

Tender No. :	Ref. No. : LSGS-14-CX0039-03
User / Customer :	Page No. : 1 of 7
Tender Title :	
Bidder : LS Cable & System Ltd.	

Document Title :

Specification

For

**FOAMED DIELECTRIC COAXIAL CABLE
FOR MOBILE NETWORKS**

< HFC(-FR) 12D, LHF(-FR) 22D, LHF(-FR) 33D, LHF(-FR) 42D >

Rev. No.	Date	Descriptions	Prepared By	Reviewed By	Approved By
3	OCT. 15, 2014	Update	Sang-Sik Shin	-	Jong-Seb Baeck
2	SEP. 17, 2014	Update	Sang-Sik Shin	-	Jong-Seb Baeck
1	AUG. 26, 2014	Update	Sang-Sik Shin	-	Jong-Seb Baeck
0	FEB. 20, 2014	Original Issue	Kyudo Cho	Sang-Sik Shin	Jong-Seb Baeck

1. SCOPE

1.1 Application

This specification details the requirements for 50 ohm foam dielectric, corrugated outer conductor coaxial cable for mobile networks.

1.2 Cable Description

Foam dielectric, Corrugated Copper Outer Conductor, Standard black PE or Flame Retardant Halogen Free black PE jacket.

Table 1 Cable description

Cable Code	Cable Type	Cable Size	Jacket
HFC 12D	Flexible Cable	1/2"	Standard black PE
HFC-FR 12D	Flexible Cable	1/2"	Flame Retardant Halogen Free black PE
LHF 22D	Low Loss Flexible Cable	7/8"	Standard black PE
LHF-FR 22D	Low Loss Flexible Cable	7/8"	Flame Retardant Halogen Free black PE
LHF 33D	Low Loss Flexible Cable	1-1/4"	Standard black PE
LHF-FR 33D	Low Loss Flexible Cable	1-1/4"	Flame Retardant Halogen Free black PE
LHF 42D	Low Loss Flexible Cable	1-5/8"	Standard black PE
LHF-FR 42D	Low Loss Flexible Cable	1-5/8"	Flame Retardant Halogen Free black PE

2. CABLE CODE DESIGNATION

Table 2 cable code designations

1 st word : Cable Type		2 nd word : Jacket Option		3 rd word : Cable Size	
HFC	Flexible Cable	FR	Low-smoke Zero-halogen, Flame retardant	12D	1/2"
				22D	7/8"
LHF	Low Loss Flexible Cable			33D	1-1/4"
				42D	1-5/8"

3. Electrical Characteristics

The Electrical Characteristics of RF coaxial cable shall be in accordance with Table 3 below

Table 3. The Flexible cable of RF coaxial cable
(ref. IEC 61196-1)

ITEM		UNITS	SPECIFICATION			
			HFC(-FR)12D (F.1/2")	LHF(-FR)22D (F.7/8")	LHF(-FR)33D (F.1-1/4")	LHF(-FR)42D (F.1-5/8")
Dielectric Strength		-	No breakdown at DC 4000V For 1 Min.	No breakdown at DC 6000V For 1 Min.	No breakdown at DC 9000V For 1 Min.	No breakdown at DC 11000V For 1 Min.
Insulation Resistance		MΩ.km	≥ 10000	≥ 10000	≥ 10000	≥ 10000
Relative Propagation Velocity		%	88±3	90±3	89±3	90±3
*Characteristic Impedance		Ω	50±1	50±1	50±1	50±1
VSWR	100~200MHz	-	≤ 1.15	≤ 1.15	≤ 1.15	≤ 1.15
	806~960MHz		≤ 1.15	≤ 1.15	≤ 1.15	≤ 1.15
	1700~2170MHz		≤ 1.15	≤ 1.15	≤ 1.15	≤ 1.15
Nominal Attenuation *Ambient temperature 20℃	150MHz	dB/100m	2.67	1.39	0.98	0.80
	450MHz		4.75	2.44	1.78	1.44
	824MHz		6.49	3.38	2.51	2.02
	890MHz		6.76	3.53	2.64	2.11
	960MHz		7.04	3.67	2.75	2.20
	1700MHz		9.61	5.04	3.84	3.05
	1800MHz		9.91	5.21	3.97	3.16
	2000MHz		10.70	5.52	4.25	3.36
	2400MHz		11.81	6.13	4.73	3.74
3000MHZ	13.44	6.96	5.43	-		

* The above electrical figures should be guaranteed on condition that the cable is well fitted with our supplied connectors for good electrical matching at the cable length 100M

* Characteristic impedance is the average value at the frequency range of 30~2400 MHz

* The attenuation may rise by 0.2%/ °C with rising temperature.

* Maximum attenuation value shall not exceed 105% of nominal value

4. CABLE CONSTRUCTION

The construction of the cable shall be in accordance with Table 4 below.

