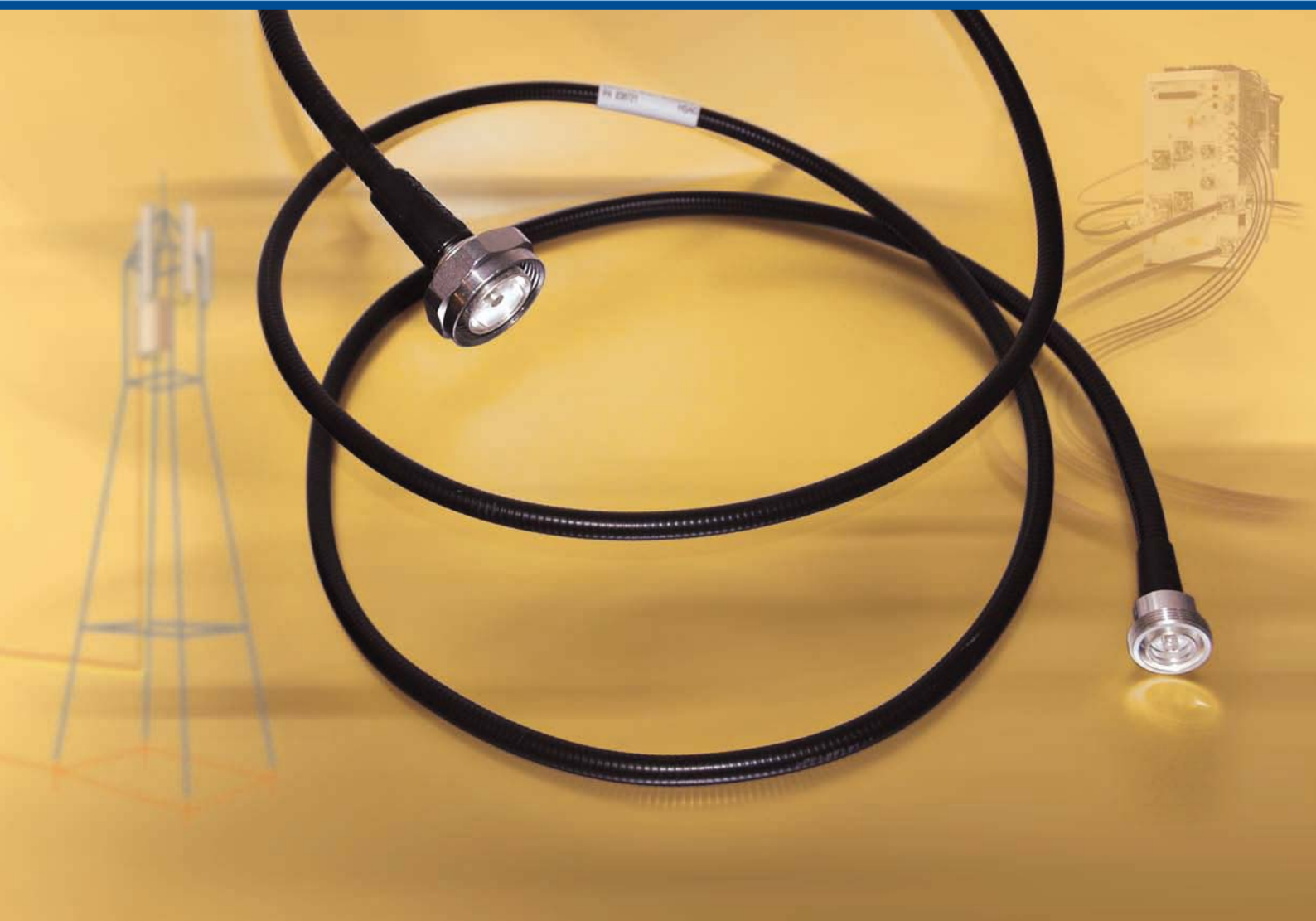




HUBER+SUHNER® LISCA CORRUGATED RF CABLE ASSEMBLIES



HUBER+SUHNER® LISCA

LISCA - Low **L**oss and Low **I**ntermodulation **S**oldered **C**orrugated Cable **A**ssembly



LISCA cable assemblies are specially developed for applications where low VSWR and low attenuation combined with low intermodulation products are required. The excellent performance is achieved by utilizing corrugated cables with low intermodulation designed connectors and a controlled assembly process with HUBER+SUHNER solder technology.

