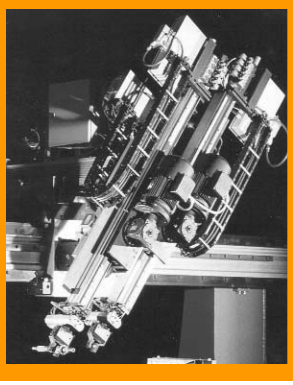
LAPP GROUP NORTH AMERICA

GUIDE TO DESIGN AND SELECTION OF CABLE MANAGEMENT AND TRACK




LAPP GROUP

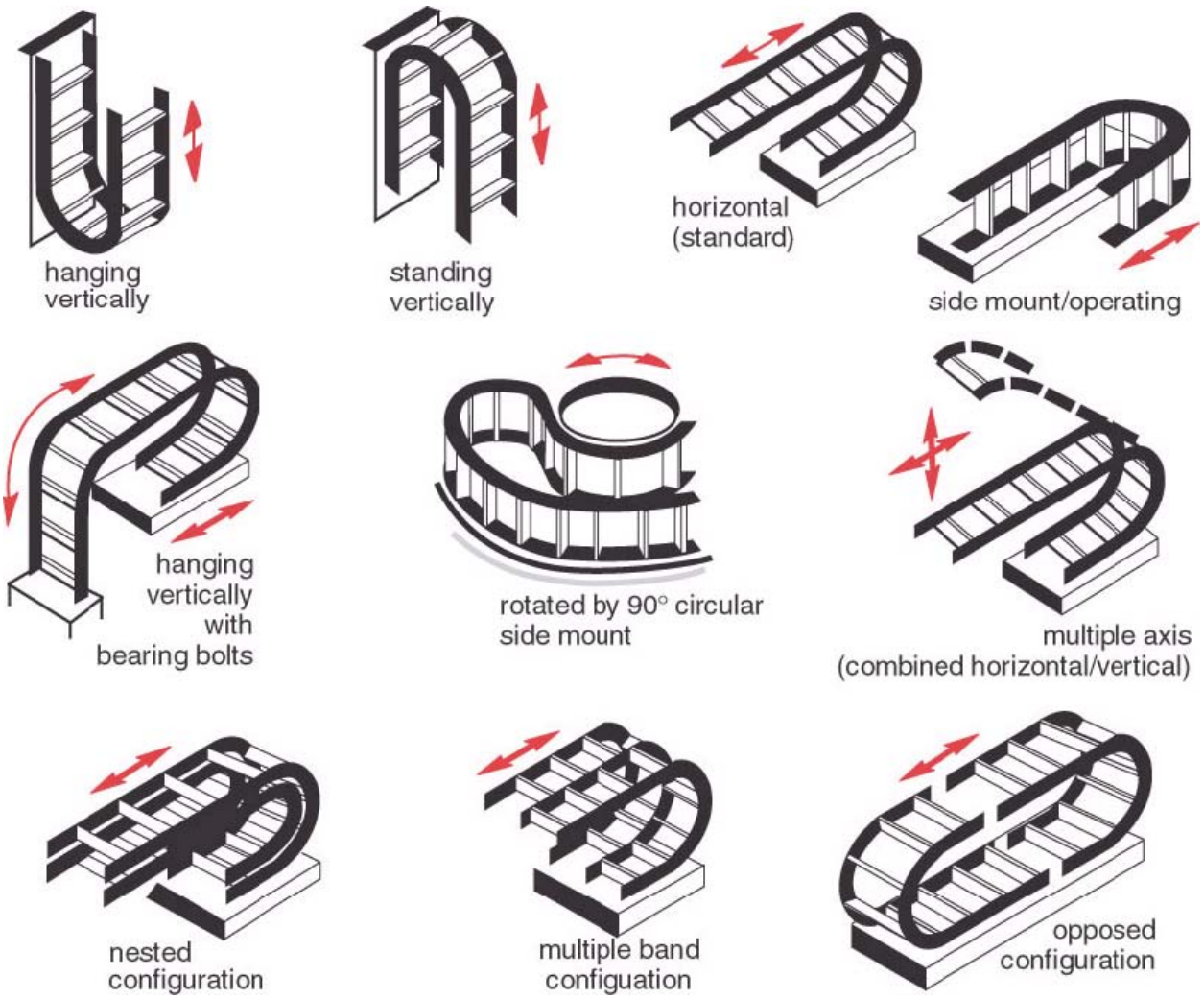
TABLE OF CONTENTS

APPLICATION

- Know the requirements & the limitations of equipment
- Design and Selection of cable management products & accessories
- Installation Variations: Which fits the best?

CABLE TRACK MOVEMENT VARIATIONS

Know the requirements & limitation of Equipment



VARIOUS TYPES OF CABLE TRACKS

- **Plastic** (Nylon)

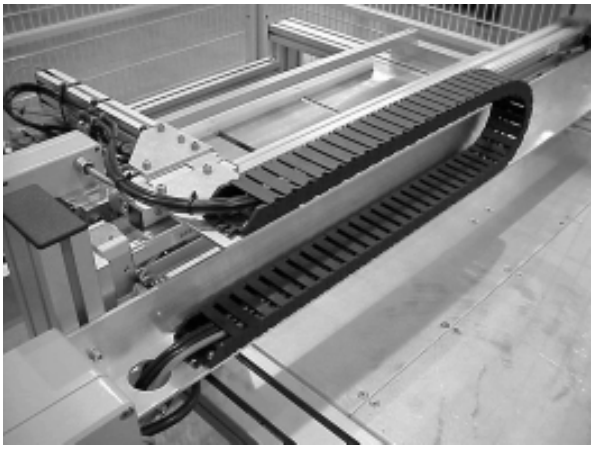
*Chemical *Cheaper *Flexible and not as rigid *Lighter in weight

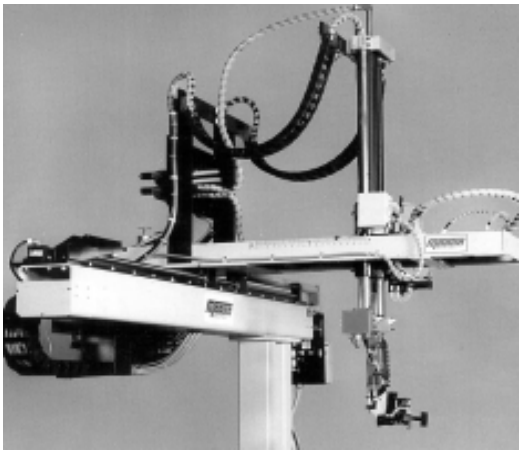
- **Metal** (Zinc Plated Steel)

*Needs less support *Operating higher temperature *Durable in harsh environment

PLASTIC CABLE TRACK

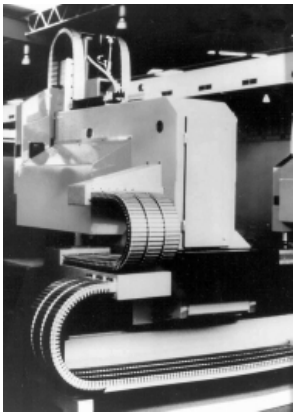
Nylon: Chemical Resistant, Cheaper, Flexible, Lighter in weight





METAL CABLE TRACK

Zinc Plated Steel: Needs less support, higher operating temperature, durable in harsh environment



