



**Draka Comteq**

Your partner in quality cable solutions

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**NK CABLES**

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# *NK Cables Indoor Products*

*Version 1*

**NK CABLES**

A world map silhouette is overlaid on a dark blue background. Numerous glowing fiber optic light trails in shades of orange, red, and yellow curve across the map, representing global communication networks. The background has a subtle grid pattern.

## Contents

<i>Your partner in quality cable solutions</i>	3
All in one package	3
Mobile Networks Worldwide	3
NK Cables	3
<i>NK Cables Indoor Products</i>	4
<i>Indoor coverage in buildings</i>	4
Applications	4
DAS system	4
Fire performance	5
Products	5
<i>Indoor coverage in tunnels and     in special areas</i>	7
Applications	7
CAS system	7
Fire performance	8
Electrical performance	8
Products	9
<i>Comparison of the DAS and     CAS systems</i>	12
<i>Jumpers</i>	12
<i>Accessories</i>	13
Connectors	13
Tools for Connectors	14
Grounding kits	14
Coaxial antenna hangers	15
Power splitters, taps, directional couplers	16
Terminations	17
Amplifiers, couplers and filters	17
<i>Drums</i>	18
<i>Codes</i>	20

All information in this catalog is subject to change without prior notice.



# *Your partner in quality cable solutions*

NK Cables' feeder cables and coaxial antennas have been designed to meet the highest quality and environmental standards. An essential part of our philosophy is to maintain continuous improvement and development of new products and services to provide value to our customers.

In response to market demand, we offer a more complete product range – NK Cables Indoor Products – consisting of feeder cables, coaxial antenna cables, jumpers, connectors and other accessories.

## *All in one package*

With this one-stop shopping package we guarantee our customers the compatibility of the different elements, and warrant the proper operation of our cables and accessories provided the installation is carried out in accordance with our installation instructions. Furthermore, we offer technical support to our indoor coverage customers.

## *Mobile Networks Worldwide*

NK Cables is a recognized feeder and coaxial antenna line provider. Our cables are produced in Oulu Finland, China and Brazil. Our distribution centers are in Hamburg, Shanghai, Singapore, Dallas, Mexico City, and Campinas near Sao Paulo. An extensive sales network serves our customers worldwide.

## *NK Cables*

NK Cables has been a recognized supplier of cables since 1912. We work under the Draka Comteq marketing label, combining communication cables, fibers and systems. Our product portfolio consists of products and services for both mobile and fixed networks.

# NK Cables Indoor Products

There are two ways to make the mobile phone signal reach the normal fixed network in indoor coverage systems: distributed antenna system and coaxial antenna system. These systems enable people to use their mobile phones in areas not normally covered by RF signals.

## Indoor coverage in buildings

### APPLICATIONS

The distributed antenna system (DAS) is the most popular way to build indoor coverage network in buildings. It is the most cost effective solution in buildings with large open spaces and light separation walls, because then the propagation of the antenna signal beam is not disrupted. Examples of structures easy to cover with point source antennas include factory halls, car park areas, office buildings and reception halls in large public buildings.

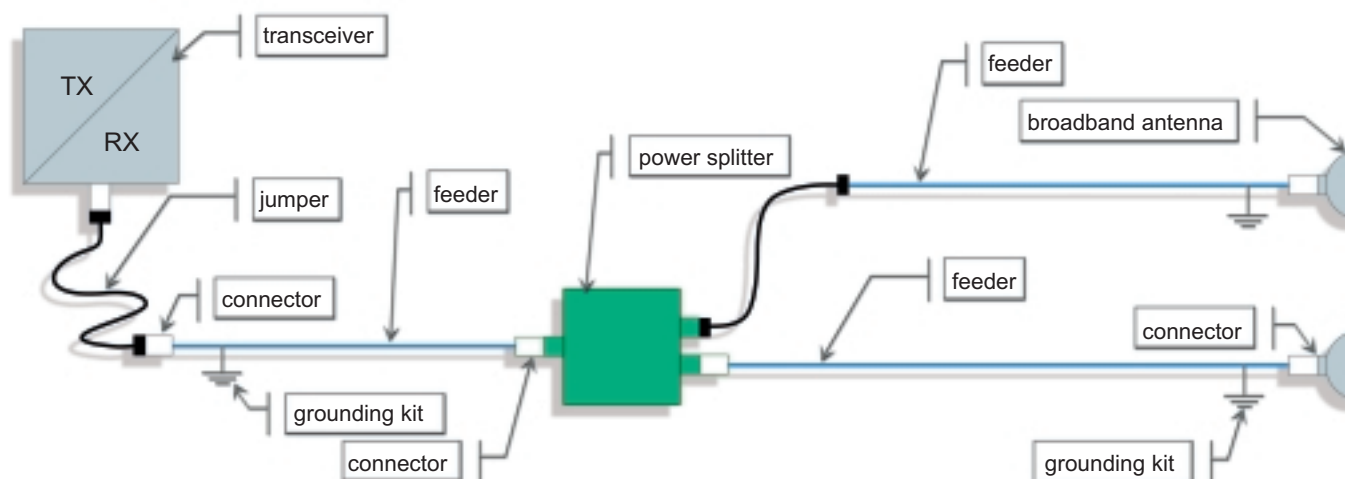


DAS system in a station environment.

### DAS SYSTEM

This system is based on several distributed antennas within the indoor coverage area, which are linked together with feeder cables. The distributed antenna system consists usually of a base station or repeater,

jumpers, connectors, feeder cables, power splitters, and distributed antennas. Also multi-frequency couplers/filters are needed in systems where different operating frequencies are connected to the same distributed antenna.



Simplified picture of the DAS system.

## FIRE PERFORMANCE

Cables for the DAS system are usually installed in environments where fire safety is essential. NK Cables supplies low-smoke halogen-free RF cables with flame or fire retardant constructions fulfilling the requirements listed in table below. In addition, our BHF jacketed RF cables pass the UL 1666 Flame test and can be supplied with a UL Rating of CATVR.

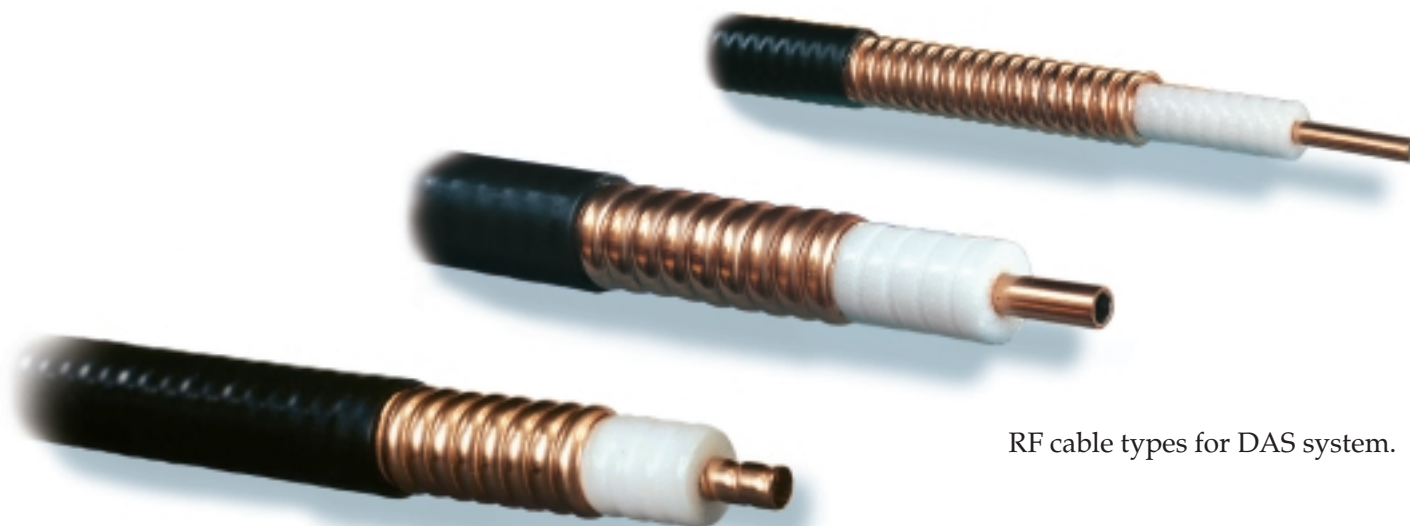


Test on flammability of single cables.

CHARACTERISTICS	TEST METHOD
Fire propagation	IEC 60332-1, IEC 60332-3C and UL 1666
Smoke generation	IEC 61034-1 and IEC 61034-2
Acid gases generation	IEC 60754-1 and IEC 60754-2

The most important aspects in the fire performance of the cables according to IEC standards.

## PRODUCTS



RF cable types for DAS system.

NK Cables' feeder cables for indoor coverage system are made as several cross sections meeting the requirements of most DAS applications: RF 1/2", RF 5/8", RF 7/8", RF 1 1/4", RFF 1/2" and RFE 7/8".

Properties and performances of the DAS cables are listed in Table below.

RF BHF cables for DAS systems.

