

# Installation guide for CELLFLEX®Lite cables

Hints and recommendations

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# General hints & recommendations for the installation of RFS CELLFLEX<sup>®</sup> Lite cables

CELLFLEX<sup>®</sup> Lite, the new generation of Coaxial cables, provides a number of advantages.

The Aluminium outer conductor facilitates an easy transportation (because of the light weight) and handling. Moreover this cable is easier to bend than the familiar coaxial cables with a copper outer conductor.

## However, this new cable generation should be handled and installed according to the same rules, instructions and regulations as other coaxial cables.

These short instructions were written for qualified and experienced personnel. They describe in short words the main points which have to be noted during the installation, without any claim of completeness. It shall highlight the few differences, which have to be noted during the installation of a cable with aluminium outer conductor instead of copper. Always take the standard installation instruction, which is included with each connector or grounding kit package in addition.

Any liability or warranty for results of improper or unsafe use is disclaimed!

#### General remarks:

**CELLFLEX**<sup>®</sup>*Lite* 

In principle, care must be taken to avoid all such strain that may cause remaining deformation on the cable, e.g. going below admissible bending radii, kinking, applying too high tensile stress or forcible deformation of the corrugated outer conductor (e.g. pulling over sharp edges, over tightening of clamps etc.).

#### Aluminium is slightly softer than copper, accordingly handle with care!

Mechanical features of LCF78-50JL & LCF78-50JFNL:			
Weight, approximately	0.36 kg/m	(0.24 lb/ft)	
Minimum Bending radius, single bending	120 mm	(5in)	
Minimum Bending radius, repeated bending	250 mm	(10in)	
Bending moment	13 Nm	(9.6lb-ft)	
Flat crush resistance	10 N/mm	(57lb/in)	
Max. tensile force	1440 N	(324lb)	
<ul> <li>Recommended clamp spacing</li> </ul>	0.8 m	(2ft 7.5in)	
Max. clamp spacing	1.0 m	(3 ft 3 in)	

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Table 1

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### Transport/shipment & handling of the drum

Drums have to be handled carefully, in order to avoid any deformation of the drum and the cable itself.

- If the drum will be shipped e.g. by van or truck the drum has to be secured against rolling. 'Take special care when loading and unloading''. Do not roll the drum from high levels (load floor) of the vehicle without protective measures, e.g. roll the drum from the vehicle by using planks as a ramp. Do not drop down the drum!
- If forklifts are used, the forks must be long enough to engage both flanges of the drum at a time to avoid cable damage.
- If a crane is used a special hanger is necessary to ensure vertical application of forces and thus avoiding damage of the drum flanges and the cable.
- Do not lay the drum on its side, reels must be transported and handled in their upright position only (the cable would be deformed because of its own weight).
- Make sure that the cable end is always properly sealed and fixed as close as possible to the drum core.
- Note the recommended turning direction of the drum, which is shown by an arrow on the drum flange (during installation / pulling of the cable the drum will be on drum stands and will then be turned in the opposite direction to unwind the cable).
- If the drum is completely protected by wooden planks, these should not be removed before the drum is placed (transported) to the final position.



Label fixed to the drum. Please follow the instructions.

### Hoisting/Pulling - Handling of the cable

• To hoist the cable hoisting grips have to be used, please note the maximum hoisting length of the different hoisting grips available. If necessary multiple hoisting grips have to be used.

Introduce the cable into the hoisting grip, protect the cable against shackles and tie the upper cable end with connector to the hoisting line, whereby the connector should be protected by wrapping e.g. cloth around it.

- If it can't be avoided to drag the cable over sharp edges, protective measures must be taken, if necessary by positioning an additional rigger at those critical places.
- In order to protect the cable against any damage protective measures also must be taken if cables have to be pulled in horizontal runs. For example by using pipe rollers, wooden planks or similar.

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 The minimum bending radius given in table 1 should be strictly observed. The CELLFLEX<sup>®</sup> cable is bend manually with a force that is applied in a distributed manner (while pressing carefully the hand slides a long the cable [see sketch 2]. –make sure to avoid punctual load)



The CELLFLEX<sup>®</sup> Lite cable with aluminium outer conductor is easier to bend, but must be handled a little more carefully. Especially during bending, because the required effort (energy) for bending the cable is lower than for copper cables.

• Do not twist the cable, e.g. if changing from vertical to horizontal run [see sketch 3].



• Do not leave the cable hanging in a long free space, e.g. during the installation under a platform. In adverse conditions additional protective measures may have to be taken [for example see picture 4].

### **RADIO FREQUENCY SYSTEMS**





• Keep the cable end down during cutting and connector installation in order to prevent any particles from entering the cable.

### Fixation of the cable

The crush resistance of aluminium is lower than copper, this should be considered for instance if tightening the clamps (especially if these clamps have not been approved by RFS).

For the fixation a number of different clamps can be used, we recommend using the RSB-Clip. The RSB-Clip is suitable for all fixing situations while at the same time it is the safest (most failure proof) clamp with a large number of exceptional advantages. US standard clamp is the SNAP-xxx or SNAP-ST-xxx.



In any case the recommended and maximum clamp spacing shown in table 1 must always be considered. The small spacing applies to severe site conditions (wind load, icing etc.), whereas the greater / recommended spacing can be used for less exposed cable runs (e.g. indoor applications).

If other clamps are used, the maximum torque has to be noted (lower torque than for copper cables). The max. torque is shown in table 5.





