm Sheets (High Output pitch of 16mm) only rows may be cut or trimmed off. DO NOT CUT or TRIM COLUMNS.

NOTE: Rows are defined as having the bus bar circuit running along the length.
Columns are defined as perpendicular to Rows.



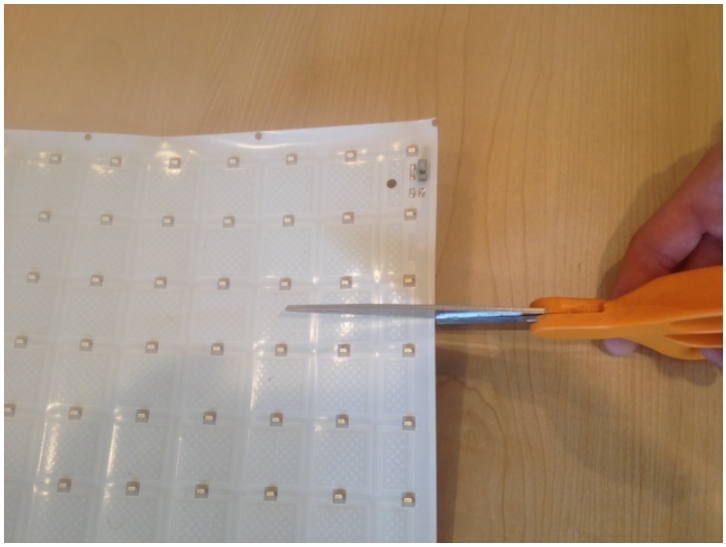
Schematic 5

Trimming/Cutting Photos:

Trimming - Columns

Carefully cut along the middle of the selected bus bar (as shown in the picture to the left). Once the LumaFilm Sheet is cut, a completed electrical circuit maybe made by soldering a wire to the connection pad.

Trimming - Rows



Carefully cut between the LEDs (as shown in the picture to the left). Keep at least 0.125”/3.175mm from either LED.

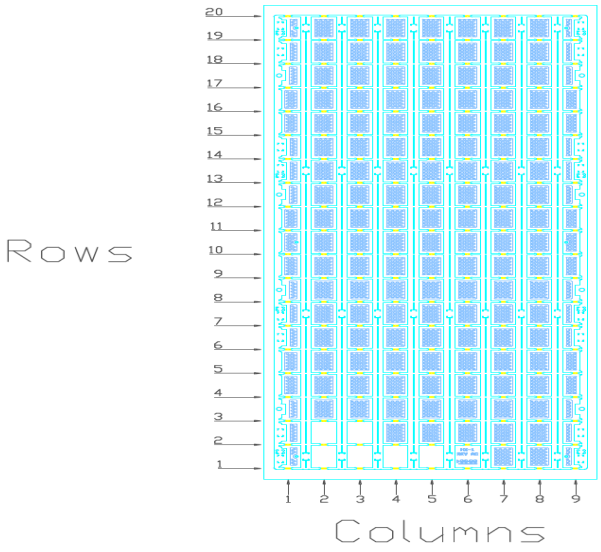
LumaFilm Power Supply Selection Guide

The instructions below are used to determine the Class 2 Power Supply specifications for a specific LumaFilm project. LumaFilm Light Emitters run on DC current. **Do not plug into an AC wall outlet. Damage will occur to the LumaFilm Light Emitters (Sheets) and LEDs will be destroyed.**

All electrical wiring must be installed by or under the direction of a qualified electrician in accordance with all national and local electrical codes as well as construction standards.

Three steps are required to determine the correct power supply:

1. Establish the current requirements
2. Determine operating voltage
3. Calculate power consumption



Schematic 6

Step 1: Establish Current Requirements (mA):

The standard current for LumaFilm is 20mA per row.

Operating current = 20mA times the number of rows

The maximum operating current is 30mA times the number of rows

Example: A 9.5" x 22" LumaFilm Light Emitter has 20 rows. Each 9.5" x 22" LumaFilm Light Emitter requires a standard current of 400mA (20mA * 20 rows = 400mA).

If the maximum current of 30mA per row is desired, a 9.5" x 22" LumaFilm Light Emitter that has 20 rows will require a maximum current of 600mA (30mA * 20 rows = 600mA).

When connecting (tiling) LumaFilm Sheets together the same standard current requirements apply.

