

TIVOFLEX PLUS™

TUBE LIGHTING

Patented, versatile, flexible LED light tubing offering neon-like brightness and uniformity of color and glow. Interior and exterior architectural delineation.

CAT:		FEET:	
TYPE:	PROJECT:		

FEATURES

- US Patent # 7,048,413 B2
- Improved color rendition and visual clarity using cool-to-touch, low heat LEDs that emit light uniformly
- Product is manufactured to customers specified length with final trim and dead-end cap attachment performed by customer
- Power connector end-preps must be made by factory
- TivoFlex Plus features improved illumination with up to 65 lm/ft (7-10 times brighter versus similar products depending on color)
- Full range dimming available

SPECIFICATIONS

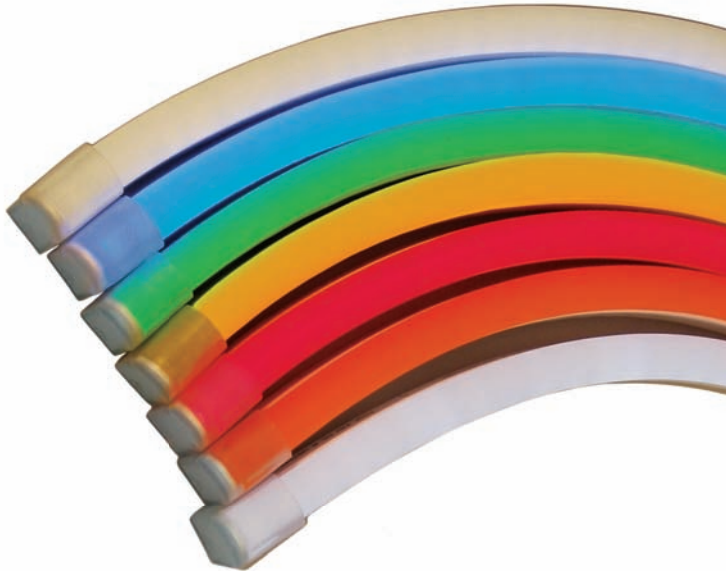
TIVOFLEX	EFFICACY LM/WT	CRI	LM/FT	WT/FT
TivoFlex Plus - Warm White	29.12	58.0	52.39	1.80
TivoFlex Plus - Cool White	25.57	71.30	49.09	1.92

Measurements are based on 24V DC power and design calculations will vary based on power supply and run lengths.

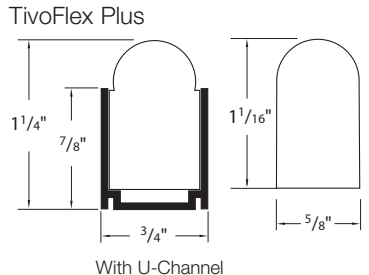
LED DATA <small>RATED TO LM79 STANDARDS</small>	WATTAGE	LED LIFE* / COLOR TEMP	VIEWING ANGLE
TivoFlex Plus	1.80W per ft	100,000 hrs. Red Orange Yellow	180°
	1.92W per ft	50,000 hrs. Blue Green	180°
		40,000 hrs. White (5800°K +/-300°K) Warm White (2900°K +/-300°K)	

* LEDs operate at 90% of LED manufacturers maximum current spec rating.

1. **Spacing** - LEDs spaced 1/2" O.C.
2. **Lens** - LEDs encased in oval-shaped, flexible PVC constant color lens which can be bent, modified and formed
3. **Mounting** - Mounting channel available in solid or notched (for curved applications) or installs easily into grooves or on flat surfaces like wood, plastic, steel, etc.
4. **Installation** - Water resistant 90° and 180° power feed connectors with extended lengths are available factory installed
5. **Max feet per 4A circuit** - 45': Red, Yellow, Orange
40': White, Warm White, Blue, Green
6. **Warranty** - Limited 1 year warranty. 18 month warranty with project application approval and use of Tivoli approved installer (consult factory for list)



PROFILES



7. **Power Supply** - Listed Class II 24V DC power supply required
8. **Rating** - IP65 rated for wet location
9. **Compliance** - SGS listed for compliance with UL standards 2108 and 8750 and Canada standard CS 22.2 for LED lighting products with field installation
10. **Listing** - UL and cUL listed in compliance with UL standard 2388 for flexible lighting



TIVOFLEX ORDER SPECIFICATION GUIDE

Example: TVFP-WH-24

PRODUCT CODE	LED COLOR	VOLTAGE	REQUIRED POWER SUPPLY
TVFP	-	24	PSU
TVFP = TivoFlex Plus	RD = Red YL = Yellow OR = Orange BL = Blue GR = Green WH = White WW = Warm White	24 = 24VDC	See power supply specsheets