PRODUCTS	RF 1/2" BHF	RF 5/8" BHF	RF 7/8" BHF	RF 1 1/4" BHF	RFF 1/2" BHF	RFE 7/8" BHF
<b>PRODUCT CODE</b>	NKRF01202	NKRF05802	NKRF07802	NKRF11402	NKRFF01202	NKRFE07802
<b>CONSTRUCTION</b>						
Inner conductor	Ø 4.8 mm	Ø 7.0 mm	Ø 9.0 mm	Ø 13.0 mm	Ø 3.55 mm*	Ø 9.4 mm**
Copper wire, tube	(Ø 0.19 in)	(Ø 0.28 in)	(Ø 0.35 in)	(Ø 0.51 in)	(Ø 0.14 in)	(Ø 0.37 in)
Dielectric	Ø 12.1 mm	Ø 17.6 mm	Ø 22.2 mm	Ø 32.2 mm	Ø 9.0 mm	Ø 21.7 mm
Cellular polyethylene	(Ø 0.48 in)	(Ø 0.69 in)	(Ø 0.87 in)	(Ø 1.27 in)	(Ø 0.35 in)	(Ø 0.85 in)
Outer Conductor	Ø 13.6 mm	Ø 19.7 mm	Ø 24.9 mm	Ø 35.8 mm	Ø 11.9 mm	Ø 24.9 mm
Corrugated copper tube	(Ø 0.54 in)	(Ø 0.78 in)	(Ø 0.98 in)	(Ø 1.41 in)	(Ø 0.47 in)	(Ø 0.98 in)
Jacketing BHF (black halogen free fire retardant)	Ø 16.0 mm	Ø 21.9 mm	Ø 27.5 mm	Ø 39.0 mm	Ø 13.5 mm	Ø 27.5 mm
	(Ø 0.63 in)	(Ø 0.86 in)	(Ø 1.08 in)	(Ø 1.54 in)	(Ø 0.53 in)	(Ø 1.08 in)
<b>ELECTRICAL CHARACTERISTICS</b>						
Characteristic impedance	50 ± 1 Ω	50 ± 1 Ω	50 ± 1 Ω	50 ± 1 Ω	50 ± 1 Ω	50 ± 1 Ω
Return loss (typical value)	24 dB	24 dB	24 dB	24 dB	24 dB	24 dB
VSWR	(1.13)	(1.13)	(1.13)	(1.13)	(1.13)	(1.13)
Attenuation dB/100m (dB/ 100ft)						
50 MHz	1.51 (0.46)	1.04 (0.32)	0.82 (0.25)	0.57 (0.17)	2.26 (0.69)	0.89 (0.27)
100 MHz	2.16 (0.66)	1.49 (0.54)	1.17 (0.36)	0.82 (0.25)	3.24 (0.99)	1.27 (0.39)
450 MHz	4.74 (1.44)	3.28 (1.00)	2.57 (0.78)	1.83 (0.56)	7.21 (2.20)	2.83 (0.86)
900 MHz	6.88 (2.10)	4.77 (1.45)	3.74 (1.14)	2.70 (0.82)	10.6 (3.23)	4.15 (1.27)
1800 MHz	10.1 (3.08)	7.02 (2.14)	5.51 (1.68)	4.03 (1.23)	15.7 (4.79)	6.17 (1.88)
2200 MHz	11.3 (3.44)	7.87 (2.40)	6.18 (1.88)	4.54 (1.38)	17.7 (5.39)	6.94 (2.11)
2400 MHz	11.9 (3.63)	8.27 (2.52)	6.49 (1.98)	4.79 (1.46)	18.6 (5.67)	7.30 (2.23)
Velocity factor	0.88	0.88	0.88	0.88	0.88	0.88
Capacitance	76 pF/m (23 pF/ft)	76 pF/m (23 pF/ft)	76 pF/m (23 pF/ft)	76 pF/m (23 pF/ft)	76 pF/m (23 pF/ft)	76 pF/m (23 pF/ft)
Cut-off frequency	10 000 MHz	6800 MHz	5300 MHz	3700 MHz	12 500 MHz	5300 MHz
Max power rating (50 MHz/2400 MHz)	5.3/0.66 kW	8.3/1.0 kW	12/1.4 kW	18/2.0 kW	3.5/0.43 kW	10/1.3 kW
Peak RF voltage rating	1.80 kV	2.50 kV	3.2 kV	4.6 kV	1.39 kV	2.8 kV
Peak power rating	25.9 kW	58 kW	89 kW	194 kW	19.0 kW	84 kW
DC-resistance						
Inner conductor	0.95 Ω/km (0.29 Ω/1000 ft)	1.23 Ω/km (0.37 Ω/1000 ft)	1.04 Ω/km (0.32 Ω/ 1000 ft)	0.64 Ω/km (0.20 Ω/ 1000 ft)	2.73 Ω/km (0.83 Ω/ 1000 ft)	2.50 Ω/km (0.76 Ω/ 1000 ft)
Outer conductor	1.99 Ω/km (0.61 Ω/1000 ft)	1.09 Ω/km (0.33 Ω/ 1000 ft)	1.00 Ω/km (0.30 Ω/ 1000 ft)	0.55 Ω/km (0.17 Ω/ 1000 ft)	4.11 Ω/km (1.25 Ω/ 1000 ft)	1.05 Ω/km (0.32 Ω/ 1000 ft)
<b>MECHANICAL CHARACTERISTICS</b>						
Weight	350 kg/km (0.24 lb/ft)	410 kg/km (0.28 lb/ft)	530 kg/km (0.36 lb/ft)	940 kg/km (0.63 lb/ft)	190 kg/km (0.13 lb/ft)	434 kg/km (0.29 lb/ft)
Maximum pulling force	1100 N (250 lb)	1600 N (360 lb)	1800 N (400 lb)	2500 N (560 lb)	500 N (110 lb)	1500 N (337 lb)
Minimum bending radius						
Single bending	80 mm (3 in)	100 mm (4 in)	120 mm (5 in)	200 mm (8 in)	15 mm (0.6 in)	80 mm (3.2 in)
Repeated bending	160 mm (6 in)	200 mm (8 in)	250 mm (10 in)	350 mm (14 in)	30 mm (1.2 in)	110 mm (4.3 in)
Operating temperature range	-40..+70 °C (-40..+158 °F)	-40..+70 °C (-40..+158 °F)	-40..+70 °C (-40..+158 °F)	-40..+70 °C (-40..+158 °F)	-40..+70 °C (-40..+158 °F)	-40..+70 °C (-40..+158 °F)
Min. installation temperature (BHF sheath)	-5 °C (+23 °F)	-5 °C (+23 °F)	-5 °C (+23 °F)	-5 °C (+23 °F)	-5 °C (+23 °F)	-5 °C (+23 °F)
<b>CONNECTOR CODE</b>						
N male	NKC1012300	NKC1058300	NKC1078300	NKC1114300	NKC2012320	NKC1078300
N female	NKC1012400	NKC1058400	NKC1078400	NKC1114400	NKC2012420	NKC1078400
7/16 male	NKC1012100	NKC1058100	NKC1078100	NKC1114100	NKC2012120	NKC1078100
7/16 female	NKC1012200	NKC1058200	NKC1078200	NKC1114200	NKC2012220	NKC1078200

Subject to change without prior notice

\*copper-clad aluminium wire  
\*\*corrugated copper tube



# Indoor coverage in tunnels and special areas

## APPLICATIONS

The coaxial antenna system (CAS) is the most popular way to build indoor coverage network in tunnels. Examples of areas difficult to cover with point source antennas include tunnels, mines, subways, metal-hulled ships, nuclear power plants, trains, airports and special applications such as vertical shafts in tall buildings.



CAS system in a tunnel environment.

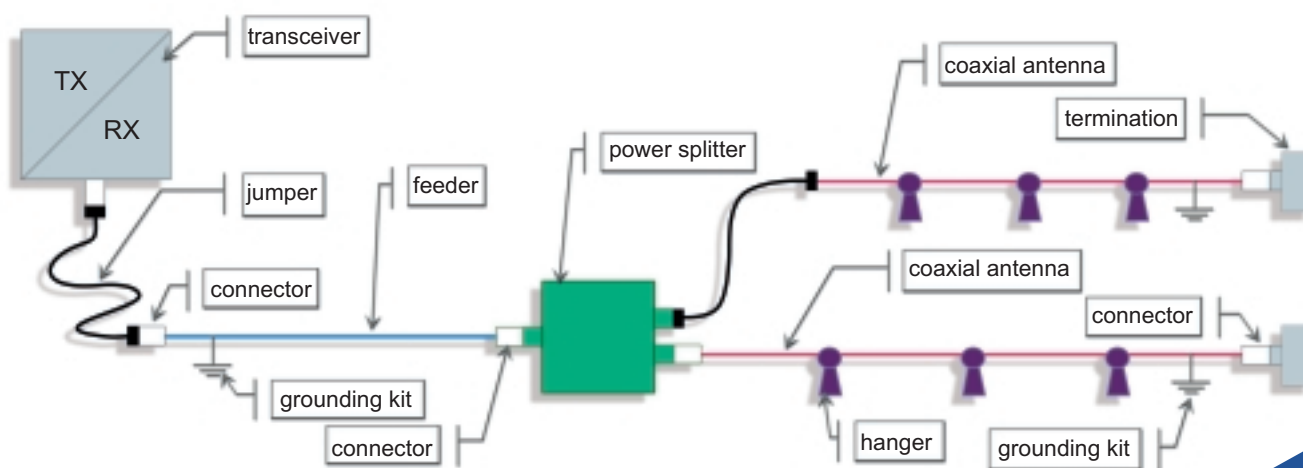
## CAS SYSTEM

This system, compared to the DAS, means the distributed antennas and some of the feeder cables are replaced with coaxial antennas. Basically, the CAS contains the same components as the DAS system. Only the coaxial antenna and a 50 Ω termination at the end of the antenna line are additional components compared to the DAS.