Examples:

30 rows (1 full sheet and 1 half sheet) at 20mA = 600mA

40 rows (2 full sheets) at 20mA = 800mA

Step 2: Determine the Voltage Required (Volts dc):

The voltage required for LumaFilm is based on the number of LEDs per row and the choice of current.

- Current at 10ma requires 2.7 volts dc per LED
- Current at 20mA requires 3.0 volts dc per LED
- Current at 30mA requires 3.2 volts dc per LED

Example: Using the standard 9.5" x 22" LumaFilm Light Emitter, there are 9 LEDs per row. Choosing to run at 20mA results in the following voltage requirement:

Volts dc = 9 LEDs per row times 3.0 volts per LED = 27 volts dc

Step 3: Calculating Power Consumption (Watts):

Once the current and voltage have been established, the power consumption (as measured in Watts) can be determined using the standard equation:

Power = Current times Voltage (*Current needs to be in Amps. Divide the current in mA by 1000)*

Watts = mA/1000m times Volts dc

Example: Two 9.5" x 22" LumaFilm Light Emitters contain 40 rows and will be run at 20mA.

Current: 40 times 20mA = 800mA

Voltage requirement for 9 LEDs per row at 20mA is 27 volts dc

Power consumption: 800mA/1000A times 27 volts dc = 21.6 Watts

Select a UL rated Class 2 Power Supply with a power rating greater than 21.6W that will provide a constant of 800mA in a voltage range of 27V or greater. Note: Class 2 power supplies must operate at 100W or less and have a maximum voltage output of 60Vdc or less. If the power supply you select is not adjustable to or available with the calculated current, select the closest to (above or below) the calculated current without exceeding Class two operating conditions or the LumaFilm maximum rating of 30mA per row.

WARNING: For applications requiring more than 100 Watts use multiple power supplies connected to separate groups of LumaFilm Sheets. Never connect the output leads of multiple power supplies in parallel to power a larger array of LumaFilm Sheets.

Power Supply Selection Guide

LumaFilm Light Emitter (9.5" x 22")

20 rows of 9 LEDs in series; 180 LEDs per sheet
5000K CCT

Operating current per LED mA: 10mA
Minimum voltage required: 26V
Operating current per sheet: 200mA
Power (V*A) per sheet: 5.2W
Average Lumens/Watt: 140

# of Sheets	Current	Power	Lumens (approx.)
1	200mA	5.2W	700
2	400mA	10.4W	1,400
3	600mA	15.6W	2,200
4	800mA	20.8W	2,800
5	1.0A	26.0W	3,600
6	1.2A	31.2W	4,300
7	1.4A	36.4W	5,100
8	1.6A	41.6W	5,800
9	1.8A	46.8W	6,500
10	2.0A	52.0W	7,200
11	2.2A	57.2W	8,000
12	2.4A	62.4W	8,700
13	2.6A	67.6W	8,900
14	2.8A	72.8W	9,500
15	3.0A	78.0W	10,900
16	3.2A	83.2W	11,600
17	3.4A	88.4W	12,300
18	3.6A	93.6W	13,000
19	3.8A	98.8W	13,800

Operating current per LED mA: 20mA
Minimum voltage required: 27V
Operating current per sheet: 400mA
Power (V*A) per sheet: 10.8W
Average Lumens/Watt: 130

# of Sheets	Current	Power	Lumens (approx.)
1	400mA	10.8W	1,400
2	800mA	21.6W	2,800
3	1.2A	32.4W	4,200
4	1.6A	43.2W	5,600
5	2.0A	54.0W	7,000
6	2.4A	64.8W	8,400
7	2.8A	75.6W	9,800
8	3.2A	86.4W	11,200
9	3.6A	97.2W	12,600

Operating current per LED mA: 30mA
Minimum voltage required: 29V
Operating current per sheet: 600mA
Power (V*A) per sheet: 17.4W
Average Lumens/Watt: 120

# of Sheets	Current	Power	Lumens (approx.)
1	600mA	17.4W	2,100
2	1.2A	34.8W	4,200
3	1.8A	52.2W	6,300
4	2.4A	69.6W	8,400
5	3.0A	87.0W	10,400

Power Supply Selection Guide

LumaFilm Light Emitter (12" x 24")

