

Report.

TIC 3150-11

Type test on 220 kV 2500 mm² XLPE insulated power cable and accessories system

Manufacturer cable

Guangdong Nanyang Extra High Voltage Cable Co., Ltd., Guangzhou, Guangdong, China

Manufacturer accessories

Nexans Suisse SA, Cossonay-Gare, Switzerland

INSPECTION REPORT

Report number TIC 3150-11
Client Guangdong Nanyang Extra High Voltage Cable Co., Ltd.
 No.19, Yongfeng Road, Yonghe District
 Guangzhou Economic & Technology Development Zone
 Guangzhou, Guangdong, 511356
 China

Reference 72130009

Concerning Type test
Date 29 April 2011 until 26 September 2011
Place TICW Laboratory, Shanghai, China
Object 220 kV 2500 mm² XLPE insulated power cable and accessories
Manufacturers
Cable Guangdong Nanyang Extra High Voltage Cable Co., Ltd.
 No.19, Yongfeng Road, Yonghe District
 Guangzhou Economic & Technology Development Zone
 Guangzhou, Guangdong, 511356, China

Accessories Nexans Suisse SA
 CH-1305 Cossonay-Gare, Switzerland

REQUIREMENTS

The requirements as mentioned in the standards IEC 62067, 2006-03 and IEC 60229, 2007-10.

TEST PROGRAMME

The programme was specified by the client and consisted of all the type tests as mentioned in IEC 62067, 2006-03 and IEC 60229, 2007-10.
For the programme reference is made to pages 12 and 13.

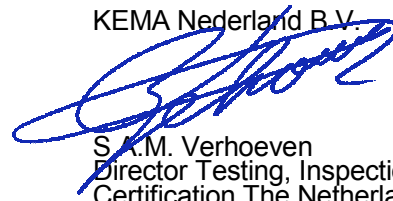
SUMMARY AND CONCLUSION

The test results obtained relate only to the work ordered and to the material tested.
The requirements for the type test were met.

Author Gu Bin

This report consists of:
55 pages incl. 10 annexes (31 pages)

KEMA Nederland B.V.



S.A.M. Verhoeven
Director Testing, Inspections &
Certification The Netherlands

Arnhem, 30 November 2011

MATERIAL DATA

A EXTRUDED SOLID DIELECTRIC INSULATED POWER CABLE

Manufacturer	Guangdong Nanyang Extra High Voltage Cable Co., Ltd.
Type	220 kV 1x2500 mm ² XLPE insulated power cable

Ratings assigned by the manufacturer

Rated voltages $U_0/U/U_m$	127/220/252 kV
Rated frequency	50 Hz
Maximum rated conductor temperature	90 °C
Cross-section	2500 mm ²

Material data and drawings

General

Number of cores	1 core
Nominal diameter of the cable	158,2 mm
Nominal dielectric stress at the conductor screen E_{max} at U_0	7,06 kV/mm
Nominal dielectric stress at the core screen E_{min} at U_0	4,07 kV/mm

Conductor

Nominal cross-section of the conductor	2500 mm ²
Conductor material	Copper
Nominal diameter on conductor	61,2 mm
Type of conductor	Stranded (Milliken type)
Max. continuous conductor temperature	90 °C

Conductor screen

Nominal thickness semi-conducting conductor screen	2 mm
Material designation	Known in KEMA file
Manufacturer	Known in KEMA file

Insulation

Insulating material	XLPE
Nominal thickness of the insulation	24 mm
Material designation	Known in KEMA file
Manufacturer	Known in KEMA file

Core screen

Nominal thickness of semi-conducting core screen	1,2 mm
Material designation	Known in KEMA file
Manufacturer	Known in KEMA file

Longitudinal water barrier

Number of semi-conducting water sweallable tapes	Two
Nominal thickness and width	1,3 mm x 80 mm 2,0 mm x 80 mm
Material designation	Known in KEMA file
Manufacturer	Known in KEMA file

Number of semi-conducting water sweallable strip	One
Nominal thickness and width	0,9 mm x 20 mm
Material designation	Known in KEMA file
Manufacturer	Known in KEMA file

Metallic sheath

Material	Corrugated aluminium
Nominal thickness	2,8 mm
Anti-corrosion protection	Thin layer of bitumen
Material designation	Known in KEMA file
Manufacturer	Known in KEMA file