The design of a coaxial antenna system is well defined. The primary objective in the design of the coaxial antenna system is to provide an adequate signal

at all points in the system. The most important system design factors of the coaxial antenna are the longitudinal attenuation and the coupling loss of the coaxial antenna.

To maintain good transmission characteristics, especially with the attenuation, it is very important that cables are installed at least 100 mm away from walls and ceilings. Special hangers have been developed to guarantee this requirement. The slots in the cable do not have to be directed if the cable is installed correctly.



Simplified picture of the CAS system.



## FIRE PERFORMANCE

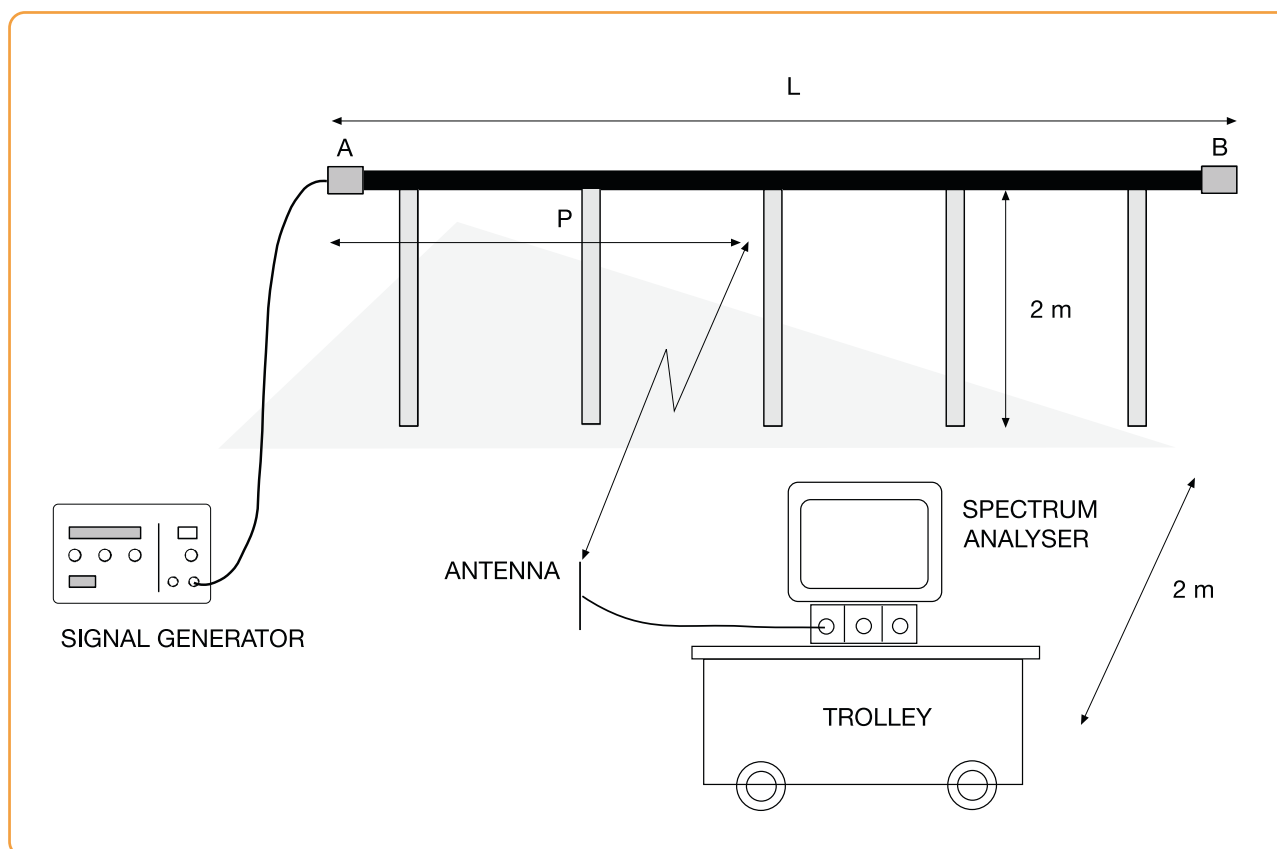
CAS cables have the same fire performance properties as DAS cables except IEC 60332-3C and UL 1666 are met only with an additional fire barrier

tape between the outer conductor and the sheath. An exception is RFX 1/2" which meets IEC 60332-3C without the barrier tape.

## ELECTRICAL PERFORMANCE

The performance of our RFX cables is measured through an extensive test program. The most important electrical characteristics of the coaxial antennas

are the longitudinal attenuation and the coupling loss. Both characteristics are measured along the standard IEC 61196-4 using the free space method.

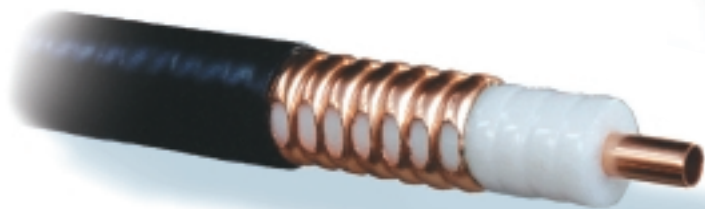


The free space method for measuring the coupling loss (IEC 61196-4).

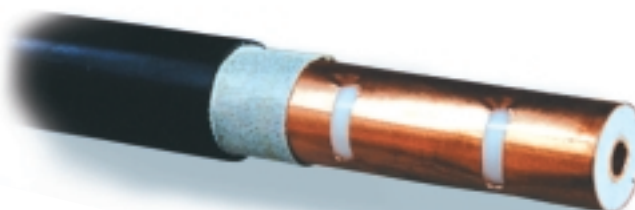
## PRODUCTS

NK Cables' coaxial antennas include two product families: RFX and RF2X cables for broadband systems in buildings and tunnels and RFXT cables mainly for selected frequencies in tunnels. RFX and RF2X cables are coupled mode cables with a corrugated and milled outer conductor. RFX cables

have slots in one line on the outer conductor and RF2X have slots in two lines on the outer conductor. A radiating mode cable RFXT has a slotted overlapped copper tape as the outer conductor. RFFX and RFEX cables are more flexible and are excellent choices for buildings, trains, etc.



RFX-type coaxial antenna



RFXT-type coaxial antenna

RFX or RF2X cables can also be equipped with a suspension wire (RFXK or RF2XK cable). Many colors are available as required.



