

# Wiring Duct

**Product Selection Guide** 



## **Comprehensive Wiring Duct Solutions**



**Buy America** 

Panduit wiring duct is the top choice in the market for efficiently organizing and protecting wires and cables. As a leader in the industry, nearly all our wiring duct is proudly manufactured in the USA, adhering to stringent quality standards and innovative design. Wiring duct products that are BABA (Build America, Buy America) compliant are called out in the compliance table on Page 8.



\*DIN Rail not included. \*\*More information on PanelMax<sup>™</sup> duct types and Halogen free materials on page 6.

These wiring duct types are sold base and cover separately: G, F, D, FS, HN, H, HS, NE, CWD, and Shielded. These wiring duct types are sold base and cover together: DRD, NNC, TNC, and MC.

## Wiring Duct Available Colors and Sizes

Duct Si	ze W x H							LG												w									BL			lE Int		IG Intl.
In.	mm						Lię	ght G	ray											Whi									ack			Blu		Gray
.5 x .5	12 x 12	GF	FS						FL					G	F			NE																
.5 x 1		GF	FS											G	F			NE																
.5 x 2		G												G																				
.5 x 4		G																																
.75 x .75		GF	FS <sup>^</sup>											G	F																			
.75 x 1		G												G																				
.75 x 1.5		GF												G	F																			
.75 x 2		G												G												G		_						
1 x 1	25 x 25	GF	FS					NNC	FL					G	F	FS		NE				NNC				G		FS						МС
1 x 1.5	25 x 37	GF	-					NNC		TNC				G	-			NE								G	F	_					F	МС
1 x 2	25 x 50		FS <sup>^</sup>	D				NNC						G	_			NE				NNC	МС			G	_					G	F	MC
1 x 2.5	25 x 62														•	-							MC			~		_				-	•	MC
1 x 3	25 x 75	G F	FS <sup>^</sup>	D				NNC		TNC				G	F			NE				NNC				G	F		D			G	F	MC
1 x 4	25 x 100	GF	-	D				NNO		niu				G	-			NE					1110			G	_		D			G		NIO
1.5 x 1	20 1 100	G F												_		FS^		INL								u	•		0			u	1	
1.5 x 1.5	37 x 37	GF	-				-	NNC	-	TNC				_	_	гэ FS		NE				NNC				G	E	FS						МС
			-	D		LINI		-		TNC				G	_	гэ		_		LINI	110	-				G	-	гэ			110	C	г	
1.5 x 2	37 x 50	G F	F5	D	н	HIN	HЭ	NNC						G	F			NE	Н	HIN	HS	NNC				G	F			н	HS	G	F	MC
1.5 x 2.5	37 x 62	0 5	50	-						THO				0	-		-		114							•	-		-			•	-	MC
1.5 x 3	37 x 75	GF	_		H	HN	HS	NNC		TNC				G	-		D	NE	H	HN	HS	NNC	MC			G			D	Н	HS		F	MC
1.5 x 4		G F		D										G				NE								G	F					G	F	
2 x 1		G F	-											G				NE								G								
2 x 1.5		G F	_											_	-	FS										_	_							
2 x 2	50 x 50	G F	_		_	_	_	NNC	FL	TNC			EMI	_	_	FS	D	_		HN		NNC				_	_	FS		Η			F	MC
2 x 3	50 x 75	GF	FS	D	H	HN	HS	NNC					EMI	_	_	FS	D	NE	Н		HS	NNC	MC			G	F		D	Η	HS	G	F	MC
2 x 4	50 x 100	GF	FS	D	H	HN		NNC					EMI	G	F		D	NE	Η	ΗN		NNC	MC			G	F		D	Η	HS	G	F	MC
2 x 5		GF												G	F																			
2.5 x 2.5	62 x 62																																	MC
2.5 x 3		GF		D										G	F											G								
3 x 1		GF	FS											G	F			NE																
3 x 2	75 x 50	GF	FS	D										G	F	FS		NE								G		FS^						MC
3 x 2.5	75 x 62																						MC											MC
3 x 3	75 x 75	G F	FS	D	Н	HN	HS	NNC		TNC				G	F	FS^	D	NE	Н	ΗN	HS	NNC				G	F	FS^	D	Н	HS	G	F	МС
3 x 4	75 x 100	GF	FS <sup>^</sup>	D	Н	HN	HS							G	F	$FS^{\wedge}$				ΗN	HS		MC			G	F		D	Н		G	F	МС
3 x 5		G F												G	_			NE								G								
4 x 1.5		G	FS											G																				
4 x 2	100 x 50	G F	-	-				NNC		TNC				_	F	FS^		NE								G								МС
4 x 3	100 x 75	G F						NNC		TNC					-	FS^		NE								G							F	MC
4 x 4	100 x 100		-		Н	HN	HS	NNC	-						_	FS		NE	Н		HS	NNC	MC			_	F	FS	D	Н	HS	G	_	MC
4 x 5		GF	_	-										G	_			NE								G	•		-			-		
6 x 4		GF	-											_	_	FS^	_				_					_	F	FS						
3.35 x 2.54*	85.0 x 64.4		. 5								CWD			~	•									CWD		~	·							
	111.8 x 90.7										CWD													CWD										
	135.3 x 115.7										CWD													CWD										
											OWD	DRD												OVVD	DRD									
	156.7 x 54.0																																	
1.25 x 3.12	184.1 x 79.4											DRD													DRD									

