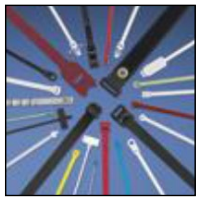
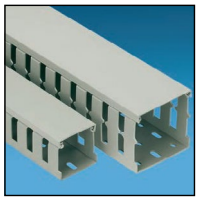
Panduit® Wiring Duct, Cable Ties and Wiring Accessories For Use According to:

Wiring Accessories



Cable Ties



Wiring Duct

EN 45545-2 European Union Standard Fire Testing to Railway Components

In order to choose the appropriate product for a given application, it is the customer's responsibility to understand the extent of use for the product, as well as the intended final use for the Rolling Stock. Vehicles are classified as: HL1, HL2 or HL3, depending on their time in tunnels and whether they contain sleeper cars. The HL1 classification represents the lowest Hazard Level and HL3 represents the highest. Please refer to EN 45545-2 for definitions.

The standard provides guidance to quantify the impact of a fire compared with the product requirements classification. Panduit's cable ties and wiring accessory products would full under the R22, R23 and R24 product requirement sets, depending on their installation location.

There are 3 tests used to establish product performance versus these product requirements:

1. Oxygen index to **TO1 EN ISO 4589-2**
2. Flue gas density to **T 10.03 EN ISO 5659**
3. Oxygen index to **T 12 NF X70-100-1 and -2**

Performance requirements on EN 45545-2 for each of these tests is summarized below. Please refer to EN 45545-2 for additional details.

				HL1	HL2	HL3
R22	T01 EN ISO 4589-2 OI	Oxygen Content %	Minimum	28	28	32
	T10.03 EN ISO 5659-2: 25 kWm	D_s max. dimensionless	Maximum	600	300	150
	T12 NF X70-100-1: and -2, 600° C	CIT_{NLP} dimensionless	Maximum	1, 2	0, 9	0.75
R23	T01 EN ISO 4589-2: OI	Oxygen Content %	Minimum	28	28	32
	T10.03 EN ISO 5659-2: 25 kWm^2	D_s max. dimensionless	Maximum	–	600	300
	T12 NF X70-100-1 and -2, 600° C	CIT_{NLP} dimensionless	Maximum	–	1, 8	1, 5
R24	T01 EN ISO 4589-2: OI	Oxygen Content %	Minimum	28	28	32

Panduit® Wiring Duct, Cable Ties and Wiring Accessories For Use According to:

Panduit® Corp. offers a wide range of Cable Ties and Accessories in materials that are compliant with the smoke generation and toxicity requirements of the EN 45545-2 standard. Based on EN 45545-2 requirements, Panduit Wiring Duct, Cable Ties and Wiring Accessories fall into the following classification:

Table 1: Summary of Panduit ® Wiring Duct, Cable Tie and Wiring Accessory materials and their EN 45545-2 Classifications. Testing conducted by Exova Warrington (Laboratory Approved by Railway Certification Agency) in 2015.

Material Code	1	2	3	4	5	6	7	8
Material Description	Natural	Weather Resistant	Weather Resistant	Heat Stabilized Weather Resistant	Heat Stabilized	Flame Retardant	Halogen-Free	Low-Smoke, Halogen-Free
Part Number Suffix/Type	(-)	(-0)	(-0)	(-300)	(-30)	(-69)	(NNC)***	(TNC)
Material Classification	UL 94-V2	UL 94-V2	UL 94-V2	UL 94-V2	UL 94-V0	UL 94-V0	UL 94-V0	UL 94-V0
EN45545-2 Product Req R22	**HL2**	**HL1**	**HL1***	**HL1***		**HL2**		**HL2**
EN45545-2 Product Req R23	**HL2**	**HL2**	**HL2**	**HL2**		**HL3**	**HL1**	**HL2**
EN45545-2 Product Req R24	**HL2**	**HL2**	**HL2**	**HL2**	**HL2****	**HL3**	**HL1**	**HL2**
Products Covered****	Cable Ties and Accessories	Accessories	Cable Ties (Cross Sections M, I, S)	Cable Ties and Accessories	Cable Ties and Accessories	Cable Ties and Accessories	Wiring Duct	Wiring Duct

* HL2 Classification at 0.9 mm thickness, HL1 Classification at 1.6 mm thickness.
** Testing for Heat Stabilized -30 material completed in an independent lab study.
*** Type NE Wiring Duct carries the same calssification as shown here for Type NNC.
**** Consult with factory regarding specific part number and package size availability.

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