RFXK-type coaxial antenna



Color choices for coaxial antennas

PRODUCTS	RFX 1/2" BHF		RFX 5/8" BHF		RFX 7/8" BHF		RFX 1 1/4" BHF		RFX 1 5/8" BHF	
	RF2X 1/2" BHF		RF2X 5/8" BHF		RF2X 7/8" BHF		RF2X 1 1/4" BHF		RF2X 1 5/8" BHF	
<b>PRODUCT CODE</b> RFX/RF2X	NKRFX01202/ NKRF2X01202		NKRFX05802/ NKRF2X05802		NKRFX07802/ NKRF2X07802		NKRFX11402/ NKRF2X11402		NKRFX15802/ NKRF2X15802	
<b>CONSTRUCTION</b>										
Inner conductor	Ø 4.8 mm (Ø 0.19 in)		Ø 7.0 mm (Ø 0.28 in)		Ø 9.0 mm (Ø 0.35 in)		Ø 13.0 mm (Ø 0.51 in)		Ø 17.5 mm (Ø 0.69 in)	
Copper wire, tube										
Dielectric	Ø 12.1 mm (Ø 0.48 in)		Ø 17.6 mm (Ø 0.69 in)		Ø 22.2 mm (Ø 0.87 in)		Ø 32.2 mm (Ø 1.27 in)		Ø 41.0 mm (Ø 1.65 in)	
Cellular polyethylene										
Outer Conductor	Ø 13.6 mm (Ø 0.54 in)		Ø 19.7 mm (Ø 0.78 in)		Ø 24.9 mm (Ø 0.98 in)		Ø 35.8 mm (Ø 1.41 in)		Ø 46.5 mm (Ø 1.83 in)	
Corrugated copper tube										
Jacketing BHF (black halogen free fire retardant)	Ø 16.0 mm (Ø 0.63 in)		Ø 21.9 mm (Ø 0.86 in)		Ø 27.5 mm (Ø 1.08 in)		Ø 39.0 mm (Ø 1.54 in)		Ø 50.0 mm (Ø 1.97 in)	
<b>ELECTRICAL CHARACTERISTICS</b>										
Characteristic impedance	50 ± 2 Ω		50 ± 2 Ω		50 ± 2 Ω		50 ± 2 Ω		50 ± 2 Ω	
Return loss (typical value)	18 dB		18 dB		18 dB		18 dB		18 dB	
Attenuation measured according to IEC 61196-4 free space method dB/100m (dB/100 ft)										
RFX/RF2X										
75 MHz	2.1/2.2	(0.64/0.67)	1.5/1.6	(0.46/0.49)	1.3/1.4	(0.40/0.43)	1.0/1.1	(0.30/0.34)	0.6/0.8	(0.18/0.24)
150 MHz	3.1/3.2	(0.94/0.98)	2.2/2.3	(0.67/0.70)	1.7/1.8	(0.52/0.55)	1.3/1.4	(0.40/0.43)	1.0/1.1	(0.30/0.34)
450 MHz	5.4/5.5	(1.65/1.68)	3.8/3.9	(1.16/1.19)	2.9/3.1	(0.88/0.94)	2.2/2.5	(0.67/0.76)	1.8/1.9	(0.55/0.58)
900 MHz	7.9/8.2	(2.41/2.50)	5.5/5.6	(1.68/1.71)	4.2/4.6	(1.28/1.40)	3.2/3.8	(0.98/1.16)	2.7/2.9	(0.82/0.88)
1800 MHz	11.7/12.2	(3.57/3.72)	8.2/8.3	(2.50/2.53)	6.2/7.0	(1.89/2.13)	4.9/6.4	(1.49/1.95)	4.2/4.9	(1.28/1.49)
2200 MHz	13.1/13.7	(3.99/4.18)	9.3/9.5	(2.83/2.90)	7.0/7.9	(2.13/2.41)	5.6/7.4	(1.71/2.26)	4.8/6.0	(1.46/1.83)
2400 MHz	14.2/14.7	(4.33/4.48)	10.0/10.2	(3.05-3.11)	7.5/8.5	(2.29/2.59)	6.2/8.0	(1.89/2.44)	5.4/6.4	(1.65/1.95)
Coupling loss measured according to IEC 61196-4 free space method (dB)										
RFX/RF2X										
	50%	95%	50%	95%	50%	95%	50%	95%	50%	95%
75 MHz	65/62	77/74	66/62	78/74	68/61	78/69	65/60	77/69	74/64	84/75
150 MHz	69/66	81/78	67/66	80/78	69/68	80/79	69/64	78/76	71/64	82/78
450 MHz	72/69	82/80	69/68	81/80	70/68	82/80	68/63	79/74	68/63	79/74
900 MHz	72/69	84/79	71/69	83/79	70/67	82/79	69/66	81/78	75/69	87/79
1800 MHz	76/73	88/86	76/72	88/84	76/71	87/82	75/67	86/81	77/71	89/82
2200 MHz	79/76	90/88	74/72	86/83	75/73	86/84	74/71	85/83	78/72	89/85
2400 MHz	76/71	88/81	68/66	78/77	72/70	83/81	72/66	83/79	78/65	89/76
Velocity factor	0.88		0.88		0.88		0.88		0.88	
Capacitance	76 pF/m (23 pF/ft)		76 pF/m (23 pF/ft)		76 pF/m (23 pF/ft)		76 pF/m (23 pF/ft)		76 pF/m (23 pF/ft)	
Cut-off frequency	10 000 MHz		6800 MHz		5300 MHz		3700 MHz		2800 MHz	
Max power rating (50 MHz/2400 MHz)	5.3/0.66 kW		8.3/1.0 kW		12/1.4 kW		18/2.0 kW		25/2.7 kW	
Peak RF voltage rating	1.80 kV		2.50 kV		3.2 kV		4.6 kV		5.6 kV	
Peak power rating	25.9 kW		58 kW		89 kW		194 kW		313 kW	
DC-resistance inner conductor Ω/km (Ω/1000ft)	0.95	(0.29)	1.23	(0.37)	1.04	(0.32)	0.64	(0.20)	0.73	(0.22)
DC-resistance outer conductor Ω/km (Ω/1000ft)	2.04	(0.62)	1.14	(0.35)	1.05	(0.32)	0.60	(0.18)	0.35	(0.11)
<b>MECHANICAL CHARACTERISTICS</b>										
Weight	350 kg/km (0.24 lb/ft)		410 kg/km (0.28 lb/ft)		530 kg/km (0.36 lb/ft)		940 kg/km (0.63 lb/ft)		1450 kg/km (0.97 lb/ft)	
Maximum pulling force	1100 N (250 lb)		1600 N (360 lb)		1800 N (400 lb)		2500 N (560 lb)		3000 N (670 lb)	
Minimum bending radius Single bending	125 mm (5 in)		175 mm (7 in)		250 mm (10 in)		380 mm (15 in)		510 mm (20 in)	
Operating temperature range	-40..+70 °C (-40...+158 °F)		-40..+70 °C (-40...+158 °F)		-40..+70 °C (-40...+158 °F)		-40..+70 °C (-40...+158 °F)		-40..+70 °C (-40...+158 °F)	
Min. installation temperature (BHF sheath)	-5 °C	(+23 °F)	-5 °C	(+23 °F)	-5 °C	(+23 °F)	-5 °C	(+23 °F)	-5 °C	(+23 °F)
<b>CONNECTOR CODE</b>										
N male	NKC1012300		NKC1058300		NKC1078300		NKC1114300		NKC1158300	
N female	NKC1012400		NKC1058400		NKC1078400		NKC1114400		NKC1158400	
7/16 male	NKC1012100		NKC1058100		NKC1078100		NKC1114100		NKC1158100	
7/16 female	NKC1012200		NKC1058200		NKC1078200		NKC1114200		NKC1158200	



PRODUCTS	RFFX 1/2" BHF		RFEX 7/8" BHF		RFXT 5/8" BHF		RFXT 7/8" BHF		RFXT 1 1/4" BHF	
<b>PRODUCT CODE</b>	NKRFFX01202		NKRFEF07802		NKRFXT05807		NKRFXT07807		NKRFXT11407	
<b>CONSTRUCTION</b>										
Inner conductor	Ø 3.55 mm		Ø 9.0 mm		Ø 6.7 mm		Ø 9.0 mm		Ø 12.8 mm	
Copper wire, tube	(Ø 0.14 in)		(Ø 0.35 in)		(Ø 0.26 in)		(Ø 0.35 in)		(Ø 0.50 in)	
Dielectric	Ø 9.0 mm		Ø 22.2 mm		Ø 17.3 mm		Ø 23.2 mm		Ø 32.5 mm	
Cellular polyethylene	(Ø 0.35 in)		(Ø 0.87 in)		(Ø 0.67 in)		(Ø 0.91 in)		(Ø 1.28 in)	
Outer Conductor	Ø 11.9 mm		Ø 24.9 mm		Ø 17.6 mm		Ø 23.5 mm		Ø 32.8 mm	
Corrugated copper tube/ copper tape	(Ø 0.47 in)		(Ø 0.98 in)		(Ø 0.69 in)		(Ø 0.93 in)		(Ø 1.29 in)	
Fire barrier Mica tape					Ø 17.8 mm (Ø 0.7 in)		Ø 23.7 mm (Ø 0.93 in)		Ø 33.0 mm (Ø 1.30 in)	
Jacketing BHF (black halogen free fire retardant)	Ø 13.5 mm (Ø 0.53 in)		Ø 27.5 mm (Ø 1.08 in)		Ø 22.0 mm (Ø 0.87 in)		Ø 28.7 mm (Ø 1.13 in)		Ø 38.8 mm (Ø 1.53 in)	
<b>ELECTRICAL CHARACTERISTICS</b>										
Characteristic impedance	50 ± 2 Ω		50 ± 2 Ω		50 ± 2 Ω		50 ± 2 Ω		50 ± 2 Ω	
Return loss (typical value)	18 dB		18 dB		18 dB		18 dB		18 dB	
Attenuation measured according to IEC 61196-4 free space method dB/100m (dB/100 ft)										
75 MHz	3.0	(0.914)	1.3	(0.396)						
150 MHz	4.4	(1.34)	1.8	(0.549)	2.1	(0.640)	1.9	(0.579)	1.1	(0.335)
450 MHz	7.7	(2.35)	3.1	(0.945)	3.9	(1.19)	3.2	(0.975)	2.1	(0.640)
900 MHz	11.2	(3.41)	4.4	(1.34)	5.8	(1.77)	5.0	(1.52)	3.0	(0.914)
1800 MHz	16.5	(5.03)	6.7	(2.04)	8.9	(2.71)	8.0	(2.44)	5.2	(1.58)
2200 MHz	18.6	(5.67)	7.5	(2.29)						
2400 MHz	20.0	(6.10)	8.1	(2.47)						
Coupling loss measured according to IEC 61196-4 free space method (dB)										
	50%	95%	50%	95%	50%	95%	50%	95%	50%	95%
75 MHz	61	71	68	80						
150 MHz	68	81	68	80	60	69	58	68	80	92
450 MHz	69	82	69	81	69	80	64	77	79	91
900 MHz	71	82	71	82	67	79	64	77	76	86
1800 MHz	76	87	71	83	74	85	70	80	68	79
2200 MHz	75	88	76	88						
2400 MHz	72	84	74	86						
Velocity factor	0.88		0.88		0.88		0.88		0.88	
Capacitance	76 pF/m (23 pF/ft)		76 pF/m (23 pF/ft)		76 pF/m (23 pF/ft)		76 pF/m (23 pF/ft)		76 pF/m (23 pF/ft)	
Cut-off frequency	12 500 MHz		5300 MHz		7100 MHz		5300 MHz		3700 MHz	
Max power rating (50 MHz/2400 MHz)	3.5/0.43 kW		10/1.3 kW							
Peak RF voltage rating	1.39 kV		2.8 kV							
Peak power rating	19.0 kW		84 kW		58 kW		89 kW		194 kW	
DC-resistance inner conductor Ω/km (Ω/1000ft)	2.73	(0.83)	2.50	(0.76)	1.23	(0.37)	1.04	(0.32)	0.64	(0.20)
DC-resistance outer conductor Ω/km (Ω/1000ft)	4.15	(1.26)	1.10	(0.34)	1.14	(0.35)	1.05	(0.32)	0.60	(0.18)
<b>MECHANICAL CHARACTERISTICS</b>										
Weight	190 kg/km (0.13 lb/ft)		434 kg/km (0.29 lb/ft)		470 kg/km (0.32 lb/ft)		750 kg/km (0.50 lb/ft)		910 kg/km (0.61 lb/ft)	
Maximum pulling force	500 N (110 lb)		1500 N (340 lb)		1500 N (340 lb)		2300 N (520 lb)		3000 N (670 lb)	
Minimum bending radius Single bending	25 mm (1 in)		120 mm (5 in)		350 mm (14 in)		400 mm (16 in)		500 mm (20 in)	
Operating temperature range	-40..+70 °C		-40..+70 °C		-40..+70 °C		-40..+70 °C		-40..+70 °C	
Min. installation temperature (BHF sheath)	-40..+158 °F		-40..+158 °F		-40..+158 °F		-40..+158 °F		-40..+158 °F	
	-5 °C	(+23 °F)	-5 °C	(+23 °F)	-5 °C	(+23 °F)	-5 °C	(+23 °F)	-5 °C	(+23 °F)
<b>CONNECTOR CODE</b>										
N male	NKC2012320		NKC1078300		NKC3058330		NKC3078330		NKC3114330	
N female	NKC2012420		NKC1078400		NKC3058430		NKC3078430		NKC3114430	
7/16 male	NKC2012120		NKC1078100		NKC3058130		NKC3078130		NKC3114130	
7/16 female	NKC2012220		NKC1078200		NKC3058230		NKC3078230		NKC3114230	