TYPES OF ACCESSORIES

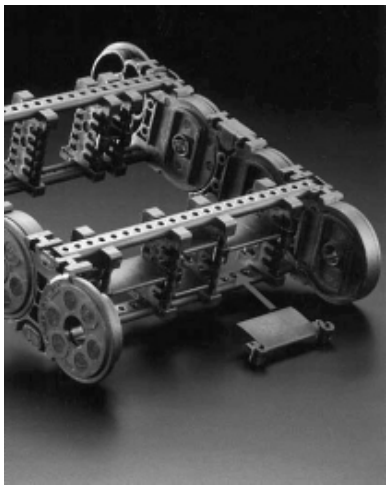
- Divider: Nylon: Verticals (more common) & Horizontal
- Brackets: Nylon (one or two piece) , Metals (two pieces)
- Standard Frame Stay:
- Nylon –Standard, In/Out Hinges
- Cover Strip
- RL/RV - Twist In/Out Aluminum Bar
- RS – Bolted Aluminum
- RM – Heavy duty bolted on aluminum bar

- Metal Guide Channels - for support & guides of the track, available in the industry - too costly

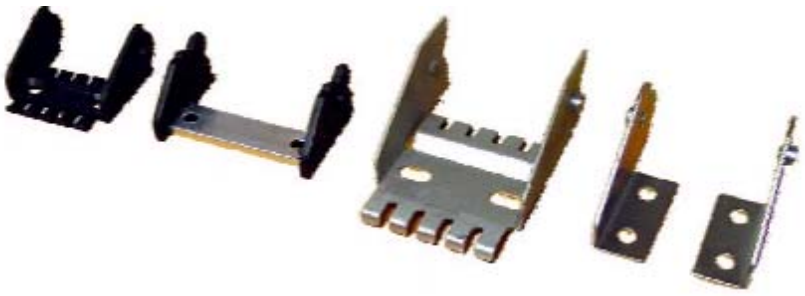
Products we offer

- Versa Trax, Plastitrak
- Plastitrak Model 32
- Varitrak, 650K, 900K
- Available in the industry
- Available in the industry

PLASTIC DIVIDERS: HORIZONTAL & VERTICAL



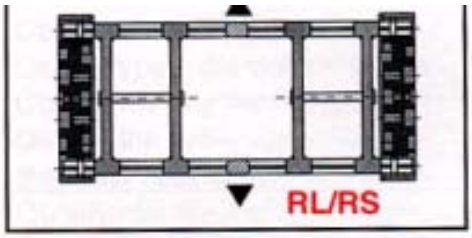
METAL & PLASTIC BRACKETS



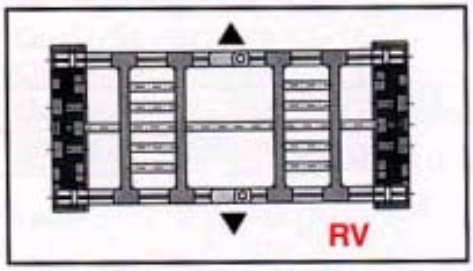
TYPES OF ACCESSORIES

FRAME STAY

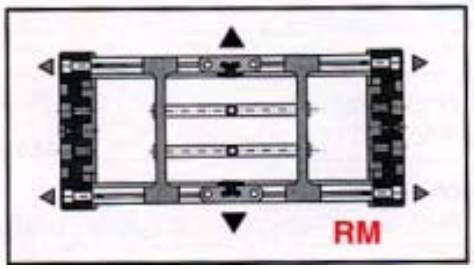
Nylon—In / Out Hinges
Cover Strip—Plastic