REQUIRED POWER SUPPLY OPTIONS **OPTIONAL DIMMERS**

- | | |
|---|---|
| <input type="checkbox"/> ADUL-300-3-4-24-D
<input type="checkbox"/> ADUL-100-1-4-24-D
<input type="checkbox"/> ADN-300-3-4-24-D
<input type="checkbox"/> ADN-100-1-4-24-D
<input type="checkbox"/> JT-300-3-4-24-D
<input type="checkbox"/> JTH-300-3-4-24-D
<input type="checkbox"/> JT-100-1-4-24-D
<input type="checkbox"/> QT-600-6-4-24-D
<input type="checkbox"/> QTH-600-6-4-24-D
<input type="checkbox"/> QT-300-3-4-24-D
<input type="checkbox"/> QTH-300-3-4-24-D
<input type="checkbox"/> MT-100-1-4-24-D | <input type="checkbox"/> N-600
<input type="checkbox"/> N-1000
<input type="checkbox"/> NH-600
<input type="checkbox"/> NH-1000
<input type="checkbox"/> DIM-24V-8A |
|---|---|

See power supply specifications for more information

* Original TivoFlex still available with extended lead times (consult factory) † In an effort to obtain consistent binned LED colors, longer lead times apply to all white and warm white colors



TIVOFLEX PLUS™ TUBE LIGHTING

TIVOFLEX PLUS POWER CORD END PREPS

Weather resistant power feed connectors are attached in factory by Tivoli. Product is manufactured to customers specified length with final trim and dead-end cap attachment performed by customer.



TVFP-EPA-24-180-XX* 180° Power Feed
180° Connector Power Feed End Prep:
1-180° Molded Power Connection w/ 5'
Cord (attached)
1 End Cap and 1 shrink tube (supplied)



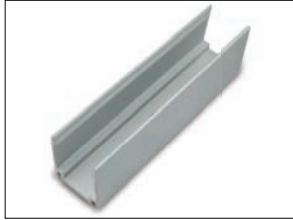
TVFP-EPB-24-90-XX* 90° Power Feed
90° Connector Power Feed End Prep:
1-90° Molded Power Connection w/ 5'
Cord (attached)
1 End Cap and 1 shrink tube (supplied)

** Cords are available in 5 foot standard or in 10 foot length increments to 50ft.
add length to part number for any length longer than 5 ft.

TIVOFLEX PLUS MOUNTING ACCESSORIES



TVFP-CHAN-6.5 TivoFlex Plus Channel
Aluminum Mounting Channel 6.5' length



TVFP-CLIP TivoFlex Plus Mounting Clip
Aluminum Mounting Clip - 3"



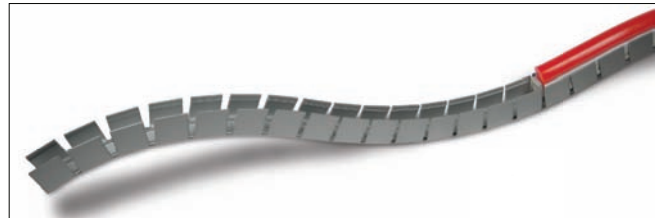
TVFP-NOTCHH-6.5 Horizontal Notched Channel for TivoFlex Plus - 6.5'
Lateral bend to 1" minimum radius.



TVFP-ENDCAP TivoFlex Plus End Cap
End cap for dead end with shrink tube



TVFX-ESIL--03 Silicone Adhesive
Silicone adhesive for endcap - 3fl oz tube
1 Tube = 10 End caps



TVFP-NOTCHV-6.5 Vertical Notched Channel for TivoFlex Plus - 6.5'
Concave bend to 6" minimum radius - Convex bend to 4" minimum radius



TVFP-EPOXY-3M-GUN Epoxy Gun (shown)
3M epoxy applicator gun, to be used with
3M 460EG adhesive - includes 1 plunger
and 1 nozzle.



TVFP-EPOXY-3M-4 3M 460EG adhesive
Dual chamber mixing compounds. Applicator
gun, mixing nozzle and gun plunger also
required.



TVFP-SIL-GUN-10 Caulking gun
Compatible with 10oz tubes of sealing
material



TVFP-SIL-GE-10
GE silicone tube 10oz - Use to adhere
TivoFlex into entire run length of channel
25' per 10oz tube

TVFP-EPOXY-3M-PLG Replacement 3M
applicator gun plunger. Applicator gun,
mixing nozzle and adhesive also required.

TVFP-EPOXY-3M-NOZ Replacement
Mixing Nozzle. Applicator gun, gun plunger
and adhesive also required.