## Comparison of the DAS and CAS systems

Property	DAS	CAS
Applications	Buildings in general, factory halls, car park areas, landscaped offices and reception halls	Tunnels, mines, subways, metal-hulled ships, nuclear power plants, trains, airports and special areas
Implementation	Antennas needed for coverage area, alignment of antennas needed, quick and easy cable installation	Coaxial antennas and more cable accessories needed, doesn't need alignment, cable installation slower
Antenna type	Distributed antenna	Coaxial antenna
Frequency response	Antenna limits usage of frequencies	Broadband capability
Field intensity	Good near antenna, weakening with distance	Uniform along the cable
Visibility	Increased	Usually decreased
Addition of new frequencies later	Usually needs new antennas	Easy to add without extra coaxial antenna

## Jumpers

The jumpers are typically used to connect the feeder cable or the coaxial antenna to the transceiver. Also, in difficult lead-ins through the building structure etc. jumpers are used because of their flexibility compared to the ordinary feeder cable or coaxial antenna. Jumpers are based on our high quality superflexible RFF 1/2" cable and soldered inner and outer conductors.

The jumpers are available with 7/16- or N-type straight or angle connectors. The external waterproof seal is achieved with injection molded plastic at the rear of the connector. Our jumpers have low intermodulation characteristics and all the jumpers are tested in production. For indoor applications fire retardant and UL approved jumpers are available.



A jumper cable for DAS and CAS systems.

More detailed information including NK-codes for the jumpers is presented in our NK Cables Antenna Line Products (ALP) catalog.

# Accessories

In DAS and CAS systems, many kinds of accessories are required. The components of the indoor system are connected to each other with cable specific connectors. Also, one grounding kit per cable line should be used in indoor systems, especially when long coaxial antenna lines are being installed. During installation, cable specific non-metallic hangers are used.

The transmitted signal is divided into the branches of the system with power splitters, taps or directional couplers. The coaxial antenna lines are usually terminated with matched terminations.

In applications where exceptionally long cable runs are installed, bi-directional amplifiers may also be needed. In addition, multi-frequency couplers/filters are needed in systems where different operating frequencies are connected to the same coaxial antenna. In the DAS system different kind of antennas are used. These modules are not dealt with in this catalog, as they depend on each indoor coverage system and are therefore selected case-by-case. If these kind of components are required, please contact our marketing or technical personnel.

## CONNECTORS

- For feeders and coaxial antennas NK Cables offers "one-piece" connectors that feature two different solutions each ensuring weatherproof connection: O-ring technology and shrink sleeve.
- O-ring: These connectors employ precision O-rings to provide the primary weatherproof seal for the cable/connector interface. A secondary heat shrink sleeve is recommended in humid installation environments. This is used with feeder and corrugated coaxial antenna cables (RFX-type).
- For RFXT cables the sealing is made with heat shrink sleeves. These connectors utilize a heat activated shrink sleeve that has been coated with an adhesive on the inside to provide the primary weatherproof sealing for the connector. This is used with coaxial antenna cables with a smooth outer conductor (RFXT-type).



Connectors for RF/RFX cable and for RFXT cable



## TOOLS FOR CONNECTORS

Factory designed cable preparation tools provide a number of assembly advantages. The required assembly time is substantially reduced leading to a considerable reduction in assembly costs.

By eliminating deviations in dimensions the cutting tools will guarantee consistent assembly quality during cable preparation.

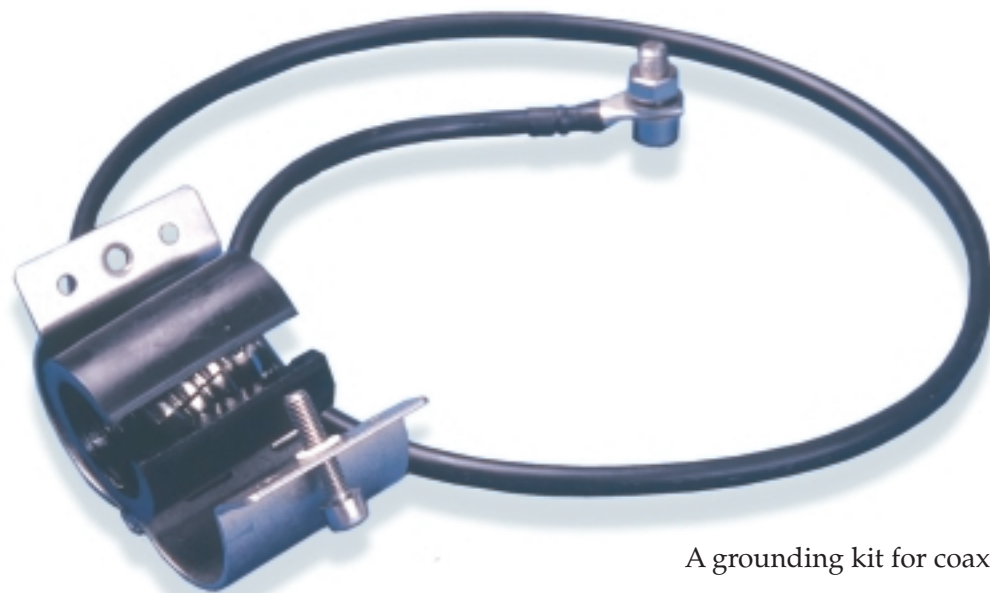


Cutting tools for RF and RFX cables

## GROUNDING KITS

The function of the grounding kit is to earth the indoor system, so that no damage through electrical shocks can occur. Easy and rapid installation,

waterproofness per IP 68, large contact surface and reusability are the main characteristics of the grounding kits.



A grounding kit for coaxial cables

## COAXIAL ANTENNA HANGERS

NK Cables offers several types of non-metallic hangers for coaxial antennas. The hanger type and the attachment method depend on the location of the installation. NK Cables can supply all components needed for installation, including full instructions. The coaxial antenna hangers are made of plastic to ensure proper functioning of the coaxial antenna. However, it is recommended that every tenth hanger in a coaxial antenna line is metallic or has a metallic lock to keep the cable securely in place in the event of fire conditions.

In many situations the coaxial antenna could be installed with standard cable ties, e.g., when mounting to the cable ladder behind a false ceiling. Care should always be taken so that metallic parts or other cables do not hide the

cable, and the correct distance from the wall or ceiling is maintained.

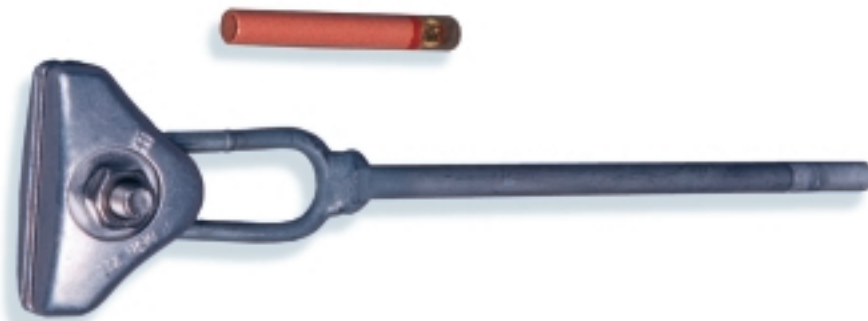
There are two kinds of non-metallic self-locking hangers that NK Cables recommends for the installation of coaxial antennas. The first choice is the clic clamp. The clic clamp is the recommended cable hanger in building installations. Another choice is the rac clamp (clamp for radiating cables) when more rigid installation is needed. This clamp is an ideal cable hanger for places where the cable is affected by air pressure or some other bending force caused by a metro or train moving near the cable. It is recommended for underground installation. The rac clamp and the clic clamp have many clamp fixing methods and spacers available.



Rac and clic clamps for coaxial antennas

Coaxial antenna with a suspension wire (RFXK-type) needs a special installation hanger. This hanger has a metallic clutch that is tightened around the suspension

wire. The clutch is then attached to the wall or ceiling. This hanger also has many attachment possibilities.



A hanger for RFXK-type coaxial antenna

## POWER SPLITTERS, TAPS, DIRECTIONAL COUPLERS

Usually indoor coverage systems should cover more than one tunnel, one corridor or one floor of the building. To expand the coverage, splitters, taps or directional couplers are used to divide RF-power into various branches, or

combine signals into a common port. For the signal distribution within larger buildings with many coaxial antenna branches, it is usually necessary to design an indoor network with similar signal levels on all floors.



