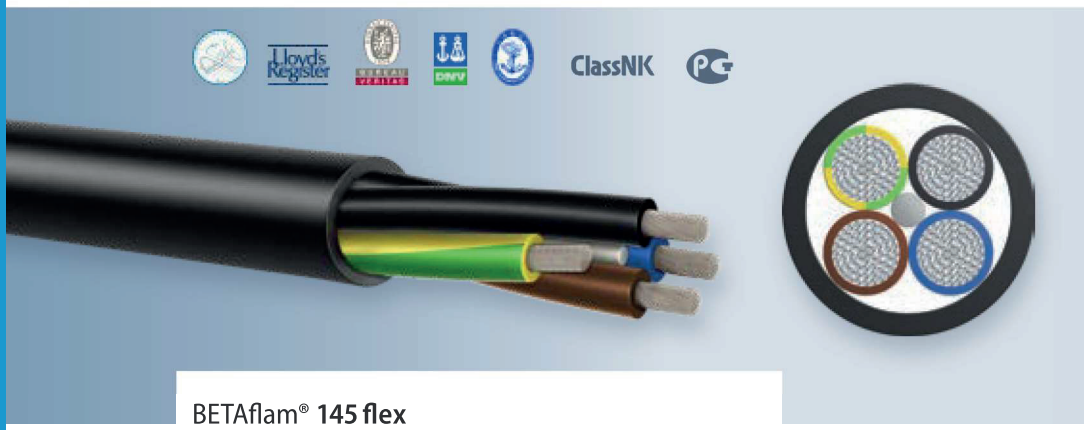
# BETAflam® 145 flex 600 V/1000 V

Connection and power cable – temperature resistant





BETAflam® **145 flex**

## Competitive advantage

- Very high resistance to temperature, service temperature up to +145 °C
- Resistance to cold down to –55 °C
- Best fire performance, halogen free
- Good media resistance
- Electron-beam cross-linked
- Marine approval Class NK

## Application

Fixed and flexible application in dry, humid and wet rooms. Good weather and UV resistance. Extensively oil resistant. Intended for installation outdoors. Typical areas of application are connections of:

- Lamps
- Heating units
- Electrical machinery (thermal class B)
- Switchboards / switch cabinets and distributors in apparatus, mechanical or plant engineering

## Construction

| | |
|---|---|
| Conductor | Tinned fine copper strands acc. to VDE 0295/IEC 60228, class 5 |
| Insulation | Polyolefine copolymer electron-beam cross-linked, HF90 |
| Core identification | ≤ 5 cores acc. to HD 308 S2 (see page 72)<br>≥ 6 cores<br>● black with white numbers or<br>● black with white numbers and ◐ |
| Outer sheath | Polyolefine copolymer electron-beam cross-linked, SHF2 |
| Colour of sheath | ● black |

## Electrical properties

| | | |
|---|---|---|
| Nominal voltage | $U_0/U \leq 1$ mm² | 300 / 500 V |
| | $U_0/U \geq 1.5$ mm² | 450 / 750 V |
| fixed and protected installation | $U_0/U \geq 1.5$ mm² | 600 / 1000 V |
| Testing voltage | 3500 V | |

## Thermal properties

| | | |
|---|---|---|
| Conductor temperature | fixed installation | +145 °C max. |
| | occasionally moved | +120 °C max. |
| Short-circuit temperature | | +280 °C max. |
| Ambient temperature | fixed installation | –55 °C min. |
| | occasionally moved | –35 °C min. |

## Bending radius

| | |
|---|---|
| Fixed installation | > 4 × outer Ø |
| Occasionally moved | > 8 × outer Ø |