These products are factory-made cable assemblies and can only be ordered in predetermined lengths. A hot-polyamide moulding between connector and cable jacket guarantees highest stability and tightness.

Features

- excellent RF performance
- high RF shielding efficiency
- low attenuation
- moisture protection IP68
- high flexibility and small bending radius
- low, stable intermodulation products

Benefits

- RoHS compliant (2002/95/EC)
- wide variety of corrugated cable and connector types
- standard products as well as customized assemblies with special lengths and markings according to customer specifications
- high volume capacity thanks to standard assembly processing at all main HUBER+SUHNER production sites worldwide

LISCA products are designed to meet customer specifications, delivery requirements and budgets.

Applications

This product line is designed to be used

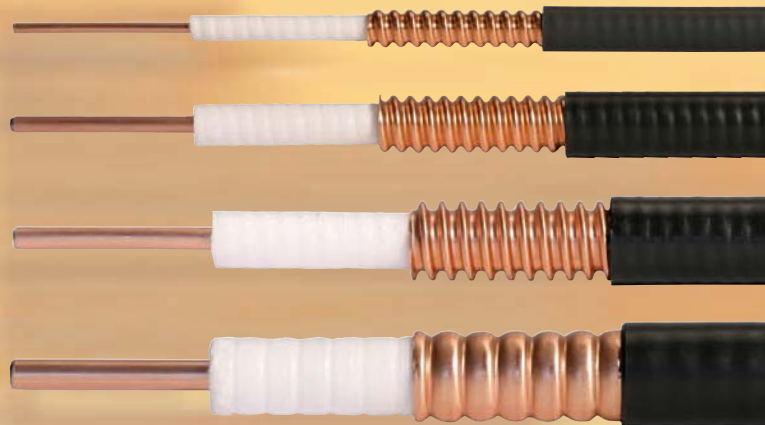
- as jumper cables for indoor and outdoor applications
- as internal connections for mobile phone base stations
- in antenna links
- as test leads for low intermodulation test equipment
- in general radio transceivers with requirements for low reflection (VSWR), low attenuation and low intermodulation products

Cables

HUBER+SUHNER LISCA cable assemblies are primarily designed for SUCOFEEED cables which are available with PE jackets, flame retardant and halogen-free material.

Product range:

SUCOFEEED_1/4_HF	helical, highest flexibility
SUCOFEEED_3/8_HF	helical, highest flexibility
SUCOFEEED_1/2_HF	helical, highest flexibility
SUCOFEEED_1/2	annular, high flexibility
Other cable sizes on request.	



Connectors

The cable assemblies consist of connectors with guaranteed excellent characteristics and proven by HUBER+SUHNER's high standard quality in design and production technology. Economical designs are achieved through minimizing connector piece parts as well as automated assembly processing.

Product range:

- series DIN 7/16, N and QN
 - patterns straight and right angle
- Other series or patterns on request.

Technical data LISCA

Electrical data					
Frequency range	DC to 5 GHz (optimized up to 4 GHz)				
Characteristic impedance	50 Ohm				
Return loss (up to length 5 m)	DC to 1 GHz: ≥ 28 dB/up to 2.2 GHz: ≥ 26 dB/(up to 4 GHz: ≥ 20 dB)				
Intermodulation (IM3 at 1.8 GHz)	-162 dBc, typical, with 2 x 43 dBm carriers				
Attenuation (max. at 20 °C)	(include cable + connectors up to length 5 m)				
Frequency	SUCOFEEED cable type	SD_1/4_HF	SD_3/8_HF	SD_1/2_HF	SD_1/2
450 MHz		0.15 dB/m	0.12 dB/m	0.09 dB/m	0.06 dB/m
900 MHz		0.20 dB/m	0.15 dB/m	0.12 dB/m	0.09 dB/m
1800 MHz		0.28 dB/m	0.21 dB/m	0.17 dB/m	0.13 dB/m
2200 MHz		0.32 dB/m	0.25 dB/m	0.21 dB/m	0.16 dB/m
(4000 MHz)		0.50 dB/m	0.40 dB/m	0.35 dB/m	0.24 dB/m