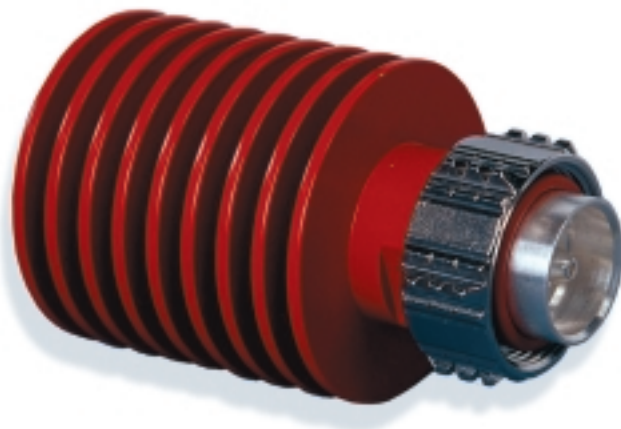
A splitter and a coupler for DAS and CAS systems



## TERMINATIONS

The coaxial antenna line should be terminated with a 50  $\Omega$  RF-load in order to prevent unwanted reflections from the open end of the cable. Usually, only 2 – 10 watt terminations are required because the transmitter power level is rather low in indoor coverage systems.

Another option is to use a normal antenna at the end of the coaxial antenna line when extra coverage at the end of the coaxial antenna is required. In this instance, there would be no need for a load termination.



A termination for CAS system

## AMPLIFIERS, COMBINERS AND FILTERS

Where, appropriate a bi-directional amplifier can overcome attenuation loss in coaxial antennas and improve RF signal levels in RF distribution systems where long coaxial antenna cable lines are used. Also, multi-frequency couplers/filters are needed in systems

where different operating frequencies are connected to the same coaxial antenna. These modules are not dealt with in this catalog. The components are dependent on each particular indoor coverage system and are selected on a case-specific basis.

# Drums

## WOODEN CABLE DRUMS

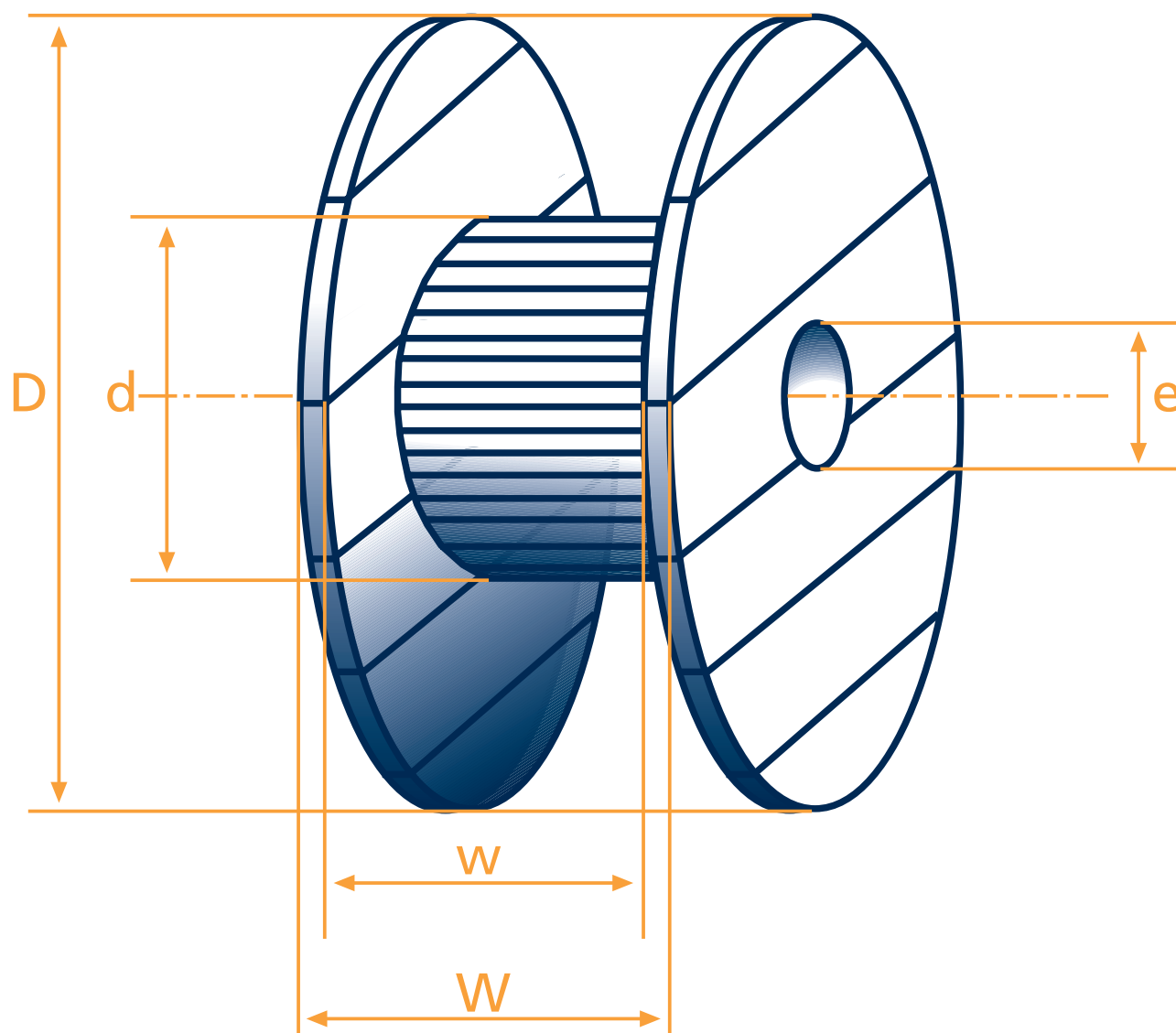
The drums are made of planed barkless boards. The standard drum sizes used for different cable types are specified below. Special non-standard drums can be supplied on request. Also impregnation is available on request.

## HANDLING AND TRANSPORT

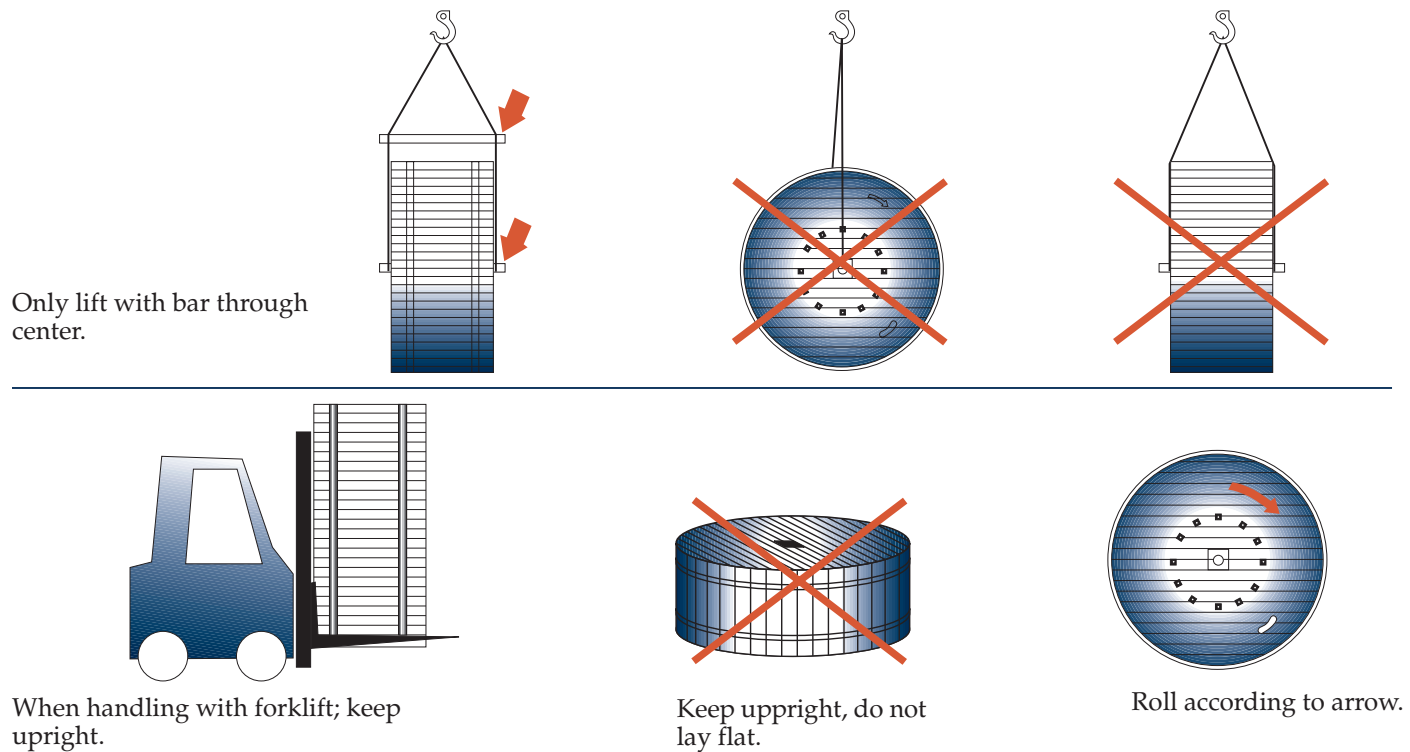
Handling instructions are attached on each drum. The reeling direction of the cable is indicated by an arrow. For

transportation and storage the cable is protected by using wooden (19 mm) lagging nailed on the outer rim of the flanges. Plastic cover is placed on the drum under the cable and also over the outer layer of the cable beneath the lagging. Cable ends are sealed with a shrinkable plastic tube.