## Standards / material properties

- Halogen free: IEC 60754-1, EN 50267-2-1
- No corrosive gases: IEC 60754-2, EN 50267-2-2
- No toxic gases: NF X 70-100
- Low smoke density: IEC 61034, DIN EN 61034-2, EN 50268-2
- Flame retardant: EN/IEC 60332-1-2
- Non-flame propagating: IEC 60332-3, DIN EN 60332-3, EN 50266-2, NF C 32-070
- Low fire load: DIN 51900
- Cross-linked insulation compound HF90: IEC 60092-360
- Cross-linked sheating compound SHF2: IEC 60092-360

## Approvals

- Germanischer Lloyd (GL)
- Lloyd's Register (LR)
- BUREAU VERITAS (BV)
- DET Norske Veritas (DNV)
- CHINA CLASSIFICATION SOCIETY (CCS)
- Class NK
- Gost R

## Special features

Special types upon request

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| Cross-section nominal | Core function | Core Ø | Outer Ø | Weight | Fire load | Order no. |
|---|---|---|---|---|---|---|
| n × mm² | | | mm | kg/km | kWh/m | |
| 2 × 0.5 | LN | 1.9 | 5.1 | 30 | 0.08 | **214001** |
| 3 G 0.5 | LNPE | 1.9 | 5.5 | 46 | 0.13 | ✆ |
| 4 G 0.5 | NRPE | 1.9 | 5.9 | 49 | 0.13 | ✆ |
| 4 × 0.5 | NR | 1.9 | 5.9 | 49 | 0.13 | **219379** |
| 5 G 0.5 | 3LNPE | 1.9 | 6.7 | 68 | 0.19 | ✆ |
| 6 G 0.5 | NRPE | 1.9 | 7.1 | 74 | 0.18 | ✆ |
| 7 G 0.5 | NRPE | 1.9 | 7.8 | 93 | 0.26 | ✆ |
| 8 G 0.5 | NRPE | 1.9 | 8.6 | 104 | 0.27 | ✆ |
| 10 G 0.5 | NRPE | 1.9 | 9.4 | 130 | 0.32 | ✆ |
| 12 G 0.5 | NRPE | 1.9 | 9.4 | 125 | 0.32 | ✆ |
| 14 G 0.5 | NRPE | 1.9 | 10.0 | 146 | 0.33 | ✆ |
| 16 G 0.5 | NRPE | 1.9 | 10.7 | 169 | 0.38 | ✆ |
| | | | | | | |
| 2 × 0.75 | LN | 2.2 | 5.9 | 52 | 0.15 | **213874** |
| 2 × 0.75 | NR | 2.2 | 5.9 | 52 | 0.15 | **217588** |
| 3 G 0.75 | LNPE | 2.2 | 6.2 | 53 | 0.13 | **216630** |
| 3 × 0.75 | NR | 2.2 | 6.2 | 53 | 0.13 | **223848** |
| 4 × 0.75 | NR | 2.2 | 6.9 | 68 | 0.17 | **220752** |
| 4 G 0.75 | 3LPE | 2.2 | 6.9 | 68 | 0.17 | **222788** |
