

## Ha-VIS EtherRail® flexible data cable, 4-wire, Cat. 5



### Advantages

- Transmission of Fast Ethernet 100 Base-T acc. to IEEE 802.3
- Suitable for data cabling in rail vehicles and buses
- Fire protection for rolling stock according to EN 45545-2 (HL 1-3), EN 50264-1 EN 50306-1 and NFPA 130
- Technical prescriptions concerning the burning behavior acc. to UN/ECE-R 118
- Temperature range: -40 °C ... +85 °C
- RoHS conform, halogen free LSZH

### Application

This data cable was especially designed for fixed and protected installation inside and outside of rail vehicles and buses. The cable fulfils the fire protection standard for railway vehicles EN 45545-2 (HL1 - HL3).

The cable sheath complies with the EM 104 requirements of EN 50264-1, EN 50306-1 and class M according to EN 50306-4. In the harsh train environment it performs with excellent resistance to oils and fuels.

The robust cable construction guaranties a reliable data transmission for all applications of class D up to 100 Mbit/s according to IEEE 802.3.

Current supply (up to 350/600 mA) and voltage (up to 48 V) can be provided via PoE/PoE+ (according to IEEE 802.3af/at).

### Description

Ha-VIS EtherRail® flexible data cable, FOAM 4xAWG22/7, Category 5

Sheath material: polyolefine copolymer electron-beam cross-linked, Comp 752

Color: black

Cable sheath diameter: (6.6 ± 0.2)mm

Transmission performance:  
Category 5 / transmission Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50288-4-2 and IEC 61156-6  
Transmission rate: 100 Mbit/s

Operating temperature range: -40°C ... +85°C

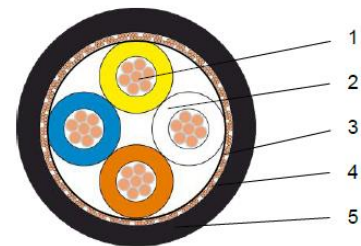
Cable weight: 61kg/km

#### Order information:

10 m ring	09 45 600 0168
50 m ring	09 45 600 0178
100 m ring	09 45 600 0108
500 m drum	09 45 600 0118
1000 m drum	09 45 600 0128

### Order number

### Construction



- Conductor**  
Tinned stranded copper wire AWG22
- Insulation**  
cellular PE, compound 717  
color: blue, yellow, white, orange, Ø 1.40mm
- Wrapping**  
Plastic tape
- Shielding**  
Aluminum-bonded polyester tape and tinned fine copper braid
- Outer sheath**  
Polyolefine copolymer electron-beam cross-linked, Comp 752, corresponds to EN 50306-1 and EN 50264-1 type EM104  
**Color:** black

## Technical characteristics

<b>Transmission performance</b>	Category 5 acc. to ISO/IEC 11801, EN 50288-4-2 and IEC 61156-6	
<b>Mechanical characteristics</b>		
Bending radius:	fixed installation:	5x cable diameter
	flexible installation:	6x cable diameter
Tensile strength during operation:	max. 15N	
<b>Thermal characteristics</b>		
Temperature range:	fixed installation:	-40 °C up to +85 °C
	flexible installation:	-25 °C up to +70 °C
<b>Electrical characteristics at 20°C</b>		
DC resistance	< 54.4 Ohm/km	
Insulation resistance	≥ 5 GOhm*km	
Propagation delay	4.4 ns/m	
Characteristic impedance at 100MHz	(100 ± 5) Ohm	
Test Voltage	1000 VAC	
(wire/wire, wire/screen, rms 50Hz for 1min)		
Operating Voltage	125 VAC	
<b>Printing</b>	"HARTING HA-VIS ETHERRAIL CAT 5 PLUS LSZH 4xAWG22/7 094560001020600 "Manufacturing code" "Meter marking"	
<b>Fire load</b>	0.258 kWh / m	
<b>Weight about</b>	61 kg/km	
<b>Fire protection for rolling stock</b>	<b>EN 45 545-2 (HL 1 – 3), EN 50 264-1 and EN 50 306-1</b>	
Vertical flame propagation for a single insulated wire or cable	EN 60332-1-2	carbonization > 50 mm and ≤ 540 mm
Vertical flame spread of bunched wires or cables > 6 mm and < 12 mm	EN 60332-3-25	carbonization < 2.5 mm
Smoke density	EN 61034-2	transmission > 70 %
Toxicity of smoke	EN 50305	insulation ITC ≤ 6 Sheath ITC ≤ 3
Absence of halogens	EN 50267-2-1	HCl and HBr ≤ 0.5%
	EN 60684-2	HF < 0.1 %
Corrosivity on gases	EN 50267-2-2	pH > 4.3
	EN 50267-2-2	conductivity < 10 µS/mm
<b>Fire protection for rolling stock</b>	<b>NFPA 130</b>	
Vertical flame propagation for a single insulated wire or cable	FT 4/IEEE 1202	carbonization < 1.5 mm
Smoke release	UL 1685	peak smoke rate ≤ 0.25 m²/s total smoke released ≤ 95 m²
<b>Technical prescriptions concerning burning behavior</b>	<b>UNECE-R 118</b>	
Resistance to flame propagation	ISO 14572	Combustion duration ≤ 70 sec. Length of unburned area ≥ 50 mm