For detailed instructions for the handling of drums please see our multi-lingual booklet "The right way to transport and move drums" (in English, Spanish, Portuguese, French, Russian, Chinese, Arabic, and Finnish).



## HANDLING INSTRUCTIONS FOR TRANSPORTATION



### STANDARD DRUMS FOR RFX,RFXK AND RFXT -CABLES

Cable type	Standard drum name	Maximum length		Outer diam.		Drum diam		Outer width		Inner width		Shaft hole		Drum weight		Cable weight		Total weight		Drum freight volume		Drums to fit in 20' container	Drums to fit in 40' container
		m	(ft)	cm	(in)	cm	(in)	cm	(in)	cm	(in)	mm	(in)	kg	(lb)	kg/m	(lb/ft)	kg	(lb)	m <sup>3</sup>	(cu.ft)		
RFX 1/2"	P11D	400-600	(1312-19689)	114 (45)	70 (28)	55 (22)	48 (19)	82 (3,2)	65 (144)	0,350	(0,235)	205-275	(453-607)	0,71	(25,24)	42	84						
RFFX 1/2"	P11D	400-600	(1312-1968)	114 (45)	70 (28)	55 (22)	48 (19)	82 (3,2)	65 (144)	0,190	(0,128)	141-179	(312-395)	0,71	(25,24)	42	84						
RFX 5/8"	P14G	400-600	(1312-1968)	144 (57)	80 (32)	74 (29)	61 (24)	82 (3,2)	128 (282)	0,410	(0,276)	292-374	(644-825)	1,53	(54,19)	12	24						
RFX 7/8"	P14G	400-600	(1312-1968)	144 (57)	80 (32)	74 (29)	61 (24)	82 (3,2)	128 (282)	0,530	(0,356)	340-446	(750-983)	1,53	(54,19)	12	24						
RFX 7/8"	P14G	400-600	(1312-1968)	144 (57)	80 (32)	74 (29)	61 (24)	82 (3,2)	128 (282)	0,434	(0,292)	302-388	(665-856)	1,53	(54,19)	12	24						
RFX 1 1/4"	P21G	400-700	(1312-2297)	214 (84)	130 (51)	74 (29)	64 (25)	82 (3,2)	202 (445)	0,940	(0,632)	578-860	(1274-1896)	3,39	(119,68)	7	16						
RFX 1 5/8"	P21G	200-400	(656-1312)	214 (84)	130 (51)	74 (29)	64 (25)	82 (3,2)	202 (445)	1,450	(0,975)	492-782	(1085-1724)	3,39	(119,68)	7	16						
RFXK 7/8"	P14G	400-600	(1312-1968)	144 (57)	80 (32)	74 (29)	61 (24)	82 (3,2)	128 (282)	0,720	(0,484)	416-560	(917-1235)	1,53	(54,19)	12	24						
RFXK 1 1/4"	P21G	400-700	(1312-2297)	214 (84)	130 (51)	74 (29)	64 (25)	82 (3,2)	202 (445)	1,200	(0,807)	682-1042	(1504-2297)	3,39	(119,68)	7	16						
RFXK 1 5/8"	P21G	200-400	(656-1312)	214 (84)	130 (51)	74 (29)	64 (25)	82 (3,2)	202 (445)	1,700	(1,143)	542-882	(1195-1944)	3,39	(119,68)	7	16						
RFXT 5/8"	P19Q	400-600	(1312-1968)	194 (76)	130 (51)	106 (42)	99 (39)	82 (3,2)	235 (518)	0,470	(0,316)	423-517	(933-1140)	3,39	(140,88)	6	12						
RFXT 7/8"	P19Q	400-600	(1312-1968)	194 (76)	130 (51)	106 (42)	99 (39)	82 (3,2)	235 (518)	0,750	(0,504)	535-685	(1179-1510)	3,39	(140,88)	6	12						
RFXT 1 1/4"	P19Q	400-600	(1312-1968)	194 (76)	130 (51)	106 (42)	99 (39)	82 (3,2)	235 (518)	0,910	(0,612)	599-781	(1321-1722)	3,39	(140,88)	6	12						

### SPECIAL DRUMS FOR RFX AND RFXT -CABLES

RFX 7/8"	P22Q	1000-2000	(3281-6562)	220 (87)	96 (38)	118 (46)	96 (38)	82 (3,2)	220 (485)	0,530	(0,356)	750-1280	(1653-2822)	5,71	(201,69)	4	9
RFX 1 1/4"	P19Q	400-600	(131-1968)	194 (76)	130 (51)	106 (42)	99 (39)	82 (3,2)	235 (518)	0,940	(0,632)	611-799	(1347-1761)	3,99	(140,88)	6	12
RFX 1 1/4"	P22U	600-1200	(1968-3937)	220 (87)	110 (43)	130 (51)	120 (47)	82 (3,2)	250 (551)	0,940	(0,632)	814-1378	(1795-3038)	6,29	(222,20)	2	5
RFX 1 5/8"	P19Q	200-400	(656-1312)	194 (76)	130 (51)	106 (42)	99 (39)	82 (3,2)	235 (518)	1,450	(0,975)	525-815	(1157-1797)	3,99	(140,88)	6	12
RFX 1 5/8"	P22U	600-1200	(1968-3937)	220 (87)	110 (43)	130 (51)	120 (47)	82 (3,2)	250 (551)	1,450	(0,975)	1120-1990	(2469-4387)	6,29	(222,20)	2	5
RFXK 7/8"	P22Q	1000-2000	(3281-6562)	220 (87)	96 (38)	118 (46)	96 (38)	82 (3,2)	220 (485)	0,720	(0,484)	940-1660	(2072-3660)	5,71	(201,69)	4	9
RFXK 1 1/4"	P19Q	400-600	(1312-1968)	194 (76)	130 (51)	106 (42)	99 (39)	82 (3,2)	235 (518)	1,200	(0,807)	715-955	(1576-2105)	3,99	(140,88)	6	12
RFXK 1 1/4"	P22U	600-1200	(1968-3937)	220 (87)	110 (43)	130 (51)	120 (47)	82 (3,2)	250 (551)	1,200	(0,807)	970-1690	(2138-3726)	6,29	(222,20)	2	5
RFXK 1 5/8"	P19Q	200-400	(656-1312)	194 (76)	130 (51)	106 (42)	99 (39)	82 (3,2)	235 (518)	1,700	(1,143)	575-915	(1268-2017)	3,99	(140,88)	6	12
RFXK 1 5/8"	P22U	600-1200	(1968-3937)	220 (87)	110 (43)	130 (51)	120 (47)	82 (3,2)	250 (551)	1,700	(1,143)	1270-2290	(2800-5049)	6,29	(222,20)	2	5

RF feeder cables use same drums as RFX cables



# Codes

NK code	Product	NK code	Product
NKA1001	Cutting tool for RF 1/2" cable	NKC1012100	Connector 7-16 male for RF 1/2", O-ring
NKA1002	Cutting tool for RF 5/8" cable	NKC1012200	Connector 7-16 female for RF 1/2", O-ring
NKA1003	Cutting tool for RF 7/8" and RFE 7/8" cable	NKC1012300	Connector N male for RF 1/2", O-ring
NKA1004	Cutting tool for RF 1 1/4" cable	NKC1012400	Connector N female for RF 1/2", O-ring
NKA1005	Cutting tool for RF 1 5/8" cable	NKC1012500	Connector 7-16 right angle male for RF 1/2", O-ring
NKA1009	Cutting tool for RFF 1/2" cable	NKC1012600	Connector 7-16 right angle female for RF 1/2", O-ring
NKA1010	Cutting tool for RFXT 5/8" cable	NKC1058100	Connector 7-16 male for RF 5/8", O-ring
NKA1011	Cutting tool for RFXT 7/8" cable	NKC1058200	Connector 7-16 female for RF 5/8", O-ring
NKA1012	Cutting tool for RFXT 1 1/4" cable	NKC1058300	Connector N male for RF 5/8", O-ring
NKA12012	Drill mounted cutting tool for RF 1/2" cable	NKC1058400	Connector N female for RF 5/8", O-ring
NKA12058	Drill mounted cutting tool for RF 5/8" cable	NKC1078100	Connector 7-16 male for RF 7/8"/RFE 7/8", O-ring
NKA12078	Drill mounted cutting tool for RF 7/8" cable	NKC1078200	Connector 7-16 female for RF 7/8"/RFE 7/8", O-ring
NKA12114	Drill mounted cutting tool for RF 1 1/4" cable	NKC1078300	Connector N male for RF 7/8"/RFE 7/8", O-ring
NKA12158	Drill mounted cutting tool for RF 1 5/8" cable	NKC1078400	Connector N female for RF 7/8"/RFE 7/8", O-ring
NKA22012	Drill mounted cutting tool for RFF 1/2" cable	NKC1078500	Connector 7-16 right angle male for RF 7/8"/RFE 7/8", O-ring
NKA13000	Replacement blade for NKA1001-NKA1003	NKC1114100	Connector 7-16 male for RF 1 1/4", O-ring
NKA13001	Replacement blade for NKA1004 and NKA1005	NKC1114200	Connector 7-16 female for RF 1 1/4", O-ring
NKA13002	Replacement blade for NKA1009	NKC1114300	Connector N male for RF 1 1/4", O-ring
NKA13012	Replacement blade for NKA1012	NKC1114400	Connector N female for RF 1 1/4", O-ring
NKA13058	Replacement blade for NKA 12058	NKC1158100	Connector 7-16 male for RF 1 5/8", O-ring
NKA13078	Replacement blade for NKA12078	NKC1158200	Connector 7-16 female for RF 1 5/8", O-ring
NKA13114	Replacement blade for NKA12114	NKC1158300	Connector N male for RF 1 5/8", O-ring
NKA13158	Replacement blade for NKA12158	NKC1158400	Connector N female for RF 1 5/8", O-ring
NKA23012	Replacement blade for NKA22012		
NKA14000	T-handles		

