



Innovate and Improve

Silicon Dioxide (SiO₂) Cable Assemblies Specification Sheet

Measure Tech's SiO₂ cable assemblies are the ideal choice for applications requiring phase stability and high performance in extreme operating environments.

SiO₂ cables are custom made in-house by extruded high purity silicon dioxide and composed of a high conductivity copper center and outer conductor with a stainless steel jacket. This construction creates a RF cable that can withstand temperatures up to 1000°C, has excellent temperature verse electrical phase performance, and superior rigidity. SiO₂ cables can then be paired with a variety of standard RF and custom designed connectors to create a complete hermetically sealed SiO₂ cable assembly to meet your needs. Cable assemblies can be made in different lengths, bend configurations, phase matched, and include additional customizations.



Materials

Outer Jacket	304 Series Stainless Steel
Outer Conductor	Oxygen-Free High-Conductivity Copper
Center Conductor	Oxygen-Free High-Conductivity Copper*
Dielectric	Silicon Dioxide (99.9%+)
<i>*Center conductor can be customized - contact us for more details</i>	

Mechanical

Parameter	Cable Diameter			
	0.090"	0.142"	0.200"	0.275"
Weight (lb./ft.)	0.018	0.036	0.048	0.079
Minimum Bend Radius (In.) ¹	0.300	0.450	0.600	0.700
Rigidity	Semi-rigid (can be hand formed)			
Tensile Strength (connector pull off)	Up to 500 lb. ²			
<i>¹ Smaller bend radii can be achieved - contact us for more details</i>				
<i>² Dependent on cable diameter and connector design</i>				

Electrical

Dielectric Constant	1.56
Velocity of Propagation	80%
Nominal Impedance	50 Ω
Delay	1.27 ns/ft.
Capacitance	25 pF/ft.
SWR	See page 2
Attenuation (Insertion Loss)	See page 2
EMI Shielding	> 100 dB
Phase Matching	Cables can be phase matched to customer's requirements

Environmental

Dielectric Constant	-273°C thru +1000°C (-459°F thru +1832°F)
Operating Temperature (Connector)*	-273°C thru +600°C (-459°F thru +1112°F)
Hermeticity (connector and cable assembly)	< 1 x 10 ⁻⁸ cc He/sec.
Altitude	Excellent (Unaffected)
Chemical Resistance	Excellent (mostly stainless steel construction)
Radiation Resistance	Excellent (mostly stainless steel construction)
<i>*Temperature may be limited by specific connector design</i>	



REGISTERED
9001:2015 & AS9100D
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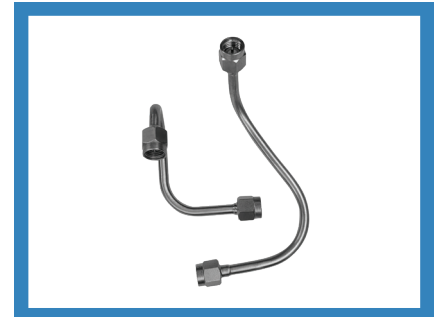
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Frequency vs. Insertion Loss (dB) and SWR of SiO₂ Cable Assemblies

Frequency (GHz)	Insertion Loss (dB./ft.)					SWR (max)
	Cable Diameter (in.)				Connector Pair	
	0.090	0.142	0.200	0.275		
0.05	0.040	0.024	0.016	0.011	0.028	1.20:1
0.5	0.131	0.075	0.049	0.035	0.086	
1.0	0.189	0.110	0.073	0.051	0.121	
2.0	0.274	0.161	0.109	0.076	0.171	
3.0	0.343	0.203	0.139	0.102	0.209	
4.0	0.403	0.241	0.166	0.117	0.241	1.25:1
5.0	0.458	0.275	0.190	0.133	0.27	
6.0	0.509	0.307	0.214	0.150	0.295	
7.0	0.556	0.337	0.237	0.166	0.319	
8.0	0.601	0.366	0.259	0.181	0.341	
9.0	0.645	0.396	0.279	0.195	0.361	1.30:1
10.0	0.686	0.422	0.299	0.209	0.381	
11.0	0.727	0.448	0.318	0.224	0.400	
12.0	0.768	0.473	0.337	0.237	0.417	
13.0	0.808	0.498	0.356	0.250	0.434	
14.0	0.845	0.522	0.374	0.263	0.451	1.40:1
15.0	0.880	0.547	0.393	0.276	0.466	1.50:1
16.0	0.912	0.570	0.410	0.288	0.481	
17.0	0.944	0.594	0.428	0.300	0.496	
18.0	0.978	0.615	0.446	0.312	0.510	

All data is at room temperature

✉ Contact us if you don't see the data you're looking for



Short cables with bends



Cable with custom connector and bend near connector



Cables with different connectors

About Measure Tech Inc.

Measure Tech's beginning goes back to 1978 when the company's sister company, Precision Measurements, started by creating specialized parts for the military, space, and laboratory business sectors. Over the years, Measure Tech has grown and expanded its focus on products such as sensors, switches, and various electromechanical products along with its unique RF product, SiO₂ cable assemblies, to serve the commercial aviation, military, and space industries. Today, all design and manufacturing is performed in their facility in Chatsworth (north of Los Angeles), California. Measure Tech prides itself as a company that rises to meet our customer's challenges.



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