



Exploration & Production

GENERAL SPECIFICATION

ELECTRICAL

GS EP ELE 161

Electrical cables

05	01/2012	Data sheets added in appendix and modifications
04	10/2009	Reviewed as marked
03	10/2005	Addition of "EP" root to GS identification
02	10/2004	Updating Colour coding & "zero halogen" requirements
00	03/2001	First issue
Rev.	Date	Notes

Owner: DEV/TEC

Managing entity: DEV/TEC/ELE



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1. Scope

This specification defines the minimum requirements for design, manufacture and testing of electrical cables for power, control, and lighting systems.

This specification covers onshore and offshore projects, but subsea cables and heating cables are excluded from this scope.

Cables related to HVAC services (except power) shall be in accordance with the instrumentation cables specification.

The Manufacturer shall make clear in his bid any deviation from this specification. No deviation from the requirements of this specification are allowable unless itemised in the Manufacturer's quotation and subsequently specifically agreed within the purchase order documents.

In cases where the Company's standard specification has been amended by Project specifications and is so noted, the Project specifications will govern.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Design and engineering shall conform as a minimum requirement to the current edition of the following in order of preference:

- Applicable laws, rules and regulations of the country in which the system will be operated. In cases where no "local" regulations exist, the French laws and legislation shall be used
- Company Particular Specifications (if any)
- Company General Specifications
- Applicable International Electro-technical Commission (IEC) Standards
- Applicable CENELEC Standards.

Applicable recognised standards and codes (e.g. UTE-NFC, BSI, VDE, etc.) where IEC publications have not yet been issued.

Standards

Reference	Title
ASTM D 2863	Standard Test Method for Measuring the Minimum Oxygen Concentration to support Candle-Like Combustion of Plastics (Oxygen Index)
ASTM D 2843	Standard Test method for density of smoke from the burning or decomposition of plastic
ASTM E 662	Standard test method for density of smoke from the burning or decomposition of plastics
IEC 60092-350	Electrical installations in ship : General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications

Reference	Title
IEC 60092-351	Electrical installations in ship : Insulating materials for shipboard and mobile and fixed offshore units ,power, telecommunication and control data cables
IEC 60092-359	Electrical installations in ship : Sheathing material for shipboard power and telecommunication cables
IEC 60227-1	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 1: General requirements
IEC 60228	Conductors of insulated cables
IEC 60287(All parts)	Electric cables - Calculation of the current rating- (All parts)
IEC 60331-21	Tests for electric cables under fire conditions. Circuit integrity. Part 21: Procedures and requirements-Cables of rated voltage up to and including 0.6/1.0 kV
IEC 60332-3-22	Tests on electric and optical fibre cables under fire conditions - Part 3-22: Tests for vertical flame spread of vertically-mounted bunched wires or cables-Category A
IEC 60445	Basic and safety principles for man-machine interface, marking and identification - Identification of equipment terminals, conductors termination and conductors
IEC 60502 (Parts 1; 2)	Power cables with extruded insulation and their accessories for rated voltages from 1 kV up to 30 kV - (Parts 1; 2)
IEC 60754 (Parts 1; 2)	Test on gases evolved during combustion of electric cables - (Parts 1; 2)
IEC 60811 (All parts)	Common test methods for insulating and sheathing materials of electric cables and optical cables - (All parts)
IEC 60885- (All parts)	Electrical test methods for electric cables – (All parts)
IEC 61034-2	Measurement of smoke density of cables burning under defined conditions - Part 2: Test procedure and requirements
IEC 61892-4	Mobile and fixed offshore units – Electrical installations – Part 4: Cables
UL 1581 (partial)	UL standard for safety for electrical wires, cables and flexible cord: Part about Physical properties after immersion in oil and part about Carbon – Arc and Xenon-Arc tests (1200)

Professional Documents

Reference	Title
Not applicable	



Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
Not applicable	

3. Environmental conditions

Cables for onshore projects shall generally be directly buried in the ground. Cables for offshore projects shall be run on cable trays/ladders. In technical voids of technical rooms they shall be supported on cable trays/ladders (offshore/onshore).