Outer sheath

Sheath material	HDPE type ST7
Nominal thickness of the sheath	5,0 mm
Colour of the sheath	Black
Material designation	Known in KEMA file
Manufacturer	Known in KEMA file
Graphite coating applied	Yes
Embossing on sheath	Yes

Manufacturing details

Type of extrusion line	VCV
Type of extrusion	Triple extrusion
Direction of extrusion	Vertical
Manufacturer of the extrusion line	Maillefer
Curing means	Nitrogen curing
Cooling means	Nitrogen cooling

Construction details

Drawing number	NYJB-2011-0808
Date	Aug. 8 th , 2011
Revision number	A

B OUTDOOR TERMINATION WITH PORCELAIN INSULATOR FOR EXTRUDED XLPE HV CABLE

Manufacturer Nexans Suisse SA
Type SOA1.245

Ratings assigned by the manufacturer

Rated voltages $U_o/U/U_m$ 127/220/252 kV
Rated frequency 50 Hz
Number of cores 1
Creepage distance min. 8820 mm
Flashover distance min. 2470 mm

Material data and drawings

General

Type of insulator Porcelain
Manufacturer Known in KEMA file
Colour of insulator Brown
Number of cores 1
Pedestal insulators Porcelain

Stress cone

Type of stress cone Pre-moulded stress cone
Manufacturers type designation EPDM
Manufacturer Euromold (Nexans company)

Insulating medium

Insulating medium Silicon oil
Manufacturers type designation Known in KEMA file
Manufacturer Known in KEMA file

Insulator

Manufacturers type designation 20178935
Manufacturer Known in KEMA file
Number of sheds 57 (29 big, 28 small)
Specified creepage distance min. 8820 mm
Specified flashover distance min. 2470 mm



Construction details

Drawing number	SOAH020002
Date	Nov. 11 th , 2010
Revision number	A
Simplified drawing	SOA1.245
Date	Sep. 27 th , 2011
Revision number	A
Assembling instructions	IM_SOAH020002
Date	Nov. 12 th , 2010
Revision number	Original

C OUTDOOR TERMINATION WITH COMPOSITE INSULATOR FOR EXTRUDED XLPE HV CABLE

Manufacturer Nexans Suisse SA
Type FR1.245

Ratings assigned by the manufacturer

Rated voltages $U_o/U/U_m$ 127/220/252 kV
Rated frequency 50 Hz
Number of cores 1
Creepage distance min. 7812 mm
Flashover distance min. 2100 mm

Material data and drawings

General

Type of insulator Composite
Manufacturer Nexans Suisse SA
Colour of insulator Light grey
Number of cores 1
Pedestal insulators Porcelain

Stress cone

Type of stress cone Pre-moulded stress cone
Manufacturers type designation EPDM
Manufacturer Euromold (Nexans company)

Insulating medium

Insulating medium Silicon oil
Manufacturers type designation Known in KEMA file
Manufacturer Known in KEMA file

Insulator

Manufacturers type designation 20155644
Manufacturer Known in KEMA file
Number of sheds 74 (37 big, 37 small)
Specified creepage distance min. 7812 mm
Specified flashover distance min. 2100 mm



Construction details

Drawing number	FR-H02510
Date	Nov. 5 th , 2010
Revision number	A
Simplified drawing	FR1.245
Date	Sep. 27 th , 2011
Revision number	A
Assembling instructions	IM_FR-H02510
Date	Nov. 15 th , 2010
Revision number	Original

D DRY TYPE GIS TERMINATION FOR EXTRUDED XLPE HV CABLE

Manufacturer Nexans Suisse SA
Type DTF1.245

Ratings assigned by the manufacturer

Rated voltages $U_0/U/U_m$ 127/220/252 kV
Rated frequency 50 Hz
Number of cores 1

Material data and drawings

General

Type of insulator Epoxy
Manufacturer Known in KEMA file
Colour of insulator Brown
Number of cores 1

Stress cone

Type of stress cone Pre-moulded stress cone
Manufacturers type designation Silicone rubber
Manufacturer Nexans Suisse SA

Epoxy insulator

Manufacturers type designation Known in KEMA file
Manufacturer Known in KEMA file

Construction details

Drawing number DTFH110041
Date May. 13th, 2008
Revision number B
Simplified drawing DTF1.245
Date Sep. 27th, 2011
Revision number A
Assembling instructions IM_DTFH110041
Date May. 14th, 2008
Revision number Original

