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### XLPE Cable Accessories

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<th>Description</th>
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<td>Transition joint for three-core LPOF – XLPE cable 36 – 52 kV</td>
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About NKT

NKT is a global front-line supplier to the energy sector and as such NKT develops, manufactures and markets high quality cables and solutions for power grid infrastructure and construction sites. NKT’s manufacturing plants are among the most modern, flexible and cost-effective facilities worldwide. At NKT we work tirelessly to reduce our carbon footprint; neutral production and waste prevention are high priorities. NKT invests heavily to ensure that the company maintains leading edge capability.

The brand new state-of-the-art factory in Cologne is an example of this commitment. Being among the most modern factories in the world, it is at the forefront of technological developments. NKT is part of NKT Holding A/S, which is listed on the Danish Stock Exchange. NKT Holding owns a number of companies, which are active in different industries, and has production facilities on four continents.

High voltage cable accessories product range

All high voltage cable accessories from NKT are developed by our R&D department, who take into account specific customer requirements as well as national and international standards in designing and producing customized solutions. All materials are subjected to intensive quality control procedures. The production- and testing equipment from NKT guarantees the highest level of quality for all products. The complete product range has been type-tested in accordance with international standards.

The high voltage product range from NKT includes accessories for all applications from 50 kV up to 550 kV voltage range, also as a modular component system. NKT offers various technical versions of accessory systems like plug-in technology, dry-type technology and conventional technology with insulating oil.
The range of cable accessories covers following applications:

We offer accessories for all applications in the voltage range up to 550 kV, optionally also as a modular component system. Our solutions include various technical versions of accessory systems such as connector technology, dry-type technology and conventional technology with oil-insulation.

- Self-supporting outdoor terminations, porcelain or composite
- Flexible outdoor terminations
- Terminations for gas-insulated switchgear
- Transformer terminations
- Straight-through joints
- Insulation joints/cross-bonding joints
- Transition joints, XLPE-insulated/oil-filled cables
- Products for the connection/installation of low-pressure oil-filled cables
KSME 72.5 – 245 kV

Premoulded one-piece joint with heat shrink outer protection

Application:
Premoulded one-piece joint with heat shrink outer protection for XLPE- and EPR-insulated cables with Al or Cu conductor.

Standard:
- IEC 60840
- IEC 62067

Design:
The different versions of the premoulded one-piece joint are designed from 72.5 kV up to 245 kV.
The complete KSME consists of premoulded silicone joint body with integrated stress control system and screw or compression type connector.
The outer sheath is recovered with a heat shrink tube.

Specific for the product:
The earthing versions are selected as follows:
- KSME
  - Straight-through
- KSME-E
  - Straight-through with earthing connection
- KSME-S
  - Screen separation with coax-bonding cable
- KSME-SE
  - Screen separation with single-bonding cable

Note:
Optional kits:
- Optical fibre kit

Tools:
- Push-on tools
- Fix points for push-on tools
- Belt strap tool

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Maximum oversheath diameter</th>
<th>Max. dimension (length, diameter)</th>
<th>Weight (approx.)</th>
</tr>
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<tbody>
<tr>
<td>72.5</td>
<td>KSME 72</td>
<td>1000</td>
<td>40.0 – 65.0</td>
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<td>1600 x 120</td>
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<tr>
<td>145</td>
<td>KSME 145</td>
<td>2500</td>
<td>41.6 – 120.0</td>
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<tr>
<td>170</td>
<td>KSME 170</td>
<td>2500</td>
<td>56.0 – 120.0</td>
<td>no limitation</td>
<td>2350 x 240</td>
<td>60 – 70</td>
</tr>
<tr>
<td>245</td>
<td>KSME 245</td>
<td>2500</td>
<td>56.0 – 120.0</td>
<td>no limitation</td>
<td>2350 x 240</td>
<td>60 – 70</td>
</tr>
</tbody>
</table>
SME 72.5 – 245 kV

Premoulded one-piece joint with housing outer protection

Application:
Premoulded one-piece joint with housing outer protection for XLPE- and EPR-insulated cables with Al or Cu conductor.

Standard:
- IEC 60840
- IEC 62067

Design:
The different versions of the premoulded one-piece joint are designed from 72.5 kV up to 245 kV.

The complete SME consists of premoulded silicone joint body with integrated stress control system and screw or compression type connector.

The joint is protected by metal or plastic housing, alternatively a combination of both.

Specific for the product:
The earthing versions are selected as follows:

SME
- Straight-through
SME-E
- Straight-through with earthing connection
SME-S
- Screen separation with coax-bonding cable
SME-SE
- Screen separation with single-bonding cable

Note:

Optional kits:
- Optical fibre kit

Tools:
- Push-on tools
- Fix points for push-on tools
- Belt strap tool

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Maximum oversheath diameter</th>
<th>Max. dimension (length, diameter)</th>
<th>Weight (approx.)</th>
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<td>SME 72</td>
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<td>40.0 – 65.0</td>
<td>no limitation</td>
<td>1600 x 120</td>
<td>70</td>
</tr>
<tr>
<td>145</td>
<td>SME 145</td>
<td>2500</td>
<td>41.6 – 120.0</td>
<td>no limitation</td>
<td>2350 x 240</td>
<td>140 – 200</td>
</tr>
<tr>
<td>170</td>
<td>SME 170</td>
<td>2500</td>
<td>56.0 – 120.0</td>
<td>no limitation</td>
<td>2350 x 240</td>
<td>200</td>
</tr>
<tr>
<td>245</td>
<td>SME 245</td>
<td>2500</td>
<td>56.0 – 120.0</td>
<td>no limitation</td>
<td>2350 x 240</td>
<td>200</td>
</tr>
</tbody>
</table>
Premoulded three-piece joint with heat shrink outer protection

**Application:**
Premoulded three-piece joint with heat shrink outer protection for XLPE- and EPR-insulated cables with Al or Cu conductor.