RL/RV - Twist in / Out Aluminum



RS - Bolted Aluminum Bar

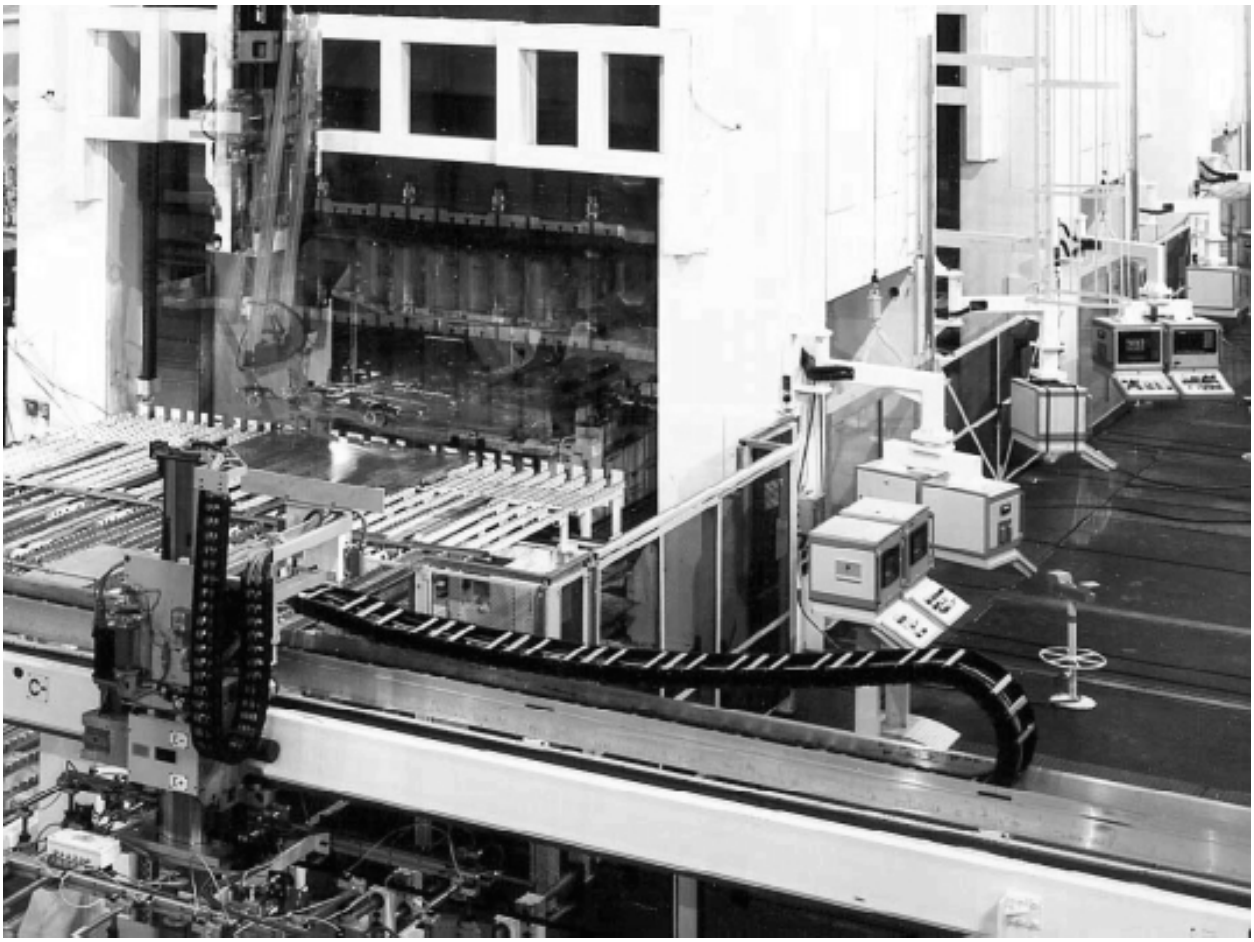


RM - Heavy Duty Bolted Aluminum Bar

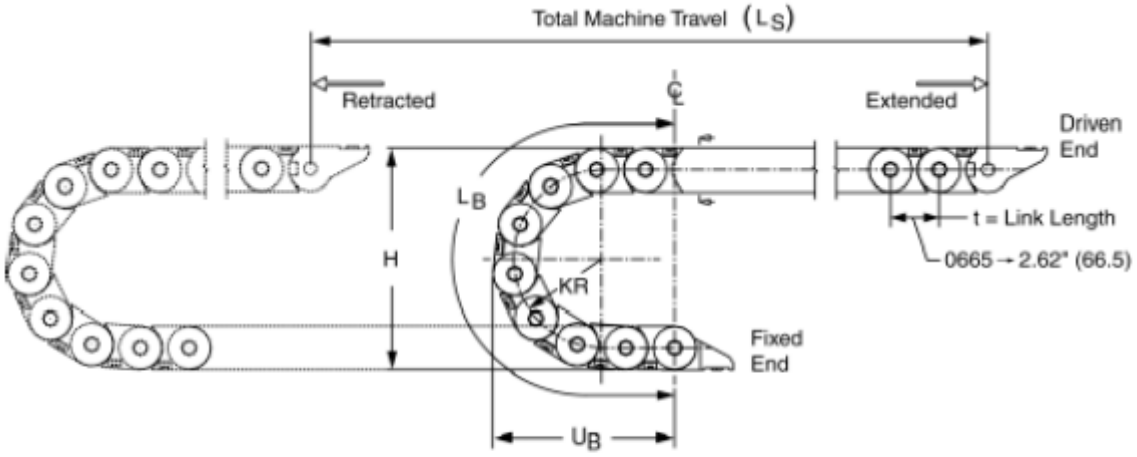
TYPES OF ACCESSORIES

METAL GUIDE CHANNELS

Supports and guides the cable track



FUNDAMENTALS AND ABBREVIATIONS



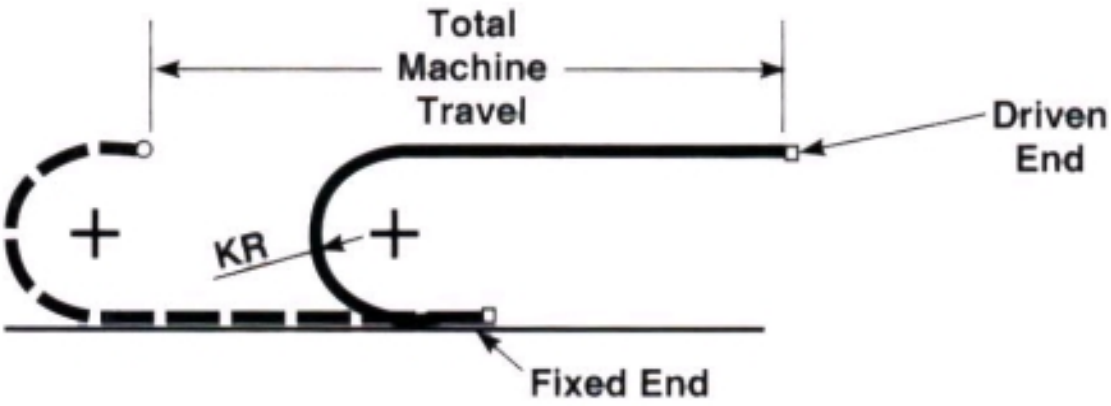
L_S = Total Travel Length
L_B = Loop Length
KR = Bend Radius
H = Mounting Height
U_B = Depot

For example - 0665.030.175

IW = Inside Width
OW = Outside Width
IH = Inside Height
OH = Outside Height
KR = Bend Radius
H = Mounting Height

DETERMINE THE AMOUNT OF TRACK NEEDED

- Determine the travel length & type of mount center or off center
- Determine the fixed and moving motion & Type of movement



Formulas:

Center Mounting (**CM**): **CM** = (Ls / 2) + Lb # of links = CM / t
Off-Center Mounting (**OCM**): **OCM** = (Ls / 2) + Off-center + Lb # of links = OCM / t

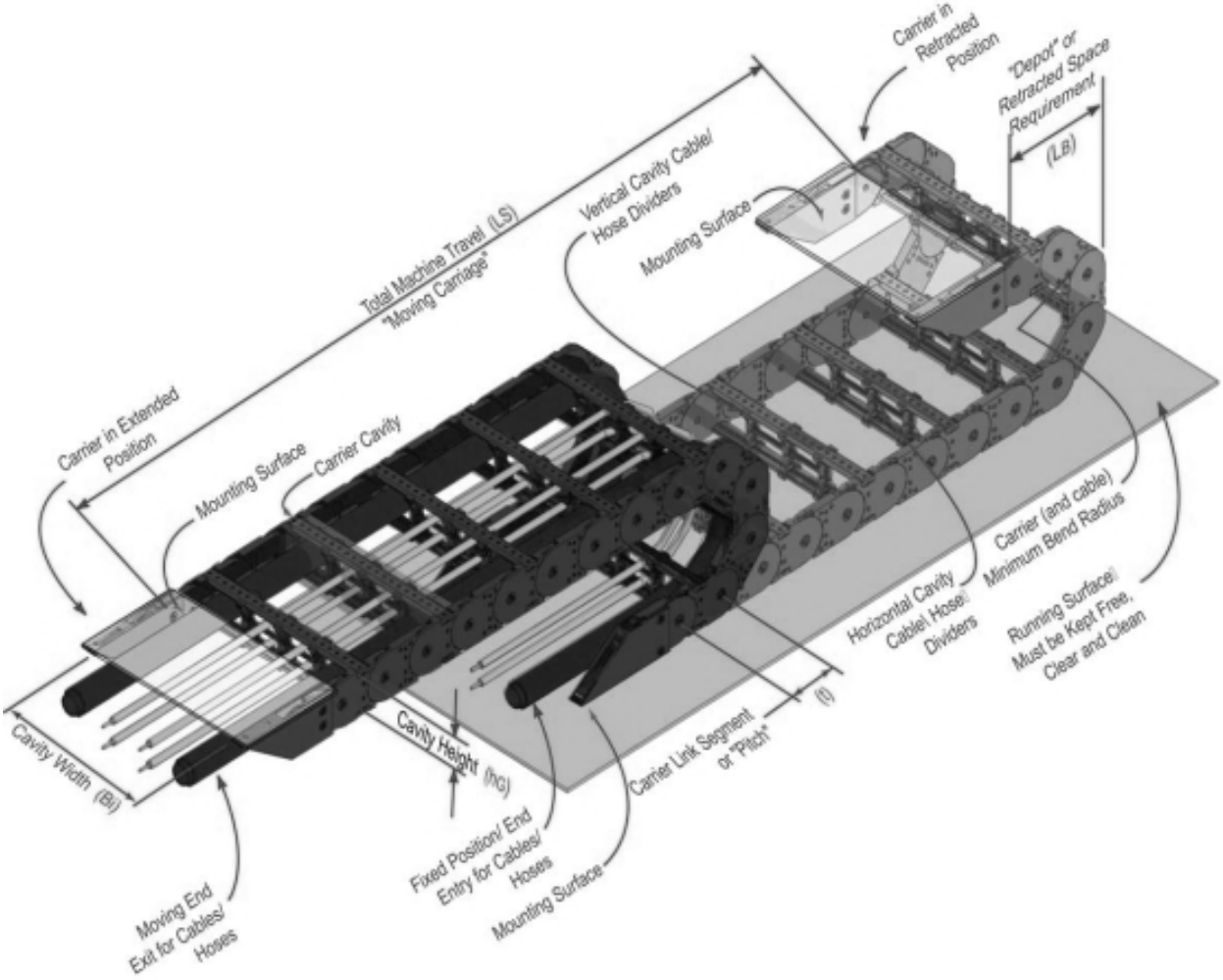
DETERMINE THE PROPER CARRIER TYPE AND SIZE

- Determine the minimum bend radius of the components inside the track .
  Choose a track that is slightly larger than minimum bend radius:
- Rule of thumb: The **cable** manufacturer will assign minimum radius.
  For **hoses** it should be 5 x diameter, **hydraulic** lines: 7.5 x diameter, confirm with customer
- **Width** clearances for **cable** inside the cable track is **10**%, for **hoses** is **20%**
- **Height** clearance for **cable & hoses** is approx. **20**%
- Distribute the weight inside the track and put the heavy components on the outside
- Calculate the weight of components inside the track
- Check Travel length for unsupported length (optional)
- Select the proper carrier type and size for the application

RULES FOR DIVIDERS

- Use when there is more than 3 conductors
- Separate the cables and hoses inside the cavity so they can move independently
- Every customer may have their own preferences on dividers, Ask the question?
- Every other link

DESIGN & FUNDAMENTALS OF CABLE TRACK



VERSATRAX™

New sideband link cable carrier designs dramatically increase the rigidity and unsupported lengths over standard plastic cable carriers. This unique design has an available snap-in partitioning system to insure proper separation of cables and/or hoses and reduce wear. The mounting brackets are supplied with an integral strain relief plate.