TIVOFLEX PLUS™ TUBE LIGHTING

**CONNECTOR KITS AVAILABLE FOR USE BY TIVOLI
CERTIFIED OEMS AND INSTALLERS ONLY**



POWER FEED CONNECTION KITS

- 180° Connector power feed kits
- TVFP-CPC-24-180** Includes 5' cord
- TVFP-CPC-24-180-10** Includes 10' cord
- TVFP-CPC-24-180-20** Includes 20' cord
- TVFP-CPC-24-180-30** Includes 30' cord
- TVFP-CPC-24-180-40** Includes 40' cord
- TVFP-CPC-24-180-50** Includes 50' cord

- 90° Connector power feed kits
- TVFP-CPC-24-90** Includes 5' cord
- TVFP-CPC-24-90-10** Includes 10' cord
- TVFP-CPC-24-90-20** Includes 20' cord
- TVFP-CPC-24-90-30** Includes 30' cord
- TVFP-CPC-24-90-40** Includes 40' cord
- TVFP-CPC-24-90-50** Includes 50' cord

* All kits include female power connector (with cord), 1 Male pin and 1 End Cap

**USE MUST BE ACCORDING TO TIVOLI CERTIFIED
INSTALLER INSTALLATION INSTRUCTION SHEETS**

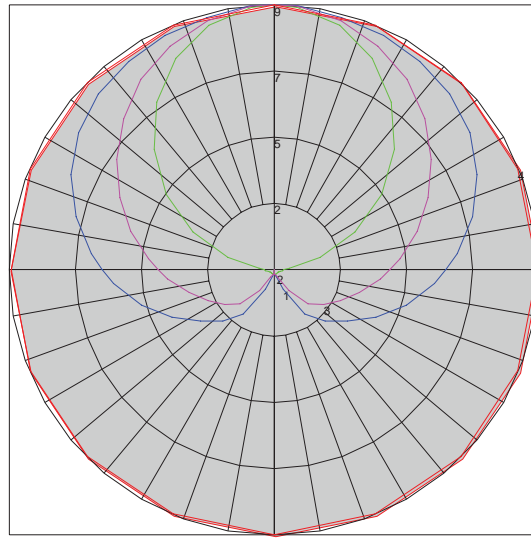
PHOTOMETRIC INFORMATION

- TivoFlex Plus - Warm White

ZONAL LUMEN SUMMARY

Zone	Lumens	% Lamp	% Fixt
0-30	0.14	N.A.	0.30
0-40	0.51		1.00
0-60	2.76		5.30
0-90	12.83		24.50
90-120	12.42		23.70
90-130	18.30		34.90
90-150	29.67		56.60
90-180	39.56		75.50
0-180	52.39		100

Total Luminare Efficiency = N.A.%



Maximum Candela = 9.33 Located At Horizontal Angle = 90, Vertical Angle = 175
 # 1 - Vertical Plane Through Horizontal Angles (90 - 270) (Through Max. Cd.) : BLUE
 # 2 - Vertical Plane Through Horizontal Angles (0 - 180) : GREEN
 # 3 - Vertical Plane Through Horizontal Angles (45 - 225) : MAGENTA
 # 4 - Horizontal Cone Through Vertical Angle (175) (Through Max. Cd.) : RED

COEFFICIENTS OF UTILIZATION - ZONAL CAVITY METHOD

Effective Floor Cavity Reflectance 0.20

RC RW	80				70				50			30			10			0
	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	
0	101	101	101	101	90	90	90	90	69	69	69	50	50	50	33	33	33	24
1	88	81	76	71	77	72	67	63	54	50	47	37	35	32	22	20	18	11
2	78	69	62	55	69	61	54	49	45	40	36	31	27	24	17	15	13	7
3	71	60	51	45	62	53	45	39	39	34	29	26	22	19	14	12	10	4
4	64	52	43	37	56	46	38	32	34	28	24	23	19	16	12	10	8	3
5	59	46	37	31	51	40	33	27	30	24	20	20	16	13	11	8	6	2
6	54	41	32	26	47	36	28	23	27	21	17	18	14	11	10	7	5	2
7	49	37	28	22	43	32	25	20	24	18	15	16	12	9	9	6	4	1
8	46	33	25	19	40	29	22	17	22	16	13	15	11	8	8	6	4	1
9	42	30	22	17	37	26	20	15	20	15	11	13	10	7	7	5	3	1
10	39	27	20	15	35	24	17	13	18	13	10	12	9	6	7	4	3	1

MTBF

Mean Time Between Failures (MTBF) for LEDs: While Tivoli utilizes LEDs provided by industry leading vendors, these are electrical components with calculated manufacturers mean time between failures (MTBF). MTBF is rated as the average point at which 1/2 of color LEDs will lose 50% of their original brightness. MTBF for White LEDs is based on when 1/2 are reduced to 70% of their original brightness.