Mechanical data					
	SUCOFEEED cable type	SD_1/4_HF	SD_3/8_HF	SD_1/2_HF	SD_1/2
Bending radius, repeated bending		min. 50 mm	min. 50 mm	min. 50 mm	min. 125 mm
Bending radius, single bending		min. 25 mm	min. 25 mm	min. 25 mm	min. 70 mm
Tensile strength (before degrading electrical specification)		max. 150 N	max. 200 N	max. 250 N	max. 250 N

Environmental data	
Waterproof (according to IEC 60529)	IP 68, with coupled interface (20 °C, 24 h, 0.1 bar)
Operating temperature range	- 40 °C to + 85 °C
Installation temperature range	- 25 °C to + 60 °C
RoHS (2002/95/EC)	compliant
Corrosion (salt spray)	MIL-STD 202 method 101, condition B
Vibration	MIL-STD 202 method 204, condition B
Shock	MIL-STD 202 method 213, condition I

Material	
Cable	
Inner conductor	copper clad aluminium
Dielectric	foamed polyethylene
Outer conductor	corrugated annular/helical copper tube
Jacket	PE-LD, black, halogen-free PE, flame retardant, black or grey, (LSFH)
Connector	
Center contact	brass/bronze, silver plated
Outer contact	brass, silver or SUCOPLATE® plated
Insulator	PTFA/PFA
Gasket	rubber
Cable entry protection	hot-polyamide

Standard LISCA Assemblies

These assemblies are produced under stringent quality manufacturing standards in order to achieve consistent high performance. All Standard products are based on SUCCOFEED cables with black PE jacket material. The assemblies are 100% tested for attenuation and return loss according to the technical data. These LISCA products are factory-made cable assemblies and can only be ordered in predetermined lengths.

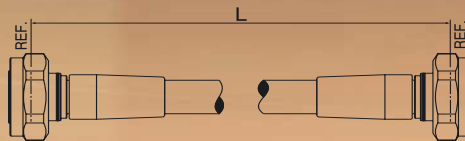
Order number for Standard LISCA

Example: **LIS-C9-11716-16716-02000-51**

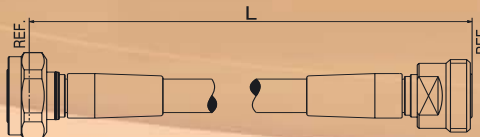
Product name			
SUCCOFEED_1/4_HF	C5	Cable type	1
SUCCOFEED_3/8_HF	C7		
SUCCOFEED_1/2_HF	C9		
SUCCOFEED_1/2	C12		
Straight male	11	Pattern of connector	1
Right angle male	16	Pattern of connector	2
Straight female	21		
DIN 7/16	716	Connector interface	1 2
N	N		
QN	QN		
Assembly length in mm			
Standard LISCA	51	Technical performance	

Assembly length: tolerance +/- 1%

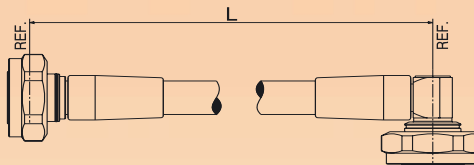
Plug to plug



Plug to jack



Plug to right angle plug



Customized LISCA Assemblies

HUBER+SUHNER's strengths also include the production of products according to customer specifications. This product line offers additional possibilities for demanding customer wishes based on the LISCA standard requirements.

Additional features are:

- improved return loss values
example: better 28 dB at 2.2 GHz with straight N or DIN 7/16 connectors
- 100% factory tested products for intermodulation
example: max. - 155 dBc at 1.8 GHz with 2x20 W carriers
- 100% factory tested products on phase length/tolerance and delay time
- specified for frequencies up to 6 GHz
- customized marking, labelling and product packaging
- special connector designs
- products with lengths over 10 meters

Low Intermodulation Test Leads LISCA Assemblies

These assemblies are specially designed for use with IM test equipments.