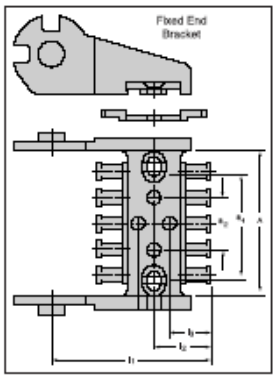
Base P/N	Inside Width (IW)	Outside Width (IW)	Inside Height (IH)	Outside Height (OH)	Bend Radius (KR)	Loop Length (Lb)	Mounting Height (H)
Model 345.30	(t=1.36) Link Length		.475 Max. cable diameter*				
345.30.015.*	0.59	1.1	0.79	1.10	1.50 (150)	7.44	4.09
345.30.020.*	0.79	1.3			1.97 (197)	8.94	5.04
345.30.025.*	0.98	1.49			2.95 (295)	12.01	7.01
345.30.038.*	1.5	2.01			3.94 (394)	15.12	8.98
345.30.050.*	1.97	2.48			4.92 (492)	18.19	10.94
345.30.065.*	2.56	3.07			5.91 (591)	21.3	12.91
Model 455.30	(t=1.79) Link Length		.75 Max. cable diameter*		2.05 (205)	10.04	5.51
455.30.025.*	0.98	1.69	1.02	1.42	2.56 (256)	11.65	6.54
455.30.038.*	1.5	2.21			3.74 (374)	15.35	8.9
455.30.058.*	2.28	2.99			4.92 (492)	19.06	11.26
455.30.078.*	3.07	3.78			5.91 (591)	22.17	13.23
455.30.103.*	4.05	4.76			7.09 (709)	25.87	15.59
455.30.130.*	5.12	5.83			7.87 (787)	28.35	17.17
					8.86 (886)	31.42	19.13
Model 555.30	(t=2.19) Link Length		1.1 Max. cable diameter*		2.48 (248)	12.17	6.93
555.30.050.*	1.97	2.84	1.5	1.97	3.15 (315)	14.29	8.27
555.30.075.*	2.95	3.82			3.94 (394)	16.77	9.84
555.30.100.*	3.94	4.81			4.92 (492)	19.84	11.81
555.30.125.*	4.92	5.79			6.30 (630)	24.17	14.57
555.30.150.*	5.91	6.78			7.87 (787)	29.13	17.72
					9.06 (906)	32.83	20.08
Model 665.30	(t=2.62) Link Length		1.3 Max. cable diameter*				
665.30.050.*	1.97	3.03	1.73	2.36	2.95 (295)	14.53	8.27
665.30.075.*	2.95	4.01			3.94 (394)	17.64	10.24
665.60.100.*	3.94	5			4.72 (472)	20.08	11.81
665.30.125.*	4.92	5.98			5.51 (551)	22.56	13.39
665.30.150.*	5.91	6.97			7.87 (787)	30.00	18.11
665.30.175.*	6.89	7.95			9.84 (984)	36.18	22.05
665.30.200.*	7.87	8.93			11.81 (1181)	42.36	25.98
665.30.225.*	8.86	9.92					
665.30.250.*	9.84	10.9					

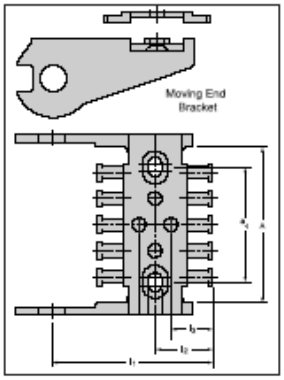
To order VersaTrax cable carrier the bend radius must be specified where the * is hown.
Reference the number shown in the ( ) of the available bend radii for each style

For example: Olflex P/N 665.30050.787 has bend radius 7.87".
*** Recommended Max. diameter of cable for the inside cavity. If you have to deviate from his, contact Engineering**

NOTE:
Style 30 shown above from outside of carrier. Options available are: 40 which opens from the inside of carrier, and style 60, totally enclosed tube, with opening to inside of carrier. Substitute either 40 or 60 in the part of number to order these options. All dimensions are in inches.

VERSATRAX™
Mounting Bracket Selection Chart





Model 345 bracket with integral strain relief							VersaTrax™ Dividers
	A	a1	a2	l1	l2	l3	For Model 345.30/.40
345.015B	0.59	N/A	N/A	2.44	N/A	0.63	use 345.30.40D
345.020B	0.79	N/A	N/A	2.44	N/A	0.63	(.08" - thickness)
345.025B	0.98	0.52	N/A	2.44	N/A	N/A	
345.038B	1.5	0.95	N/A	2.44	0.87	N/A	For Model 345.60
345.050B	1.97	1.42	N/A	2.44	0.87	N/A	use 345.60D
345.065B	2.56	2.01	N/A	2.44	0.87	N/A	

Model 455 bracket with removable strain relief							
	A	a1	a2	l1	l2	l3	For Model 455.30/.40
455.025B	0.98	0.43	N/A	2.91	1.04	0.78	use 455.30.40D
455.038B	1.5	0.93	N/A	2.91	1.04	N/A	(.10" - thickness)
455.058B	2.28	1.71	0.59	2.91	1.04	N/A	
455.078B	3.07	2.5	1.38	2.91	1.04	N/A	For model 455.60
455.103B	4.06	3.48	2.36	2.91	1.04	N/A	use 455.60D
455.130B	5.12	4.55	3.43	2.91	1.04	N/A	

Model 555 bracket with removable strain relief							
	A	a1	a2	l1	l2	l3	For Model 555.30/.40
555.050B	1.97	1.22	N/A	3.7	1.04	0.78	use 555.30.40D
555.075B	2.95	2.17	0.98	3.7	1.04	N/A	(.10" - thickness)
555.100B	3.94	3.15	1.97	3.7	1.04	N/A	
555.125B	4.92	4.13	2.95	3.7	1.04	N/A	For Model 555.60
555.150B	5.91	5.12	3.94	3.7	1.04	N/A	use 555.60D

Model 665 bracket with removable strain relief							
	A	a1	a2	l1	l2	l3	For Model 665.30/.40
665.050B	1.97	1.18	N/A	3.64	1.38	0.89	use 665.30.40D
665.075B	2.95	2.17	0.79	3.64	1.38	N/A	(.12" - thickness)
665.100B	3.39	3.15	1.57	3.64	1.38	N/A	
665.125B	4.92	4.13	2.56	3.64	1.38	N/A	
665.150B	5.91	5.12	3.54	3.64	1.38	N/A	
665.175B	6.89	6.1	4.53	3.64	1.38	N/A	
665.200B	7.87	7.09	5.51	3.64	1.38	N/A	For Model 665.60
665.225B	8.86	8.07	6.50	3.64	1.38	N/A	use 665.60
665.250B	9.84	9.06	7.48	3.64	1.38	N/A	

OLFLEX® CABLE TRACK

Plastitrak easy open lids

OLFLEX® Cable Tracks are designed to maintain cable alignment in continuous-flexing applications. With proper cable selection and installation (see page 9), OLFLEX® Cable Tracks increase the life of cable and hoses by protecting them from mechanical wear and stress. The tracks are simple to assemble and install, reduce downtime, and greatly improve machine operation and appearance. OLFLEX® Cable Track is resistant to oils, gasoline and coolants. Custom designs are readily available. These modular tracks are designed to offer the maximum usable internal dimensions with the smallest overall envelope, assuring compact and efficient space utilization and unparalleled application flexibility.