24 rows of 12 LEDs in series; 288 LEDs per sheet
5000K CCT

Operating Current per LED mA)	10mA
Minimum Voltage required	34.8V
Operating current per sheet	240mA
Power (V*A) per sheet	8.35W
Average Lumens/Watt:	140

# of Sheets	Current	Power	Lumens (approx.)
1	240mA	8.35W	1,200
2	480mA	16.7W	2,300
3	720mA	25.1W	3,500
4	960mA	33.4W	4,700
5	1.2A	41.8W	5,800
6	1.44A	50.1W	7,000
7	1.68A	58.5W	8,200
8	1.92A	66.8W	9,300
9	2.16A	75.2W	10,500
10	2.4A	83.5W	11,700
11	2.64A	91.9W	12,800
12	2.88A	100W	14,000

Operating current per LED mA:	20mA
Minimum voltage required:	36V
Operating current per sheet:	480mA
Power (V*A) per sheet:	16.7W
Average Lumens/Watt:	130

# of Sheets	Current	Power	Lumens (approx.)
1	480mA	17.3W	2,250
2	960mA	34.6W	4,500
3	1.44A	51.8W	6,700
4	1.92A	69.5W	9,000
5	2.4A	86.4W	11,200
6	2.78A	100W	13,000

Operating current per LED mA:	30mA
Minimum voltage required:	38.4V
Operating current per sheet:	720mA
Power (V*A) per sheet:	27.6W
Average Lumens/Watt:	120

# of Sheets	Current	Power	Lumens (approx.)
1	720mA	27.6W	3,300
2	1.44A	55.3W	6,600
3	2.16A	82.9	9,900
4	2.60A	100	12,000

Power Supply Selection Guide

LumaFilm Light Emitter (5" x 24")

39 rows of 8 LEDs in series; 312 LEDs per sheet
5000K CCT

Operating Current per LED mA)	10mA
Minimum Voltage required	23.2V
Operating current per sheet	390mA
Power (V*A) per sheet	9.05W
Average Lumens/Watt:	140

# of Sheets	Current	Power	Lumens (approx.)
1	390mA	9.05W	1,200
2	780mA	18.1W	2,500
3	1.17A	27.2W	3,800
4	1.56A	36.2W	5,000
5	1.95A	45.9W	6,400
6	2.34A	54.8W	7,700
7	2.73A	63.3W	8,800
8	3.12A	72.4W	10,100
9	3.51A	81.4W	11,400
10	3.90A	90.5W	12,700
11	4.29A	99.5W	13,900

Operating current per LED mA:	20mA
Minimum voltage required:	24V
Operating current per sheet:	780mA
Power (V*A) per sheet:	18.7W
Average Lumens/Watt:	130

# of Sheets	Current	Power	Lumens (approx.)
1	780mA	18.7W	2,400
2	1.56A	37.4W	4,900
3	2.34A	56.2W	7,300
4	3.12A	74.9W	9,700
5	3.90A	93.6W	12,100

Operating current per LED mA:	30mA
Minimum voltage required:	25.6V
Operating current per sheet:	1170mA
Power (V*A) per sheet:	30.0W
Average Lumens/Watt:	120

# of Sheets	Current	Power	Lumens (approx.)
1	1.17A	30.0W	3,600
2	2.34A	60W	7,200
3	3.51A	90W	10,800

Troubleshooting

If a LumaFilm Light Emitter (Sheet) does not illuminate when the power is turned on:

1) Check to ensure all electrical connections have been made and are intact.
2) Check to ensure that the wires from the LumaFilm Sheet to the power supply are correctly connected by polarity.

If one section of LEDs on a LumaFilm Light Emitter (Sheet) does not illuminate when the power is turned on it is likely that the circuit to that section of LEDs is damaged. The LumaFilm Light Emitter (Sheet) should be replaced.

If a single LED on a LumaFilm Light Emitter (Sheet) does not illuminate when the power is turned on it is likely that the connection between the single LED and the circuit on that particular Light Emitter has been broken or the LED has failed. The overall light output of the system will not be affected significantly. If the LumaFilm Light Emitter is mounted such that the LED is not visible, there is no need to replace the Light Emitter (Sheet). If the LumaFilm Light Emitter is mounted such that the failed LED is visible, then a replacement Light Emitter (Sheet) may be required.

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