

Bending properties of cables with bend insensitive optical fibres

Background

This whitepaper address the bending performance of cables with BendBright XS and MaxCap-BB-OMx bend insensitive fibres. The paper is a supplement to the separate documentation for the MaxCap-BB-OMx fibres and the BendBright XS fibres, as well as the individual cable data sheets

Tables 1 and 2 below give the bending properties of the optical fibres according to the fibre data sheets. In the following sections we give information about bending performance of the different cable constructions within the UC^{FIBRE} portfolio.

Table 1 bending properties of BendBright XS single mode fibres

Bending action	Maximum attenuation increase [dB]
10 turns on a mandrel R = 15 mm, @1550nm	≤ 0.03
10 turns on a mandrel R = 15 mm, @1625nm	≤ 0.1
1 turn on a mandrel R = 10 mm, @1550nm	≤ 0.1
1 turn on a mandrel R = 10 mm, @1625nm	≤ 0.2
1 turn on a mandrel R = 7.5 mm, @1550nm	≤ 0.5
1 turn on a mandrel R = 7.5 mm, @1625nm	≤ 1.0

Table 2 bending properties of MaxCap-BB-OMX multi mode fibres □

Bending action	Maximum attenuation increase [dB]
2 turns on a mandrel R=15 mm, @ 850 nm	≤ 0.1 dB
2 turns on a mandrel R=15 mm, @ 1300 nm	≤ 0.3 dB
2 turns on a mandrel R=7.5 mm, @ 850 nm	≤ 0.2 dB
2 turns on a mandrel R=7.5 mm, @ 1300 nm	≤ 0.5 dB

Bending properties of the cables

The fibres in the cables of cause adhere strictly to the properties given in the fibre data sheets. Depending of the cable construction the cables may be bend very narrowly when containing the bend insensitive fibres. Other cables are designed such a way that they still can only be bend like if they were build with the traditional fibres.

Bare and buffered fibres

When bending the cabled bare fibers, the ES9 easy strippable tightly buffered fibres, and other tight and semi tight fibres, the above mentioned bending properties are of cause 100 % preserved: The minimum bending radius is R= 7.5 mm (diameter 15 mm).

Assembly cables

The same is the case for all assembly cables (single and two fibre cables for patch cords), as well as certain small cables. Table 3 below is a list of these cables

Central tube cables and stranded loose tube cables

These cable do not inherit the properties of the fibres, as the tubes inside the cables may kink and the central FRP rod make the cable construction so stiff that very narrow bending of the cable and the tubes are not advised


















Multi fiber cable with ES9 tight buffer and LS9 semi tight buffer

The buffered fibres and for the break out cables also the fibre units, have their bending properties 100 % preserved: The minimum bending radius is R= 7.5 mm (diameter 15 mm).

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The same is the case for the distribution cable constructions D02b, D12b, D15a and D20a with 6 fibres or less. For the mentioned cables with 8 fibres and more and for the other constructions not mentioned, the original bending restrictions have to be adhered to.

Table 3: Cable constructions where the bending performance of the fibres are 100% preserved

Cable Designation	Data sheet	DIN/VDE code	
UC ^{FIBRE} I T N LSHF-FR ES9 2.8 2	D01c	J-V(ZN)H 2	
UC ^{FIBRE} I T N LSHF-FR ES9 3.0 2	D01d	J-V(ZN)H 2	
UC ^{FIBRE} I S N LSHF-FR ES9 2.8 1	D04c	J-V(ZN)H 1	
UC ^{FIBRE} I T N LSHF-FR ES9 1.6 2	D05b	J-V(ZN)H 2	
UC ^{FIBRE} I T N LSHF-FR ES9 2.8 2	D07a	J-V(ZN)H 2	
UC ^{FIBRE} I S N LSHF-FR ES9 1.6 1	D08a	J-V(ZN)H 1	
UC ^{FIBRE} I S N LSHF-FR ES9 2.0 1	D10d	J-V(ZN)H 1	
UC ^{FIBRE} I T N LSHF-FR ES9 2.0 2	D10e	J-V(ZN)H 2	
UC ^{FIBRE} I FL N LSHF-FR ES9 2.0 2	D10f	J-V(ZN)H H 2	
UC ^{FIBRE} I T N LSHF-FR ES9 1.8 2	D17a	J-V(ZN)H 2	
UC ^{FIBRE} I T N LSHF-FR LS9 3.0	D19a	J-V(ZN)H 2	
UC ^{FIBRE} I FL N LSHF-FR LS9 2.0	D21a	J-V(ZN)HH 2	
UC ^{FIBRE} I B N LSHF-FR ES9 2.1 2	D23	J-V(ZN)HH 2	
UC ^{FIBRE} I B N LSHF-FR ES9 2.1 4	D24	J-V(ZN)HH 4	
UC ^{FIBRE} S LSHF LS9 0.9 1	D26	J-V 1	
UC ^{FIBRE} I T N LSHF-FR LS9 1.8	D27	J-V(ZN)H 2	
UC ^{FIBRE} I S N LSHF-FR LS9 1.8 1	D28	J-V(ZN)H 1	
UC ^{FIBRE} S LSHF ES9 0.9 1	D29	J-V 1	