Table 4. Construction of the Cable

ITEM	DESCRIPTION			
	HFC 12D / HFC-FR 12D	LHF 22D / LHF-FR 22D	LHF 33D / LHF-FR 33D	LHF 42D / LHF-FR 42D
Inner conductor	Copper clad aluminum	Smooth copper tube	Smooth copper tube	Corrugated copper tube
Diameter[mm]	4.82 ± 0.2	9.45 ± 0.4	13.8 ± 0.5	18.0 ± 1.0
Dielectric	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene	Foamed Polyethylene
Diameter[mm]	12.2 ± 0.5	23.0 ± 1.0	33.0 ± 1.0	43.0 ± 1.2
Outer conductor	Corrugated copper tube	Corrugated copper tube	Corrugated copper tube	Corrugated copper tube
Diameter[mm]	13.8 ± 0.5	25.2 ± 1.0	36.5 ± 1.0	46.7 ± 1.2
Jacket	*Standard black PE or F-R/H-F black PE	*Standard black PE or F-R/H-F black PE	*Standard black PE or F-R/H-F black PE	*Standard black PE or F-R/H-F black PE
Diameter[mm]	15.9 ± 0.8	28.2 ± 1.2	39.4 ± 1.3	50.0 ± 1.5

* F-R : Fire-Retardant, H-F : Halogen Free

5. PHYSICAL / MECHANICAL / ENVIRONMENTAL PERFORMANCE AND TESTS

5.1 Temperature Range

For the cables covered by this specification, the following temperature ranges apply:

- Operating Temperature
 - .Standard Jacket : -40°C to +80°C
 - .F-R Jacket : -30°C to +80°C

5.2 Mechanical and Environmental Performance of the Cable

The mechanical and environmental performance of the cable shall be in accordance with Table 5 below

Table 5. The Mechanical and Environmental Performance of the Cable

ITEMS	TEST METHOD AND ACCEPTANCE CRITERIA
Bending	# Test method: IEC 61196-1 - Mandrel diameter: : HFC 12D / HFC-FR 12D : 250 mm : LHF 22D / LHF-FR 22D : 500 mm : LHF 33D / LHF-FR 33D : 760 mm : LHF 42D / LHF-FR 42D : 1000 mm - No. of turns: 10 turns # Acceptance Criteria - No breaks in metallic elements of the cable
Behavior under fire Conditions (Jacket Option:F-R Type)	No-fire propagation : IEC 60332-3-24 (height of charred portion: max. 2500mm) Halogen content : IEC 60754-1/2 (1: chlorine<0.5%, 2: pH-value>3.5, conductivity<100 μ s/cm) Smoke density : IEC 61034-1/2 (light transmittance : min. 60%)

6. PACKING AND MARKING

6.1 Cable Marking

The jacket shall be marked with white characters at intervals of one meter with the following information. Other marking is also available if requested by customer.

- (1) Cable type
- (2) Manufacturer's name
- (3) Year of manufacture
- (4) Length marking

6.2 Cable Packing

6.2.1 Each length of the cable shall be wound on a separate wooden or plywood reel.

6.2.2 Both ends of the cable shall be sealed with a suitable plastic cap to prevent the entry of moisture during shipping, handling and storage.

6.2.3 The cable ends shall be securely fastened to the reel to prevent the cable from becoming loose in transit or during placing operations.

6.2.4 Cable may be reeled in drum inversely. The end of cable length marking may be positioned at the start point of drum.

6.3 Cable Reel

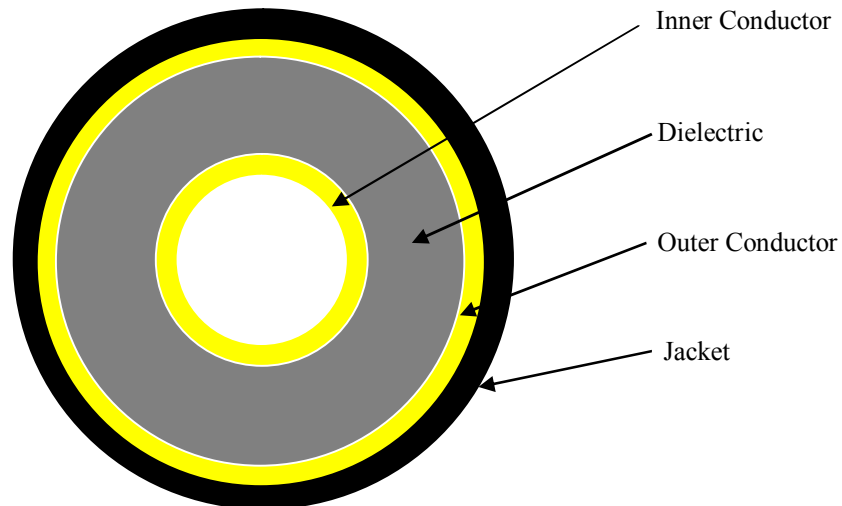
6.3.1 Details given below shall be distinctly marked with a weather proof material on the both outer sides of the reel flange. Other shipping mark is also available if requested by customer.

- (1) Length of cable in meter or feet
- (2) Cable type
- (3) Gross weight in kilogram
- (4) Reel number
- (5) Name of the manufacturer
- (6) Arrow showing the direction the drum shall be rolled

6.3.2 The cable shall be shipped on reels designed to prevent damage to the cable during shipment and installation.

< Cross-sectional Drawing of Cable >

1. RF Coaxial Cable



- The drawing appearing on this page is not warranty, and may be subject to change or modification without any prior notice.

== End of Specification ==