**Standard:**
- IEC 60840
- IEC 62067

**Design:**
The different versions of the premoulded three-piece joint are designed from 145 kV up to 300 kV.
The complete KSM consists of premoulded silicone main joint body, two silicone adapters with integrated stress control system and screw or compression type connector.
The outer sheath is recovered with a heat shrink tube.
The joint is designed to connect two different cable dimensions.

**Specific for the product:**
The earthing versions are selected as follows:
- KSM
  - Straight-through
- KSM-E
  - Straight-through with earthing connection
- KSM-S
  - Screen separation with coax-bonding cable
- KSM-SE
  - Screen separation with single-bonding cable

**Technical details:**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Maximum oversheath diameter</th>
<th>Max. dimension (length, diameter)</th>
<th>Weight (approx.)</th>
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</thead>
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<tr>
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<td>KSM 145</td>
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<td>34.5 – 108.0</td>
<td>118</td>
<td>2200 x 240</td>
<td>110</td>
</tr>
<tr>
<td>170</td>
<td>KSM 170</td>
<td>2500</td>
<td>50.0 – 108.0</td>
<td>118</td>
<td>2200 x 240</td>
<td>110</td>
</tr>
<tr>
<td>245</td>
<td>KSM 245</td>
<td>2500</td>
<td>50.0 – 108.0</td>
<td>118</td>
<td>2200 x 280</td>
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<tr>
<td>300</td>
<td>KSM 300</td>
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<td>56.0 – 108.0</td>
<td>118</td>
<td>2200 x 280</td>
<td>120</td>
</tr>
</tbody>
</table>

**Note:**
- Optional kits: Optical fibre kit
- Tools: Push-on tools
SM 145 – 550 kV

Premoulded three-piece joint with housing outer protection

Design:

The different versions of the premoulded three-piece joint are designed from 145 kV up to 550 kV.

The complete SM consists of premoulded silicone main joint body, two silicone adapters with integrated stress control system and screw or compression type connector.

The joint is designed to connect two different cable dimensions.

The cable joint has a metal and plastic housing as an outer protection.

Application:

Premoulded three-piece joint with housing outer protection for XLPE- and EPR-insulated cables with Al or Cu conductor.

Standard:

- IEC 60840
- IEC 62067

Specific for the product:

The earthing versions are selected as follows:

- SM
- Straight-through
- SM-E
- Straight-through with earthing connection
- SM-S
- Screen separation with coax-bonding cable
- SM-SE
- Screen separation with single-bonding cable

Note:

Optional kits:

- Optical fibre kit
- PD measuring kit

Tools:

- Push-on tools

Technical details:

<table>
<thead>
<tr>
<th>Voltage (kV)</th>
<th>Type/ designation</th>
<th>Max. cross section (mm²)</th>
<th>Prepared cable insulation diameter (mm)</th>
<th>Maximum oversheath diameter (mm)</th>
<th>Max. dimension (length, diameter) (mm)</th>
<th>Weight (approx.) (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>145 SM 145</td>
<td></td>
<td>2500</td>
<td>34.5 – 108.0</td>
<td>118</td>
<td>2105 x 421</td>
<td>150</td>
</tr>
<tr>
<td>170 SM 170</td>
<td></td>
<td>2500</td>
<td>50.0 – 108.0</td>
<td>118</td>
<td>2105 x 421</td>
<td>150</td>
</tr>
<tr>
<td>245 SM 245</td>
<td></td>
<td>2500</td>
<td>50.0 – 108.0</td>
<td>118</td>
<td>2105 x 473</td>
<td>200</td>
</tr>
<tr>
<td>300 SM 300</td>
<td></td>
<td>2500</td>
<td>81.5 – 108.0</td>
<td>118</td>
<td>2105 x 473</td>
<td>200</td>
</tr>
<tr>
<td>420 SM 420</td>
<td></td>
<td>3200</td>
<td>81.5 – 140.0</td>
<td>185</td>
<td>3620 x 715</td>
<td>850</td>
</tr>
<tr>
<td>550 SM 550</td>
<td></td>
<td>3200</td>
<td>97.0 – 140.0</td>
<td>185</td>
<td>3620 x 715</td>
<td>850</td>
</tr>
</tbody>
</table>
SKKB

Screen separation kit

Application:

SKKB is a screen separation kit for cross bonding or earthing of cables up to 245 kV.

Design:

The SKKB can be fitted on already laid cable, where the load condition has changed and losses need to be reduced.

It also gives the possibility to optimize the cable system since cross bonding can be fitted at any position along the cable route.

Specific for the product:

The earthing versions are selected as follows:

- **SKKB-PAL**
  - Al laminate as radial water barrier
- **SKKB-MET**
  - Metallic sheath with or without copper screen wires
- **SKKB-CUW**
  - Copper screen wires

### Technical details:

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<th>Cable outer sheath diameter mm</th>
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<th>Max. length mm</th>
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<td>50 – 100</td>
<td>SKKB 10 - x</td>
<td>1200</td>
</tr>
<tr>
<td>100 – 150</td>
<td>SKKB 15 - x</td>
<td>1200</td>
</tr>
</tbody>
</table>
KSEV/KTEV 72.5 – 550 kV

Dry plug-in GIS/transformer termination

Application:
Dry GIS/transformer termination suitable for XLPE- and EPR-insulated cables with Al or Cu conductor.