\*Corner Duct Profile \*\*DIN Rail Duct Profile ^Only offered with no mounting holes

\*Intrinsic Blue Color Intrinsic Blue wiring duct is made from the same lead-free PVC material as our standard PVC duct. Intrinsic Blue is an Internationally recognized standard blue color that identifies the wiring duct as "incapable of releasing sufficient electrical or thermal energy under normal or abnormal conditions, to cause ignition of a specific hazardous atmospheric mixture in its most easily ignited concentrations."

## Panduct<sup>®</sup> Type D, G, F and FS Wiring Duct – Wire Fill Capacity

			Electrical													(	Commu	nicatio	n	
Nominal Duct		8 AWG	10 AWG		12 AWG			14 AWG			16 AWG			18 AWG		22 AWG	23 AWG	23/24 AWG	24 AWG	Fiber Cable
Size (W x H)	Nominal Area	0.216	0.164	0.13	0.141	0.152	0.111	0.124	0.133	0.096	0.111	0.118	0.084	0.100	0.106	0.085	0.330 Cat.	0.25 Cat.	0.190 Cat.	0.118 3.0
In.	In. <sup>2</sup>		THHN		MTW	MTW	THHN		MTW	TFFN	MTW	MTW	TFFN	MTW	MTW	MTW	6A	6	5e	mm
0.50 x 0.50	0.250	3	5	8	7	6	11	9	8	15	11	10	20	14	12	19	1	2	3	10
0.50 x 1.00	0.500	6	10	16	14	12	23	18	16	31	23	20	40	28	25	39	2	4	7	20
0.50 x 2.00	1.000	12	21	33	28	24	46	37	32	62	46	41	80	57	50	79	5	9	15	40
0.75 x 0.75	0.563	6	11	19	16	13	26	20	18	34	26	23	45	32	28	44	2	5	8	23
0.75 x 1.00	0.750	9	15	25	21	18	34	27	24	46	34	30	60	42	38	59	3	6	11	30
0.75 x 1.50	1.125	13	23	38	32	27	52	41	36	69	52	46	91	64	57	88	5	10	17	46
0.75 x 2.00	1.500	18	31	50	43	37	69	55	48	93	69	61	121	85	76	118	7	13	23	61
1.00 x 1.00	1.000	12	21	33	28	24	46	37	32	62	46	41	80	57	50	79	5	9	15	40
1.00 x 1.50	1.500	18	31	50	43	37	69	55	48	93	69	61	121	85	76	118	7	13	23	61
1.00 x 2.00	2.000	24	42	67	57	49	92	74	64	124	92	82	161	114	101	158	10	18	31	81
1.00 x 3.00	3.000	36	63	101	86	74	139	111	96	186	139	123	242	171	152	237	15	27	47	122
1.00 x 4.00	4.000	48	84	135	114	98	185	148	129	248	185	164	323	228	203	316	20	36	63	163
1.50 x 1.00	1.500	18	31	50	43	37	69	55	48	93	69	61	121	85	76	118	7	13	23	61
1.50 x 1.50	2.250	27	47	76	64	55	104	83	72	139	104	92	182	128	114	177	11	20	35	92
1.50 x 2.00	3.000	36	63	101	86	74	139	111	96	186	139	123	242	171	152	237	15	27	47	122
1.50 x 3.00	4.500	55	95	152	129	111	208	167	145	279	208	184	364	257	228	355	23	41	71	184
