Video Cables 75 Ω
Pathfinder

General information to construction and application of **Draka Multimedia Cable** Video Cables	**General Information**
Overview of the maximum transmission distances of **Draka Multimedia Cable** video cables depending on the digital video transmission system	**Overview maximum Transmission distances**
High screened (Al-PETP-Al-foil + copper braid, tinned)	**0.51/2.4 AF**
coaxial cable with low loss and low reflection for	**0.58/2.6 AF**
digital and analog video transmission	**0.6/2.8 AF**
Flexible Patch Cable for digital and analog video transmission	**0.6L/2.8 AF**
High screened (Al-PETP-Al-foil + copper braid, tinned)	**0.8/3.7 AF**
	1.0/4.8 AF
coaxial cable with low loss and	**1.2L/4.95 AF**
low reflection for digital and analog	**1.4/6.6 AF**
video transmission	**1.6/7.3 AF**
Standard 75 Ω coaxial cable for analog video transmission	**0.6/3.7**
Standard 75 Ω coaxial cable for mobile use	**0.6L/3.7**
Standard 75 Ω coaxial cable, double screened, with low reflection according to BBC-PSF 1/3M	**0.6/3.7 Dz**
Standard 75 Ω coaxial cable, double screened, with low reflection according to BBC-PSF 1/2M	**0.8/4.9Dz**
Standard 75 Ω coaxial cable with low loss and low reflection for analog video transmission	**1.0/6.6**
Standard 75 Ω coaxial cable, double screened, with low loss and low reflection for digital and analog video transmission	**1.0/6.6 D**

Video Cables 75 W
General Information

Application

Video cables are used as coaxial cables with a characteristic impedance of 75 Ω for the connection of recording and intermediate amplifiers as well as monitors and cameras. In indoor applications cables with flame retardant, halogen free sheaths are particularly recommended for safety reasons. Compared to the drop cables - the dimensions are partially identical - the video cables have a maximum tolerance concerning deviation from the characteristic impedance: +/- 1 % of the nominal value. Comparative studies of the independent institute "Rundfunk-Betriebstechnik GmbH, Nürnberg" (broadcast services technique) showed a first rate performance of the **Draka Multimedia Cable** video cable type 0.6/2.8 AF concerning attenuation and interference resistance acc. to IEC 801.4. Permanent tests through independent test institutes are decisive for the constant product qualtity. The frequency range specification up to 300 MHz allows application of the video cables for serial digital transmission.

Electrical properties

Essential properties of these coaxial cables are their characteristic impedance and its regularity, their attenuation as well as their behaviour concerning the electrical separation of cable and environment, i.e. their screening efficiency. Another important factor is the D.C.resistance, because the supply voltage for repeaters and other active components in a distribution network is partially transmitted via the coaxial cables.

Characteristic Impedance

The characteristic impedance of a coaxial cable is determined by the relation of outer conductor diameter to inner conductor diameter and by the dielectric constant of the insulation. The characteristic impedance 75 Ω is an international standard - based on optimizing the design of long distance coaxial cables.
It is important in a distribution network that all components, i.e. cables, connectors, active components and subscribers are desgined for the charactristic impedance of 75 Ω. A deviation from this value can result in interfering reflections, thus the adherence to tolerances is a strict requirement for the cable.

As a result of manufacture the cable presents slight deviations in the characteristic impedance. It is important for the transmission systems which (undesired) echo is reflected by a cable while the effective signal is being transmitted. This cable property is characterized by the return loss.

Attenuation

The attenuation of the waves transmitted through the cable results from the losses caused by the ohmic resistance of the metallic conductors as well as from the losses in the insulating medium between inner and outer conductor. The inner conductor has the biggest share in attenuation, followed by the outer conductor and finally the insulation which only in very high frequency ranges causes an increase in attenuation.

The lower the attenuation of a cable - the longer the distance that can be covered without considerable signal interferences. Increasing the inner conductor section reduces the attenuation of the cable, but results in a bigger outer diameter. Since larger cable dimensions involve higher costs for production and installation, a cable network has to be optimized economically. Depending on the network structure normally coaxial cables with different dimensions are used.

Video Cables 75 W
General Information

Screening Factor

The quality of the electromagnetic screening is determined by the outer conductor of the cable. Real conductors with a finite conductivity radiate up to some 100 kHz of electromagnetic energy in the lower frequency range, with higher frequencies there is, however, a sufficient screening for all practical applications. With outdoor cables the tube as outer conductor is designed as copper tape formed and welded into a tube. In indoor cables, where a higher flexibility is required, a tube geometry is approached through a longitudinal, thin-wall foil with an overlying braid. This construction assures a good flexibility and an easy connecting technique. The screening efficiency achieves values of ≥ 100 dB.

Electromagnetic compatibility

Electromagnetic compatibility is an essential prerequisite for faultless and reliable operation of the complex systems of the broadcast services for radio and television. Modern technologies as micro electronics and digital engineering are established in the broadcasting companies and involve further electromagnetic compatibility problems. On the one hand digital eqipment produces high frequent and broadband interference effects - on the other hand the effective protection distances between the system components are reduced and thus the risk of mutual interference effects is increased. The technical specifications of the public broadcasting companies are considered in the design of **Draka Multimedia Cable** products.

Video Cables 75 W

Maximum Transmission distance in [m] at Digital Data Rates

Draka Multimedia Cable recommended (90% of the calculated max. lengths)

Draka Multi-media Cable Typ	143 Mb/s Compo-site NTSC SMPTE 170M	177 Mb/s Compo-site PAL	270 Mb/s Compo-nent SMPTE 259M	360 Mb/s Compo-nent Wide-screen	1.5 Gb/s HDTV SMPTE 292M	2.2 Gb/s HDTV
0.51/2.4 AF	205	180	165	145	45	37
0.58/2.6 AF	270	240	218	190	55	45
0.6/2.8 AF	290	255	230	200	60	49
0.6/3.7 Dz	285	245	200	170	55	45
0.8/3.7 AF	385	340	305	265	80	66
0.8/4.9 Dz	380	325	265	225	75	62
1.0/4.8 AF	485	430	365	315	100	82
1.0/6.6 D	475	425	360	310	95	78
1.4/6.6 AF	645	570	480	415	130	107
1.6/7.3 AF	705	630	530	460	145	120

Calculated

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0.51/2.4 AF	225	198	183	160	49	40
0.58/2.6 AF	300	265	240	209	60	50
0.6/2.8 AF	322	280	255	220	65	54
0.6/3.7 Dz	255	275	220	190	60	50
0.8/3.7 AF	430	380	340	295	90	74
0.8/4.9 Dz	425	365	295	250	80	66
1.0/4.8 AF	540	480	405	350	110	91
1.0/6.6 D	525	470	400	345	105	87
1.4/6.6 AF	715	635	535	465	145	120
1.6/7.3 AF	785	700	590	510	160	132