## Technical characteristics

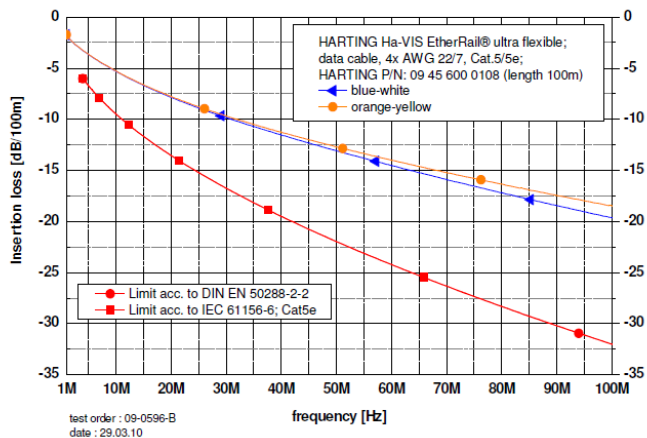
### Material properties of sheath

	<b>EN 50264-1</b> <b>EN 50306-1</b>	<b>EM 104</b>
Resistance to ozone	EN 60811-403	72 h / 40 °C, method B volume concentration 200x10 <sup>-6</sup>
High resistance to cold	EN 60811-504	-40°C
High resistance to oil	EN 60811-404	72 h / 100 °C, IRM 902
Resistance to fuel	EN 60811-404	168 h / 70 °C, IRM 903
Resistance to acid	EN 60811-404	168 h / 23 °C, n-Oxalic
resistance to alkaline	EN 60811-404	168 h / 23 °C, n-NaOH
low fire load	DIN 51900	
resistance to UV	EN 50618	> 2000 h

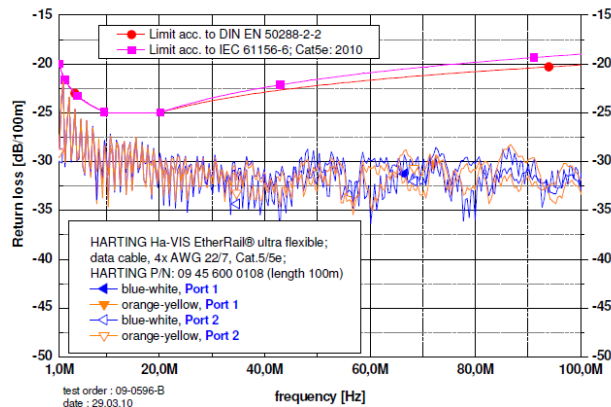
The national standards as BS 6853, DIN 5510-2, PN-K-02511, UNI CEI 11170 had been withdrawn and replaced by EN 45545-2.

## Technical characteristics

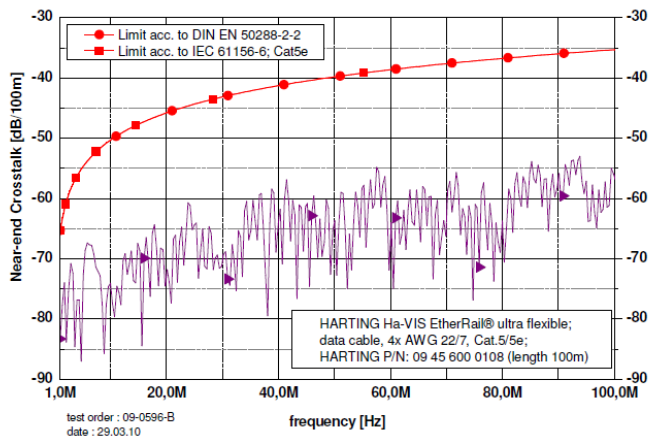
Attenuation:



Return loss:



Near end crosstalk (NEXT):



Propagation Delay:

