**SubLine ESP Power Cable**

The Sub-Line product family offers a complete range of ESP power cables engineered to provide superior, reliable performance in a wide variety of well conditions.

### APPLICATION
- Oil, gas and water wells ranging from benign to harsh conditions including high temperature and corrosive wells

### FEATURES & BENEFITS
- EPDM rubber insulation:
  - Special Borets formula designed with high modulus and low swell characteristics
- Nitrile jacket with option for EPDM:
  - Nitrile is very resistant to oil swelling and EPDM offers reliability in higher temperatures
- Option for a continuous lead sheath extruded over the insulation:
  - Creates a barrier to protect the conductors against corrosive gas and shields the insulation from well fluids
  - Standard armor using coated fully galvanized (four-sided, hot dipped) steel in thicknesses 0.020", 0.025", 0.034"
  - Stainless steel armor
  - Monel armor
  - Robust mechanical protection for insulated conductors
- Solid copper conductor:
  - Eliminates gas migration associated with stranded and solid conductor design
- High temperature cable:
  - Offers reliable operation in hot wells up to 450 °F (232 °C)

A critical component of any ESP system is the electric power cable. The overall ESP system is strongly influenced by the quality and reliability of the power cable and is a contributing factor towards achieving the maximum ESP run life performance.

Borets Sub-Line power cable provides a comprehensive range of surface and downhole cables for low temperature, benign well conditions to high temperature, high GOR applications.

Our state-of-the-art cable manufacturing facility is fully ISO 9001 certified. The 100+ employees are a highly-qualified group of specialists with expertise in all requisite areas of cable design, manufacturing, and application.

Our quality control processes and testing facilities ensure a product of the highest specification is produced on a consistent basis. Our cable facilities are equipped with advanced, modern machinery.

The power cables are provided in both round and flat profiles, while the motor lead extension (MLE) only comes in a flat profile. All are available in either 4 kV or 5 kV voltage rating.

**SL-212**
- This cable provides a good mix of chemical resistance, toughness and electrical properties.
- Recommended application is for water or high water cut wells with low bottom hole temperatures and pressures.
- The flat profile should be used where there is a geometric constraint.
- Temperature rating is 100 °C (212 °F), available in 4 kV and 5 kV.

**SL-285**
- This cable has extremely good electrical and temperature properties. The EPDM insulation is specially formulated to have low swell characteristics in the presence of hydrocarbons.
- Recommended for all oil well applications where the temperature rating is not exceeded. The flat profile should be used where there is a geometric constraint.
- Temperature rating is 140 °C (285 °F), available in 4 kV and 5 kV.

**SL-450**
- This cable has extremely good electrical and temperature properties. The EPDM insulation is specially formulated to have low swell characteristics in the presence of hydrocarbons.
- Recommended for all oil well applications where the temperature is not excessive. The flat profile should be used where there is a geometric constraint.
- Temperature rating is 232 °C (450 °F), available in 4 kV and 5 kV.

**SL-450 E-LEAD**
- The cable has a lead sheath protecting the cable against chemical effect and decompression, ensuring superior performance in harsh environments such as high temperature and high GOR. The flat cable is ideal for space constrained applications. Temperature rating is 232 °C (450 °F), available in 4 kV and 5 kV.

**SL-MLE**
- This cable is designed as a Motor Lead Extension and can be used with either a tape-in or plug-in motor pothead.
CABLE NOMENCLATURE

The Sub-Line power cable construction is identified by using a descriptive naming convention that addresses the individual components of the cable from the copper conductor outwards to the armor, as follows:

**CONDUCTOR CONFIGURATION**

*AWG#*
- Type - Solid, stranded, compact-stranded

**INSULATION**
- PP - Polypropylene
- E - EPDM
- K - Kapton

**JACKET**
- O - Nitrile
- E - EPDM

**PROTECTIVE BARRIER AND MECHANICAL REINFORCEMENT**
- T - Fluoropolymer or Polyimid tape
- B - Specialty synthetic braid
- L - Extruded lead sheath

**ARMOR**
- G - Galvanized steel
- HG - Heavy galvanized steel
- DG - Double-layered galvanized steel
- SS - Stainless Steel
- M - NiCu Alloy

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### TECHNICAL PARAMETERS

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<tbody>
<tr>
<td>Maximum cable operating temperature, °C (°F)</td>
<td>100 (212)</td>
<td>140 (285)</td>
<td>230 (450)</td>
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<tr>
<td>Cable size, AWG (mm²)</td>
<td>1, 2, 4, (16), 6, 8</td>
<td>1, 2, 4, (16), 6, 8</td>
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<td>Cable cross-section, mm²</td>
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<td>42.4, 33.6, 21.15, 16.0, 13.3, 10.0, 8.3</td>
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<td>Maximum voltage</td>
<td>4 kV, 5 kV</td>
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**Ampacity Chart SL-450 (E-Lead) Flat**

Current, A vs. Temperature, °C

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