Table 5

Clamp type	Model Number (e.g.)	Information – maximum torque	
RSB-Clip	RSB-78	Can be used without any reservation, torque limit not applicable because cable holding and clamp fixing are disconnected	
Snap in Hanger	SNAP-ST-78	Can be used without any reservation, torque limit not applicable because of snap-in fixation	
Bolt-on Hanger	CLAMP-78	Tighten carefully, clamp mustn't be fully closed	
SCS clamp	SCS-78-L3M	0.5 Nm	
SCS clamp modified	SCS-78-L3M	2 – 3 Nm	
MBH (Multi Block Hanger)	MBH-78-6	2 Nm; clamp mustn't be fully closed	
MBH (Multi Block Hanger) modified	MBH-78-6	4 - 5 Nm; clamp fully closed	

### Installation of connector

Because of electrochemical potential differences between copper and aluminium the connectors for the aluminium cables are made with special plating.



Please note: The first generation of RAPID FIT Lite connectors are exclusively for use with cables with aluminium outer conductor – a label is attached to the bag for positive



identification. The second generation will work with both cables alike, hence no label.

Connector for CELLFLEX® Lite with special

plating, sealed with a rubber sleeve

Do not use standard RAPID FIT connectors, which are made for copper cables, for Lite cables.

In order to prevent any particles from entering, the cable should be kept downwards during the whole installation process of the connector.

Connectors can only be installed in straight cable runs. It is not possible to straighten the front part of the cable; therefore the cable has to be cut  $20 \text{ cm} (7 \frac{3}{4})$  after straightening the first 1 m (39). To reduce scrap, it can help to generally straighten cables before cutting.

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For the preparation of the CELLFLEX® Lite cable a new Preparation tool is available -Model Name: TRIM-78-LF (note: the Preparation tool for the copper cable can not be used!). It is recommended to clean the knife of the tool with spirits from time to time.



High precision combination preparation tool: TRIM-78-LF

For the dismantling of the jacket (first step) we strongly recommend to use the stripping tool Model Name: JSTRIP-78-2.





Put the JSTRIP onto the cable (necessary length / distance see installation instruction of the concerning connector), whereby the straightened cable end should be kept downwards in order to prevent any particles from entering. Insert a screwdriver into the two support holes and start turning, keep a straight line - do not push in any directions and do not twist / leave the right angle line. Continue with turning by hand (the screwdriver is needed for the start only) until the jacket is cut around, still keep the straight line.

Put the tool onto the cable again, whereby the knife should be in the already dismantled area. Start again, while turning push the tool slowly to the cable end. The jacket will be cut in a spiral. Turn further by pushing the tool slowly to the cable end. Then remove tool with jacket. Now follow the installation instruction of the connector.

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Please read the installation instruction that come with the connector very carefully. Take special care to remove any metal particles - the silver aluminium particles are not easily visible in the dielectric area.

Please ensure to properly tighten the connector to the torque specified in the installation instruction.

### Installation of the Grounding Kit

In order to avoid any corrosion problems, the body of the Pre-Formed Grounding Kit model name GKFORM20-78LITE is made of aluminium as the outer conductor of the cable.



Pre-Formed Grounding Kit for LCF78-50Lite cable: **GKFORM20-78Lite** 

## Because of electrochemical potential differences between copper and aluminium do not use the groundings, which are made for copper cables and visa versa!

New versions will be made available with compatible plating of the contact elements to ensure functionality with aluminium and copper conductors.

Please follow the included installation instruction carefully.

For the dismantling of the jacket we also strongly recommend to use the Stripping tool with the model name: **JSTRIP-78-2**.





Put the JSTRIP onto a **straight running** part of cable. Insert a screwdriver into the two support holes and start with turning, keep a straight line – do not push in any directions and do not twist / leave the right angle line. Continue with turning by hand (the screwdriver is needed for the start only) until the jacket is cut around, still keep the straight line. Make a mark onto the cable jacket in a distance of 70 mm ( $2\sqrt[3]{4}$ ") from the beginning of the first cut (that's 50 mm (2") which is needed for the grounding kit installation and the part of the tool from the end of the knife to the end of the tool). Put the tool onto the cable again, whereby the knife should be in the already dismantled area. Start again, while pushing the tool slowly in direction of the marking. The jacket will be cut in a spiral. Turn further by pushing the tool very slowly until reaching the marking.

If the tool is on the mark, turn further, but now push a little bit in the direction backwards in order to finish the cut in straight line / in a right angle.

Note: If the tool has been started to cut in a spiral, the tool will move continuously by itself in the direction of beginning. If the mark area is reached, this movement has to be stopped by pushing carefully in the opposite direction. Because of this problem we recommend to make a practice strip on a part of cable which is not needed for the installation. If this process is not easy enough / not acceptable a clamp (e.g. RSB-Clip) can be placed on the mark place. This clamp will then stop the movement of the tool in the final position [see pictures 6].



Pictures 6

## **RADIO FREQUENCY SYSTEMS**



Please put the body of the grounding kit very carefully around the cable, in order to prevent damaging the outer conductor. Then tighten the nuts carefully because these are made of aluminium as well.



Finally use the supplied sealing materials as described in the instruction to perform a proper sealing of the complete kit.

Place especially the third 50 mm (2") piece of butyl mastic carefully over the ground wire. We recommend to bend it with overlapping on both sides when placing over the ground wire. Afterwards mould it in a straight line to the coaxial cable to avoid holes where water could enter [see sketch 7].









Special care must also be taken to form tile-like overlaps when wrapping the tape layers, i.e. start from the bottom and end at the top.



In case of additional questions please refer to your RFS sales contact or <u>www.rfsworld.com</u> or <u>applicationsengineering.americas@rfsworld.com</u> or <u>technical.consulting@rfsworld.com</u>