1.50 x 4.00	6.000	73	127	202	172	148	278	222	193	372	278	246	485	342	305	474	31	54	94	245
2.00 x 1.00	2.000	24	42	67	57	49	92	74	64	124	92	82	161	114	101	158	10	18	31	81
2.00 x 1.50	3.000	36	63	101	86	74	139	111	96	186	139	123	242	171	152	237	15	27	47	122
2.00 x 2.00	4.000	48	84	135	114	98	185	148	129	248	185	164	323	228	203	316	20	36	63	163
2.00 x 3.00	6.000	73	127	202	172	148	278	222	193	372	278	246	485	342	305	474	31	54	94	245
2.00 x 4.00	8.000	97	169	270	229	197	371	297	258	496	371	328	647	457	406	632	41	73	126	327
2.00 x 5.00	10.000	122	212	338	287	247	463	371	323	620	463	410	809	571	508	790	52	91	158	409
2.50 x 3.00	7.500	91	159	253	215	185	347	278	242	465	347	307	607	428	381	593	39	68	118	307
3.00 x 1.00	3.000	36	63	101	86	74	139	111	96	186	139	123	242	171	152	237	15	27	47	122
3.00 x 2.00	6.000	73	127	202	172	148	278	222	193	372	278	246	485	342	305	474	31	54	94	245
3.00 x 3.00	9.000	110	191	304	258	222	417	334	290	558	417	369	728	514	457	711	47	82	142	368
3.00 x 4.00	12.000	146	254	405	344	296	556	445	387	744	556	492	971	685	610	949	62	109	189	491
3.00 x 5.00	15.000	183	318	507	431	370	695	557	484	930	695	615	1214	857	762	1186	78	137	237	614
4.00 x 1.50	6.000	73	127	202	172	148	278	222	193	372	278	246	485	342	305	474	31	54	94	245
4.00 x 2.00	8.000	97	169	270	229	197	371	297	258	496	371	328	647	457	406	632	41	73	126	327
4.00 x 3.00	12.000	146	254	405	344	296	556	445	387	744	556	492	971	685	610	949	62	109	189	491
4.00 x 4.00	16.000	195	339	540	459	395	742	594	516	992	742	656	1295	914	813	1265	83	146	253	655
4.00 x 5.00	20.000	244	424	676	574	494	927	743	646	1240	927	820	1619	1142	1017	1581	104	182	316	819
6.00 x 4.00	24.000	293	509	811	689	593	1113	891	775	1488	1113	984	1943	1371	1220	1898	125	219	379	983

#### **General Formula**

Panduit Wiring Duct wire fills are calculated using the following general formula:

50% Wire fill = 50% of  $\left(\frac{\text{Usable Duct Area}}{\text{Wire Area}}\right)$ 

#### What is the Usable Duct Area?

The usable area we define as the calculation of internal area that can be occupied by wires or cables. Accounting for thickness of material, 90% of the nominal area (WxH) is used in the formula.



