

GORE® Microwave/RF Assemblies

Care and Handling

Summary

Microwave coaxial assemblies, regardless of manufacturer or type, will provide you with better service when proper care and usage are maintained. Your equipment will perform better, last longer, and your measurements will be more accurate and repeatable.

GORE® Microwave Coaxial Assemblies are precision components. Proper use, routine inspection of the complete assembly, and cleaning of the connectors are extremely important.

Initial connector mating

Never attempt to mate connectors before first aligning their center lines when applicable. Due to necessary play in the coupling nut mechanism, or coupling arrangement, it is often possible to mate without connector pins aligned. This can result in bent pins and destroyed dielectric inserts.

Depending on the connector type, it is often possible to “feel” whether or not the pins are aligned. If you are reasonably sure they are aligned, proceed by gently mating the coupling nut until it bottoms. If during this process the nut is difficult to turn, it may be due to one of the following:

- The pins are not aligned
- The coupling nut is cross-threaded
- The connector (or its mate) is damaged by excessive torque

Stop and determine the reason. To proceed will risk destruction of the assembly and/or the mating connector.

Never hold a pin connector coupling nut stationary while screwing the socket counterpart into it. This will ultimately destroy both connectors. Such rotation will wear away plating and score both the outer interface rim and the pin. If the pins lock up, serious damage can be induced within the device and/or the assembly. This is a very common form of damage, since it is a natural way to mount an adapter to an assembly.

Connector torque

Prior to tightening a connector to the proper torque, grasp the body of the connector firmly to keep it from rotating. As the pin coupling nut becomes tighter, frictional forces will increase and the nut and body will tend to lock up, which in turn will cause the body to rotate with the nut. If allowed, this rotation will wear away plating and score both the outer interface rim and the pin of both connectors.

Additionally, unwanted torque will be transferred to the cable assembly.

Always use a torque wrench that is permanently set to the correct torque value to mate a connector with wrench flats. Tighten slowly until the wrench “snaps” (fast tightening overrides the torque-limiting capability of the wrench). Resist the urge to snap the wrench more than once; this can be likened to an uncontrolled impact wrench and can cause over-torque.

To mate connectors with knurled nuts, use only your fingers. If you feel that this does not provide sufficient tightness, you should use hex-nut connectors and torque wrenches. Never use pliers to tighten any connector.

Depending upon the connector, over-torque can cause damage to connectors in a variety of ways:

- Mushroomed outer interface shells
- Mushroomed pin shoulders
- Recessed or protruding pins
- Recessed or protruding dielectrics
- Bent pins
- Chipped plating
- Coupling nut retaining ring damage
- Damage to coupling threads

When an assembly connector is over-torqued, not only is it damaged, but so is the connector to which it is mated.

Once a connector has been damaged, it will continue to damage each and every connector to which it is mated. In most cases, it will also give you poor system performance, erroneous data, etc.

Cable handling

Failure to observe the minimum bend radius specified for the cable will destroy it. Be alert to tight bends where they are not necessarily obvious, for example, at the end of connector strain relief tubing, or at the end of marker tubing. Remember, although the angular displacement of the cable may be slight, the bend radius at the point of angular departure may be far smaller than that recommended.

Cable assemblies are normally stored in a coiled configuration. Cable “set” can be minimized by using large coil diameters of 1 or 2 ft (304.8 mm or 609.6 mm). When you are ready to use them, unroll them; never just pull the loops out. Similarly, re-roll them when you put them away.

Cable bend radius

Cable Type	Single in. (mm)	Multiple in. (mm)
4L	0.125 (3.2)	0.25 (6.4)
53	0.25 (6.4)	0.40 (10.2)
89	0.25 (6.4)	0.50 (12.7)
G1/G4	0.30 (7.6)	0.50 (12.7)
2Z	0.50 (12.7)	1.00 (25.4)
GD	0.50 (12.7)	1.00 (25.4)
G2/G5	0.50 (12.7)	1.00 (25.4)
G3/G6	0.75 (19.1)	1.50 (38.1)
8W	0.90 (22.9)	2.00 (50.8)

Avoid pinching, crushing, or dropping objects on assemblies. Dragging cables over sharp edges will tend to flatten one side. Additionally, it is highly likely that the minimum bend radius will be exceeded.

Never pull equipment around by the assemblies and never expect the assemblies to support equipment or devices.

To hold a cable in place, the use of toothed, rubber-lined "P-clamps" is recommended. If tie-wraps must be used, use the widest possible wrap and the lowest setting on the gun to reduce pressure to the lowest possible level.

Inspection of assemblies

First, inspect the cable itself for dents, twists, flattening, abraded jacket, or other signs of abuse.

Wrinkles in the jacket are an indication that the minimum bend radius has been exceeded. This may occur at or near the connectors and marker tubes.

Next, inspect the connector interfaces using magnification for the following:

- Bent pins
- Bent or missing pin tines
- Worn or chipped plating
- Damaged or displaced dielectric inserts
- Thread damage
- Folded or mushroomed outer interface rims
- Mushroomed pin shoulder or tine ends
- Score lines on pins and outer interface rims
- Recessed or protruding pins

If any of the above damage is noted, the assembly should be replaced before its further use results in equipment damage. If, during the preceding inspection, debris is found in the interface, clean it as directed. (It may be helpful to clean the connectors prior to inspection to make subtle damage more apparent.)

Debris may take the form of:

- Plating chips or other metal particles
- Dust or dirt
- Oily films
- Other of unknown character or origin

Do not forget to inspect the mating connectors.

Connector interface cleaning

Do not use chlorinated solvents, particularly those in pressurized cans. These solvents are extremely penetrating and sometimes ruin otherwise good devices and assemblies.

Moisten a lint-free synthetic material swab, such as polyester, with isopropyl alcohol. Roll the swab on a paper towel to remove excess (the swab should only be dampened). Use the dampened swab to wipe away debris (do not try to dissolve debris by over-wetting the swab).

Repeat the cleaning process using additional swabs as necessary. If metallic particles are embedded in the dielectric, use an eyeglass and a sharp pick to dislodge them.

When satisfied that the interfaces are clean, blow them dry with dry compressed air or, preferably, dry nitrogen (pressurized spray cans work well). Do not use your breath: it is moistureladen and alcohol absorbs moisture.

Do not forget to clean the mating connectors. They may be the source of the debris.

NOTICE — USE RESTRICTIONS APPLY. Not for use in food, drug, cosmetic or medical device manufacturing, processing, or packaging operations.

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