

Technical Specification

Cable Type: Indoor VDSL2 Multi-Pair Cable 32x2x26# PE Insulated U/UTP 100 Ohm

Western Wire Part Number: VU432D9E

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General description

A multi-pair cable, made of 32 twisted pairs cabled in a concentric formation, tape-wrapped and overall jacketed with a PVC compound for indoor use.

The cable supports a large variety of applications using digital signaling in central offices and in customer premise, including ITU-T G.993.2 - VDSL2.

Physical Description

Basic wire conductor	Solid 0.404±0.008mm (26 AWG) tin-coated annealed copper The tin coating shall be commercially pure, continuous and firmly adhered to the copper conductor.
Basic wire insulation	Solid PE conforming to ASTM D1248-02.
Insulation Thickness	0.15 mm min. 0.27mm max.
Insulation OD	0.75±0.06mm
Total number of wires	64
Total number of twisted pairs	32
Lays of twisted pairs	Suitable to meet the transmission requirements, 50 mm max.
Cabling formation	All pairs cabled in three concentric layers (4-11-17).
Color code	See Page No. 3.
Overall tape wrap	Polyester tape, providing 100% coverage and 25% overlap.
Overall jacket	PVC compound for indoor use.
Rip cord	Stranded polyamide rope, 14 Kgf min. breaking strength.
Jacket color	Gray RAL 7032
Jacket thickness	1.17 mm nom. 0.78 mm min.
Jacket eccentricity	10% max. (Tmax/Tmin=1.1 Max.)
Overall diameter	11.0±0.4 mm.
Surface marking	WESTERN WIRE VU432D9E VDSL2 CONNECTING CABLE 32x2x0.4 U/UTP 100 Ohm 300V 80C FR IEC 60332-1 CE 2002/95/EC (RoHS) [Month, Year] [Batch Number] [Seq. meter mark] METER
Total weight	150 Kg/Km nom.
Total copper weight	75.2 Kg/Km nom.
Minimum bend radius	8xD mm.
Operating temperature range	-20 to +80C
Flame test	IEC 60332-1.

Electrical Properties @ 20C

Characteristic Impedance	100 ± 15 Ohm @ 1-60 MHz
Average Capacitance	55 pF/m max. @ 1 KHz
Individual Capacitance	58 pF/m max. @ 1 KHz
Capacitance unbalance - pair to shield acc. to IEC 61156-1 (2002) Para. 2.1.2.	1600 pF/m max @ 1 KHz
Capacitance unbalance - pair to pair	400 pF/500m max. @ 1 KHz
Velocity of Propagation	58% min. @ 1-60 MHz
Propagation Delay Skew	48 ns/100m max.
DC Resistance	148 Ohm /Km max.
DC Resistance unbalance	3% max.
Voltage rating	300V rms max.
Dielectric strength	1500 Vrms / 1 minute min.
Jacket spark-test	2.5 KV ac min.
Insulation resistance	1GOhm·Km min @ 500V

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Transmission Properties tested on 100m sample @ 20C

Frequency MHz	Max. Attenuation dB/100m	Min. PS-NEXT dB	Min. PS-ELFEXT dB	Min. RL dB
1-10	$2.93 \cdot f^{1/2} + 0.176 \cdot f$	55-15·Log(f)	55-20·Log(f)	$17+3 \cdot \text{Log}(f)$
10-20				20
20-60				$20-7 \cdot \text{Log}(f)$
1.0	3.1	55	55	17
10.0	11.0	40	35	20
20.0	16.6	35	29	20
30.0	21.3	33	25	9.6
60.0 (Ref.)	33.2	29	19	7.6

Mechanical Properties

Basic conductor elongation at break	15% min.
Conductor insulation tensile properties Aging: 168h @ 100C.	Tensile strength: 2.4 Kg/mm ² min. 80% retention after accelerated aging. Elongation: 300% min. 80% retention after accelerated aging.
Insulation to Conductor adhesion	2N min. 1" sample.
Insulation eccentricity	Tmax/Tmin < 1.2 at any point. (T=Insulation thickness)
Insulation cold bend	The insulation material shall remain pliable and shall not crack @ -20C.
Insulation heat shock	The insulation shall not crack and shall not deform at temperature variation between -20 to +80C.
Outer jacket tensile properties Aging: 168h @ 100C.	Tensile strength: 1.22 Kg/mm ² (12 MPa) min. 80% retention after accelerated aging. Elongation: 125% min. 80% retention after accelerated aging.
Outer jacket cold bend	The jacketing material shall remain pliable and shall not crack @ -20C.
Jacket heat shock	The jacketing material shall not crack and shall not deform at temperature variation between -20 to +80C.

Color Code

Pair	Wire A	Wire B	Pair	Wire A	Wire B
1	White	Blue	17	Yellow	Orange
2	White	Orange	18	Yellow	Green
3	White	Green	19	Yellow	Brown
4	White	Brown	20	Yellow	Gray
5	White	Gray	21	Purple	Blue
6	Red	Blue	22	Purple	Orange
7	Red	Orange	23	Purple	Green
8	Red	Green	24	Purple	Brown
9	Red	Brown	25	Purple	Gray
10	Red	Gray	26	White	Red
11	Black	Blue	27	White	Black
12	Black	Orange	28	White	Yellow
13	Black	Green	29	White	Purple
14	Black	Brown	30	Red	Black
15	Black	Gray	31	Red	Yellow
16	Yellow	Blue	32	Red	Purple

All colors shall conform to BS6746C and shall be stable in the temperature operating range of the cable.

 This cable fully conforms to EU Directive 2002/95/EC (RoHS)