#### **Air Space Allotment**





As specified in NFPA79-2012 section 13.5.2, Percentage Fills of Raceways (Ducts), a 50% wire fill is given as the maximum wire fill capacity in all Panduit Wiring Ducts. This helps ensure general safe wiring practices are followed. In actual practice, a 50% wire fill is the maximum amount of wiring the duct can hold given the additional airspace created between cables by non-uniform cable shapes, cable interlacing, and cable packing factors.

#### Wire Area

The wire area formula is converted to allow calculation using the cable diameter:

$$\begin{aligned} A_{\text{WIRE}} &= \pi r^2 \\ A_{\text{WIRE}} &= (\pi/4) \times D^2 \\ A_{\text{WIRE}} &= 0.785 \times D^2 \end{aligned}$$

#### **Formula Derivation**

Inserting the elements from above into the general formula results in the following:

50% Wire fill = 0.50 
$$\left(\frac{(W \times H) \times 0.90}{0.785 \times D^2}\right)$$

Simplifying this formula results in the formula used for wire fill calculation:

50% Wire fill = 
$$\left(\frac{W \times H}{1.75 \times D^2}\right)$$

Note: When calculating wire fill capacity using the above formula, variables W, H, and D must be expressed in same units (i.e. mm or inches).

#### Part Numbering System for Panduct® Wiring Duct

MC = Narrow Slot, Metric TNC = Low Smoke, Halogen-Free

G	2	Х	2	<u>LG</u> –	6	<u>-A</u>
Туре	Nominal Width		Nominal Height	Color	Length	Options
G = Wide Slot F = Narrow Slot FL = Flexible Duct FS = Solid Wall H = Hinged Cover Wide Slot HN = Hinged Cover, Narrow S HS = Hinged Cover, Solid Wa D = Round Hole	Slot		in. or mm	LG =Light Gray WH =White BL =Black IB =Intrinsic Blu IG =Internationa		-A = Adhesive backed NM = No mounting holes = Leave blank for no options
NNC = Halogen-Free, Metric NE = Halogen-Free						

#### Part Numbering System for Panduct<sup>®</sup> PanelMax<sup>™</sup> DIN Rail Wiring Duct

DRD Type	22 J Size	LG Color	6 Length
DRD = DIN Rail Duct	Capability Height 22 = 2" Height 33 = 3" Height 44 = 4" Height	LG = Light Gray WH = White	6 ft.

#### Part Numbering System for Panduct<sup>®</sup> PanelMax<sup>™</sup> Corner Wiring Duct

CWD	2	LG	6
Туре	Size	Color	Length
CWD = Corner Wiring Duct	Capability Height 2 = 2" Height 3 = 3" Height 4 = 4" Height	LG = Light Gray WH = White	6 ft.

#### Part Numbering System for Panduct® Wiring Duct Covers

<b>C</b>	2	LG	6
Туре	Width	Color	Length
C = Cover HC = Hinged Cover NC = Halogen-Free TNC = Low Smoke, Halog DRDC = DIN Rail Duct	In. or mm en-Free	LG = Light Gray WH = White BL = Black IB = Intrinsic Blue IG = International Gray	6 ft. or 2m

#### Panduct<sup>®</sup> PanelMax<sup>™</sup> Shielded Wiring Duct

Shielded wiring duct is a Type G style duct with bridges wrapped with an aluminum foil shield. Sold in 6 ft. lengths, available in three (3) sizes and uses Type C covers.

Part Number	Size (W x H)
G2X2LG6EMI	2" x 2"
G2X3LG6EMI	2" x 3"
G2X4LG6EMI	2" x 4"

#### Panduct<sup>®</sup> PanelMax<sup>™</sup> Noise Shield

Noise shield is zinc-plated steel and black powder coated except at bonding locations. Each kit contains two (2) 3 ft. sections and four (4) bonding clips.<sup>\*</sup>

Part Number	Size (H)
SD2EMI	2"
SD3EMI	3"
SD4EMI	4"

\*Additional bonding clips available - SDCLIP (2 per package).