Specific for the product:
The kits are selected as follows:

KSEV
- Dry plug-in GIS termination

ISEV
- Insulator for dry plug-in GIS termination

KTEV
- Dry plug-in transformer termination

ITEV
- Insulator for dry plug-in transformer termination

XEV
- Plug-In for dry GIS/transformer termination

Standard:
- IEC 60840
- IEC 62067
- IEC 62271-209
- EN 50299

Technical details:

<table>
<thead>
<tr>
<th>Voltage (kV)</th>
<th>Type/designation</th>
<th>Max. cross section (mm²)</th>
<th>Prepared cable insulation diameter (mm)</th>
<th>Maximum oversheath diameter (mm)</th>
<th>Insert length (short/long) (mm)</th>
<th>Weight (approx.) (kg)</th>
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</thead>
<tbody>
<tr>
<td>72.5</td>
<td>KSEV/KTEV 72</td>
<td>1200</td>
<td>35.5 – 76.0</td>
<td>96</td>
<td>310/583</td>
<td>35</td>
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<tr>
<td>123 – 170</td>
<td>KSEV/KTEV 123/145/170</td>
<td>2500</td>
<td>35.5 – 100.0</td>
<td>135</td>
<td>470/757</td>
<td>60</td>
</tr>
<tr>
<td>245 – 300</td>
<td>KSEV/KTEV 245/300</td>
<td>3200</td>
<td>47.0 – 140.0</td>
<td>185</td>
<td>620/960</td>
<td>150</td>
</tr>
<tr>
<td>420 – 550</td>
<td>KSEV/KTEV 420/550</td>
<td>3200</td>
<td>81.0 – 140.0</td>
<td>185</td>
<td>960/1400</td>
<td>193</td>
</tr>
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</table>

Design:
The different types of the dry type termination KSEV/KTEV are designed from 72.5 kV up to 550 kV.

The KSEV is suitable for installation in the gas-filled cable connection box of a metal enclosed gas-insulated switchgear (GIS).

The KTEV is suitable for installation in the oil-filled cable connection box of a metal enclosed oil-insulated transformer. The complete KSEV/KTEV consists of epoxy resin insulator with embedded electrode, fixing ring and plug-in part, which is fitted to the cable, comprising metal cable gland with spring loaded device and premoulded silicone stress cone for electrical field control. The KTEV is additionally equipped with a corona shield.

The standard conductor connector is of screw type. Press type connector is also available.

All metal parts are made of corrosion proof materials.

Special offshore solution is available.

Note:
Optional kits:
- Optical fibre kit
- PD measuring kit
- IEC adapter
- Blind plug (BST 72-245)
- Testing plate
- Current testing device
- Termination clamp
- Protecting housing for XEV

Tools:
- Push-on cone
SEV/TEV 123 – 420 kV
Oil-filled GIS/transformer termination

Application:
Oil-filled GIS/transformer termination suitable for XLPE- and EPR-insulated cables with Al or Cu conductor.

Standard:
- IEC 60840
- IEC 62067
- IEC 62271-209
- EN 50299

Design:
The different types of the oil-filled termination SEV/TEV are designed from 123 kV up to 420 kV.
The SEV is suitable for installation in the gas-filled cable connection box of a metal enclosed gas-insulated switchgear (GIS).
The TEV is suitable for installation in the oil-filled cable connection box of a metal enclosed oil-insulated transformer.
The complete termination consists of epoxy resin insulator with embedded electrode, fixing ring, metal cable gland, prefabricated silicone stress cone for electrical field control.
The TEV is additionally equipped with a corona shield.
Screw or compression type conductor connector is available.
All metal parts are made of corrosion proof materials.

Specific for the product:
The kits are selected as follows:

SEV
- Oil-filled GIS termination

TEV
- Oil-filled transformer termination

Note:
Optional kits:
- Oil expansion vessel

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Maximum oversheath diameter</th>
<th>Insert length</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>123 – 170</td>
<td>SEV/TEV 123/145/170</td>
<td>2500</td>
<td>34.5 – 112.0</td>
<td>135</td>
<td>757</td>
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<td>245 - 300</td>
<td>SEV/TEV 245/300</td>
<td>2500</td>
<td>56.0 – 122.0</td>
<td>135</td>
<td>960</td>
<td>235</td>
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<tr>
<td>420</td>
<td>SEV/TEV 420</td>
<td>2500</td>
<td>56.0 – 124.0</td>
<td>&lt; 165</td>
<td>1400</td>
<td>530</td>
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</tbody>
</table>
TD 123 – 145 kV

Dry prefabricated outdoor termination

Application:

Dry outdoor termination suitable for XLPE- and EPR-insulated cables with Al or Cu conductor.

Standard:

- IEC 60840

Design:

The different versions of the outdoor termination TD are designed for operation voltage from 123 kV up to 145 kV.

The complete termination consists of a pre-assembled cable termination, top bolt and conductor connector in the top fitting and also cable clamp and earth clamp.

The pre-assembled cable termination consists of a composite insulator with integrated base part and stress cone.

Both the support pipe and the cable clamp are made of fiberglass reinforced polyester that provides an insulated screen/sheath installation.

The conductor bolt is available as screw type. All metal parts are made of corrosion proof aluminium alloy or stainless steel.

The insulators are available according to IEC 60815 with the standard pollution levels. The insulators have standard flashover distance.

