

# MULTIMEDIA & DATA TRANSMISSION CABLES

For on-board equipments in rolling stock applications

## Applications

Nexans produces a range of Multimedia & Data Transmission cables for on-board railway equipments.

Using the FLAMEX® technology, these halogen free cables are intended for applications where flame retardancy is required. They are particularly recommended for the cabling of rolling stock applications.

Customized products - 75 to 120 Ω

## Advantages

This range of products meets the current needs of the market especially regarding the interoperability of trains and railway equipments throughout Europe (ERTMS). These cables are adapted for data transmission up to 100 MHz, with performance close to that of 'CAT5' cables.

Nexans experience in the design of shielding technology enables us to propose all constructions with high EMC protection.

## Supported Protocols

- **WTB ( Wire Train Bus ) :**
  - connectivity between coaches, Plug & Play concept,
  - coaches can be coupled and uncoupled while in service.
- **MVB ( Multifunction Vehicle Bus ) :**
  - connectivity within one car,
  - can be used within a set of cars ( TGV ).

MVB & WTB are a part of the TCN protocol defined in the IEC 61375.

- **PROFIBUS**, video on request, audio...

## Standards and specifications

External Jacket NF F 63-808 or NF F 63-826 according to the version.

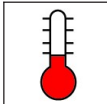
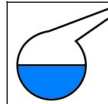




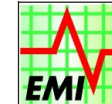

## Connector compatibility

Our cables are compatible with :

- Most available connectors for rolling stock,
- 'Field RJ 45' connectors,
- Shielded connectors.

## Minimum bending radius

Static use : 6 x outer diameter

							
From - 40°C to +90°C according to the version	Good chemical resistance (acids, oils, ...)	Flame retardant (NF C 32-070 C2 and IEC 60-332- 1)	Low smoke emission and low opacity (IEC 61034).	Non corrosive and non toxic (IEC60754-2 and EN 50267)	Flexible	EMI	Halogen free (IEC 60754-1)

	Nexans Ref.	Cable type	Construction	Impedance			Conductor		
				75 Ω	100 Ω	120 Ω	Composition n x Ø mm	Section mm <sup>2</sup>	Nature
MVB, WTB, Profibus	<b>2PF146</b>	Shielded Quad	4 x 0.60 mm <sup>2</sup>		●		19 x 0.20	0.60	TC
	<b>2PE993</b>	Shielded Quad	4 x 0.50 mm <sup>2</sup>			●	19 x 0.18	0.50	TC
	<b>2PF861</b>	Shielded Quad + 4 cores	4 x 0.50 mm <sup>2</sup> (quad) + 4 x 0.25 mm <sup>2</sup> (cores)			●	19 x 0.18 (quad) 19 x 0.13 (cores)	0.50 (quad) 0.25 (cores)	TC
	<b>289779</b>	Twinax	2 x 0.60 mm <sup>2</sup>			●	19 x 0.20	0.60	TC
	<b>2PF580</b>	Twinax	2 x 0.50 mm <sup>2</sup>			●	19 x 0.18	0.50	TC
	<b>2PF860</b>	Twinax + 1 core	2 x 0.50 mm <sup>2</sup> (twinax) + 1 x 0.50 mm <sup>2</sup> (core)			●	19 x 0.18	0.50	TC
	<b>2PF578</b>	Bus	2 x 0.75 mm <sup>2</sup>			●	19 x 0.223	0.75	TC
	<b>2PE424</b>	Bus	2 x 0.22 mm <sup>2</sup>			●	7 x 0.20	0.22	TC
	<b>2PC352</b>	Composite (bus + power)	2 pairs 120 Ω + 2 conductors (0.60 mm <sup>2</sup> )			●	19 x 0.20	0.60	TC
Multimedia	<b>2PC912</b>	Shielded pairs	2 pairs, overall Shield (2 x 2 x 0.25 mm <sup>2</sup> )		●		19 x 0.13	0.25	TC
	<b>2PF953</b>	Shielded pairs	4 pairs overall Shield (4 x 2 x 0.25 mm <sup>2</sup> )		●		19 x 0.13	0.25	TC
	<b>2PC854</b>	Shielded pairs	4 pairs overall Shield (4 x 2 x 0.13 mm <sup>2</sup> )		●		7 x 0.15	0.13	BC
	<b>2PF704</b>	Composite (video + power)	1 Coax 75 Ω + 2 conductors (0.60 mm <sup>2</sup> )	●			19 x 0.20 (pair) 7 x 0.18 (coax)	0.60 (pair)	TC (pair) BC (coax)
Ticket Machines	<b>2PC747</b>	Shielded pairs	2 pairs, overall Shield (2 x 2 x 0.60 mm <sup>2</sup> )		● (90)		19 x 0.20	0.60	TC