Environmental data is given in the environmental data Project specification.

4. Construction requirements

Cables for onshore plants shall follow the requirement of the [IEC 60502 \(Parts 1; 2\)](#), while cable for installation in ships (hull of Floating Units, etc) and fixed offshore units (including topsides of Floating Units) shall follow the requirements of the [IEC 60092-350 / 351 /359](#).

4.1 Rated voltages

The voltage designation of the cables shall be $U_0/U(U_m)$ as defined in [IEC 60502-1](#) § 4.1 , [IEC 60502-2](#) § 4.1 or [IEC 60092-350](#).

System Voltage	Rated Voltage $U_0/U (U_m)$
LV (control)	450/750 V
LV (< 1000 V) Power and lighting	0.6/1kV(1.2kV)
≤ 6.6 kV	6/10 (12) kV
11 kV	8.7/15 (17.5) kV
20 or 22 kV	12/20 (24) kV
33 kV	18/30 (36) kV

4.2 Conductors

Conductors shall meet the requirements of [IEC 60228](#).

For all cables, conductors shall be class 2 for fixed installations and class 5 for flexible installations.

Cable conductors shall be of high conductivity, stranded plain annealed copper.

Exceptionally for sites where the concentration of H_2S is high, all cable conductors shall be tinned.

HV cables shall incorporate a conductor screen made of an extruded semi-conducting compound applied to the conductors.

4.3 Insulation

4.3.1 HV Cables

The insulation material shall be XLPE (cross linked polyethylene) in accordance with [IEC 60502 \(Parts 1: 2\)](#) or [IEC 60092-351](#).

EPR insulated cables may be quoted as an alternative for HV cables in accordance with [IEC 60502-2](#) or [IEC 60092-351](#).

HV cables shall incorporate an insulation screen which consists of an extruded semi-conducting layer in combination with a metallic layer (copper tape).

4.3.2 LV Cables

Power and lighting cables shall be XLPE insulated in accordance with [IEC 60502-1](#) and or [IEC 60092-351](#).

Control cables (multi-core cables) shall be PVC insulated in accordance with [IEC 60502-1](#) or [IEC 60092-351](#).



4.3.3 Earthing cables

Earthing cables shall be copper. PVC sheathed,.

4.4 Inner sheath and fillers

The assembly of three core cables shall be arranged to form a round shape, using appropriate fillers.

The inner sheath shall be of the extruded type to provide a good radial seal against humidity, gas and vapours.

4.5 Metallic armour

When metallic armour is required, it shall be made of double galvanised steel tape for multi core cables or aluminium tape for single core cable.

For onshore plants, galvanized steel wire armour might be used.

For Floating Units applications, galvanized steel wire braid armour might be used for low voltage cable.

4.6 Tape thickness shall be in accordance with IEC 60502 (Parts 1; 2) or IEC 60092-350.Oversheath

The oversheath shall be an extruded layer of low smoke thermoplastic compound with the necessary additives to obtain the following characteristics:

- Flame retardant as per IEC 60332-3-22 (previously called Cat A)
- Oxygen index: >30 as per ASTM D 2863
- Minimum production of noxious gases and fumes in the event of fire:
 - Acid gas generation: HCl < 17% as per IEC 60754-1
- U.V. resistance as per UL 1581 art. 1200, unless otherwise specified in project particular specification
- Resistant to aliphatic hydrocarbons as per UL 1581 or IEC 60092-359, when required.

4.7 Cancelled

4.8 Colour identification

- For Power cables the colour coding for cores shall be as per IEC 60445
- For Multi core control cable: White with an alphanumeric system as per IEC 60445 §7.1 marked on the sheath of each core.

The following colour coding for over sheath shall be used:

- LV Cable = black
- HV Cable = red
- Fire resisting Cable = orange
- Earthing Cable = yellow with green stripes.

4.9 Cable marking

The over sheath of the cable shall be legibly and permanently marked every meter by indelible printing or embossing with:

- Manufacturer name,
- Cable type
- Rated voltage, (Uo/U)
- Cross-section
- Number of cores
- Metric indication.

4.10 References to IEC 60332-3-22 or IEC 60331-21. Cable lengths

The tolerances used for cable lengths during manufacturing shall be -0%, +3%.

5. Special cables

5.1 Fire resisting cables

Fire resisting cables shall meet the following requirements in addition/deletion to those requirements specified in paragraph 4.

- The conductors shall have silicone rubber insulation or as another alternate mica/glass tape with EPR or XPLE insulation
- The inner sheath shall be made of a low smoke fire retardant compound
- The armour and oversheath shall be of the same type as defined for flame retardant cables (see 4.5 and 4.6)
- The cables shall be tested in accordance with IEC 60331-21. The cable shall have circuit integrity for a minimum 30 minutes and shall withstand a flame test at 1000°C. For offshore project cable shall be tested for 90 minutes as per IEC 61892-4, Clause 4.14. at 1000°C
- Use of MICC (Mineral Insulated Copper Cables) is prohibited.

5.1.1 “Zero halogen” cables

When required by the PROJECT, cables shall be Zero halogen type i.e. with insulation filler inner and oversheath made with suitable elastomers or thermoplastic materials.

The Manufacturer shall meet the following requirements:

- IEC 60332-3-22 for Flame retardant cables
- IEC 60331-21 for Fire resisting cables
- Acid gas generation: HCl < 0.5% as per IEC 60754-2 or IEC 60092-350.
- Maximum smoke density: Dm < 250 as per ASTM E 662 (tests on materials)
- Smoke in chamber (4 mm): VOF4 < 150 as per ASTM E 662 (tests on materials)



- Oxygen index: > 30 as per [ASTM D 2863](#) except for core insulation
- Transmittance: as per [IEC 61034-2](#).

5.2 Cables for aromatic hydrocarbons

Whenever cables may come into contact with aromatic hydrocarbons they shall be fitted with a sealed lead sheath or other appropriate material proposed by Manufacturer, subject to Company approval.

6. Inspection and testing

6.1 Type tests

Type test certificates issued by a recognised testing authority in accordance with the relevant IEC standards shall be provided by the Manufacturer for Company review before purchase order.

- Flame retardant test as per [IEC 60332-3-22](#).
- Oxygen index tests as per [ASTM D 2863](#)
- Smoke emission test to - [ASTM E 662](#)
- Fire resistance test as per [IEC 60331-21](#) but at 1000°C during 90 or 30 mm following cable type
- Acid gas generation test as per [IEC 60754-1](#) and [60754-2](#)
- Transmittance as per [IEC 61034-2](#)
- Aliphatic hydrocarbons withstand
- UV resistance (Cable's sheath shall be certified to pass the UV resistance test defined in UL 1581 Section 1200,

6.2 Factory acceptance tests

Acceptance tests shall be performed by the Manufacturer in the presence of Company or his representatives.

These tests shall be performed either on all finished cable lengths or on samples of completed cables.

The tests to be made shall be specified by the Company from the lists given hereafter at the time of purchasing. Normally the "Usual non-electrical checks" (6.3.2) and "Electrical tests" (6.3.4) shall be carried out.

If special tests (see 6.3.3) are required they shall be agreed on with the Manufacturer and shall be explicitly specified in the purchase order.

After testing the ends of the cable shall be sealed by an approved method to prevent the ingress of moisture.