Note:

Optional kits:

- Opto Kit

Tools:

- RKM 145
- Installation cone

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Maximum oversheath diameter</th>
<th>Creepage distance</th>
<th>Length (approx.)</th>
<th>Weight (approx.)</th>
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<tbody>
<tr>
<td>123</td>
<td>TD 123</td>
<td>2500</td>
<td>50.0 – 102.0</td>
<td>150</td>
<td>3940</td>
<td>1810</td>
<td>90</td>
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<tr>
<td>145</td>
<td>TD 145</td>
<td>2500</td>
<td>50.0 – 102.0</td>
<td>150</td>
<td>4650</td>
<td>1955</td>
<td>102</td>
</tr>
</tbody>
</table>
KFEV 123 – 300 kV

Dry plug-in outdoor termination

Application:
Dry outdoor termination suitable for XLPE- and EPR-insulated cables with Al or Cu conductor.

Standard:
- IEC 60840
- IEC 62067

Design:
The different versions of the outdoor termination KFEV are designed for operation voltage from 123 kV up to 300 kV.

The complete termination consists of combination of epoxy resin insulator with embedded electrode and composite insulator with silicone sheds and upper metal work, metal base plate with supporting insulators and prefabricated silicone stress cone for electrical field control. The cable gland is sealed to avoid entrance of water. All metal parts made of corrosion proof aluminium alloy or stainless steel.

The insulators are available according to IEC 60815 with the standard pollution levels. The insulators have standard flashover distance.

Note:
Optional kits:
- Optical fibre kit
- PD measuring kit

Tools:
- Push-on cone

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ design</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Maximum oversheath diameter</th>
<th>Creepage distance</th>
<th>Length (approx.)</th>
<th>Weight (approx.)</th>
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<tbody>
<tr>
<td>kV</td>
<td>mm²</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
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<tr>
<td>123</td>
<td>KFEV 123</td>
<td>2500</td>
<td>47.0 – 100.0</td>
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<td>4495</td>
<td>1754</td>
<td>150</td>
</tr>
<tr>
<td>145</td>
<td>KFEV 145</td>
<td>1200</td>
<td>35.5 – 76.0</td>
<td>96</td>
<td>4495</td>
<td>1750</td>
<td>130</td>
</tr>
<tr>
<td>300</td>
<td>KFEV 245/300</td>
<td>2000</td>
<td>47.0 – 100.0</td>
<td>138</td>
<td>8755</td>
<td>2861</td>
<td>384</td>
</tr>
</tbody>
</table>
**APED 52 – 84 kV**

**Oil-filled outdoor termination**

Application:
Outdoor termination suitable for XLPE- and EPR-insulated cables with Al or Cu conductor.

Standard:
- IEC 60840

Design:
The different versions of the outdoor termination APED are designed for operation voltage from 52 kV up to 84 kV.

The complete termination consists of composite or porcelain insulator with metal head plate, metal base plate with supporting insulators and premoulded EPDM rubber stress cone with integrated stress control system and synthetic polyisobutene (PIB) insulating oil for insulator filling and cable clamps.

The conductor bolt is available as screw type. All metal parts are made of corrosion proof aluminum alloy or stainless steel.

The insulators are available according to IEC 60815 with the standard pollution levels. The insulators have standard flashover distance.

Specific for the product:
The kits are selected as follows:

- **APED – P**
  - Composite insulator
- **APED – B**
  - Porcelain insulator

Note:
Optional kits:
- GAP-APED
- PIU-APED

### Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Max. oversheath diameter</th>
<th>Creepage distance</th>
<th>Length (approx.)</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>APED 52 P</td>
<td>1200</td>
<td>25.0 – 66.0</td>
<td>85</td>
<td>&gt; 1700</td>
<td>1172</td>
<td>35</td>
</tr>
<tr>
<td>52</td>
<td>APED 52 B</td>
<td>1200</td>
<td>25.0 – 66.0</td>
<td>85</td>
<td>&gt; 1240</td>
<td>1050</td>
<td>51</td>
</tr>
<tr>
<td>72.5</td>
<td>APED 72 P</td>
<td>1200</td>
<td>25.0 – 66.0</td>
<td>85</td>
<td>&gt; 2330</td>
<td>1366</td>
<td>37</td>
</tr>
<tr>
<td>72.5</td>
<td>APED 72 B</td>
<td>1200</td>
<td>25.0 – 66.0</td>
<td>85</td>
<td>&gt; 2200</td>
<td>1330</td>
<td>67</td>
</tr>
<tr>
<td>84</td>
<td>APED 84 P</td>
<td>1200</td>
<td>25.0 – 66.0</td>
<td>85</td>
<td>&gt; 2710</td>
<td>1461</td>
<td>40</td>
</tr>
<tr>
<td>84</td>
<td>APED 84 B</td>
<td>1200</td>
<td>25.0 – 66.0</td>
<td>85</td>
<td>&gt; 2635</td>
<td>1445</td>
<td>74</td>
</tr>
</tbody>
</table>
### APECB

**Application:**
Outdoor termination suitable for XLPE- and EPR-insulated cables with Al or Cu conductor.

**Standard:**
- IEC 60840
- IEC 62067

### Design:
The different versions of the outdoor termination APECB are designed for operation voltage from 123 kV up to 420 kV.

The complete termination consists of composite or porcelain insulator with metal head plate, metal base plate with supporting insulators and premoulded EPDM stress cone with integrated stress control system and synthetic polyisobutene (PIB) insulating oil for insulator filling and cable clamps.

The conductor bolt is available as screw type. All metal parts are made of corrosion proof aluminum alloy or stainless steel.

The insulators are available according to IEC 60815 with the standard pollution levels. The insulators have standard flashover distance.