| 4 G 0.75 | 2LNPE | 2.2 | 6.9 | 68 | 0.17 | **216328** |
| 5 G 0.75 | 3LNPE | 2.2 | 7.7 | 86 | 0.21 | **222910** |
| 5 × 0.75 | NR | 2.2 | 7.7 | 86 | 0.21 | **223774** |
| 6 G 0.75 | NR | 2.2 | 8.3 | 102 | 0.25 | **222161** |
| 6 G 0.75 | NRPE | 2.2 | 8.3 | 102 | 0.25 | **226089** |
| 7 G 0.75 | NRPE | 2.2 | 9.1 | 122 | 0.30 | **218510** |
| 8 G 0.75 | NRPE | 2.2 | 10.2 | 147 | 0.37 | **213641** |
| 10 G 0.75 | NR | 2.2 | 11.1 | 171 | 0.41 | **214566** |
| 10 G 0.75 | NRPE | 2.2 | 11.1 | 171 | 0.41 | **302843** |
| 12 G 0.75 | NRPE | 2.2 | 11.1 | 182 | 0.40 | **221971** |
| 14 G 0.75 | NRPE | 2.2 | 11.7 | 203 | 0.43 | ✆ |
| 16 G 0.75 | NRPE | 2.2 | 12.5 | 238 | 0.51 | **302844** |
| | | | | | | |
| 1 × 1 | L | 2.4 | 3.9 | 25 | 0.06 | ✆ |
| 2 × 1 | LN | 2.4 | 6.3 | 49 | 0.12 | **219674** |
| 2 × 1 | NR | 2.4 | 6.3 | 49 | 0.12 | **218860** |
| 3 G 1 | LNPE | 2.4 | 6.8 | 65 | 0.15 | **214075** |
| 3 × 1 | NR | 2.4 | 6.8 | 65 | 0.15 | **301676** |
| 4 G 1 | 3LPE | 2.4 | 7.4 | 83 | 0.19 | **222969** |
| 4 × 1 | NR | 2.4 | 7.4 | 83 | 0.19 | **224018** |
| 4 G 1 | 2LNPE | 2.4 | 7.4 | 83 | 0.19 | **218509** |
| 5 G 1 | 3LNPE | 2.4 | 8.3 | 105 | 0.24 | **222911** |
| 5 G 1 | NRPE | 2.4 | 8.3 | 105 | 0.24 | **218863** |
| 5 × 1 | NR | 2.4 | 8.3 | 105 | 0.24 | **220309** |
| 6 G 1 | NRPE | 2.4 | 8.9 | 124 | 0.28 | ✆ |
| 7 G 1 | NRPE | 2.4 | 9.9 | 152 | 0.35 | **218864** |
| 8 G 1 | NRPE | 2.4 | 11.0 | 181 | 0.43 | ✆ |
| 10 G 1 | NRPE | 2.4 | 12.1 | 222 | 0.47 | ✆ |
| 12 G 1 | NRPE | 2.4 | 12.1 | 226 | 0.46 | **218859** |
| 14 G 1 | NRPE | 2.4 | 12.7 | 252 | 0.50 | ✆ |
| 16 G 1 | NRPE | 2.4 | 13.6 | 290 | 0.59 | ✆ |
| 19 G 1 | NRPE | 2.4 | 15.1 | 365 | 0.77 | **223244** |
| 21 G 1 | NRPE | 2.4 | 16.0 | 380 | 0.78 | ✆ |
| 24 G 1 | NRPE | 2.4 | 17.1 | 437 | 1.28 | ✆ |
| 25 G 1 | NRPE | 2.4 | 17.1 | 463 | 0.94 | **218861** |