E OIL IMMERSSED TYPE GIS TERMINATION FOR EXTRUDED XLPE HV CABLE

Manufacturer Nexans Suisse SA
Type SFY1.245

Ratings assigned by the manufacturer

Rated voltages $U_o/U/U_m$ 127/220/252 kV
Rated frequency 50 Hz
Number of cores 1

Material data and drawings

General

Type of insulator Epoxy
Manufacturer Known in KEMA file
Colour of insulator Chocolate
Number of cores 1

Stress cone

Type of stress cone Pre-moulded stress cone
Manufacturers type designation EPDM
Manufacturer Euromold (Nexans company)

Epoxy insulator

Manufacturers type designation Known in KEMA file
Manufacturer Known in KEMA file

Construction details

Drawing number SFYH110251
Date May. 14th, 2008
Revision number B
Simplified drawing SFY1.245
Date Sep 27th, 2011
Revision number A
Assembling instructions IM_SFYH110251_a
Date May. 14th, 2008
Revision number A

F CROSSBONDING JOINT FOR EXTRUDED XLPE HV CABLE

Manufacturer Nexans Suisse SA
Type SMP1.245-31

Ratings assigned by the manufacturer

Rated voltages $U_0/U/U_m$ 127/220/252 kV
Rated frequency 50 Hz
Number of cores 1

Material data and drawings

General

Type of joint Crossbonding joint
Type of insulation Pre-moulded type
Number of cores 1
Type of connector Compression type

Stress cone

Type of stress cone Pre-moulded sleeve
Manufacturers type designation EPDM
Manufacturer Euromold (Nexans company)

Construction details

Drawing number SMPH319973
Date Jul. 15th, 2010
Revision number A
Simplified drawing SMP1.245-31
Date Sep. 27th, 2011
Revision number A
Assembling instructions IM_SMPH319973
Date Oct. 22nd, 2010
Revision number Original

The manufacturer has guaranteed that the objects submitted to the tests have been manufactured in accordance with the technical data represented above.

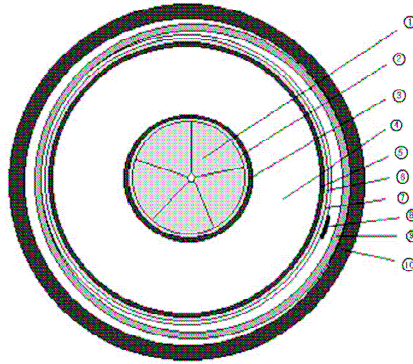
The manufacturer is responsible for the correctness of these data.

For the data of the cable and cable accessories reference is made to annex J.

For pictures reference is made to annex H and I.

