



SUBMERSIBLE PUMPS POWER CABLES / CABLES PARA BOMBAS SUMERGIBLES





SUBMERSIBLE PUMPS POWER CABLES

Paige offers cables for the pumping systems installations (Electrical Submersible Pump) in oil wells, water and gas.

ESP Paige Cables are designed according to International standards ANSI / ICEA Insulated Cable Engineers Association, IEEE 1018, 1019 "Recommended Practice for Specifying Electric Submersible Pump Cable", API RP 1155 "Recommended Practice for Application of Electric Submersible Cable Systems") to operate in extreme conditions in a well of oil. High temperature, high pressure, depth, presence of corrosive liquids and gases; characteristics that must be analyzed carefully for proper cable selection.

ESP Paige Cables are available in round configuration (ESP-R) and flat configuration (E-F). The round configuration is generally used in oil wells where there is no limitation of space between the tubing and casing, if this limitation exists to use the flat configuration.

The flat configuration is generally used in shallow, low temperature, provided that the insulation does not have barriers thermal or additional protection (mesh or tape).

The conductor used in the ESP Paige Cables is copper, with 99.9% purity, manufactured in accordance with ASTM 93, B8, 8496 and 833. The driver is selected or mm² AWG according to the required current capacity, voltage drop, economic considerations and characteristics of the well.

The copper wire may be tinned, with the aim of increasing its resistance to oxidation, gas attack and to improve adherence to the compound of isolation. Internationally, the industry has standardized the sizes 1, 2, 4 and 6 AWG, but other sizes can be used for special applications.

The standard ESP Paige Cables are composed of three insulated phase conductors and pre-assembled, which can be solid, or wired and compacted. The solid conductors are mainly used where you need a good blocking against the migration of gases and minimize the damage by hydrogen sulfide.

The adhesion between copper and the insulation is improved by using a special adhesive compound to prevent migration of gases and fluids.

The drivers lock wiring is done using a special locking compound fills the interstices between the wires preventing the migration of gases and fluids.

In addition to the three phases in the ESP cable, may be included control conductors, grounding, or galvanized steel conductors both in the flat configuration as in the round.

The insulation and jacket materials are selected according to the characteristics of the well where they are installed. Factors determine the proper selection of this compound are: temperature, pressure, GLR (gas-liquid ratio), operating voltage, physical stress on the cable.

Insulation materials determined by the IEEE standard are EPDM (Ethylene-polypropylene Diene Monomer) and polypropylene, and is used for jackets EPDM and Nitrile.

In addition to insulation and jacket materials can be used as barriers or mesh tape. The tapes form a barrier against ingress of fluid and gas to drivers tapes are generally used FEP (fluorinated ethylene propylene) or TEOLAR. The mesh provides mechanical reinforcement is generally used or Kynar® Nylon.

The armor on the cable provides protection and mechanical strength, as well as resistance against the expansion of elastomeric materials (insulation and covers) when exposed to well fluids. The armor can be galvanized steel, stainless steel, or Monel®, the selection of reinforcement material is based on the corrosiveness of the fluid in the well into which the cable will be installed. Monel® is used in the harshest environments, some of which include CO₂, H₂S and high temperatures (above 160 ° F).

SUBMERSIBLE PUMPS POWER CABLES 180° F



APLICACIONES

Bom sumergibles eléctricas en:
Pozos de agua.
Pozos poco profundos.
Baja presión en la profundidad del pozo

CARACTERÍSTICAS

Configuración: redonda
Temperatura de operación: 180°F [82°C]
Tensión de operación: 4 kV

NORMAS

ASTM 83, Especificación estándar para alambre de cobre blando o recocido.
ASTM B496 Especificación estándar para conductores cableados concentricos redondos compactos.
ASTM 833, Especificación esrnndar para alambres estafados de cobre blando o recocido.
ICEA 5-96-659, Norma para cables no – apantallados con tensión nominal 2001-5000 voltios para uso en distribución de energía eléctrica.

NOTAS

Construcciones opcionales y otras no indicadas, están disponibles bajo pedido.

APPLICATIONS

Electrical submersible pumps in:
Water Wells.
Shallow wells.
Low pressures in bottom-hole.

CHARACTERISTICS

Configuration: round
Rated Temperature: 180°F [82°C]
Rated Voltage: 4 kV

STANDARDS

ASTM 83, Standard specification for soft or annealed copper wire.
ASTM 8496 Standard specification for compact round concentric lay - stranded copper conductors.
ASTM B33, Standard specification for tinned soft or annealed copper wires.
ICEA 5-96-659, Standard for nonshielded cables rated 2001 - 5000 Volts for use in the distribution of electric energy.

NOTES

Optional constructions and other technical conditions different to the indicated are available upon request.



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Paige[®]

SUBMERSIBLE PUMPS POWER CABLES 180° F

4 kV-180°F/82°C Round Electrical Submersible Pump Cable

Conductor Size	Wires	Conductor Diameter	Insulation Diameter	Overall Diameter	Approx. Weight				
AWG	No.	mm	inch	mm	inch	mm	inch	kg/km	lb/ft
1	7	7.64	0.301	11.62	0.457	29.2	1.15	1673	1.12
2	7	6.81	0.268	10.79	0.425	27.4	1.08	1382	0.9
4	1	5.19	0.204	9.17	0.361	23.9	0.94	932	0.63
6	1	4.11	0.162	8.10	0.319	21.6	0.85	665	0.45

Materials and specifications are subject to change without notice.