Part Number	Inside Width (IW)	Outside Width (OW)	Inside Height (IH)	Outside Height (OH)	Bend Radius (KR)	Loop Length (Lb)	Mounting Height (Lb)	Std. of Dividers	Links/Foot
Model 32	**(t = 1.26)**	**Link Length**							
320915* *	0.9	1.4	0.6	.98	1.5	7.1	4.0	0	9.5
320930* *	0.9	1.4	0.6	.98	3.0	12.1	7.1	0	9.5
Model 45	**(t = 1.77)**	**Link Length**							
451520	1.5	2.1	0.9	1.57	2.0	10	5.7	1	6.8
451537	1.5	2.1	0.9	1.57	3.7	15.2	9	1	6.8
451549	1.5	2.1	0.9	1.57	4.9	19	11.5	1	6.8
451559	1.5	2.1	0.9	1.57	5.9	22.1	13.4	1	6.8
452320	2.3	2.9	0.9	1.57	2.0	10	5.7	1	6.8
452337	2.3	2.9	0.9	1.57	3.7	15.2	9	1	6.8
452349	2.3	2.9	0.9	1.57	4.9	19	11.5	1	6.8
452359	2.3	2.9	0.9	1.57	5.9	22.1	13.4	1	6.8
453120	3.1	3.7	0.9	1.57	2.0	10	5.7	1	6.8
453137	3.1	3.7	0.9	1.57	3.7	15.2	9	1	6.8
453149	3.1	3.7	0.9	1.57	4.9	19	11.5	1	6.8
453159	3.1	3.7	0.9	1.57	5.9	22.1	13.4	2	6.8
454120	4.1	4.7	0.9	1.57	2.1	10	5.7	2	6.8
454137	4.1	4.7	0.9	1.57	3.7	15.2	9	2	6.8
454149	4.1	4.7	0.9	1.57	4.9	19	11.5	2	6.8
454159	4.1	4.7	0.9	1.57	5.9	22.1	13.4	2	6.8
Model 625	**(t = 2.46)**	**Link Length**							
6252635	2.6	3.7	1.6	2.44	3.5	16.1	9.5	1	4.9
6252649	2.6	3.7	1.6	2.44	4.9	20.4	12.3	1	4.9
6252679	2.6	3.7	1.6	2.44	7.9	29.7	18.3	1	4.9
6252612	2.6	3.7	1.6	2.44	11.8	42.1	26	1	4.9
6254235	4.2	5.4	1.6	2.44	3.5	16.1	9.5	2	4.9
6254249	4.2	5.4	1.6	2.44	4.9	20.4	12.3	2	4.9
6254279	4.2	5.4	1.6	2.44	7.9	29.7	18.3	2	4.9
6254512	4.2	5.4	1.6	2.44	11.8	42.1	26	2	4.9
6254935	4.9	6.0	1.6	2.44	3.5	16.1	9.5	2	4.9
6254949	4.9	6.0	1.6	2.44	4.9	20.4	12.3	2	4.9
6254979	4.9	6.0	1.6	2.44	7.9	29.7	18.3	2	4.9
6254912	4.9	6.0	1.6	2.44	11.8	42.1	26	2	4.9
6255935	5.9	7.0	1.6	2.44	3.5	16.1	9.5	3	4.9
6255949	5.9	7.0	1.6	2.44	4.9	20.4	12.3	3	4.9
6255979	5.9	7.0	1.6	2.44	7.9	29.7	18.3	3	4.9
6255912	5.9	7.0	1.6	2.44	11.8	42.1	26	3	4.9
6256635	6.6	7.8	1.6	2.44	3.5	16.1	9.5	3	4.9
6256649	6.6	7.8	1.6	2.44	4.9	20.4	12.3	3	4.9
6256679	6.6	7.8	1.6	2.44	7.9	29.7	18.3	3	4.9
6256612	6.6	7.8	1.6	2.44	11.8	42.1	26	3	4.9

* * Model 32 has cover strip instead of hinges

OLFLEX® CABLE TRACK

Mounting brackets & dividers for plastitrak series

OLFLEX® Cable Tracks require mounting brackets to affix both the stationary and the moving ends. The mounting brackets supplied face outward. The bolts used to fasten the mounting brackets are directed toward the outside curve of the track. Please contact an OLFLEX® Technical Specialist for dimensional information.

Mounting Brackets				Moving End		Dividers	
Model	Inside Width Cavity)	Stationary End P/N	# Req'd	P/N	#Req'd	Model	P/N
32	0.9"	420	1	425	1	32	None
45	1.5"	900	1	890	1	45	720
	2.3"	969	1	968	1		
	3.1"	994	1	993	1		
	4.1"	131	1	130	1		
625	All	772	2 each	770	2 each	625	784
650	All	852	2	852	2	650	848
900	All	952	2	952	2	900	970

NEW PLASTITRAK STRAIN-RELIEF MOUNTING BRACKET SELECTION CHART

Standard

Model	Inside Width Cavity)	Stationary End P/N	# Req'd	Moving End P/N	#Req'd	Dividers* Model	P/N
32	0.9"	420SR	1	425SR	1	32	None
45	1.5"	900SR	1	890SR	1	45	720
	2.3"	969SR	1	968SR	1		
	3.1"	994SR	1	993SR	1		
	4.1"	131SR	1	130SR	1		
625	2.6"	625SR	1	624SR	1	625	784
	4.2"	645SR	1	644SR	1		
	4.9"	655SR	1	654SR	1		
	5.9"	665SR	1	664SR	1		
	6.6"	675SR	1	674SR	1		

*Dividers are recommended for use on every other link. Consult your OLFLEX® Technical Specialist for the number of dividers required for your particular application.

OLFLEX® CABLE TRACK
Example # 1

Known: Components: 3 - Cables
Type of Mounting: **Center**

1 - .550” PVC Tube (.500” Inside Diameter)
Travel Length (**Ls**): 8 feet, convert feet into inches: 8’ * 12= 96”

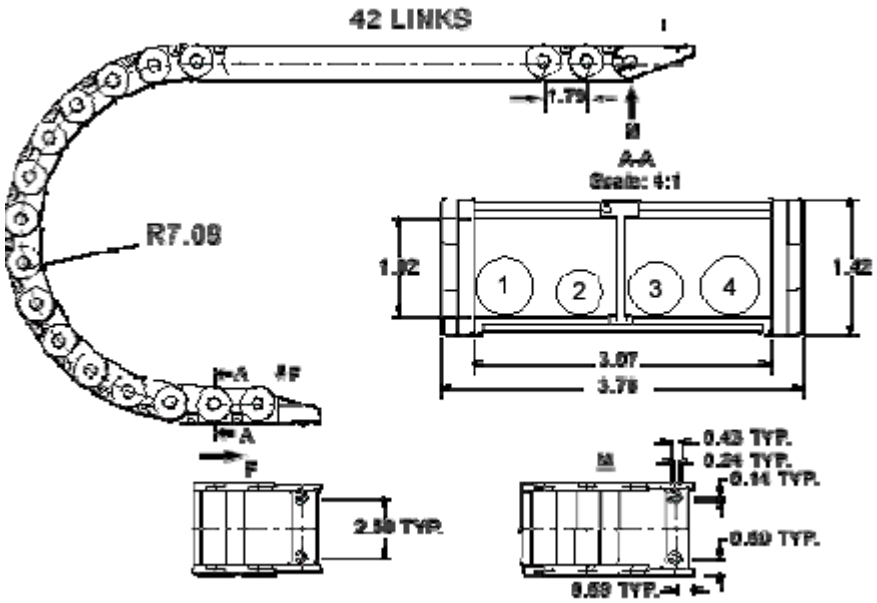
Item #	Part Number	Quantity (#)	Nominal Diameter	Min. Radius Factor	Min. Radius	Clearances Fator - Min.	Min. Clearance	Weight (Lbs./ft)
1	26254	1	.594"	7.5 x cable diameter	4.45"	1.10%	.653"	.27
2	6001	1	.475"	14 x cable diameter	6.65"	1.10%	.522"	.14
3	891407	1	.602"	7.5 x cable diameter	4.50"	1.10%	.622"	.22
4	PVC Tube	1	.550"	5 x tube diameter	2.75"	1.20%	.660"	.20
5	Dividers - Vert.	1	.100"				.100"	
						Total:	**2.557"**	.83 lbs./ft