| Cross-section nominal | Core function | Core Ø | Outer Ø | Weight | Fire load | Order no. |
|---|---|---|---|---|---|---|
| n × mm² | | | mm | kg/km | kWh/m | |
| 27 G 1 | NRPE | 2.4 | 17.1 | 468 | 1.40 | ✆ |
| 30 G 1 | NRPE | 2.4 | 17.7 | 514 | 1.57 | ✆ |
| 33 G 1 | NRPE | 2.4 | 18.9 | 582 | 1.75 | **224020** |
| 37 G 1 | NRPE | 2.4 | 20.3 | 680 | 1.37 | ✆ |
| | | | | | | |
| 1 × 1.5 | L | 3.0 | 4.3 | 32 | 0.07 | ✆ |
| 2 × 1.5 | LN | 3.0 | 7.6 | 69 | 0.17 | **211350** |
| 2 × 1.5 | NR | 3.0 | 7.6 | 69 | 0.17 | **217256** |
| 3 G 1.5 | LNPE | 3.0 | 8.1 | 91 | 0.21 | **211351** |
| 3 × 1.5 | NR | 3.0 | 8.1 | 91 | 0.21 | **217180** |
| 4 × 1.5 | NR | 3.0 | 8.8 | 115 | 0.26 | **215037** |
| 4 G 1.5 | 3LPE | 3.0 | 8.8 | 115 | 0.26 | **222789** |
| 4 G 1.5 | 2LNPE | 3.0 | 8.8 | 115 | 0.26 | **211352** |
| 5 G 1.5 | 3LNPE | 3.0 | 9.8 | 147 | 0.33 | **222778** |
| 5 × 1.5 | NR | 3.0 | 9.8 | 147 | 0.33 | **221932** |
| 6 G 1.5 | NRPE | 3.0 | 10.9 | 190 | 0.48 | **211354** |
| 7 G 1.5 | NRPE | 3.0 | 12.0 | 256 | 0.65 | **211355** |
| 10 G 1.5 | NRPE | 3.0 | 14.6 | 297 | 0.68 | **211357** |
| 12 G 1.5 | NRPE | 3.0 | 14.6 | 320 | 0.66 | **211358** |
| 14 G 1.5 | NRPE | 3.0 | 15.4 | 366 | 0.74 | ✆ |
| 16 G 1.5 | NRPE | 3.0 | 16.2 | 418 | 0.85 | **211359** |
| 19 G 1.5 | NRPE | 3.0 | 18.3 | 486 | 0.99 | ✆ |
| 21 G 1.5 | NRPE | 3.0 | 19.7 | 595 | 1.30 | **214968** |
| 24 G 1.5 | NRPE | 3.0 | 21.1 | 644 | 1.39 | **220314** |
| 25 G 1.5 | NRPE | 3.0 | 21.1 | 674 | 1.41 | **212866** |
| 27 G 1.5 | NRPE | 3.0 | 21.1 | 696 | 1.39 | **217181** |
| 30 G 1.5 | NRPE | 3.0 | 21.8 | 760 | 1.48 | ✆ |
| 33 G 1.5 | NRPE | 3.0 | 22.6 | 831 | 1.62 | ✆ |
| 37 G 1.5 | NRPE | 3.0 | 24.8 | 975 | 2.00 | **302217** |
| | | | | | | |
| 1 × 2.5 | L | 3.7 | 5.0 | 45 | 0.10 | ✆ |
| 2 × 2.5 | LN | 3.7 | 9.0 | 99 | 0.22 | **211360** |
| 2 G 2.5 | NR | 3.7 | 9.0 | 99 | 0.22 | **216689** |
| 3 G 2.5 | LNPE | 3.7 | 9.8 | 138 | 0.30 | **211361** |
| 4 G 2.5 | 3LPE | 3.7 | 10.8 | 176 | 0.37 | **222790** |
| 4 × 2.5 | NR | 3.7 | 10.8 | 176 | 0.37 | **218979** |
| 4 G 2.5 | 2LNPE | 3.7 | 10.8 | 176 | 0.37 | **211362** |
| 5 G 2.5 | 3LNPE | 3.7 | 12.0 | 225 | 0.47 | **222779** |
| 6 G 2.5 | NRPE | 3.7 | 13.2 | 288 | 0.62 | ✆ |
| 7 G 2.5 | NRPE | 3.7 | 14.6 | 331 | 0.72 | **211365** |
| 8 G 2.5 | NRPE | 3.7 | 15.7 | 372 | 0.80 | **216500** |
| 10 G 2.5 | NRPE | 3.7 | 17.7 | 450 | 0.95 | ✆ |
| 12 G 2.5 | NRPE | 3.7 | 17.7 | 486 | 0.92 | **211366** |
| 14 G 2.5 | NRPE | 3.7 | 19.0 | 576 | 1.12 | **301167** |
| 16 G 2.5 | NRPE | 3.7 | 20.1 | 651 | 1.25 | ✆ |
| 19 G 2.5 | NRPE | 3.7 | 20.7 | 765 | 1.48 | ✆ |
| 21 G 2.5 | NRPE | 3.7 | 22.7 | 857 | 1.49 | ✆ |
| 24 G 2.5 | NRPE | 3.7 | 25.8 | 984 | 2.21 | ✆ |
| 25 G 2.5 | NRPE | 3.7 | 25.8 | 1036 | 2.00 | ✆ |
| 27 G 2.5 | NRPE | 3.7 | 25.8 | 1069 | 1.94 | ✆ |
| 30 G 2.5 | NRPE | 3.7 | 26.7 | 1175 | 2.12 | ✆ |
| 33 G 2.5 | NRPE | 3.7 | 28.0 | 1301 | 2.35 | ✆ |
| 37 G 2.5 | NRPE | 3.7 | 30.6 | 1599 | 3.41 | ✆ |