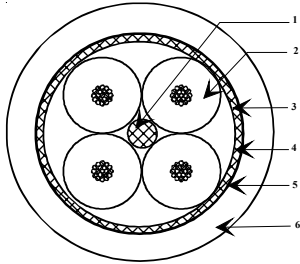
See page 114 for drawings.

TC : tinned copper BC : bare copper

Nexans Ref.	Insulation		Screen	Sheath		Operating temperature	Average weight kg/km	Att. at 1MHz (dB/1 km)
	Nature	Ø mm		Nature	Overall Ø mm			
<b>2PF146</b>	Foam PE	2.20	Poly/Alu tape + TC braid	Flamex NFF 63826	7.80	-40°C to +80°C	82	≤21
<b>2PE993</b>	Foam PE	2.20	Poly/Alu tape + TC braid	Flamex NFF 63826	8.00	-40°C to +85°C	82	≤12
<b>2PF861</b>	Foam PE (quad) + Flamex (cores)	2.30 (quad) 1.15 (cores)	Poly/Alu tape + TC braid	Halogen free	7.90	-30°C to +85°C	90	<12.5
<b>289779</b>	Foam PE	2.55	Poly/Alu tape + TC braid	Flamex NFF 63808	7.50	-40°C to +80°C	73	<15
<b>2PF580</b>	Foam PE	2.45	Poly/Alu tape + TC braid	Flamex EM104	8.00	-40°C to +85°C	87	≤14
<b>2PF860</b>	Foam PE (twinax) + Flamex (core)	2.35 (twinax) 1.45 (core)	Poly/Alu tape + TC braid	Halogen free	6.80	-30°C to +85°C	62	<12.5
<b>2PF578</b>	Foam PE	2.90	Poly/Alu tape + TC braid	Flamex NFF 63826	8.00	-40°C to +85°C	87	≤10
<b>2PE424</b>	Foam PE	1.50	Poly/Alu tape + TC braid	Flamex NFF 63808	4.25	-30°C to +80°C	27	<22
<b>2PC352</b>	Ø hal (power) Foam PE(bus)	1.40 (power) 2.30 (bus)	Poly/Alu tape + TC braid	Flamex NFF 63826	10.70	-20°C to +80°C	165	15.5
<b>2PC912</b>	PE	1.25	Poly/Alu tape + TC braid	Flamex NFF 63826	6.50	-30°C to +70°C	60	21
<b>2PF953</b>	PE	1.25	Poly/Alu tape + TC braid	Flamex NFF 63826	9.00	-30°C to +80°C	100	21
<b>2PC854</b>	PE	0.95	TC braid	Flamex NFF 63826	7.50	-25°C to +70°C	65	30
<b>2PF704</b>	Ø hal (power) Foam PE (coax)	1.45 (pair) / 2.45 (coax)	Poly/Alu tape + TC braid	Flamex NFF 63826	8.30	-30°C to +90°C	90	20
<b>2PC747</b>	PE	2.10	Poly/Alu tape + TC braid + 7 x 0.20 TC drain wire	Flamex NFF 63808	9.90	-30°C to +80°C	150	<40