Inside Height (20% Max.): .602" x 1.20% = .722"

Min Radius: 6.65" Min. Clearance: 2.557" Weigth: .83 lbs/ft
Inside Width: 3.07" Outside Width: 3.78" Inside Heigth: 1.02"
Track chosen: 455.30.078.709 Bend Radius: 7.09"
Outside Heigth: 1.42"

Center Mounting (CM): Formula **CM: (Ls / 2) + Lb (Loop Length)** **# of links = CM / t (Link Length)**
= (96"/2) + 25.87"= 73.87" = 73.87" / 1.79" = 41.26 (round up) = 42 links

Order Track Part Number: 455.30.078.709 x 42 links + 1 set (brackets) + 21 dividers vert



OLFLEX® CABLE TRACK
Example # 2

Known: Components: 3 - Cables
Type of Mounting: **Off-Center, 12”**

1 - .550” PVC Tube (.500” Inside Diameter)
Travel Length (**Ls**): 5 feet, convert feet into inches: 5’ * 12= 60”

Item #	Part Number	Quantity (#)	Nominal Diameter	Min. Radius Factor	Min. Radius	Clearances Fator - Min.	Min. Clearance	Weight (Lbs./ft)
1	26254	1	.594"	7.5 x cable diameter	4.45"	1.10%	.653"	.27
2	6001	1	.475"	14 x cable diameter	6.65"	1.10%	.522"	.14
3	891407	1	.602"	7.5 x cable diameter	4.50"	1.10%	.622"	.22
4	PVC Tube	1	.550"	5 x tube diameter	2.75"	1.20%	.660"	.20
5	Dividers - Vert.	1	.100"				.100"	
						Total:	**2.557"**	.83 lbs./ft

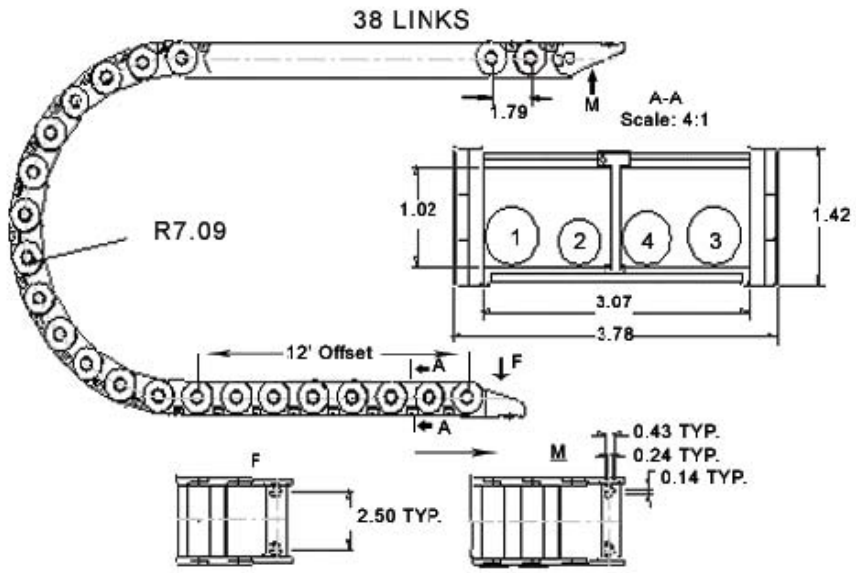
Inside Height (20% Max.): .602" x 1.20% = **.722"**
Min Radius: 6.65" Min. Clearance: 2.557" Weigth: .83 lbs/ft
Inside Width: 3.07" Outside Width: 3.78" Inside Heigth: 1.02"
Track chosen: 455.30.078.709
Outside Heigth: 1.42"

Off-Center Mounting (OCM): Formula

OCM: (Ls / 2) + Off-Center + Lb (Loop Length)
= (60"/2) + 12"= 25.87"
= 67.87"

# of links = CM / t (Link Length)
= 67.87" / 1.79"
= 37.91 (round up) = 38 links

Order Track Part Number: 455.30.078.709 x 38 links + 1 set (brackets) + 19 dividers vert



OLFLEX® CABLE TRACK
Example # 3

Known: Components: 8 - Cables
Type of Mounting: **Center**

2 - .650” Air lines
Travel Length (**Ls**): 9 feet, convert feet into inches: 9’ * 12= 108”

Item #	Part Number	Quantity (#)	Nominal Diameter	Min. Radius Factor	Min. Radius	Clearances Fator - Min.	Min. Clearance	Weight (Lbs./ft)
1	27567	4	.571"	5 x cable diameter	2.85"	1.10%	.628 x 4 = 2.512"	.20 x 4 = .80
2	891805CY	2	.441"	10 x cable diameter	4.41"	1.10%	.485 x 2 = .970"	.13 x 2 = .96
3	890804	2	**.736"**	7.5 x cable diameter	**5.52"**	1.10%	.809 x 2 = 1.619"	.48 x 2 = .96
4	Air lines	2	.650"	5 x air line diameter	3.25"	1.20%	.780 x 2 = 1560"	.50 x 2 = 1.0
5	Dividers - Vert.	9	.120"				.120 x 9 = 1.080"	
						Total:	**7.741"**	3.02 lbs./ft

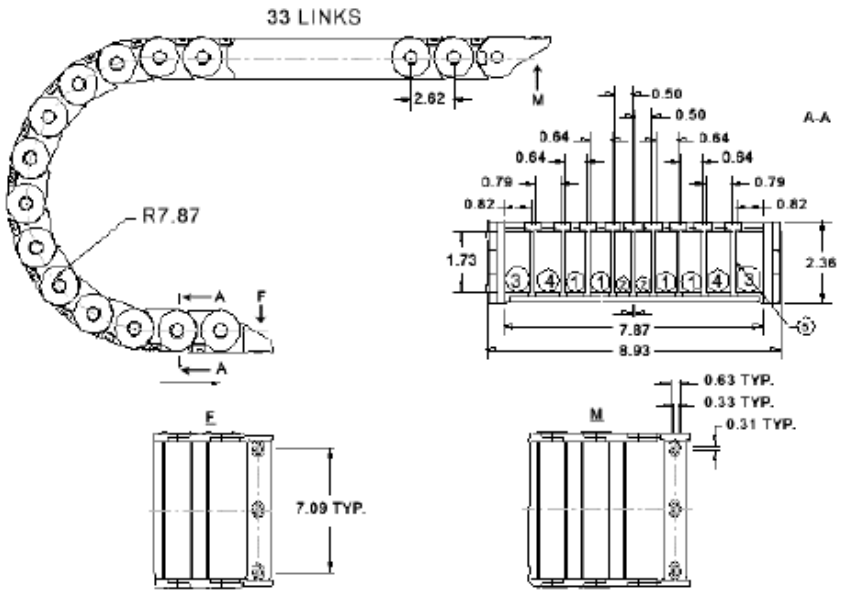
Inside Height (20% Max.): .736" x 1.20% = **.883"**
Min Radius:5.52" Min. Clearance: 7.741" Weigth: 3.02 lbs/ft
Inside Width: 7.87" Outside Width: 8.93" Inside Heigth: 1.73"
Track chosen: 655.30.200.787
Outside Heigth: 2.36"

Center Mounting (CM): Formula

CM: (Ls / 2) + Lb (Loop Length)
= (108"/2) + 30"= 84"