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| Cross-section nominal | Core function | Core Ø | Outer Ø | Weight | Fire load | Order no. |
|---|---|---|---|---|---|---|
| n × mm² | | | mm | kg / km | kWh / m | |
| 1 × 4 | L | 4.2 | 5.6 | 62 | 0.12 | ✆ |
| 2 × 4 | LN | 4.2 | 10.2 | 154 | 0.35 | **212870** |
| 2 × 4 | NR | 4.2 | 10.2 | 154 | 0.35 | **300782** |
| 3 G 4 | LNPE | 4.2 | 10.9 | 190 | 0.35 | **216165** |
| 4 G 4 | 3LPE | 4.2 | 12.2 | 249 | 0.45 | **223188** |
| 5 G 4 | 3LNPE | 4.2 | 13.5 | 312 | 0.57 | **222913** |
| 6 G 4 | NRPE | 4.2 | 14.9 | 380 | 0.70 | ✆ |
| 7 G 4 | NRPE | 4.2 | 16.4 | 456 | 0.86 | ✆ |
| 8 G 4 | NRPE | 4.2 | 17.6 | 523 | 0.96 | ✆ |
| 10 G 4 | NRPE | 4.2 | 20.1 | 674 | 1.67 | ✆ |
| 12 G 4 | NRPE | 4.2 | 20.1 | 694 | 1.14 | **302379** |
| 14 G 4 | NRPE | 4.2 | 21.5 | 810 | 1.33 | **302380** |
| 1 × 6 | L | 4.7 | 6.1 | 83 | 0.13 | **222433** |
| 2 × 6 | LN | 4.7 | 11.6 | 209 | 0.43 | ✆ |
| 2 × 6 | NR | 4.7 | 11.6 | 209 | 0.43 | **301418** |
| 3 G 6 | LNPE | 4.7 | 12.4 | 275 | 0.49 | **219627** |
| 4 G 6 | 3LPE | 4.7 | 13.8 | 338 | 0.54 | **222791** |
| 4 G 6 | 2LNPE | 4.7 | 13.8 | 338 | 0.54 | **213672** |
| 4 × 6 | NR | 4.7 | 13.8 | 338 | 0.54 | **224652** |
| 5 G 6 | 3LNPE | 4.7 | 15.4 | 427 | 0.69 | **222780** |
| 6 × 6 | NR | 4.7 | 16.7 | 515 | 0.84 | **219613** |
| 7 G 6 | NRPE | 4.7 | 18.3 | 612 | 1.02 | **214964** |
| 1 × 10 | L | 6.1 | 7.7 | 133 | 0.20 | ✆ |
| 2 × 10 | LN | 6.1 | 14.7 | 355 | 0.68 | ✆ |
| 3 × 10 | NR | 6.1 | 15.7 | 443 | 0.76 | **219628** |
| 4 G 10 | 3LPE | 6.1 | 17.5 | 574 | 0.94 | **223189** |
| 4 G 10 | 2LNPE | 6.1 | 17.5 | 574 | 0.94 | **214969** |
| 5 G 10 | 3LNPE | 6.1 | 19.6 | 727 | 1.33 | **222912** |
| 6 G 10 | NRPE | 6.1 | 21.7 | 856 | 1.21 | ✆ |
| 7 G 10 | NRPE | 6.1 | 23.7 | 1000 | 1.61 | ✆ |
| 1 × 16 | L | 7.2 | 8.8 | 194 | 0.24 | ✆ |
| 2 × 16 | LN | 7.2 | 17.1 | 489 | 0.87 | **213749** |
| 3 G 16 | LNPE | 7.2 | 19.7 | 649 | 0.99 | ✆ |
| 4 G 16 | 3LPE | 7.2 | 20.6 | 857 | 1.29 | **303609** |
| 4 G 16 | 2LNPE | 7.2 | 20.6 | 857 | 1.29 | **214979** |
| 5 G 16 | 3LNPE | 7.2 | 23.2 | 1084 | 1.64 | **223190** |
| 6 G 16 | NRPE | 7.2 | 25.6 | 1295 | 1.95 | ✆ |
| 7 G 16 | NRPE | 7.2 | 28.3 | 1494 | 2.20 | ✆ |