6.3 Test list

6.3.1 General checks

- Qualitative and quantitative control of technical documentation given with cables and its compliance with the general and particular specifications if any
- Control of drums: quality of flanges, marking and labelling, cable designation, length, section, sizes and weight, observance of minimum curve radii, capping of terminations, packaging and protection against shocks
- Control of conformity with the technical documentation
- All routine and acceptance test shall be carried out on cables as per IEC standards listed in paragraph 2.

6.3.2 Usual non-electrical checks

- Control of the nature and composition of conductors
- Measurement of the thickness of the insulating material
- Inspection of bedding and assembly
- Measurement of inner sheath diameter (cable gland sizing)
- Measurement of the thickness of the external sheath
- Check of the nature and constitution of the conductor or semi-conductor screens
- Verification of the nature, composition and thickness of the metallic armour
- Measurement of the external dimensions of the complete cable.

6.3.3 Special non electrical checks

Following tests shall be carried out on a sample length of cable when required and indicated in the Purchase Order (PO) documents:

- Check for flame retardant properties as per [IEC 60332-3-22](#)
- Oxygen Index and temperature index tests as per [ASTM D 2863](#)
- Acid gas generation test as per [IEC 60754-1](#)
- Smoke generation as per [ASTM E 662](#)
- Transmittance as per [IEC 61034-2](#)
- Check of the oversheath resistance to aliphatic hydrocarbons. Manufacturer procedure to be submitted for company review
- For fire resisting cables all routine and acceptance tests shall be carried out as per [IEC 60502](#) or [IEC 60092-350](#) and [IEC 60331-21](#) with modifications as indicated in paragraph 5.1
- For zero halogen cables tests with values as indicated in paragraph 5.1.1
- Control of mechanical properties of insulating material

- Control of the mechanical properties of the external protective sheaths (IEC 60502 or IEC 60092-359)
- Test of the anti-corrosion protective coatings of the metallic armour (IEC 60502 or IEC 60092-350)
- Bending test (IEC 60502 or IEC 60092-350)
- Alternating flexibility test - for flexible cables (class 5) only
- Hot set test for EPR, HEPR and XLPE insulations and elastomeric sheaths (IEC 60502 or IEC 60092-351 and IEC 60092-359, respectively)
- Low temperature tests (PVC).

6.3.4 Electrical tests

- Voltage tests as per IEC 60502 or IEC 60092-350 according to cable rated voltage
- Partial discharge tests (HV only - IEC 60885-2 and IEC 60885-3)
- Impulse tests followed by power frequency tests for HV cable only - when required in Purchase Order.

6.4 Test reports

A specimen test report shall be submitted to the Company for approval before the placing of the order.

The test reports shall detail as a minimum:

- Expected theoretical values
- Permitted tolerances
- Results of measurements carried out, including any intermediate values, which lead to a temporary non-acceptance, if any.

The test reports shall be incorporated into the contractual technical documentation.

7. Information required from cable Manufacturer

The Manufacturer shall submit with the tender the information listed below for every cable size supplied:

- Standard Drum Length
- Maximum and minimum manufacturing drum lengths and weights of individual drums for each size and type of cable
- Number and size of conductors making up the cross-sectional area of each core
- Insulation thickness
- Inner sheath diameter with maximum tolerance
- Oversheath diameter with maximum tolerance
- Armour thickness

- Minimum installation temperature
- Maximum permissible tensile force
- Minimum bending radii at minimum installation temperature during pulling and after laying
- Weight per unit length
- Current carrying capacity according to IEC standard reference conditions
- Maximum conductor temperature for normal operation and short circuit conditions
- DC Resistance per unit length
- AC Resistance per unit length at maximum conductor temperature in normal operation
- Reactance per unit length (in trefoil formation for single core cables)
- Capacitance per unit length
- Short-circuit withstand capacity.

For fire resisting cables: fire resistance behaviour (temperature/duration).

For zero halogen cables: Dm, VOF4, acid gas generation (%), transmittance.