<b>NK code</b>	<b>Product</b>	<b>NK code</b>	<b>Product</b>
NKC2012120	Connector 7-16 male for RFF 1/2", heat shrink sleeve	NKDP11D	Drum P11D
NKC2012220	Connector 7-16 female for RFF 1/2", heat shrink sleeve	NKDP14G	Drum P14G
NKC2012320	Connector N male for RFF 1/2", heat shrink sleeve	NKDP19Q	Drum P19Q
NKC2012420	Connector N female for RFF 1/2", heat shrink sleeve	NKDP21G	Drum P21G
NKC2012520	Connector 7-16 right angle male for RFF 1/2", heat shrink sleeve	NKDP21Q	Drum P21Q
NKC2012620	Connector N right angle male for RFF 1/2", heat shrink sleeve	NKDP22U	Drum P22U
NKC3058130	Connector 7/16 male for RFXT 5/8", heat shrink sleeve	NKDP22Q	Drum P22Q
NKC3058230	Connector 7/16 female for RFXT 5/8", heat shrink sleeve	NKG101200	Grounding kit for RF 1/2" cable
NKC3058330	Connector N male for RFXT 5/8", heat shrink sleeve	NKG105800	Grounding kit for RF 5/8" cable
NKC3058430	Connector N female for RFXT 5/8", heat shrink sleeve	NKG107800	Grounding kit for RF 7/8" and RFE 7/8" cable
NKC3078130	Connector 7/16 male for RFXT 7/8", heat shrink sleeve	NKG111400	Grounding kit for RF 1 1/4" cable
NKC3078230	Connector 7/16 female for RFXT 7/8", heat shrink sleeve	NKG115800	Grounding kit for RF 1 5/8" cable
NKC3078330	Connector N male for RFXT 7/8", heat shrink sleeve	NKRF01200	Feeder cable RF 1/2"-50
NKC3078430	Connector N female for RFXT 7/8", heat shrink sleeve	NKRF01201	Feeder cable RF 1/2"-50 GHF
NKC3114130	Connector 7/16 male for RFXT 1 1/4", heat shrink sleeve	NKRF01202	Feeder cable RF 1/2"-50 BHF
NKC3114230	Connector 7/16 female for RFXT 1 1/4", heat shrink sleeve	NKRF01204	Feeder cable RF 1/2"-50 BHF (UL) CATVR E205016
NKC3114330	Connector N male for RFXT 1 1/4", heat shrink sleeve	NKRF05800	Feeder cable RF 5/8"-50
NKC3114430	Connector N female for RFXT 1 1/4", heat shrink sleeve	NKRF05801	Feeder cable RF 5/8"-50 GHF
		NKRF05802	Feeder cable RF 5/8"-50 BHF
		NKRF05804	Feeder cable RF 5/8"-50 BHF (UL) CATVR E205016
		NKRF07800	Feeder cable RF 7/8"-50
		NKRF07801	Feeder cable RF 7/8"-50 GHF
		NKRF07802	Feeder cable RF 7/8"-50 BHF
		NKRF07804	Feeder cable RF 7/8"-50 BHF (UL) CATVR E205016

<b>NK code</b>	<b>Product</b>	<b>NK code</b>	<b>Product</b>
<b>NKRF11400</b>	Feeder cable RF 1 1/4"-50	<b>NKRFX01202</b>	Coaxial antenna RFX 1/2"-50 BHF
<b>NKRF11401</b>	Feeder cable RF 1 1/4"-50 GHF	<b>NKRFX05800</b>	Coaxial antenna RFX 5/8"-50
<b>NKRF11402</b>	Feeder cable RF 1 1/4"-50 BHF	<b>NKRFX05801</b>	Coaxial antenna RFX 5/8"-50 GHF
<b>NKRF15800</b>	Feeder cable RF 1 5/8"-50	<b>NKRFX05802</b>	Coaxial antenna RFX 5/8"-50 BHF
<b>NKRF15801</b>	Feeder cable RF 1 5/8"-50 GHF	<b>NKRFX05807</b>	Coaxial antenna RFX 5/8"-50 MBHF
<b>NKRF15802</b>	Feeder cable RF 1 5/8"-50 BHF	<b>NKRFX07800</b>	Coaxial antenna RFX 7/8"-50
<b>NKRFE07800</b>	Extraflexible cable RFE 7/8"-50	<b>NKRFX07801</b>	Coaxial antenna RFX 7/8"-50 GHF
<b>NKRFE07801</b>	Extraflexible cable RFE 7/8"-50 GHF	<b>NKRFX07802</b>	Coaxial antenna RFX 7/8"-50 BHF
<b>NKRFE07802</b>	Extraflexible cable RFE 7/8"-50 BHF	<b>NKRFX07807</b>	Coaxial antenna RFX 7/8"-50 MBHF
<b>NKRFF01200</b>	Superflexible cable RFF 1/2"-50	<b>NKRFX11400</b>	Coaxial antenna RFX 1 1/4"-50
<b>NKRFF01201</b>	Superflexible cable RFF 1/2"-50 GHF	<b>NKRFX11402</b>	Coaxial antenna RFX 1 1/4"-50 BHF
<b>NKRFF01202</b>	Superflexible cable RFF 1/2"-50 BHF	<b>NKRFX11407</b>	Coaxial antenna RFX 1 1/4"-50 MBHF
<b>NKRFF01204</b>	Superflexible cable RFF 1/2"-50 BHF (UL) CATVR E205016	<b>NKRFX15800</b>	Coaxial antenna RFX 1 5/8"-50
<b>NKRFFX01202</b>	Coaxial antenna RFFX 1/2"-50 BHF	<b>NKRFX15802</b>	Coaxial antenna RFX 1 5/8"-50 BHF
<b>NKRFX01200</b>	Coaxial antenna RFX 1/2"-50	<b>NKRFX15807</b>	Coaxial antenna RFX 1 5/8"-50 MBHF
<b>NKRFX01201</b>	Coaxial antenna RFX 1/2"-50 GHF	<b>NKRF2X01201</b>	Coaxial antenna RF2X 1/2"-50 GHF
		<b>NKRF2X01202</b>	Coaxial antenna RF2X 1/2"-50 BHF
		<b>NKRF2X05801</b>	Coaxial antenna RF2X 5/8"-50 GHF
		<b>NKRF2X05802</b>	Coaxial antenna RF2X 5/8"-50 BHF
		<b>NKRF2X07801</b>	Coaxial antenna RF2X 7/8"-50 GHF
		<b>NKRF2X07802</b>	Coaxial antenna RF2X 7/8"-50 BHF
		<b>NKRF2X07807</b>	Coaxial antenna RF2X 7/8"-50 MBHF
		<b>NKRFX07808BN</b>	Coaxial antenna RF2X 7/8"-50 MHF BN 8017



<b>NK code</b>	<b>Product</b>	<b>NK code</b>	<b>Product</b>
NKRF2X11401	Coaxial antenna RF2X 1 1/4"-50 GHF	NKRFXK11400	Coaxial antenna RFXK 1 1/4"-50 LD
NKRF2X11402	Coaxial antenna RF2X 1 1/4"-50 BHF	NKRFXK11402	Coaxial antenna RFXK 1 1/4"-50 BHF
NKRF2X11407	Coaxial antenna RF2X 1 1/4"-50 MBHF	NKRFXK11407	Coaxial antenna RFXK 1 1/4"-50 MBHF
NKRF2X11408BN	Coaxial antenna RF2X 1 1/4"-50 MHF BN 8017	NKRFXK15800	Coaxial antenna RFXK 1 5/8"-50 LD
NKRF2X15801	Coaxial antenna RF2X 1 5/8"-50 GHF	NKRFXK15802	Coaxial antenna RFXK 1 5/8"-50 BHF
NKRF2X15802	Coaxial antenna RF2X 1 5/8"-50 BHF	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRF2X15807	Coaxial antenna RF2X 1 5/8"-50 MBHF	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRF2X15808BN	Coaxial antenna RF2X 1 5/8"-50 MHF BN 8017	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK01200	Coaxial antenna RFXK 1/2"-50 LD	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK01202	Coaxial antenna RFXK 1/2"-50 BHF	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK05800	Coaxial antenna RFXK 5/8"-50 LD	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK05802	Coaxial antenna RFXK 5/8"-50 BHF	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK05807	Coaxial antenna RFXK 5/8"-50 MBHF	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK07800	Coaxial antenna RFXK 7/8"-50 LD	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK07801	Coaxial antenna RFXK 7/8"-50 GHF	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK07802	Coaxial antenna RFXK 7/8"-50 BHF	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
NKRFXK07807	Coaxial antenna RFXK 7/8"-50 MBHF	NKRFXK15807	Coaxial antenna RFXK 1 5/8"-50 MBHF
		NKRFXK11407	Coaxial antenna RFXK 1 1/4"-50 MBHF
		NKRFXK11407	Coaxial antenna RFXK 1 1/4"-50 MBHF