CONSTRUCCIONES ALTERNATIVAS NOMENCLATURA

Conductor:
AWG / Conductor redondo sólido
AWG / Conductor redondo cableado

Aislamiento:
Polipropileno
Caucho de etileno propileno (EPDM)

Annadura:
Acero galvanizado (una o dos capas)
Acero galvanizado para trabajo pesado
Acero Inoxidable

Configuración del Cable:
ESP-R: Redondo
ESP-F: Plano

Chaqueta:
Polietileno de alta densidad (HDPE)
Caucho de etileno propileno (EPDM)
Nitrito
Polipropileno

Voltaje Nominal:
3, 4, 5, 8, kV

ALTERNATIVE CONSTRUCTIONS NOMENCLATURE

Conductor:
AWG / Solid round conductor
AWG / Stranded round conductor

Insulation:
Polypropylene
Ethylene propylene diene (EPDM)

Armor:
Galvanized steel (one or two layers)
Heavy galvanized steel
Stainless steel

Cable Configuration:
ESP-R: Round
ESP-F: Flat

Jacket:
High density polyethylene (HDPE)
Ethylene propylene diene (EPDM)
Nitrile
Polypropylene

Voltage Rating:
3, 4, 5, 8, kV

SUBMERSIBLE PUMPS POWER CABLES 250° F



CONSTRUCCIONES ALTERNATIVAS NOMENCLATURA

Conductor:
AWG / Conductor redondo sólido
AWG / Conductor redondo cableado

Aislamiento:
Polipropileno
Caucho de etileno propileno (EPDM)

Annadura:
Acero galvanizado (una o dos capas)
Acero galvanizado para trabajo pesado
Acero Inoxidable
Monel®

Configuración del Cable:
ESP-R: Redondo
ESP-F: Plano

Barrera:
Barrera contra la cinta de petróleo y productos químicos
Reinforcement nylon trenzado

Chaqueta:
Polietileno de alta densidad (HDPE)
Caucho de etileno propileno (EPDM)
Nitrito
Polipropileno

Voltaje Nominal:
3, 4, 5, 8, kV

ALTERNATIVE CONSTRUCTIONS NOMENCLATURE

Conductor:
AWG / Solid round conductor
AWG / Stranded round conductor

Insulation:
Polypropylene
Ethylene propylene diene (EPDM)

Armor:
Galvanized steel (one or two layers)
Heavy galvanized steel
Stainless steel
Monel®

Cable Configuration:
ESP-R: Round
ESP-F: Flat

Barrier:
Barrier tape against oil and chemicals
Reinforcement nylon braid

Jacket:
High density polyethylene (HDPE)
Ethylene propylene diene (EPDM)
Nitrile
Polypropylene

Voltage Rating:
3, 4, 5, 8, kV

SUBMERSIBLE PUMPS POWER CABLES 400° F



-60°F/250°C Flat Electrical Submersible Pump Cable EPDM

Description	Cond.	Wires	Conductor Diameter	Insulatron Diameter	Jacket Diameter	Overall Dimensions		Approx. Weight				
	Size	AWG	No.	mm	inch	mm	inch	mm	inch	kg/km	lb/ft	
5kV FLAT	2/0	7	10.2	0.402	2.30	0.09	18.9	0744	21.7x61.0	0.85x2.40	4130	2.78
Materials and specifications are subject to change without notice.												

APLICACIONES

Bombas sumergibles eléctricas en: Pozos de petróleo con temperaturas bajas hasta -60°F y medias hasta 250°F. Contenido de gas moderado. Ambientes con nivel bajo de corrosión.

CARACTERÍSTICAS

Temperatura de operación: -60°F / 250°F (-51°C / 121 °C)
Tensión de operación: 5 kV
Otros Calibres: Bajo pedido

NORMAS

ASTM B3, Especificación estándar para alambre de cobre blando o recocido.

ASTM B496 Especificación estándar para conductores cableados concéntricos redondos compactos.

ICEA S- 96- 659, Norma para cables no apantallados con tensión nominal 2001 - 5000 voltios para uso en distribución de energía eléctrica.

IEEE 1018 Prácticas recomendadas para la especificación de cables para bombas sumergibles Aislamiento en caucho de etileno propileno.

NOTAS

Construcciones opcionales y otras no indicadas, están disponibles bajo pedido.

APPLICATIONS

Electrical submersible pumps in: Low temperatures up to -60°F and medium temperature up to 250°F. Moderate gas content. Low corrosives environments.

CHARACTERISTICS

Rated Temperature: -60°F / 250°F (-51 °C / 121°C)
Rated Voltage: 5 kV
Other sizes: Upon request

STANDARDS

ASTM 83, Standard specification for soft or annealed copper wire.

ASTM 8496 Standard specification for compact round concentric lay - stranded copper conductors.

ICEA S- 96- 659, Standard for nonshielded cables rated 2001 - 5000 Volts for use in the Distribution of Electric Energy.

IEEE 1018 Recommended practice for specifying electric submersible pump cable - Ethylene propylene rubber insulation

NOTES

Optional constructions and other technical conditions different to the indicated are available upon request.