ANNEX J DRAWING OF THE 220 KV XLPE CABLE

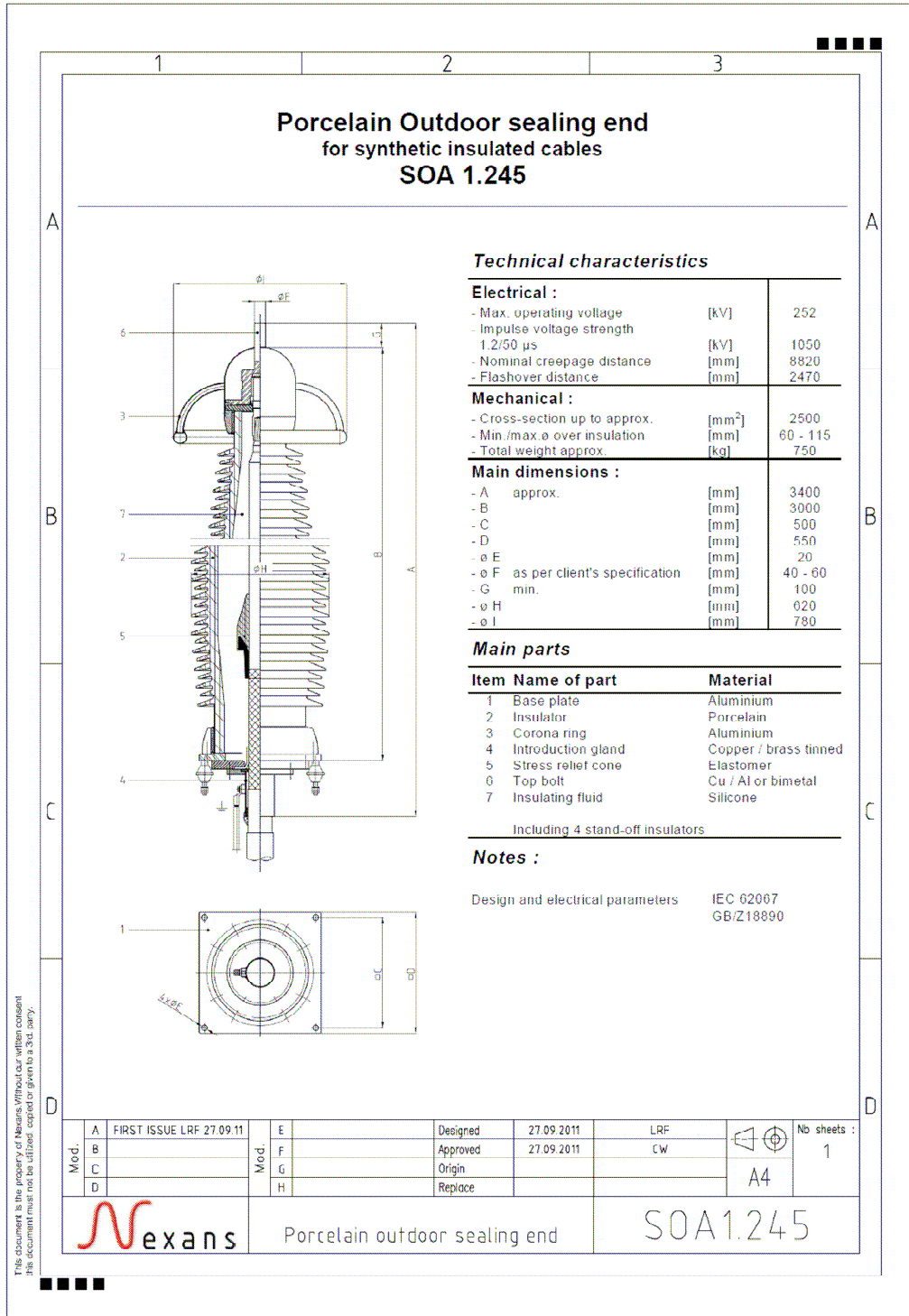
Cable Cross-section Drawing YJLW03-Z 127/220kV 1×2500 mm²