Typically, LED product failures occur within fixture construction, interdependent component failure, or operation under adverse conditions. Tivoli operates LEDs at a derated current to insure that LED MTBF values are based on product fixture construction and real application standards.

Still, conditions such as excessive voltage, vibration, heat, and other adverse conditions may negatively effect the life of LEDs.

LED BINNING

LED technology is changing rapidly. LED's are made in lots and sorted into bins based on wavelength ranges that achieve colors. Tivoli uses a range of 2500°k to 3100°k for warm white and 5000° to 6000°K for white. Individual orders will be bin-sorted to within plus or minus 200°k and it is recommended to purchase 10% replacement stock within that bin lot to ensure matched color for needed replacements.



TIVOFLEX PLUS™ TUBE LIGHTING

RECOMMENDED POWER SUPPLIES

PART #	PRIMARY AND SECONDARY	TOTAL WATTAGE / AMPERAGE PER BREAKER	LISTING	DIMENSIONS	WEIGHT	ELECTRONIC OR AC MAGNETIC	DIMMABLE (Y OR N)
ADUL-100-1-4-24-D	85-264V AC / 24V DC	100 / 1X4A	UL/ETL	10"W X 10"L X 4"D		Electronic	Y: C
ADUL-300-3-4-24-D	85-264V AC / 24V DC	300 / 3X4A	UL/ETL	10"W X 10"L X 4"D		Electronic	Y: C
ADNM-100-1-4-24-D	85-264V AC / 24V DC	100 / 1X4A	UL/ETL	10"W X 10"L X 4"D		Electronic	Y: C
ADNM-300-3-4-24-D	85-264V AC / 24V DC	300 / 3X4A	UL/ETL	10"W X 10"L X 4"D		Electronic	Y: C
JT-100-1-4-24-D	120V AC / 24V DC	100 / 1X4A	ETL	4.25"W X 11.00"L X 4.00"D		Magnetic	Y: A, B, C
JT-300-3-4-24-D	120V AC / 24V DC	300 / 3X4A	ETL	8.50"W X 16.00"L X 4.50"D		Magnetic	Y: A, B, C
JTH-300-3-4-24-D	277V AC / 24V DC	300 / 3X4A	ETL	8.50"W X 16.00"L X 4.50"D		Magnetic	Y: C, D, E
QT-300-3-4-24-D	120V AC / 24V DC	300 / 3X4A	ETL	14.50"W X 8.00"L X 4.00"D		Magnetic	Y: A, B, C
QTH-300-3-4-24-D	277V AC / 24V DC	300 / 3X4A	ETL	14.50"W X 8.00"L X 4.00"D		Magnetic	Y: C, D, E
QT-600-6-4-24-D	120V AC / 24V DC	600 / 6X4A	ETL	14.50"W X 8.00"L X 4.00"D		Magnetic	Y: B, C
QTH-600-6-4-24-D	277V AC / 24V DC	600 / 6X4A	ETL	14.50"W X 8.00"L X 4.00"D		Magnetic	Y: C, E
MT-100-1-4-24-D	100-240V AC / 24V DC 277V AC / 24V DC	100 / 1x4A	UL	4.25"W X 12.32"L X 4.00"D		Electronic	N

DIMMERS

SELECTOR	DIMMER	TYPE	CONTROL SIGNAL	INPUT VOLTAGE	OUTPUT VOLTAGE	MAX LOAD	BREAKER RATING	DIMENSIONS
A	N-600	AC Magnetic	N/A	120V AC	120V AC	450W Max.	N/A	Recessed Single gang box
B	N-1000	AC Magnetic	N/A	120V AC	120V AC	800W Max.	N/A	Recessed Dual gang box
C	DIM-24V-8A	DC Digital	N/A	24V DC	24V DC	96W	8A*	Single gang box
D	NH-600	AC Magnetic	N/A	277V AC	277V AC	450W	N/A	Recessed Single gang box
E	NH-1000	AC Magnetic	N/A	277V AC	277V AC	800W	N/A	Recessed Dual gang box

**OTDIM applications require 1 each OTDIM per 5 amp circuit

PRODUCT SPECIFICATION GUIDE

TIVOFLEX PLUS	WATTS PER FOOT	MAX FEET PER CIRCUIT
Red, Yellow, Orange	1.80W	45
White, Warm White, Blue, Green	1.92W	40