8. Other references

Following documents are applicable:

- Standards: [ASTM D 2843](#), [IEC 60227-1](#), [IEC 60287](#), [IEC 60811](#).



Appendix 1 High Voltage electrical cables data sheet



Exploration & Production

General Specification

Date : 01/2012

GS EP ELE 161

Rev : 05

Appendix 1



Exploration & Production

DATA SHEET	N°
Project:	
DS EP ELE 161 Rev. 03 - 10/11	High voltage electrical cable

Rev. Date						
Written						
Verified						
Approved						

1						
2	Repère de l'équipement/Equipment tag:					
3	CONDITIONS D'INSTALLATION					
4	INSTALLATION CONDITIONS					
5						
6	Pays					
7	<i>Country</i>					
8						
9	Location	Terrestre ☐	Off shore ☐			
10	<i>Installation</i>	<i>On shore</i>	<i>Off shore</i>			
11						
12	Température de l'air :	Moyenne °C	Maximum	Minimum °C		
13	Air temperature	<i>Average</i>	<i>Maximum</i>	<i>Minimum</i>		
14						
15	CARACTERISTIQUES TECHNIQUES					
16	TECHNICAL DATA					
17						
18	Tension spécifiée U ₀ /U	kV	Tension de service	kV		
19	<i>Rated voltage U₀/U</i>		<i>Operating voltage</i>			
20						
21	Fréquence	Hz	I _{cc} maximum	kA	Temps d'élimination	s
22	<i>Frequency</i>		<i>Maximum over current</i>		<i>Clearing time</i>	
23						
24	I homopolaire maximum	A	Temps d'élimination	s		
25	<i>Maximum homopolar current</i>		<i>Clearing time</i>			
26						
27	Type	Champ radial ☐	A ceinture ☐			
28	Type	<i>Radial field</i>	<i>Non radial field</i>			
29						
30	Ames	Cuivre ☐	Aluminium ☐	Section	mm ²	Classe
31	Conductor	<i>Copper</i>	<i>Aluminium</i>	<i>Cross section</i>		
32						
33	Flexible ☐	Massive ☐	Cablée ☐	Ronde ☐	Sectorale ☐	
34	<i>Flexible</i>	<i>Solid</i>	<i>Stranded</i>	<i>Round</i>	<i>Sector shaped</i>	
35						
36	Ecran interne	Semi conducteur	Extrudé ☐	Ruban ☐		
37	Conductor screen	<i>Conductive layer</i>	<i>Extruded</i>	<i>Tape</i>		
38						
39	Isolation	XLPE ☐	EPR ☐	TPR ☐	AUTRES ☐	
40	<i>Insulation</i>	<i>XLPE</i>	<i>EPR</i>	<i>TPR</i>	<i>OTHER</i>	
41						
42	Ecran externe	Semi conducteur :	Extrudé ☐	Ruban ☐		
43	Insulation screen	<i>Conductive layer</i>	<i>Extruded</i>	<i>Tape</i>		
44						
45	Ecran métallique	Ruban de cuivre ☐	Epaisseur mm			
46	Metallic screen	<i>Annealed copper wires</i>	<i>Thickness</i>			
47						
48	Bourrage	Extrudé ☐	Fillins ☐			
49	Filler	<i>Extruded</i>	<i>Plastics yarn</i>			
50						
51	Gaine intérieure	PE ☐	PCV ☐	Plomb ☐		
52	Inner sheath	<i>PE</i>	<i>PCV</i>	<i>Lead sheath</i>		
53						
54						
55						
ORIGINE DU DOCUMENT/ORIGINATOR				FABRICANT/VENDOR		
Société :				Société :		
No. d'affaire/Job number				No. d'affaire/Job number		

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General Specification

Date : 01/2012

GS EP ELE 161

Rev : 05

Appendix 1



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DATA SHEET	N°
Project:	
DS EP ELE 161 Rev. 03 - 10/11	High voltage electrical cable