### Specific for the product:
The kits are selected as follows:

- **APECB – P**
  - Composite insulator
- **APECB – B**
  - Porcelain insulator

### Note:
- **Optional kits:**
  - Opto kit
  - GAP-APECB
  - PIU-APECB

### Tools:
- SV 140, SV 190, SV 215 – installation tool for stress cone

### Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Maximum oversheath diameter</th>
<th>Creepage distance</th>
<th>Length (approx.)</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>kV</td>
<td></td>
<td>mm²</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>mm</td>
<td>kg</td>
</tr>
<tr>
<td>123 APECB 123</td>
<td>2500</td>
<td>45.5 – 107.0</td>
<td>170</td>
<td>&gt; 3150</td>
<td>1555</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>145 APECB 145</td>
<td>2500</td>
<td>45.5 – 107.0</td>
<td>170</td>
<td>&gt; 4350</td>
<td>1855</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>170 APECB 170</td>
<td>2500</td>
<td>45.5 – 107.0</td>
<td>170</td>
<td>&gt; 5250</td>
<td>2055</td>
<td>110</td>
<td></td>
</tr>
<tr>
<td>245 APECB 245</td>
<td>2500</td>
<td>68.0 – 120.0</td>
<td>170</td>
<td>&gt; 9360</td>
<td>3275</td>
<td>295</td>
<td></td>
</tr>
<tr>
<td>300 APECB 300</td>
<td>2500</td>
<td>68.0 – 120.0</td>
<td>170</td>
<td>&gt; 9360</td>
<td>3275</td>
<td>295</td>
<td></td>
</tr>
<tr>
<td>420 APECB 420</td>
<td>2500</td>
<td>80.0 – 124.0</td>
<td>170</td>
<td>&gt; 14900</td>
<td>4825</td>
<td>600</td>
<td></td>
</tr>
</tbody>
</table>
THV 72.5 – 245 kV

Dry flexible outdoor termination

Application:

Outdoor termination is suitable for XLPE- and EPR-insulated cables with Al or Cu conductor.

Standard:

- IEC 60840
- IEC 62067

Design:

The different versions of the dry flexible outdoor termination THV are designed for operation voltage from 72.5 kV up to 245 kV.

The complete termination consists of push-on prefabricated silicone element with integrated electrical field control, shed modules according to creepage distance requirement, sealing material and screw type conductor bolt. Press type conductor bolts are available on request. The insulating elements are according to IEC 60815 with the standard pollution levels and have standard flashover distance.

Specific for the product:

THV 245 BIL max. 750kV

Note:

Tools:

- Push-on cone

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Maximum oversheath diameter</th>
<th>Creepage distance</th>
<th>Length (approx.)</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72.5</td>
<td>THV 72</td>
<td>1600</td>
<td>40.0 – 78.0</td>
<td>no limitation</td>
<td>&gt; 2248</td>
<td>1280</td>
<td>7.5</td>
</tr>
<tr>
<td>100</td>
<td>THV 100</td>
<td>1200</td>
<td>51.5 – 78.0</td>
<td>no limitation</td>
<td>&gt; 2500</td>
<td>1830</td>
<td>10</td>
</tr>
<tr>
<td>123</td>
<td>THV 123</td>
<td>1200</td>
<td>55.0 – 78.0</td>
<td>no limitation</td>
<td>&gt; 3675</td>
<td>2200</td>
<td>25</td>
</tr>
<tr>
<td>145</td>
<td>THV 145</td>
<td>1200</td>
<td>55.0 – 78.0</td>
<td>no limitation</td>
<td>&gt; 4495</td>
<td>2200</td>
<td>25</td>
</tr>
<tr>
<td>245</td>
<td>THV 245</td>
<td>1200</td>
<td>55.0 – 78.0</td>
<td>no limitation</td>
<td>&gt; 4495</td>
<td>2200</td>
<td>30</td>
</tr>
</tbody>
</table>
Description:

**Linkbox for Termination:**
- Direct earthing (without SVL)
- Earthing with SVL

**Linkbox for Joints:**
- Crossbonding of cable screen (with SVL)
- Direct earthing (without SVL)

**Additional different versions available:**
- Connection of coax and single bonding cables
- Different cross sections of bonding cables
- Different outer housings
- Special solutions on request
- Different SVL types available
Transition joints

In addition to modern XLPE cable accessories, our portfolio also includes a complete range of low-pressure oil-filled (LPOF) cable accessories up to 170 kV. We develop our LPOF cable solutions together in close cooperation with our customers. This allows us to provide cost-efficient and fast installation of appropriate transition technologies.

Although some oil cable systems (LPOF) have already been in use for 70 years, they can still be operated for years to come with good and regular maintenance. Furthermore, it is possible to connect low-pressure oil-filled cable systems with modern XLPE systems at any time and offers the advantage of being able to renew or convert your cable system section by section.

Furthermore our transition joint portfolio also includes a broad range of gas-pressured cable accessories to enable a reliable and cost-efficient transition technology to XLPE cables.

Features and advantages:

- Minimum tools and installation space needed
- Available as cross-bonding or straight-through application
- Advanced production technology
- Cover housing size and material optimized
- Routinely tested
- Customized solutions
MUDC 36 – 52 kV

Transition joint for three-core LPOF – XLPE cable

Application:
Transition joint for three-core low-pressure oil-filled to XLPE cables with Al or Cu conductor

Standard:
- EN 61442
- IEC 60840

Design:
The transition joint MUDC is designed for operation voltage from 36 kV up to 52 kV.
The complete joint connects a three-core oil cable with three single-core XLPE cables.
The XLPE-side is designed with the plug-in part CPI, which consists of stress cone, main body and screw type connector.
The stress cones are made of oil-impregnated insulation paper, carbon paper, copper mesh and if necessary a stress relief ring.
The oil cable conductor can be connected with screw and compression type connector.
All necessary assembling accessories are part of the kit.
For outer protection a glass fibre housing and filling compound will be supplied.
An optional oil-stop-housing reduces significant oil loss during installation.
The version is prepared for screen separation requirement.