## Types

#### **DIN Rail Duct**

Uses enclosure depth to save up to 30% panel space vs. traditional wiring duct. High strength construction (4 lbs./in.) allows mounting of most DIN rail components.

#### **EMI Duct & Noise Shield**

Reduces EMI noise up to 20dB equal to 6 inches (152mm) air space. Saves space by allowing power and data cables to be closer together. Up to 35% cheaper than using shielded cables.

#### **Corner Wiring Duct**

Allows functional use of side panels while improving panel aesthetics. Up to 20% space savings.

#### **Hinged Wiring Duct**

Dual-sided hinged design eliminates lost covers and makes cable changes up to 20% faster. Suitable for frequent upgrades and MRO needs.

#### **Flexible Wiring Duct**

Cover-free interlocking finger design allows repeated wiring changes. High bond adhesive backing eliminates need for fasteners. Ideal for panel doors and AGV applications.

## **Material Properties**

#### **Rigid Polyvinyl Chloride (PVC)**

A general purpose lead-free material for indoor applications. It has a UL 94 flame class of V-0 with a UaL recognized continuous-use temperature up to  $50^{\circ}$ C (122°F). Used in the manufacture of the following types of Panduit wiring duct and covers: G, F, D, FS, MC, H, HN, HS, CWD, DRD.

#### Modified Polyphenylene Oxide (mPPO) – Halogen-Free

A special purpose material for use in halogen-free or hightemperature applications. It has a UL 94 flame class of V-0 with a UL recognized continuous-use temperature up to 95°C (203°F) and is 20% lighter than PVC. Used in the manufacture of the following types of Panduit wiring duct and covers: NE and NNC.

#### Polyphenylene Ether + High Impact Polystyrene (PPE+HIPS) – Halogen-Free

A special purpose material for use in low-smoke, halogen-free, and high-temperature applications. It has a UL 94 flame class of V-0 with a UL recognized continuous-use temperature up to 105°C (221°F). Meets the regulatory requirements of the mass transit industry and other applications where fire and public safety are critical; such as in trains, buses, offshore oil and gas platforms, and other similar environments. Used in the manufacture of Type TNC wiring duct and covers.

#### **Polypropylene (PP)**

A flexible material with a UL 94 flame class of V-2 with a UL recognized continuous-use temperature up to 65°C (149°F). Used in the manufacture of Type FL flexible wiring duct.

#### **Recommended Precaution when using Type NE, NS, NNC, and TNC Wiring Duct**

Cleaning solvents and cutting fluids that contain any of the following chemical agents should not come into contact with these types of wiring duct or covers. These chemicals are the most commonly known to cause stress cracking.

- Hydrocarbons
   Phenols
  - Amines
- KetonesEthers
- Organic, inorganic, and oxidizing acids
- Petrol

Refer to **www.panduit.com** for more information on chemical resistance.

### **Unmatched Expertise**

Panduit continually invests in resources to solve your greatest business and technology challenges. Our network of sales, technical support, distribution, and manufacturing teams are readily accessible to help you with your project needs.

## **Complete Your Installation with Accessories and Installation Tools**





For Type F and HN Wiring Duct FWR-C for 1.5" – 4" duct width



For Type FS and D Wiring Duct WRS-A-C10 for 1" – 2" duct width



For Type G and H Wiring WR2-C – for 2" duct width WR3-C – for 3" duct width WR4-C – for 4" duct width WR5-C – for 5" duct width

