

# FREETOX NH-80 450/750 V from 16 mm<sup>2</sup>

## FREETOX NH-80 450/750 V 50 mm<sup>2</sup> NG

Contact  
Local Sales  
ventas.peru@nexans.com

Nexans Ref.: P00008416-4

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. Not recommended for outdoor installations. Not recommended for outdoor installations.

#### Construction:

Conductor: Compact soft copper, class 2.

Insulation: Halogen free thermoplastic compound HFFR.

#### Main characteristics:

Fire retardant, low emission dense smoke and halogen free.

#### Cross section:

From 16 mm<sup>2</sup> up to 300 mm<sup>2</sup>.

#### Marking:

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

#### Packing:

Non returnable wooden reels.

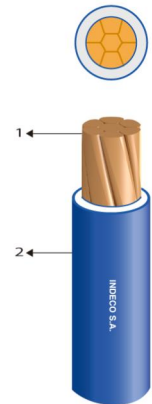
#### Colour:

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



Lead free  
Yes



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

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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                         |
| Lead free              | Yes                                 |
| Conductor flexibility  | Class 2 IEC 60228                   |
| Conductor shape        | Compact stranded                    |
| With Green/Yellow core | No                                  |

### Dimensional characteristics

|                         |                    |
|-------------------------|--------------------|
| Total number of wires   | 19                 |
| Conductor cross-section | 50 mm <sup>2</sup> |



Halogen free  
IEC 60754-1



Lead free  
Yes



Conductor flexibility  
Class 2 IEC 60228



Rated Voltage U<sub>o</sub>/U  
(Um)  
450 / 750 V



Gases toxicity  
Low toxicity to IEC  
60684-2



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Flame retardant  
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### Dimensional characteristics

|                              |           |
|------------------------------|-----------|
| Conductor diameter           | 7.9 mm    |
| Minimum insulation thickness | 1.4 mm    |
| Nominal outer diameter       | 10.8 mm   |
| Approximate weight           | 475 kg/km |
| Number of cores              | 1         |

### Electrical characteristics

|                                                           |              |
|-----------------------------------------------------------|--------------|
| Dielectric strength                                       | 2.5 kV       |
| Time of application Dielectric strength core to screen DC | 5 min.       |
| Max. DC resistance of the conductor at 20°C               | 0.387 Ohm/km |
| Nominal capacitance                                       | 444.0 pF/m   |
| Perm current rating in air 30°C                           | 204 A        |
| Perm current rating in duct 30°C                          | 138 A        |
| Rated Voltage U <sub>0</sub> /U (Um)                      | 450 / 750 V  |

### 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                         |

## CURRENT CAPACITY TABLE PVC INSULATION SINGLE CORE THREE PHASE

PVC insulation/two loaded conductors, copper or aluminium – Conductor temperature: 80 °C, ambient temperature: 30 °C in air, 20 °C in ground

| Conductor cross-section |                                                                                  | 1   |    | 2   |                                                     | 3   |    | 4   |     | 5                                                         |     | 6   |     |
|-------------------------|----------------------------------------------------------------------------------|-----|----|-----|-----------------------------------------------------|-----|----|-----|-----|-----------------------------------------------------------|-----|-----|-----|
| [mm <sup>2</sup> ]      |                                                                                  | Cu  | Al | Cu  | Al                                                  | Cu  | Al | Cu  | Al  | Cu                                                        | Al  | Cu  | Al  |
| 50                      |                                                                                  | 119 | 92 | 147 | 114                                                 | 125 | 98 | 140 | 107 | 191                                                       | 146 | 184 | 141 |
| 1                       | A1 Insulated conductors in conduit in a thermally insulated wall                 |     |    | 2   | B1 Insulated conductors in conduit on a wooden wall |     |    |     | 3   | D1 Single-core or Multi-core cable in ducts in the ground |     |     |     |
| 4                       | D2 Single-core or Multi-core cables designed to be buried directly in the ground |     |    | 5   | F Single-core flat cables, touching in free air     |     |    |     | 6   | F Single-core trefoil cables, touching in free air        |     |     |     |



Halogen free  
IEC 60754-1



Lead free  
Yes



Conductor flexibility  
Class 2 IEC 60228



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



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PVC insulation/two loaded conductors, copper or aluminium – Conductor temperature: 80 °C, ambient temperature: 30 °C in air, 20 °C in ground

| Conductor cross-section |                                                                                  | 1   |     | 2                                                   |     | 3   |     | 4                                                         |     | 5   |     |
|-------------------------|----------------------------------------------------------------------------------|-----|-----|-----------------------------------------------------|-----|-----|-----|-----------------------------------------------------------|-----|-----|-----|
| [mm²]                   |                                                                                  | Cu  | Al  | Cu                                                  | Al  | Cu  | Al  | Cu                                                        | Al  | Cu  | Al  |
| 50                      |                                                                                  | 131 | 102 | 166                                                 | 130 | 151 | 118 | 168                                                       | 126 | 216 | 164 |
| 1                       | A1 Insulated conductors in conduit in a thermally insulated wall                 | 2   |     | B1 Insulated conductors in conduit on a wooden wall |     | 3   |     | D1 Single-core or Multi-core cable in ducts in the ground |     |     |     |
| 4                       | D2 Single-core or Multi-core cables designed to be buried directly in the ground | 5   |     | F Single-core flat cables, touching in free air     |     |     |     |                                                           |     |     |     |

## BENDING RADIUS WHEN INSTALLED IN L.V.

$$R = D \times f$$

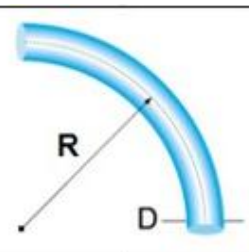
R: Bending radius when installed (mm)

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

f: Multiplicative factor; given the following table:

## 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        |



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

### CALCULATION OF CURRENT CONDITION

Maximum conductor temperature : 80°C.

Ambient air temperature : 30°C.



Halogen free  
IEC 60754-1



Lead free  
Yes



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