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/designation</th>
<th>Max. cross section XLPE</th>
<th>Max. cross section LPOF</th>
<th>Max. XLPE cable insulation diameter</th>
<th>Max. oversheath diameter</th>
<th>Max. dimensions (length, ...)</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 – 52</td>
<td>MUDC 36/52</td>
<td>1000</td>
<td>630</td>
<td>62.0</td>
<td>no limitation</td>
<td>2300 x 500</td>
</tr>
</tbody>
</table>
USM 170 – OX

Transition joint for single-core LPOF – XLPE cable

Design:

The different versions of the transition joint USM are designed for operation voltage from 72.5 kV up to 170 kV and connect a single core oil-filled cable with a single-core XLPE cable.

The two cables will be connected by a common epoxy resin insulator with embedded electrode.

The XLPE-side is designed with a fixing ring and plug-in part, comprising metal cable gland with spring loaded device and premoulded silicone stress cone for electrical field control.

The standard conductor bolt is of screw type.

The oil cable stress cone is made of oil-impregnated insulation paper, carbon paper, copper mesh and the stress relief ring.

Compression type conductor connector, inlet funnel with oil feed-in and all necessary assembling accessories are part of the kit.

Only approx. 15 litre filling of cable insulation oil is needed.

For outer protection a glass fibre housing is in the standard scope of supply.

Two component cast resin filling material is used.

The versions are prepared for screen separation requirement.

Connection of a three-core LPOF cable is possible with the trifurcation kit – AGOW.

Note:

Optional kits:

- Optical fibre kit
- PD measuring kit

Technical details:

<table>
<thead>
<tr>
<th>Voltage (kV)</th>
<th>Type/designation</th>
<th>Max. cross section XLPE (mm²)</th>
<th>Max. cross section LOPF (mm²)</th>
<th>Max. XLPE cable insulation diameter (mm)</th>
<th>Max. oversheath diameter oil side (mm)</th>
<th>Max. dimensions (length, ...)</th>
</tr>
</thead>
<tbody>
<tr>
<td>123-170</td>
<td>USM 170-OX</td>
<td>2500</td>
<td>1200</td>
<td>47.0 – 100.0</td>
<td>110.0</td>
<td>2700 x 450</td>
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</tbody>
</table>
**Application:**

Transition joint for single/three-core low-pressure oil-filled to XLPE cables with Al or Cu conductor

**Standard:**

- IEC 60141-1
- SS 424 14 17
- IEC 60840

**Design:**

The different versions of the transition joint TJ are designed for operation voltage from 72.5 kV up to 170 kV and connect a single/three-core oil-filled cable with a single-core XLPE cable.

The XLPE-side is designed with premoulded silicone stress cone for electrical field control, a metal cable gland, expansion vessels and insulating oil.

The standard conductor bolt is of compression type. The connection between both cable types takes place by an epoxy resin insulator and compression connectors.

The oil-cable-side is made by a stress cone, which is made of oil-impregnated insulation paper, carbon paper, copper mesh and the stress relief ring.

Compression type conductor connector, stainless steel housing, oil feed-in and all necessary assembling accessories are part of the kit.

A oil-stop-housing reduces significant oil loss during installation. For outer protection a glass fibre housing and filling compound are part of supply.

---

**Technical details:**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/designation</th>
<th>Max. cross section XLPE (mm²)</th>
<th>Max. cross section LPOF (mm²)</th>
<th>Max. XLPE cable insulation diameter (mm)</th>
<th>Max. oversheath diameter oil side (mm)</th>
<th>Max. dimensions (length, ...)</th>
</tr>
</thead>
<tbody>
<tr>
<td>84 kV</td>
<td>single-core LPOF TJ 84-1</td>
<td>1000</td>
<td>800</td>
<td>66.0</td>
<td>78.0</td>
<td>1800 x 250</td>
</tr>
<tr>
<td>84 kV</td>
<td>three-core LPOF TJ 84-3</td>
<td>1000</td>
<td>800</td>
<td>66.0</td>
<td>114.0</td>
<td>2500 x 480</td>
</tr>
<tr>
<td>170 kV</td>
<td>three-core LPOF TJ 170-3</td>
<td>1000</td>
<td>630</td>
<td>83.5</td>
<td>114.0</td>
<td>3400 x 700</td>
</tr>
</tbody>
</table>
LPOF
Low-pressure oil-filled cable accessories

LPOF
We offer a full range of accessories for LPOF cables up to 170 kV. Even today, in close cooperation with our customers, we are developing customized LPOF solutions for repairs or for use as a transition joint for a new XLPE cable.

Some of the advantages using NKT LPOF-solutions:
- Contemporary and advanced products for the fastest and easiest installation
- Simple, cost-effective storage due to overlapping cable cross-sections and cable types
- Extensive expertise with years of experience in the condition of oil cable systems

NKT – A reliable expert
LPOF cables and gas-pressured cables are used for the transmission of electrical power over several decades. Thanks to our extensive experience and world-wide installations, we are a reliable expert when it comes to service, maintenance or transition to XLPE-insulated cables. We have a high level of expertise for service, maintenance, repair and reconstruction as well as dismantling and disposal of oil-filled cable systems:
- Expertise on the condition of oil-cable systems
- Tests and preventive measures
- Condition of insulating oil
- Filling factor
- Gas-in-oil analysis
- Pressure volume tests on tanks
- High voltage test
- Localisation of leaks
- Repair of leaks
- Disposal of dismantled materials in accordance with local regulations
- Flushing of oil cables in the case of poor oil quality
MVEO 72 – 170 kV

Straight-through joint for single-core LPOF cable

MVEO

Application:

Straight-through joint for single core low-pressure oil-filled cables with Al or Cu conductor.