## **Panduit Wiring Duct Approvals and Compliances**

Agency Mark	Agency	Requirement	Classification/Performance	Wiring Duct Types/ Products				
<b>A</b> L	Underwriters	UL 1565	Material Flame Class V-0 Continuous-use temperature up to 50°C (122°F)	All wiring duct types and covers				
c <b>FLL</b> us	Laboratories, Inc. File No. E147128	UL 1565 CSA C22.2 No. 18.5-13	Material Flame Class V-0 Continuous-use temperature up to 50°C (122°F)	Type H, HS, HN, and DRD				
		UL 508 section 15	An insulating barrier material shall comply with the minimum material properties indicated in Table 15.1	PVC divider walls				
	Underwriters Laboratories, Inc.	UL 508 sections 34 and 181	Qualifies as a metal barrier with required thickness as indicated in Table 6.1	SD*EMI metal barrier				
	Canadian Standards Association File No. 016446	CSA C22.2 No. 18.5-02	Material Flame Class V-0 Continuous-use temperature up to 50°C (122°F)	All wiring duct types and covers (except H, HS, and HN)				
		Low Voltage Directive 2006/95/EC	<ul> <li>CDS (cable ducting system for impact 2 J)</li> <li>Minimum storage, transport, installation, and application temperature: -5°C (23°F)</li> <li>Maximum application temperature: 60°C (140°F)</li> </ul>	H, HS, G, F, D, MC, FS, NNC, NE, DRD,				
CE	Conformity European	EN 50085-1 EN 50085-2-3	<ul> <li>Non-flame propagating</li> <li>Without electrical continuity</li> <li>Cover removable without a tool</li> </ul>	and TNC				
		EN 45545-2	EN 45545-2 Type NNC and Type NE: Exterior (R23) - HL1 Type TNC: Interior (R22) - HL2 & Exterior (R23) - HL2					
	DIN German Institute for Standardization		<ul> <li>Specifies dimensions for slotted trunkings used in electrical switch-gear assemblies and that conform to DIN VDE 060 Part 506</li> <li>Channel mounting hole pattern, slot dimensions, pitch, and location</li> <li>Distance from first to last like-size mounting hole</li> <li>Minimum overall product length</li> </ul>	MC, NNC, and TNC				
	Standardization	DIN 5510-2 DIN 54837	Smoke Class' SB2					
	AFNOR French Association of Normalization	NF F 16-101 NF F 16-102	Type NNC Wiring Duct Classification = F3/I4 Type TNC Wiring Duct Classification = F1/I4	NNC and TNC				
	UNIFER Italian Railway Standards	EN ISO 11925-2	Pass 30-second flame application	TNC				
	FRA – Federal Railroad Administration	49 CFR Part 238	Surface Flammability: $< 35$ Smoke Density D <sub>s</sub> (1.5) $< 100$	TNC				
	NFPA – National Fire Protection Association	NFPA130	$D_{s}(4.0) < 200$	inc				
		NFPA 79-2012, Section 13.3.1 IEC 60332-1	Non-metallic duct shall be permitted (inside enclosures) only when they are made with a flame-retardant material; flame-retardant material is defined in the standard by the IEC 60332-1 test method	All wiring duct types and covers (except FL)				
	National Fire Protection Agency	NFPA 79-2012, Section 13.5.2	Panduit publishes a maximum percentage wire fill for common wire types equal to 50% of the interior cross-sectional area of the wiring duct	All wiring duct types and covers				
		NFPA 79-2012, section 13.1.6.9	Panduit bend radius control accessories can be mounted at right angles and T junctions created using wiring duct in order to maintain cable bend radius control	Corner strip with 1" bend radius control				
RoHS	European Union	European Directive 2015/863/EU	Meets the requirements on the Restriction of Hazardous Substances and is free of the six substances listed in the directive	All wiring duct products				
	U.S. Government	Build America Buy America Act	Meets the requirements for manufactured products produced in the United States.	All wiring duct types and covers (except flexible wiring duct, metal noise shield, corner duct mounting clips, and tools)				



For more information Visit us at www.panduit.com Contact Customer Service by email: cs@panduit.com or by phone: 800.777.3300

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