# of links = CM / t (Link Length)
= 84" / 2.62" = 32.06 (round up) = 33 links

Order Track Part Number: 655.30.200.787 x 33 links + 1 set (brackets) + 153 dividers vert



OLFLEX® CABLE TRACK
Example # 4

Known: Components: 8 - Cables
Type of Mounting: **Center**

2 - .650" Air lines
Travel Length (**Ls**): 9 feet, convert feet into inches: 9' * 12= 108"

Item #	Part Number	Quantity (#)	Nominal Diameter	Min. Radius Factor	Min. Radius	Clearances Fator - Min.	Min. Clearance	Weight (Lbs./ft)
1	27567	4	.571"	5 x cable diameter	2.85"	1.10%	.628"	.20 x 4 = .80
2	891805CY	2	.441"	10 x cable diameter	4.41"	1.10%	485"	.13 x 2 = .96
3	890804	2	**.736"**	7.5 x cable diameter	**5.52"**	1.10%	.809"	.48 x 2 = .96
4	Air lines	2	.650"	5 x air line diameter	3.25"	1.20%	.780"	.50 x 2 = 1.0
E&F	Dividers - Horz.	5	.160"				.120"	
G	Dividers-Vert.	6	.310"				310"	
						Total:	**See Below**	3.02 lbs./ft

Min. Clearance:

Vertical = (1.2 x #1) + (1.2 x #4) + Horz. Divider
= (1.2 x .571") + (1.2 x .650") + .160

Horizontal = (1 x #1) + (2 x #3) + (2 x #4) + (6 * Vert. Divider)
= (1 x .628") + (2 x .809") + (2x .780") + (6* .31)
=628" + 1.618" + 1.560 + 1.86" = 5.66"

Min. Radius: 5.52"
Inside Width: 6.89"
Bend Radius: 7.87"

Weight: 3.02 lbs/ft
Outside Width: 7.95"

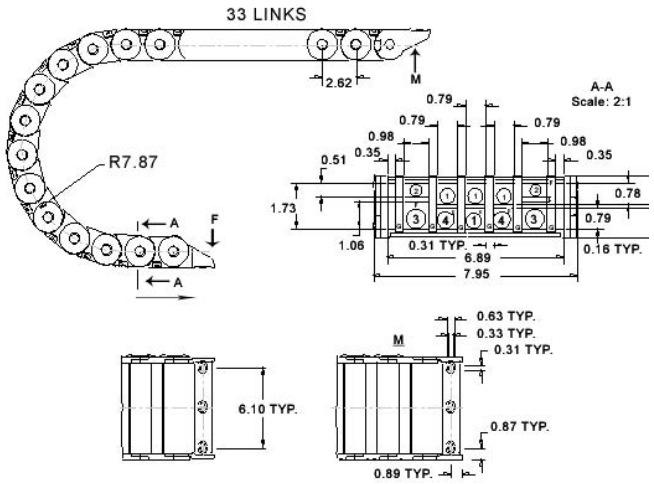
Track chosen: 655.30.175.787
Inside Height: 1.73" Outside Height: 2.36"

Center Mounting (CM): Formula

CM: (Ls / 2) + Lb (Loop Length)
= (108"/2) + 30"= 84"

# of links = CM / t (Link Length)
= 84" / 2.62" = 32.06 (round up) = 33 links

Order Track Part Number: 655.30.175.787 x 33 links + 1 set (brackets) + 85 dividers-horz. + 102 dividers-vert



OLFLEX® CABLE TRACK
Example # 5

Known: Components: 10 - Cables 2 - .725" Hydraulic lines 1 - 600" Air lines
Type of Mounting: **Off-Center,** 36" Travel Length (**Ls**): 10 feet, convert feet into inches: 10' * 12= 120"

Item #	Part Number	Quantity (#)	Nominal Diameter	Min. Radius Factor	Min. Radius	Clearances Fator - Min.	Min. Clearance	Weight (Lbs./ft)
1	3022134	2	.709"	7.5 x cable Dia.	5.31"	1.10%	.779 x 2 = 1.558"	.31 x 2 = .62
2	891604	3	**.362"**	7.5 x cable Dia.	2.75"	1.10%	.398 x 3 = 1.194"	.01 x 3 = .03
3	27579	2	**.524"**	5 x cable Dia.	**2.62"**	1.10%	.576 x 2 = 1.152"	.19 x 2 = .38
4	Blue Cable	3	.713"	7.5 x Hydraulic Dia.	8.55"	1.10%	.784 x 3 = 2.352"	.38 x 3 = 1.14
5	Air lines	1	.600"		3.00"	1.20%	.720 x 1 = .720"	.50 x 1 = .50
6	Hydraulic lines	2	.725"		5.62"	1.20%	.870 x 2 = 1.740"	.90 x 2 = 1.80
7	Dividers - Vert.	9	.120"				.120 x 9 = 1.08"	
8	Dividers - Horz.	1	.160"					
						Total:	**9.796"**	4.47 lbs./ft

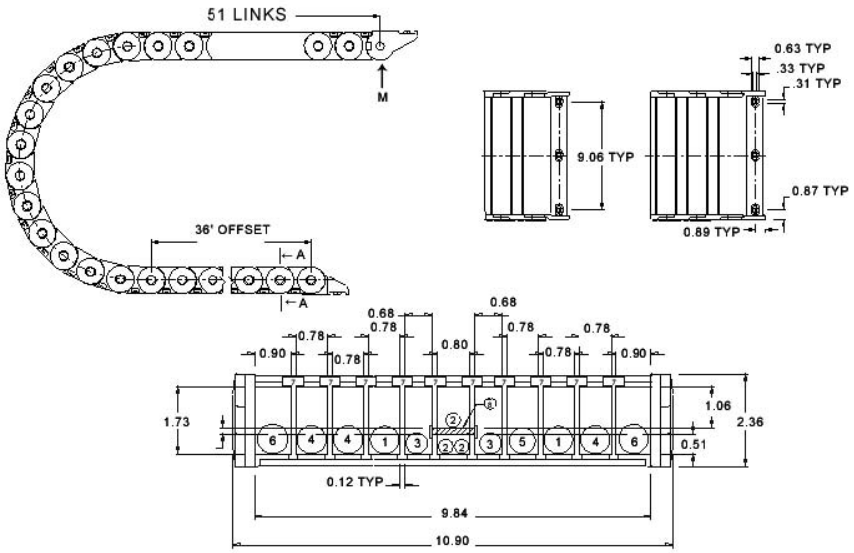
Min. Clearance: **Vertical** = 2 Elements * (1.2 x #2) + Horz. Divider
= 2 * (1.20% x .362") + .160" = **1.028"**

Min. Radius: 8.55" Min Clearance: 9.796"
Inside Width: 9.84" Weight: 4.47 lbs/ft Track chosen: 665.30.250.984
Bend Radius: 9.84" Outside Width: 10.9" Inside Height: 1.73" Outside Height: 2.36"

Off-Center Mounting (OCM): Formula

OCM: (Ls / 2) + Off-Center + Lb (Loop Le **# of links = OCM / t (Link Length)**
= (120"/2) + 36"= 36.18" = 132.18" / 2.62"
= 132.18" = 50.45 (round up) = 51 links

Order Track Part Number: 655.30.250.984 x 51 links + 1 set (brackets) + 26 dividers-horz. + 234 dividers-vert.