Standard:

- IEC 60141-1

Design:

The different versions of the straight-through joint MVEO/i are designed for operation voltage from 72.5 kV up to 170 kV.

The complete joint connects two single-core oil cable by a stress cone, made of oil-impregnated insulation paper, carbon paper, copper mesh and if necessary a stress relief ring.

Compression type conductor connector, inner copper housing and necessary assembling accessories are part of the kit.

For outer protection a heat shrink tube or a plastic housing are available.

Specific for the product:

The earthing versions are selected as follows:

- **MVEO**
  - Straight-through
- **MVEO-i**
  - Screen separation

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/designation</th>
<th>Max. cross section</th>
<th>Max. cable insulation diameter</th>
<th>Max. oversheath diameter</th>
<th>Max. dimensions (length, …)</th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
<td>MVEO/i 145</td>
<td>1200</td>
<td>60.0</td>
<td>85.0</td>
<td>1950 x 250</td>
</tr>
<tr>
<td>170</td>
<td>MVEO/i 170</td>
<td>1400</td>
<td>76.0</td>
<td>102.0</td>
<td>2500 x 410</td>
</tr>
</tbody>
</table>
**MVDO 72 – 145kV**

**Straight-through joint for three-core LPOF cable**

**Application:**

Straight-through joint for three-core low-pressure oil-filled cables with Al or Cu conductor.

**Standard:**

- IEC 60141-1

**Design:**

The different versions of the straight-through joint MVDO are designed for operation voltage from 72 kV up to 145 kV.

The complete joint connect two three-core oil cable by stress cones, made of oil-impregnated insulation paper, carbon paper and copper mesh.

Compression type conductor connector, inner copper housing and all necessary assembling accessories are part of the kit.

Two oil-stop-housings reduce oil loss during installation.

For outer protection a heat shrink tube or a plastic housing are available.

---

**Technical details:**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/designation</th>
<th>Max. cross section</th>
<th>Max. cable insulation diameter</th>
<th>Max. oversheath diameter</th>
<th>Max. dimensions (length, …)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>MVDO 72</td>
<td>630</td>
<td>50.0</td>
<td>no limitation</td>
<td>2500 x 410</td>
</tr>
<tr>
<td>145</td>
<td>MVDO 145</td>
<td>630</td>
<td>50.0</td>
<td>no limitation</td>
<td>3550 x 410</td>
</tr>
</tbody>
</table>
Stop-joint for single-core LPOF cable

MEYOSL 145 kV

Design:

The stop-joint type MEYOSL is designed for operation voltage up to 145 kV.

The complete joint enables a hydraulic independent connection between two low-pressure oil-filled cables. It consists of two separate stress cones, which are made of oil-impregnated insulation paper, carbon paper, copper mesh and the stress relief ring.

The kit includes compression type conductor connector, GIS insulator according IEC 62271-209, both sided oil feed-in, inner copper housing and all necessary assembling accessories.

The outer sheath is recovered with outer protective housing.

The connecting of different cable cross sections are possible.

The version is prepared for screen separation requirement. Connection of two three-core LPOF cables are possible with the trifurcation kit – AGOW.

Technical details:

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/designation</th>
<th>Max. cross section</th>
<th>Max. cable insulation diameter</th>
<th>Max. oversheath diameter</th>
<th>Max. dimensions (length, …)</th>
</tr>
</thead>
<tbody>
<tr>
<td>145</td>
<td>MEYOSL 145</td>
<td>800</td>
<td>62.0</td>
<td>100.0</td>
<td>3150 x 530</td>
</tr>
</tbody>
</table>
**EYOK/EYOT 145kV**

**Oil-filled GIS/transformer termination**

---

**Application:**

Oil-filled GIS/transformer termination suitable for low-pressure oil-filled cables with Al or Cu conductor

---

**Standard:**

- IEC 60840
- IEC 62271-209
- EN 50299

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**Design:**

The different types of the oil-filled termination EYOK/EYOT are designed from 123 kV up to 145 kV.

The EYOK is suitable for installation in the gas-filled cable connection box of a metal enclosed gas-insulated switchgear (GIS).

The EYOT is suitable for installation in the oil-filled cable connection box of a metal enclosed oil-insulated transformer.

The complete termination consists of epoxy resin insulator with embedded electrode, fixing ring, metal cable gland. The stress cone is made of oil-impregnated insulation paper, carbon paper, copper mesh and the stress relief ring.

The EYOT is additional equipped with a corona shield.

The conductor will be connected with compression type connection bolt.

All metal parts are made of corrosion proof materials.

---

**Specific for the product:**

The kits are selected as follows:

- **EYOK**
  - Oil-filled GIS termination
- **EYOT**
  - Oil-filled transformer termination

---

**Technical details:**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Prepared cable insulation diameter</th>
<th>Max. oversheath diameter</th>
<th>Insert length</th>
<th>Weight (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>123 – 145</td>
<td>EYOK/EYOT 123 – 145</td>
<td>800</td>
<td>62.0</td>
<td>no limitation</td>
<td>757</td>
<td>82</td>
</tr>
</tbody>
</table>
EPO/EROW 72 – 145 kV

Oil-filled outdoor cable termination

**Application:**

Outdoor termination suitable for low-pressure oil-filled cables with Al or Cu conductor

**Standard:**

- IEC 60840

**Design:**

The different versions of the outdoor termination are designed for operation voltage from 72.5 kV up to 145 kV.

