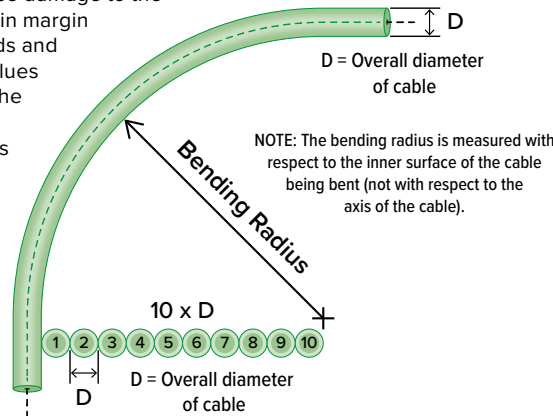


Minimum bending radius

The radius of curvature used in the installation of electrical cables must be such that it does not cause damage to the cable. In order to maintain a certain margin of safety, manufacturers, standards and regulations establish minimum values depending on the type of cable, the application and the installation conditions. These minimum values are generally stated as multiples of the overall diameter of the cable (D).

In general, when the cable is not subjected to mechanical tensile stress, the radius of curvature is less critical and smaller values are allowed (e.g. in its final static position).



IMPORTANT:

- The bending radius is measured with respect to the inner surface of the cable (not with respect to the axis of the cable).
- The minimum bending radius must be considered as a limit situation and not as a rule to be followed. The bending radius used should be the maximum that the situation and circumstances allow.
- The temperature at which the bending is carried out is a critical parameter for the bending operation.
- Special attention must be paid to the bending radius used near the anchorage or fixing points.
- There may be regulatory limitations that must be respected.

• Insulated conductors from standard serie EN 50525 for “fixed installation” and rated voltage of 300/500 V & 450/750 V (EN 50565-1)

BARRY H07V-U/R, BARRYFLEX H07V-K, AFIRENAS L ES05Z1-K & H07Z1-K TYPE2 (AS), AFIRENAS H07Z1-U/R TYPE2 (AS), AFIRENAS L H07Z1-K TYPE2 (AS) & AFIRENAS CC-Z H07Z-R

	D ≤ 8	8 < D ≤ 12	12 < D ≤ 20	D > 20
Normal use	4 x D	5 x D	6 x D	6 x D
Careful bending at termination (with a former)	2 x D	3 x D	4 x D	4 x D

D= Overall diameter of insulated conductor (mm). Note: Values for insulated conductor temperature of 20 °C ± 10 °C.

• Cables from standard serie EN 50525 for “mobile or portable applications” (EN 50565-1)

Particular conditions (if applicable)	H05VV-F, ES05VV-F & H05Z1Z1-F				H1Z2Z2-K, H05SS-F, H05RR-F & H07RN-F			
	D ≤ 8	8 < D ≤ 12	12 < D ≤ 20	D > 20	D ≤ 8	8 < D ≤ 12	12 < D ≤ 20	D > 20
Fixed installation	3 x D	3 x D	4 x D	4 x D	3 x D	3 x D	4 x D	4 x D
Free movement	5 x D	5 x D	6 x D	6 x D	4 x D	4 x D	5 x D	6 x D
At inlet of portable appliance or mobile equipment (without mechanical stresses)	5 x D	5 x D	6 x D	6 x D	4 x D	4 x D	5 x D	6 x D
Under allowed mechanical load	9 x D	9 x D	9 x D	10 x D	6 x D	6 x D	6 x D	8 x D
Festooned	10 x D	10 x D	11 x D	12 x D	6 x D	6 x D	6 x D	8 x D
Repeated reeling	7 x D	7 x D	8 x D	8 x D	6 x D	6 x D	6 x D	8 x D
Deflected by pulleys	10 x D	10 x D	10 x D	10 x D	6 x D	8 x D	8 x D	8 x D

D= Overall diameter of cable (mm). Note: Values for cable temperature of 20 °C ± 10 °C.

• Cables with insulation and overseath (without armour and/or shield) and rated voltage of 0,6/1 kV

BARRYNAX RV & U-1000 R2V, BARRYFLEX RV-K, AFIRENAS X RZ1-K (AS) and AFIREFENIX SZ1-K(AS+)

D= Overall diameter of cable (mm)	D < 25	25 ≤ D ≤ 50	D > 50
Minimum bending radius (mm)	4 x D	5 x D	6 x D

Note: These values are not valid for the laying, installation or handling processes. In these cases, values higher than those indicated will be used (Rmin ≥ 15 x D, “D” = overall diameter of the cable). A minimum temperature of 0 °C will be respected during the installation, manipulation, handling and assembly of accessories. If lower bending radii are required during installation and/or laying, special installation methods must be adopted (e.g. a 50% reduction (i.e. 7.5 x D) may be applied in case of a single careful bending of the end of the cable, carried out by qualified and trained personnel, using templates for bending the cable and carrying out the operations when the cable (not the environment) has a temperature of 20 or 30 °C).

In order to protect the integrity, overlap and performance of the mica tapes of AFIREFENIX MICA RZ1-K 0.6/1 kV PH120 (AS+) cables, it is recommended to use a minimum bending radius of 10 times the overall diameter of the cable.

• Cables with armour and/or shield

BARRYNAX, BARRYFLEX, AFIRENAS & AFIREFENIX, AR-FLEJE, AR-CORONA or SHIELD

Minimum bending radius (mm)	10 x D	D= Overall diameter of cable (mm).
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Note: These values are not valid for the laying, installation or handling processes. In these cases, values higher than those indicated will be used (Rmin ≥ 20 x D, “D” = overall diameter of the cable). A minimum temperature of 0 °C will be respected during the installation, manipulation, handling and assembly of accessories. If lower bending radii are required during installation and/or laying, special installation methods must be adopted.

• Cable BARRYNAX RZ 0,6/1 kV (Cu)

Formation	2 x S	3 G S	4 x S	5 G S	
Minimum bending radius (mm)	9 x D	8,33 x D	7,44 x D	6,67 x D	D= Overall diameter of the conductor bundle in mm.

Note: The indicated values are equivalent to a value of 18 times the diameter of the largest insulated conductor (UNE 21030).

In the case of laying with controlled curvature, for example, by bending it on a former/template at a temperature not lower than 15 °C, the bending radius specified above can be reduced by half.

• Bare copper conductor (TERRANAX or TENDENAX)

Minimum bending radius (mm)	20 x D	D= Overall diameter of bare copper conductor (mm). Note: They must not be subjected to axial torsion stresses while bending.
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• THHN, THWN or THWN-2

D= Overall diameter of cable (mm)	25	50	> 50
Minimum bending radius (mm)	4 x D	5 x D	6 x D

• PRECAB (pre-wired conduit)

D= Overall diameter of conduit (mm)	Ø 16	Ø 20	Ø 25
Minimum bending radius (mm)	48	60	75