CABLE TRACK FORMAT

Application Information: _____

_____

Type of Mounting: Center or Off-Center: Distance: _____" Travel Length (Ls): _____"

Unsupported length: (CM = Ls/2, OCM = Ls) : _____"

Mounting Sketch

	A	B	C	D	E	F	G	H
Item #	Part Number	Quantity	Nominal Diameter	Min. Radius Factor	Min. Radius	Clearances Factor - Min.	Min. Clearance (G * B)	Weight (Lbs./ft) x B
1			"		"		"	
2			"		"		"	
3			"		"		"	
4			"		"		"	
5			"		"		"	
6			"		"		"	
7			"		"		"	
8	Dividers – Vert.		"				"	
						Total:	"	Lbs./ft

Min. Inside Height (Largest Nominal Diameter of C): _____" x 1.20 % = _____"

Min. Radius: _____" (Largest radius of E) Min. Width: _____" (Total of G) Weight: _____Lbs./ft. (Total of H) Track chosen: _____ (Smallest Model / Type chosen)

Cable Track Layout Sketch

(From Catalog Based on Track chosen)

Inside Height: _____" Outside Height: _____" Inside Width: _____" Outside Width: _____" Bend Radius: _____"

Do all the characteristics of the selected track match the application requirements?

Center Mounting Formula (CM): Calculate Track Length & Links needed

CM = (Ls / 2) + Lb (Loop Length) # of links = CM / t (Link Length)

= _____ = _____

= _____ inches = _____ (round up) = _____ links

Off-Center Mounting Formula (OCM): Calculate Track Length & Links needed

OCM = (Ls / 2) + Off-center + Lb (Loop Length) # of links = OCM / t (Link Length)

= _____ = _____

= _____ inches = _____ (round up) = _____ links

# of Dividers: (#of links / 2, rounded up)*(Dividers per link) _____

Order Track Part Number: _____

Comments: _____

_____

LIMITATION GUIDE FOR UNSUPPORTED CABLE TRACK

For example:

OLFLEX® P/N 8912618CY weighs **493 lb./1000 ft**. or **.493 lb./ft**. If there were four cables in a track the weight would be 1.972 lb./ft. If the track has to move 100", go to the left hand column and move down until you find **2 lb./ft**. Then follow the column to the right and whatever track allows 100" or more, the end user can use.
Options available: Versa Trax 655, Varitrak 900K & 1250MK.

	Model Type	Plastitrak 32	Plastitrak 45	Plastitrak 625	VersaTrax 345	VersaTrax 455	VersaTrax 555	VersaTrax 665	VariTrak 650K	Varitrak 900K	Varitrak 1250MK
Wt. of Content lb./ft.	**Link Length**	**t = 1.26"**	**t = 1.77"**	**t = 2.46"**	**t = 1.36"**	**t = 1.79"**	**t = 2.19"**	**t = 2.62"**	**t = 2.56"**	**t = 3.54"**	**t = 4.92"**
0.25		39"	56"	96"	73"	86"	120"	127"	98"	169"	187"
0.5		35"	49"	91"	65"	78"	113"	123"	97"	168"	184"
0.75		30"	43"	86"	49"	74"	109"	119"	95"	166"	182"
1		19"	39"	81"	43"	68"	104"	115"	93"	164"	180"
1.5			32"	72"	33"	61"	98"	108"	91"	161"	178"
2			21"	63"		49"	88"	100"	89"	158"	156"
2.5				54"		42"	78"	93"	87"	156"	174"
3				45"			74"	88"	86"	153"	172"
3.5				38"			65"	80"	85"	151"	170"
4							59"	73"	84"	148"	168"
5							36"	62"	81"	144"	164"
6								45"	78"	140"	160"
7								39"	74"	136"	156"
8									70"	132"	152"
					9				67"	127"	147"
					10				63"	122"	143"
					11					115"	139"
					12					109"	135"
					13					104"	131"
					14					101"	127"
					15					97"	123"
					16					94"	119"
					17					90"	115"
					18					86"	110"
					19					83"	106"
					20					79"	102"
					25						82"
					30						61"
					33						49"

Unsupported Length Formula:

Loop length on left
CM = Ls/2
OCML = Ls

Loop length on right
CM = Ls/2
OCMR = Ls

OLFLEX-FD®
Installation instructions for OLFLEX® cable in cable track

1. Only OLFLEX-FD® or UNITRONIC-FD® cables should be used in a moving cable track application.

2. When selecting cable for cable track the following criteria must be taken into consideration; environmental conditions such as temperature, chemical influences, indoor or outdoor operation, as well as traveling speed and frequency of operation.

3. The recommended minimum bend radius of the cable should not be exceeded. Refer to the technical data section of this catalog for minimum bend radius for flexing.

4. The cables must be prepared for installation into the cable track without twists, bends or kinks in the cable. Therefore, the cable should always be unwound from the outside layer of the reel or spool. The cable should never be pulled from a coil. Before insertion into the track, it is important that the cable be laid out or hung at least 24 hours prior to installation into the cable track to relax any stresses resulting from transit or storage. If the cable cannot be relaxed, it should be shook out by grasping the cable length at its mid-point and shaking the cables as you move to each end. Then, wrap each end of the cable with masking tape and mark the top of each cable end.
   Maintain this alignment throughout installation and clamping.

5. When placing the cable into the cable track, the track should be laid out flat with the bending direction facing upward, the fitted with the cables in working position. The cables should be laid into the cable track and not weaved between or around other cables. The cables should lay loosely side by side in the track. A minimum clearance of five (5) percent of the cable diameter should be allowed on each side of the cable. When cable is installed in track where spacers are provided, they should be separated from each other.

6. **The cables should not be fixed to the track or tied together in the track.**

7. The weight of the cables must be evenly distributed. Heavier cables should be placed towards the outside of the cable track, while lighter ones should occupy the center of the cable track. When the cable track is side mounted, always place the larger cable towards the outside and the smaller cables toward the inside of the cable track. Cables must not be pulled tight against the inner track curve. Cables must not be pushed tight against the outer track curve.

8. After the cable track is installed, the cables should be cycled through several flexes and observed for freedom of movement. It is important to ensure that cables can move with complete freedom within the bend radius, so that movement of the cables among themselves and with the track possible.

9. The cables should be clamped into position at both ends of the cable track. Prior to clamping, the alignment marks on the taped ends should be correctly positioned. Do not crush the cables when clamping. The clamping points must be located at a distance of 15 x cable diameter from the end point of the flexing movement.
   NOTE: When calculating 15 x cable diameter, it is important to use the diameter of the largest cable in the track.

CABLE TRACK QUESTIONNAIRE

Need help selecting your cable carrier?
Complete this form and fax it to your Tech Specialist

Company Name _____ Contact Name _____ Phone Number _____

1. Total length of existing track (if replacing): _____

2. Total distance traveled in one cycle: _____

3. Direction /Orientation of travel, please check one:
___ Horizontal ___ Side Running
___ Vertical ___ Other, please provide sketch

4. Is track center mounted?
(eg. is the fixed end of carrier mounted in the center of travel?) _____

5. If not center mounted, how much off center in inches? _____

6. Type of equipment track is installed on: _____

7. Number of cables and hoses in track: _____

8. Outside diameters (in inches) of each cable and hose: _____

9. Minimum bending radius of cables and hoses: _____

10. Estimated total weight of track contents (lbs/ft, if available): _____

11. Operation speed (feet per second): _____

12. Operation frequency (cycles per minute): _____

13. **Maximum** available mounting **width** (in inches): _____

14. **Maximum** available mounting **height** (in inches): _____

15. Environmental data; please check all that apply:
___ Clean, Dry, Indoor
___ Chemical, Wet or Chips
___ High Temperatures (> 150 F)
___ Outdoors*
* Please describe any unusual environmental factor(s): _____

16. Standard mounting bracket orientation is **outside** to **outside**; if other please specify: _____
_____

IMPORTANT
See page 251 for proper cable installation instructions in CableTrack.

See back of catalog for phone and fax information

ÖLFLEX®
Power and Control Cables

SKINTOP®
Cable Glands

SILVYN®
Conduit

ETHERLINE®
Industrial Ethernet

EPIC®
Connectors

UNITRONIC®
Data Cables

FLEXIMARK®
Marking Systems

HITRONIC®
Fiber Optic Cables

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Alamo Industrial, C.P. 44490
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