



Cable Assembly Family Extends Laboratory-Grade Measurements to 70 GHz

HUBER+SUHNER AG
Herisau, Switzerland

Our increasingly high-tech world relies on the capabilities of new generations of infrastructure, as society adopts 5G, autonomous cars, the IoT and Industry 4.0. To ensure these complex systems work as designed, the underlying components—antennas, semiconductor chipsets, passive components and high speed interfaces—require rigorous testing. With test and measurement, the best measurement setup is only as good as its weakest link, which is often the cable assembly used to connect the device being tested to the measurement equipment. Repeated connecting and disconnecting flexes the cable assembly and may damage the connectors. Even without damage, the

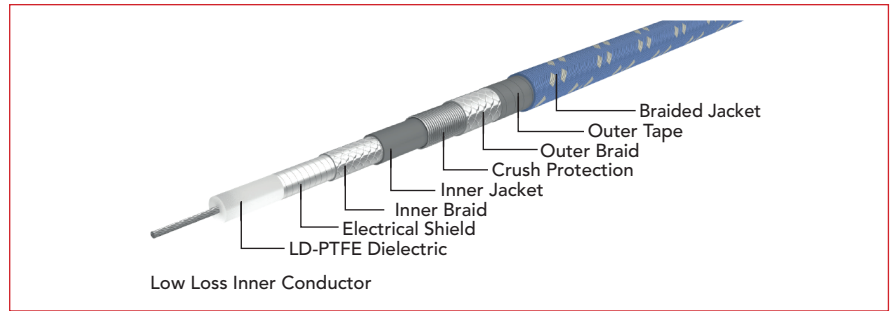
phase and amplitude responses of the cable will change with movement and variation in the surrounding temperature. For fixed installations, RF/microwave cable assemblies are often damaged during equipment installation. Even when installed without damage, the cables are prone to amplitude and phase variation caused by system vibration and temperature changes.

Recognizing the importance of rugged, high performance cable assemblies for these applications, HUBER+SUHNER developed the SUCOFLEX® 500 series for RF and high speed digital test and measurement applications. Recently, HUBER+SUHNER added the 570S to the family, extending the frequency range to 70 GHz. SUCOFLEX 500 now comprises five cable assembly types with upper frequency coverage beginning at 26.5 and extending to 70 GHz when configured with compatible connectors (see **Table 1**). These cable assemblies assure precise, repeatable and reliable measurements in laboratories and other installations that require the highest quality and reliability.

The cables in the family share a common construction (see **Figure 1**), which makes them extremely flexible with zero spring back, so they are easy to handle and connect to equipment. As required for labo-

TABLE 1					
SUCOFLEX PRODUCT FAMILY					
Cable Type	526S	526V	550S	550S	570S
Maximum Frequency (GHz)	26.5	26.5	40	50	70
Connector (mm)	3.5	3.5	2.92	2.4	1.85
Typical Insertion Loss (dB/m)	1.63	3.63	3.41	3.87	6.48
Flex Lifetime (Cycles)	>100,000	>100,000	>100,000	>100,000	>20,000

ProductFeature



▲ Fig. 1 SUCOFLEX 500 cable construction.

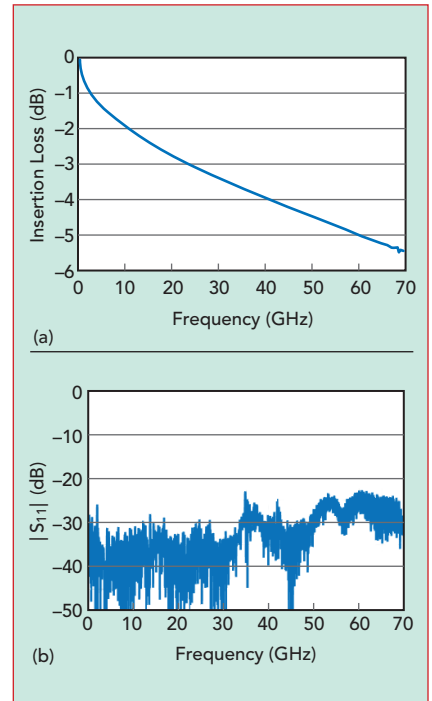
ratory-grade measurements, they have a stable phase response, high flex life, low insertion loss and excellent return loss (see **Figure 2**). Amplitude, phase repeatability and stability are essential to achieving accurate laboratory measurements, which is used to assess the performance of multi-million dollar prototypes or decide to pass/fail at final manufacturing test. The members of the SUCOFLEX 500 family exhibit just ± 0.05 dB amplitude change with cable movement or flexure, and the phase stability versus flexure is within ± 3 degrees for the 26.5 GHz 526S cable assembly and ± 8 degrees for the 70 GHz 570S. The cable assemblies have an operating temperature range from -55°C to $+125^{\circ}\text{C}$, so they support measurements over temperature.

SUCOFLEX 500 assemblies are available in various lengths, with stock assemblies shipped within five working days and customized configurations within 10 working days. The cable assemblies can also be supplied matched to the same time delay within ± 1 ps.

To assist customers specifying a cable assembly, HUBER+SUHNER offers several online tools: eCatalogue, RF assembly calculator and RF assembly configurator. The tools help designers identify suitable cables, configure cable assemblies with appropriate connectors, estimate electrical performance and compare the performance of various designs.

HUBER+SUHNER's SUCOFLEX 500 series offers excellent performance and good value. The newest addition, the 570S, is a precise, long-lasting connectivity solution that ensures extremely accurate mmWave measurements.

As RF, microwave and mmWave



▲ Fig. 2 Insertion loss (a) and $|S_{11}|$ (b) of a 36 in. 570S cable assembly with 1.85 mm connectors.

technology enables innovations such as 5G and IoT, testing remains essential to product development and manufacturing. Even with the adoption of over-the-air testing, cable assemblies remain an integral part of the test system and should be chosen from a supplier with a long heritage delivering high performance, rugged and reliable products. Since the late 1800s, HUBER+SUHNER has been providing products that help people connect, beginning with insulating copper wires supporting the adoption of electricity to today's world of RF/microwave and optical networks.



HUBER+SUHNER AG
Herisau, Switzerland
www.hubersuhner.com