Appel d'offre/Call for tender ☐		Commande/Order ☐	
1			
2	Armure	Feuillard d'acier	☐
3	Armour	Steel tapes	
4			
5	Gaine extérieure	Extrudée	☐
6	External sheath	Extruded	
7		PE	☐
8		PE	
9		PVC	☐
10		PVC	
11		Résistant aux hydrocarbures	☐
12		Hydrocarbons resistant	
13		Aromatiques	☐
14		Aromatics	
15		Aliphatiques	☐
16		Aliphatics	
17		Couleur	
18		Color	
19		Comportement au feu :	
20		Non propagateur de la flamme	☐
21		Flame retardant	
22		Résistant au feu	☐
23		Fire resistant	
24		Marquage métrique	☐
25		Nature	
26		Nature	
27	ESSAIS EN USINE		
28	FACTORY ACCEPTANCE TESTS		
29	Mesure de la résistance électrique des conducteurs et des écrans à 20°C		
30	Measurement of the electrical resistance of conductors and screens at 20°C		
31		Essai de tension pendant 5 min	☐
32		Voltage test for 5 min	
33		Mesure de la résistance d'isolement	☐
34		Insulation resistance measurement	
35		Mesure échométrique avec détermination de la vitesse de propagation	☐
36		Echometric measurement with determination of velocity of propagation	
37		Tests de décharges partielles	☐
38		Partial discharge tests	
39		Tests d'impulsion	☐
40		Impulse tests	
41		Vérifications dimensionnelles	☐
42		Check of dimensions	
43	CARACTERISTIQUES A FOURNIR PAR LE CONSTRUCTEUR		
44	SPECIFICATIONS TO BE SUPPLIED BY CONSTRUCTOR		
45	Diamètre sur l'âme	mm	Sur l'isolant
46	Diameter on core		On insulation
47			mm
48			Sur écran
49			On screen
50			mm
51	Diamètre sur armure	mm	
52	Diameter on armour		
53	Diamètre sur gaine extérieure	mm	
54	Diameter on external sheath		
55	Rayon de courbure mini	Fois le diamètre extérieur	
56	Minimum bending radius	Time of external diameter	
57			
58	Masse linéique	kg/m	
59	Lineic weight		
60	Courant admissible :	Dans l'air	
61	Rated current	In air	
62		Dans le sol	
63		In soil	
64	ORIGINE DU DOCUMENT/ORIGINATOR		FABRICANT/VENDOR
65	Société/Company:		Société/Company:
66	No. d'affaire/Job number		No. d'affaire/Job number

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Appendix 2 Low Voltage electrical cables data sheet


Exploration & Production

DATA SHEET	N°
Project:	
DS EP ELE 162 Rev. 02 - 10/11	Low voltage electrical cable

