

# FREETOX NH-80 450/750 V up to and including 10 mm<sup>2</sup> in double layer

Contact  
Local Sales  
ventas.peru@nexans.com

Special application in places with poor ventilation and places public attendance high.

## DESCRIPTION

### Application:

Special application in places with poor ventilation, where, in case of fire, the emission of corrosive, toxic gases and smoke threatens life and destroys electrical and electronic equipment, for example in residential buildings, offices, industrial plants, movie, theaters, discotheques, hospitals, airports, underground stations, etc. In case of fire, possible victims have higher chances of surviving because they don't breath in toxic gases and have good visibility to escape the area. They are usually installed in conduits and in indoor areas in tray. 100% purity copper, double layer, double protection. Not recommended for outdoor installations

### Construction:

1. Conductor: Soft copper, class 2.
2. Insulation: Halogen free thermoplastic material HFFR, double layer.

### Main characteristics:

Fire retardant, low emission dense smoke and halogen free.

### Cross section:

From 1,5 mm<sup>2</sup> up to 10 mm<sup>2</sup>.

### Marking:

INDECO S.A. FREETOX NH-80 450/750 V - Section - Year - Sequential length.

### Packing:

From 1,5 mm<sup>2</sup> up to 6 mm<sup>2</sup> in 100-meter standard coils.

10 mm<sup>2</sup> in reels.

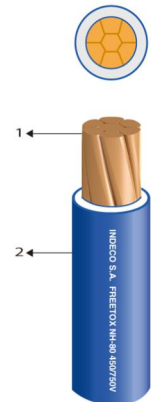
### Colour:

At the customer's request.

### National standards

**NTP-IEC 60228:** Conductors of insulated cables.

**NTP 370.252:** Thermoplastic and thermoset insulated cables of rated voltages up to and including 450/750 V.



## STANDARDS

**International** IEC 60228;  
IEC 60332-1-2;  
IEC 60332-3-24 Cat.C;  
IEC 60684-2; IEC 60754-1;  
IEC 60754-2; IEC 61034-2

**National** NTP 370.252; NTP-  
IEC 60228; UL 2556



Halogen free  
IEC 60754-1



Conductor flexibility  
Class 2 IEC 60228



Rated Voltage Uo/U  
(Um)  
450 / 750 V



Gases toxicity  
Low toxicity to IEC  
60684-2



Gases corrosivity  
Low pH  
Corrosivity IEC  
60754-2



Smoke density  
Low IEC 61034-2



Flame retardant  
IEC 60332-1-2; FT1



Fire retardant  
IEC 60332-3-24  
Cat.C

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**NTP 370.266-3-31:** Low voltage electrical cables. Cable with nominal voltage less than or equal to 450/750 V - Part 3-31: Cables with special properties before the fire. Single core cables without cover with halogen-free thermoplastic insulation and low smoke emission.

**NTP 370.264-7:** Insulation, covering and coating materials for low voltage electrical power cables - Part 7: Halogen-free thermoplastic compounds for insulation.

## International standards

**IEC 60228:** Conductors of insulated cables.

**IEC 60332-1-2:** Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame.

**UL 2556:** Wire and Cable Test Methods. **Section 9.3:** FT1 (Vertical-Specimen) Flame Test.

**IEC 60332-3-24:** Test for vertical flame spread of vertically-mounted bunched wires or cables - Category C.

**IEC 60684-2:** Flexible insulating sleeving - Part 2: Methods of test.

**IEC 60754-1:** Test on gases evolved during combustion of materials from cables - **Part 1:** Determination of the halogen acid gas content.

**IEC 60754-2:** Test on gases evolved during combustion of materials from cables - **Part 2:** Determination of acidity (by pH measurement) and conductivity.

**IEC 61034-2:** Measurement of smoke density of cables burning under defined conditions.

## CHARACTERISTICS

### Construction characteristics

Conductor material	Soft copper
Insulation	Halogen free thermoplastic material
Halogen free	IEC 60754-1
Conductor flexibility	Class 2 IEC 60228
Conductor shape	Compressed

### Electrical characteristics

Rated Voltage U <sub>0</sub> /U (Um)	450 / 750 V
Dielectric strength	2.5 kV
Time of application Dielectric strength core to screen AC	5 min.