All products are based on SUCOFEED_3/8_HF_FR cable with flame retardant jacket.

The assemblies are individually packed and include a test report showing the intermodulation performance.

Technical data		
Return Loss	DC to 2.2 GHz	≥ 24 dB
Intermodulation IM3	Series DIN 7/16, N	≤ - 165 dBc
1.8 GHz, 2 x 43 dBm carriers	Series QN	≤ - 155 dBc

Order number for Test Leads LISCA

Example: LIS-C7-11716-21716-02000-81		
		Product name
SUCOFEED_3/8_HF	C7	Cable type
Straight male	11	Pattern of connector
Straight female	21	Pattern of connector
DIN 7/16	716	Connector interface
N	N	
QN	QN	
		Assembly length in mm
Test leads LISCA	81	Technical performance



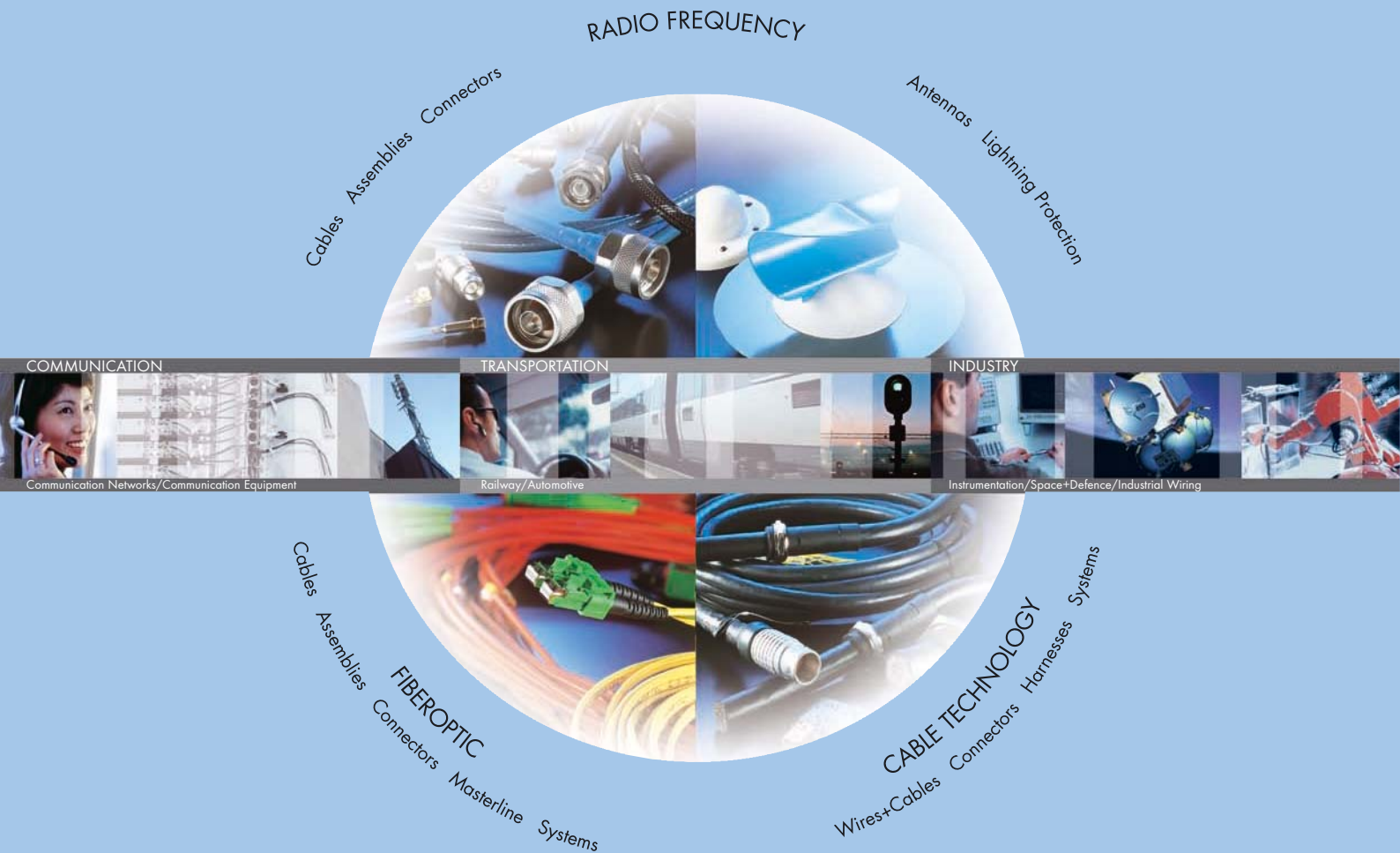
LISCA Connector Pattern

Description	Series DIN 7/16	Series N	Series QN
Straight male (Pattern code: 11)	<p>max. 60 7.5 34.7 HEX. 32 REF.</p> <p>cable: C5, C7, C9, C12</p>	<p>max. 60 1 max. Ø21 HEX. 19 REF.</p> <p>cable: C5, C7, C9, C12</p>	<p>max. 60 14.3 max. Ø19 REF.</p> <p>cable: C5, C7, C9, C12</p>
Right angle male (Pattern code: 16)	<p>max. 50 max. 37 7.5 Ø34.7 HEX. 32 REF.</p> <p>cable: C5, C7, C9, C12</p>	<p>max. 50 max. 37 1 max. Ø21 HEX. 19 REF.</p> <p>cable: C5, C7, C9, C12</p>	<p>max. 50 max. 32 14.3 max. Ø19 REF.</p> <p>cable: C5, C7, C9</p>
Straight female (Pattern code: 21)	<p>max. 60 REF. M29 x 1.5 AF. 21</p> <p>cable: C5, C7, C9, C12</p>	<p>max. 60 9 1 max. Ø18 AF. 16 REF. 5/8-24 UNEF-2A</p> <p>cable: C5, C7, C9, C12</p>	