| Cross-section nominal | Core function | Core Ø | Outer Ø | Weight | Fire load | Order no. |
|---|---|---|---|---|---|---|
| n × mm² | | | mm | kg / km | kWh / m | |
| 1 × 25 | L | 8.6 | 10.4 | 287 | 0.33 | ✆ |
| 2 × 25 | LN | 8.6 | 20.4 | 730 | 1.24 | ✆ |
| 3 × 25 | NR | 8.6 | 21.8 | 972 | 1.37 | **223541** |
| 4 G 25 | 3LPE | 8.6 | 24.4 | 1281 | 1.78 | **303610** |
| 5 G 25 | 3LNPE | 8.6 | 27.1 | 1584 | 2.16 | ✆ |
| 6 G 25 | NRPE | 8.6 | 30.3 | 1917 | 2.65 | ✆ |
| 7 G 25 | NRPE | 8.6 | 33.5 | 2205 | 2.95 | ✆ |
| 1 × 35 | L | 10.1 | 12.1 | 405 | 0.53 | ✆ |
| 2 × 35 | LN | 10.1 | 23.7 | 1008 | 1.63 | **223191** |
| 3 G 35 | LNPE | 10.1 | 25.5 | 1353 | 1.83 | **301141** |
| 4 G 35 | NRPE | 10.1 | 28.4 | 1767 | 2.29 | **301143** |
| 5 G 35 | 3LNPE | 10.1 | 31.3 | 2186 | 2.77 | **301144** |
| 1 × 50 | L | 12.5 | 14.7 | 578 | 0.62 | ✆ |
| 2 × 50 | LN | 12.5 | 28.9 | 1419 | 2.23 | ✆ |
| 3 G 50 | LNPE | 12.5 | 31.1 | 1965 | 2.71 | ✆ |
| 4 G 50 | 3LPE | 12.5 | 34.9 | 2578 | 3.44 | **302205** |
| 5 G 50 | 3LNPE | 12.5 | 38.7 | 3193 | 4.19 | **306276** |
| 1 × 70 | L | 14.0 | 16.4 | 777 | 0.74 | ✆ |
| 2 × 70 | LN | 14.0 | 32.3 | 1889 | 2.73 | ✆ |
| 3 G 70 | LNPE | 14.0 | 34.7 | 2629 | 3.29 | ✆ |
| 4 G 70 | 3LPE | 14.0 | 38.6 | 3429 | 4.08 | ✆ |
| 5 G 70 | 3LNPE | 14.0 | 43.1 | 4253 | 4.97 | ✆ |
| 1 × 95 | L | 16.0 | 18.4 | 1010 | 0.88 | **308543** |
| 2 × 95 | LN | 16.0 | 36.7 | 2459 | 3.39 | ✆ |
| 3 × 95 | NRPE | 16.0 | 39.2 | 3374 | 3.86 | **303871** |
| 4 G 95 | 3LPE | 16.0 | 44.1 | 4492 | 5.11 | **303913** |
| 5 G 95 | 3LNPE | 16.0 | 49.9 | 5648 | 6.52 | **306423** |

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