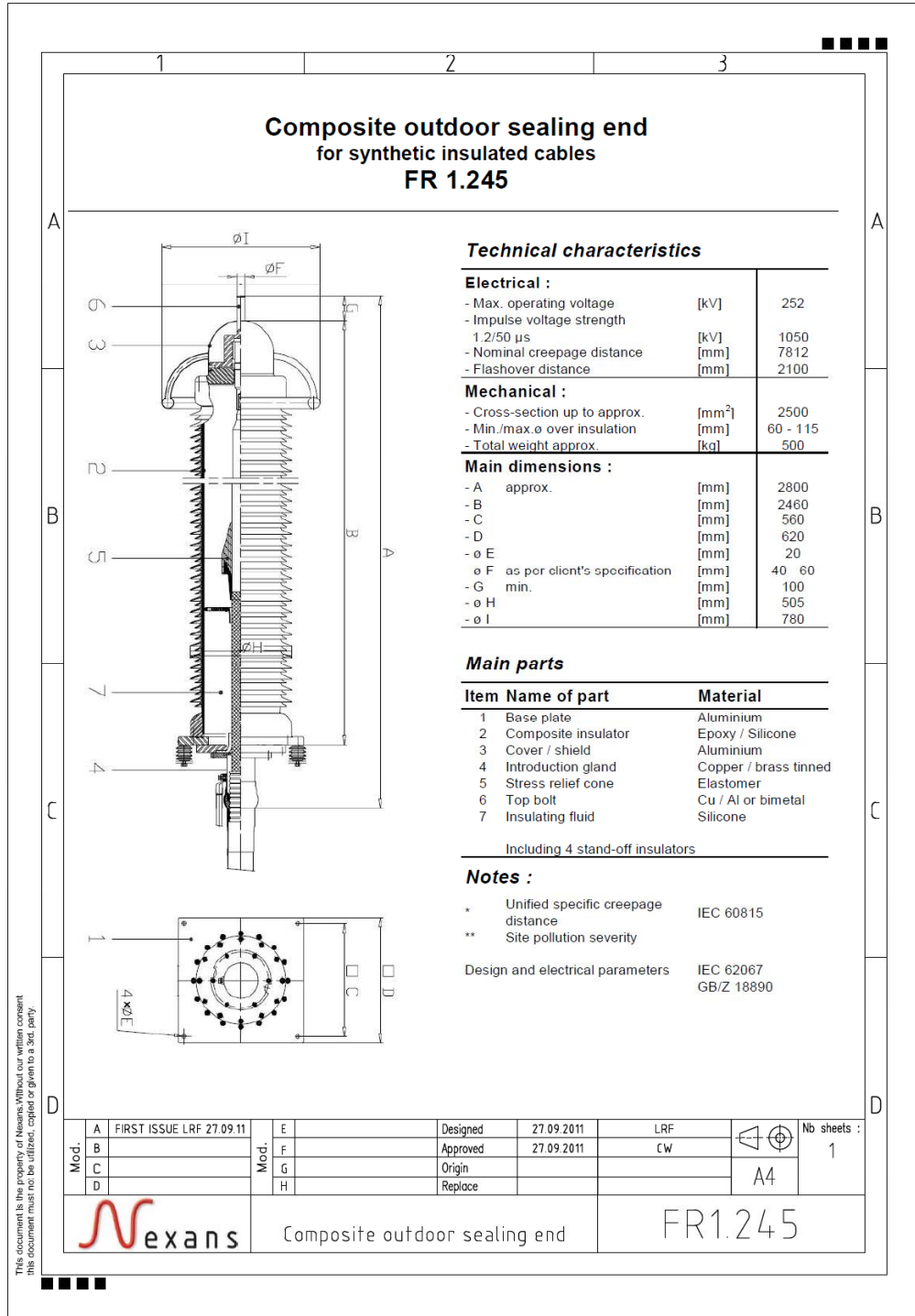
No.	Construction of cable	Diameter (mm)
①	Five segment conductor	61.2±0.8
②	Semi-conductive tape	62.8±0.8
③	Conductor screen	66.8±0.5
④	XLPE insulation	116.4±1.0
⑤	Insulation screen	118.8±1.0
⑥	Semi-conductive waterblocking tape	122.8±1.5
⑦	Semi-conductive cushion water blocking tape	128.8±2.0
⑧	Semi-conductive cushion water blocking strip	129.0±2.0
⑨	Corrugated aluminium sheath	148.2 ±3.0
⑩	HDPE outer sheath (including bitumen anti-corrosion layer and graphite coating)	158.2 ±3.0

Manufacturer name	Drawing number	Drawing written date	Revision number
Guangdong Nanyang Extra High Voltage Cable Co., Ltd	NYJB-2011-0808	AUGUST 8,2011	A

DRAWING OF THE OUTDOOR TERMINATION WITH PORCELAIN INSULATOR



DRAWING OF THE OUTDOOR TERMINATION WITH COMPOSITE INSULATOR



DRAWING OF THE DRY TYPE GIS TERMINATION

**Dry type GIS sealing end
for synthetic insulated cables
DTF 1.245**

Technical characteristics

Electrical :		
- Max. operating voltage	[kV]	252
- Impulse voltage strength		
1.2/50 μs	[kV]	1050
Mechanical :		
- Cross section up to approx.	[mm ²]	2500
- Min./max. ø over insulation	[mm]	08 - 115
- Total weight approx.	[kg]	140
Main dimensions :		
- A approx.	[mm]	1200
- B	[mm]	620
- ø C	[mm]	475
- ø D	[mm]	500
- E		16
- ø F	[mm]	14
- ø G	[mm]	110
- ø H	[mm]	M12

Main parts

Item	Name of part	Material
1	Insulator	Epoxy
2	Stress relief cone	Elastomer
3	Connector	Copper / Aluminium
4	Introduction gland	Copper / brass tinned
5	Intermediate part	Aluminium
6	Fixing flange	Aluminium

Notes :

Technical specification as per IEC 62271-209 (former IEC 60859)
 Design and electrical parameters IEC 62067
 GB/Z 18890