Straight bulkhead female (Pattern code: 24)	<p>max. 60 19.6 max. 4.5 max. Ø34 REF. M29 x 1.5 AF. 25 HEX. 32</p> <p>cable: C5, C7, C9</p>	<p>max. 60 22 9.1 AF. 13.5 REF. max. 7 HEX. 19 5/8-24 UNEF-2A</p> <p>cable: C5, C7</p>	
Right angle bulkhead female (Pattern code: 29)	<p>max. 50 max. 2 max. 23 17.1 REF. HEX. 32 M29 x 1.5 AF. 25 max. Ø34</p> <p>cable: C5, C7</p>	<p>max. 50 max. 4 max. 20 19.1 REF. HEX. 19 AF. 13.5 5/8-24 UNEF-2A</p> <p>cable: C7</p>	
Straight bulkhead female (Pattern code: 25)	<p>max. 60 M3 21.7 REF. Ø24.8 M29 x 1.5 5</p> <p>cable: C5, C7</p>		

HUBER+SUHNER – Excellence in Connectivity Solutions

HUBER+SUHNER is a leading global supplier of components and systems for electrical and optical connectivity in communications, industrial and transportation markets. HUBER+SUHNER can draw on core competences in the

areas of high frequency technology, fibre optics, cables and polymers. Working in close collaboration with our customers around the globe, we strive for excellence in the development and manufacturing of high quality products.



HUBER+SUHNER is certified according to ISO 9001 and ISO 14001.

WAIVER

It is exclusively in written agreements that we provide our customers with warrants and representations as to the technical specifications and/or the fitness for any particular purpose. The facts and figures contained herein are carefully compiled to the best of our knowledge, but they are intended for general informational purposes only.



HUBER+SUHNER AG
RF Technology
CH-9100 Herisau, Switzerland
Phone +41 (0)71 353 41 11
Fax +41 (0)71 353 44 44
www.hubersuhner.com