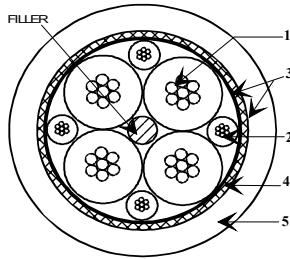
## Typical constructions

**Shielded quad**  
2PF146/2PE993



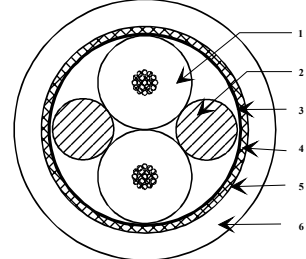
- ① 1 filler
- ② 4 conductors
- ③ Tapes
- ④ Braid
- ⑤ Tape
- ⑥ Sheath

**Shielded quad**  
2PF861



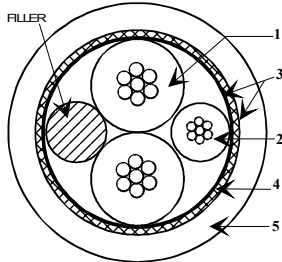
- ① 4 conductors (quad)
- ② 4 conductors
- ③ Tapes
- ④ Braid
- ⑤ Sheath

**Twinax/Bus**  
289779/2PF580/  
2PF578/2PE424



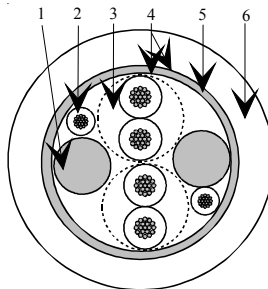
- ① 2 conductors
- ② 2 fillers
- ③ Tapes
- ④ Braid
- ⑤ Tape
- ⑥ Sheath

**Twinax +  
1 conductor**  
2PF860



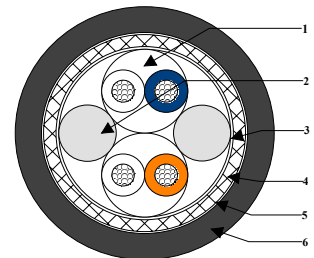
- ① 2 conductors
- ② 1 conductor
- ③ Tapes
- ④ Braid
- ⑤ Sheath

**Composite**  
2PC352



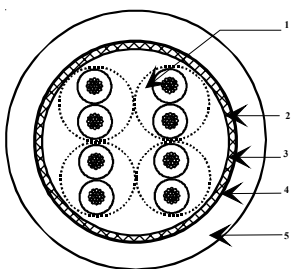
- ① 2 fillers
- ② 2 conductors
- ③ 2 pairs
- ④ Tapes
- ⑤ Braid
- ⑥ Sheath

**Shielded pairs**  
2PC912



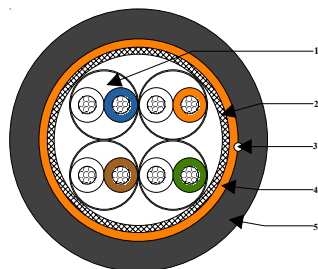
- ① 2 pairs
- ② Fillers
- ③ Tape
- ④ Braid
- ⑤ Tape
- ⑥ Sheath

**Shielded pairs**  
2PF953



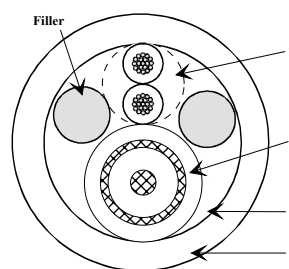
- ① 4 pairs
- ② Polyester/alu tape
- ③ Braid
- ④ Tape
- ⑤ Sheath

**Shielded pairs**  
2PC854



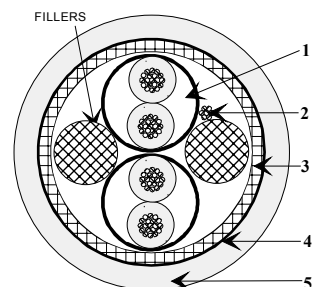
- ① 4 pairs individually shielded
- ② Braid
- ③ Rip cord
- ④ Inner Sheath
- ⑤ Outer Sheath

**Composite**  
2PF704



- ① 1 pair
- ② 1 coaxial 75  $\Omega$
- ③ Tape
- ④ Sheath

**Shielded pairs**  
2PC747



- ① 2 pairs
- ② Drain wire
- ③ Braid
- ④ Tape
- ⑤ Sheath