Halogen free  
IEC 60754-1



Conductor flexibility  
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Rated Voltage U<sub>0</sub>/U (Um)  
450 / 750 V



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60684-2



Gases corrosivity  
Low pH  
Corrosivity IEC  
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## Usage characteristics

Gases toxicity	Low toxicity to IEC 60684-2
Gases corrosivity	Low pH Corrosivity IEC 60754-2
Smoke density	Low IEC 61034-2
Flame retardant	IEC 60332-1-2; FT1
Fire retardant	IEC 60332-3-24 Cat.C
Minimum operating temperature	-40 °C
Maximum operating temperature	80 °C
Overload maximum core temperature	100 °C
Short-circuit max. conductor temperature	160 °C

## DIMENSIONAL DATA



Cross section [mm <sup>2</sup> ]	Total nb wires	Conductor diam. [mm]	Min. insulation thick. [mm]	Nom. outer diam. [mm]	Approx. weight [kg/km]
1.5	7	1.5	0.7	3.0	21
2.5	7	1.9	0.8	3.6	33
4	7	2.4	0.8	4.1	48
6	7	3.0	0.8	4.6	68
10	7	3.7	1.0	5.8	111

## ELECTRICAL DATA

Cross section [mm <sup>2</sup> ]	Max. DC Resist. Cond. 20°C [Ohm/km]	Perm current rating in air 30°C [A]	Perm rating in duct 30°C [A]	Nominal capacitance [pF/m]
1.5	12.1	18	14	641.0
2.5	7.41	30	24	695.0
4	4.61	35	31	830.0
6	3.08	50	39	1040.0
10	1.83	74	51	989.0

## PRODUCT LIST

Nexans Ref.	Country Ref.	Name	Colour	Approximate weight [kg/km]
 P00000853-5	-	FREETOX NH-80 450/750 V 4 mm <sup>2</sup> RJ, R100	Red	48

 = Make to order,  = In stock,



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IEC 60754-1



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Class 2 IEC 60228



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Flame retardant  
IEC 60332-1-2; FT1























Fire retardant  
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Nexans Ref.	Country Ref.	Name	Colour	Approximate weight [kg/km]
 P00007389-3	-	FREETOX NH-80 450/750 V 4 mm <sup>2</sup> AZ, CARRETE	Blue	48
 P00000856-4	-	FREETOX NH-80 450/750 V 6 mm <sup>2</sup> BL, R100	White	68
 P00000321-7	-	FREETOX NH-80 450/750 V 1,5 mm <sup>2</sup> AZ, R100	Blue	21
 P00000841-7	-	FREETOX NH-80 450/750 V 1,5 mm <sup>2</sup> BL, R100	White	21
 P00000846-7	-	FREETOX NH-80 450/750 V 2,5 mm <sup>2</sup> BL, R100	White	33
 P00000845-7	-	FREETOX NH-80 450/750 V 2,5 mm <sup>2</sup> AZ, R100	Blue	33
 P00000850-5	-	FREETOX NH-80 450/750 V 4 mm <sup>2</sup> AZ, R100	Blue	48
 P00007392-3	-	FREETOX NH-80 450/750 V 4 mm <sup>2</sup> BL, CARRETE	White	48
 P00007390-3	-	FREETOX NH-80 450/750 V 4 mm <sup>2</sup> RJ, CARRETE	Red	48
 P00000848-7	-	FREETOX NH-80 450/750 V 2,5 mm <sup>2</sup> RJ, R100	Red	33
 P00000847-7	-	FREETOX NH-80 450/750 V 2,5 mm <sup>2</sup> NG, R100	Black	33
 P00000852-4	-	FREETOX NH-80 450/750 V 4 mm <sup>2</sup> NG, R100	Black	48
 P00000857-4	-	FREETOX NH-80 450/750 V 6 mm <sup>2</sup> NG, R100	Black	68
 P00008443-6	-	FREETOX NH-80 450/750 V 10 mm <sup>2</sup> NG, CARRETE	Black	111
 P00000842-5	-	FREETOX NH-80 450/750 V 1,5 mm <sup>2</sup> NG, R100	Black	21
 P00000843-7	-	FREETOX NH-80 450/750 V 1,5 mm <sup>2</sup> RJ, R100	Red	21
 P00000851-4	-	FREETOX NH-80 450/750 V 4 mm <sup>2</sup> BL, R100	White	48
 P00022322-3	-	FREETOX NH-80 450/750 V 4 mm <sup>2</sup> NG, CARRETE	Black	48
 P00000855-4	-	FREETOX NH-80 450/750 V 6 mm <sup>2</sup> AZ, R100	Blue	68
 P00000858-4	-	FREETOX NH-80 450/750 V 6 mm <sup>2</sup> RJ, R100	Red	68

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## BENDING RADIUS WHEN INSTALLED IN L.V.

### R=Dxf

R: Bending radius when installed (mm)

D: Diameter over sheath or over insulation (when it has not sheath) (mm)

f: Multiplicative factor; given the following table:



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IEC 60754-1



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(U<sub>m</sub>)  
450 / 750 V



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60684-2



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## BENDING RADIUS FACTOR LV

Without Armor	Thickness of Conductor Insulation (mm)	Overall Diameter of Cable		
		< 25.4 mm	25.4 mm ≤ D ≤ 50.8 mm	> 50.8 mm
	De 0 a 4.31	4	5	6
Greater or equal 4.32	5	6	7	
Cables with Tape Flat Armor or Wire Sheathed Armor			12	



## CALCULATION OF CURRENT CONDITION L.V.; 80°C

### CALCULATION OF CURRENT CONDITION

Maximum conductor temperature : 80°C.

Ambient air temperature : 30°C.



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