Optional: adapter for "B" = 960 mm and intermediate fixing flange are possible

Mod.	A	FIRST ISSUE LRF 27.09.11
	B	
	C	
	D	

Mod.	E	
	F	
	G	
	H	

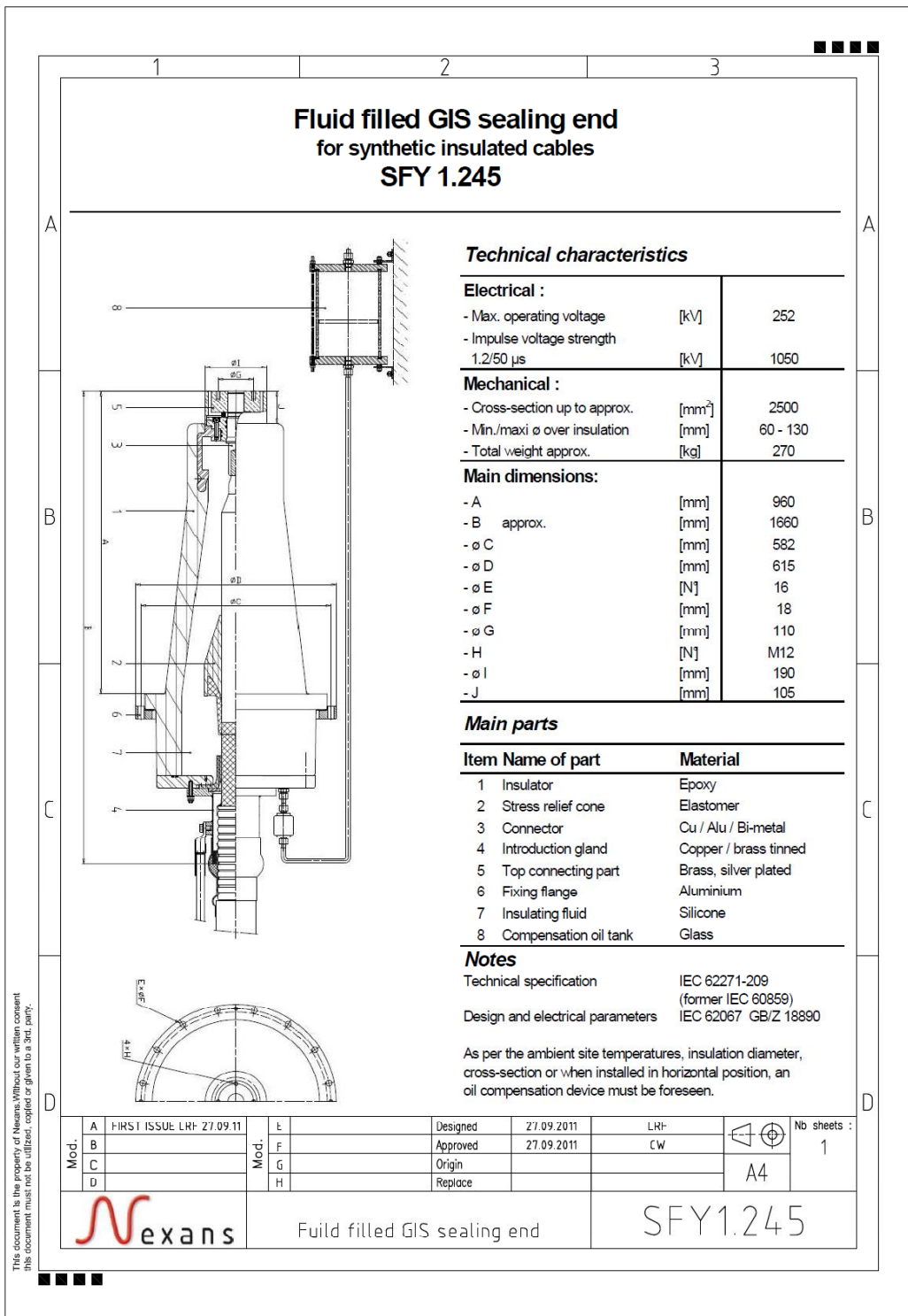
Designed	27.09.2011	LRF
Approved	27.09.2011	CW
Origin		
Replace		

Nb sheets :	1
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Dry type GIS sealing end

DTF1.245

DRAWING OF THE OIL IMMERSED TYPE GIS TERMINATION



DRAWING OF THE CROSSBONDING JOINT