Rev. Date						
Written						
Verified						
Approved						

Appel d'offre/Call for tender ☐		Commande/Order ☐	
1			
2	Puissance	Commande	Eclairage
3	Power cable	Control cable	Lighting cable
4	☐	☐	☐
5	CONDITIONS D'INSTALLATION		
6	INSTALLATION CONDITIONS		
7			
8	Pays		
9	Country		
10			
11	Lieu d'installation	A terre	En mer
12	Installation site	On shore	Off shore
13		☐	☐
14		Enterrés	Nature du sol
15		Underground	Type of soil
16		☐	
17	Risque d'immersion dans l'eau	Rayonnement solaire	
18	Water immersion hazard	Solar radiation	
19		☐	☐
20	Température de l'air :	Moyenne	Maximum
21	Air temperature	Average	Maximum
22		°C	°C
23			Minimum
24			Minimum
25	CARACTERISTIQUES TECHNIQUES		
26	TECHNICAL DATA		
27	Tension spécifiée Uo/U:	300/500 V	450/750 V
28	Rated voltage Uo/U:	☐	☐
29		0.6/1 kV	Tension de service
30		☐	Operating voltage
31			V
32	Fréquence	1cc maximum	Temps d'élimination
33	Frequency	Maximum over current	Clearing time
34	Hz	kA	s
35	Type :	Unipolaire	Tripolaire
36	Type	Single core	Three cores
37		☐	☐
38			Autres : Nombre de conducteurs
39			Others : Number of conductors
40			
41	Ame :	Cuivre	Aluminium
42	Conductor	Copper	Aluminium
43		☐	☐
44		Section	mm²
45			
46		Classe	Etamé
47			Tinned
48		☐	☐
49		Souple	Massive
50		Flexible	Solid
51		☐	☐
52		Cablée	Ronde
53		Stranded	Round
54		☐	☐
55			Sectorale
56			Sector shaped
57			☐
58	Enveloppe isolante :	PVC	PRC
	Insulating material	PVC	XLPE
		☐	☐
			Autres
	Bourrage extrude :	Oui	
	Extruded filling	Yes	☐
	Gaine d'étanchéité :	PE	PVC
	Inner sheath	PE	PVC
		☐	☐
			Plomb
			Lead
			☐
	Armure :	Oui	Métallique
	Armour	Yes	Metallic
		☐	☐
			Non métallique
			Non-metallic
			☐
	Double feuillards en métal	Acier	Aluminium
	Double metal tapes	Steel	Aluminium
		☐	☐
			Cuivre
			Copper
			☐
			Acier galvanisé
			Galvanised steel
			☐

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DATA SHEET	N°
Project:	
DS EP ELE 162 Rev. 02 - 10/11	Low voltage electrical cable

Appel d'offre/Call for tender ☐		Commande/Order ☐	
1			
2	Tresse ☐	Cuivre ☐	Cuivre étamée ☐
3	Braid	Copper	Tinned copper
4			
5	Fils d'acier galvanisés ☐	Acier galvanisé ☐	
6	Galvanised steel wires	Galvanised steel	
7			
8	Gaine extérieure :		PVC ☐
9	External protective sheath:		PE ☐
10			Autre ☐
11	Résistant aux hydrocarbures:	Aromatiques ☐	Aliphatiques ☐
12	Hydrocarbons resistant:	Aromatics	Aliphatic
13			
14	Couleur :		
15	Colour:		
16			
17	Comportement au feu :	Non propagateur de la flamme ☐	Résistant au feu ☐
18	Fire performances:	Flame retardant	Fire resistant
19			
20	Câble sans halogène ☐		
21	Halogen free cable		
22			
23	Marquage métrique ☐		
24	Meter marking		
25			
26	ESSAIS EN USINE		
27	FACTORY ACCEPTANCE TESTS		
28			
29	Vérifications de routine non électriques ☐	Tests électriques ☐	
30	Usual non electric checks	Electrical tests	
31			
32			
33	Essais particuliers ☐		
34	Special tests		
35			
36			
37	CARACTERISTIQUES A FOURNIR PAR LE CONSTRUCTEUR		
38	DATA TO BE SUPPLIED BY MANUFACTURER		
39			
40	Diamètre sur l'âme	Sur l'isolant	Sur gaine d'étanchéité
41	Diameter on conductor	On insulation	On inner sheath
42			
43	Diamètre sur armure		
44	Diameter on armour		
45			
46	Diamètre sur gaine extérieure		
47	Diameter on external sheath		
48			
49	Rayon de courbure mini	Fois le diamètre extérieur	
50	Minimum bending radius	Time of external diameter	
51			
52	Masse linéique		
53	Lineic weight		
54			
55	Température maximale admissible sur l'âme :	En permanence	En court-circuit
56	Conductor's maximum operating temperature	Permanently	During short circuit
57			
58	Courant admissible selon CEI 60364-5-52 :	Dans l'air	Dans le sol
59	Rated current according to IEC 60364-5-52:	In air	In soil
60			
61	Autres		
62	Others		
63			