The complete termination consists of composit or porcelain insulator with metal head plate, metal base plate with supporting insulators and the stress cone is made of oil-impregnated insulation paper, carbon paper, copper mesh and the stress relief ring.

The conductor bolt is available as compression type. All metal parts are made of corrosion proof aluminum alloy or stainless steel.

The insulators are available according to IEC 60815 with the standard pollution levels. The insulators have standard flashover distance.

**Specific for the product:**

The kits are selected as follows:

- **EROW**
  - Composite insulator
- **EPO**
  - Porcelain insulator

**Technical details:**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Type/ designation</th>
<th>Max. cross section</th>
<th>Max. cable insulation diameter</th>
<th>Max. oversheath diameter</th>
<th>Creepage distance</th>
<th>Length (approx.)</th>
<th>Weight (min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>72.5</td>
<td>EROW/EPO 72</td>
<td>1200</td>
<td>62.0</td>
<td>no limitation</td>
<td>&gt; 2320</td>
<td>960</td>
<td>70 – 150</td>
</tr>
<tr>
<td>123</td>
<td>EROW/EPO 123</td>
<td>1200</td>
<td>62.0</td>
<td>no limitation</td>
<td>&gt; 3250</td>
<td>1450</td>
<td>82 – 205</td>
</tr>
<tr>
<td>145</td>
<td>EROW/EPO 145</td>
<td>1200</td>
<td>62.0</td>
<td>no limitation</td>
<td>&gt; 4840</td>
<td>1650</td>
<td>85 – 230</td>
</tr>
</tbody>
</table>
Oil Tank

Oil tank for low-pressure oil-filled cables

Application:

Oil tank

Design:

The various tank types can be used as an expansion vessel in all types of low-pressure oil cable systems.

The tanks are prepared according to the customer's requirements for the necessary internal pressure as well as the appropriate discharge pressure and delivered ready-to-install.

Surface: Galvanized and painted after customer's requirements. Additional glass fibre reinforced plastic surface for further mechanical protection possible. Different stands possible. Connection points M18x1.5.

Technical details:

<table>
<thead>
<tr>
<th>Description</th>
<th>Max. volumes</th>
<th>Expansion bellows</th>
<th>Height</th>
<th>Diameter</th>
<th>Weight of tank and oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>OT-40</td>
<td>73</td>
<td>40</td>
<td>1596</td>
<td>435</td>
<td>325</td>
</tr>
<tr>
<td>OT-45</td>
<td>82</td>
<td>45</td>
<td>1739</td>
<td>435</td>
<td>350</td>
</tr>
<tr>
<td>OT-50</td>
<td>91</td>
<td>50</td>
<td>1892</td>
<td>435</td>
<td>370</td>
</tr>
<tr>
<td>OT-55</td>
<td>100</td>
<td>55</td>
<td>2045</td>
<td>435</td>
<td>393</td>
</tr>
<tr>
<td>OT-60</td>
<td>110</td>
<td>60</td>
<td>2198</td>
<td>435</td>
<td>420</td>
</tr>
</tbody>
</table>

Pre-compression of bellows

<table>
<thead>
<tr>
<th>Pre-compression of bellows</th>
<th>Working pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3</td>
<td>0.3 – 2.0</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5 – 2.5</td>
</tr>
<tr>
<td>0.75</td>
<td>0.75 – 3.0</td>
</tr>
<tr>
<td>1*</td>
<td>1.0 – 3.5*</td>
</tr>
<tr>
<td>1.5*</td>
<td>1.5 – 4.8*</td>
</tr>
</tbody>
</table>

* Only available after additional check of our technical engineers and in special cases
Certificates

NKT is certified according to all main international standards and at all locations. High voltage cable accessories from NKT are produced in Cologne, Germany and in Alingsås, Sweden. All certificates are also available on our websites.

**Certificate**

**Standard:** ISO 9001:2015
**Certificate-Reg. No.:** 01 109 1542133

**Certificate Holder:** NKT GmbH & Co. KG
Düsseldorfer Strasse 400
51061 Köln
Germany

**Scope:** Research, development, production, project execution, installation, service, marketing and sale of power cable systems and fibre optic cable systems and metal products.

**Validity:** The certificate is valid from 2020-01-01 until 2022-12-31.

First certification 1993

2019-11-27

www.tuv.com

® TÜV, TUEV and TUV are registered trademarks. Utilisation and application requires prior approval.

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**Standard:** ISO 9001:2015
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**Certificate**

**Standard:** BS OHSAS 18001:2007
**Certificate-Reg. No.:** 01 213 1542152

**Certificate Holder:** NKT GmbH & Co. KG
Düsseldorfer Strasse 400
51061 Köln
Germany

**Scope:** Research, development, production, project execution, installation, service, marketing and sale of power cable systems and fibre optic cable systems and metal products.

**Validity:** The certificate is valid from 2019-11-02 until 2021-03-11.

First certification 2012

2019-11-27

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**Certificate**

**Standard:** ISO 50001:2011
**Certificate-Reg. No.:** 01 407 1542159

**Certificate Holder:** NKT GmbH & Co. KG
Düsseldorfer Strasse 400
51061 Köln
Germany

**Scope:** Research, development, production, project execution, installation, service, marketing and sale of power cable systems and fibre optic cable systems and metal products.

**Validity:** The certificate is valid from 2019-11-29 until 2021-08-20.

First certification 2013

2019-12-02

www.tuv.com

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