



Spauldite® G-10CR 是严格控制的以玻璃布增强的环氧树脂层压板材。G-10CR 是为低温超导磁体而开发的绝缘与结构材料。在核聚变反应中经过  $2 \times 10^8$  rads 辐射后介电性能和机械性能都没有明显的改变。G-10CR 达到并超出 NEMA G-10, 美国军标 MIL-P-181777 以及 美国国家标准 LP 509 的要求。

主要特色	应用
<ul style="list-style-type: none"> <li>在低温下被证明的成功使用历史</li> <li>材料在低温温度下被美国国家标准局、洛斯阿拉莫斯国家实验室、麻省理工以及美国橡树岭国家实验室全面测试认定</li> <li>材料机械性能在低温温度比在常温下明显更好</li> </ul>	<p>G-10CR 做为结构件、垫块、热绝缘或电子绝缘件被使用在核聚变反应堆、超导磁储能线圈、磁铃发电机、高能加速器以及低温保持器中，常见的使用形式为支撑件、颈管或盖板。</p>
介电性能	机械加工
<p>G-10CR 在很大的温度范围内具有良好的介电性能。</p>	<p>除了可以锯，粗磨或研磨加工外，Grade G-10CR 也可以使用其他机加工方法比如钻孔，螺纹攻丝，仿形加工，刨铣加工等。G-10CR 的机加工性能和普通 NEMA G-10 层压材料相仿或更好一些。</p>
机械性能	
<p>Grade G-10CR 在低温温度比在常温具有明显更高的机械强度。通常来说，G-10CR 比普通 G-10 层压材料的性能更好。</p>	

A table of typical characteristic properties are shown on page 2.

*"To the best of our knowledge the information contained herein is accurate; however, Spaulding Composites Company, Inc. does not accept any liability regarding the accuracy or completeness of such information. Further, such information is based on standard base material and thus may change if the product ordered by purchaser requires further processing of base material by us and/or the purchaser. Purchaser has the sole responsibility in determining the suitability of any material described herein for the use contemplated and the processing of such material by purchaser."*



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## 材料特性

材料性能	测试方法	预处理	厚度 英寸	平均值		工业要求	
				英制	公制	英制	公制
<b>介电性能</b>							
介电强度 (平行法)	D-229	A D-48/50	.031-1.000	88 kV 83 kV	88 kV 83 kV	≥55 kV ≥50 kV	≥55 kV ≥50 kV
介电损耗因子 (1 MHz)	D-229	A D-24/23 D-48/50	Up to .500 Up to .500 .125	0.020 0.021 0.022	0.020 0.021 0.022	≤0.025 ≤0.030 ≤0.040	≤0.025 ≤0.030 ≤0.040
电容率 (1 MHz)	D-229	A D-24/23 D-48/50	Up to .500 Up to .500 .125	4.9 5.0 5.1	4.9 5.0 5.1	≤5.2 ≤5.4 ≤5.8	≤5.2 ≤5.4 ≤5.8
表面电阻	D-257	C-96/35/90	.015-.125	3.0 X 10 <sup>6</sup> MΩ	3.0 X 10 <sup>6</sup> MΩ	≥ 1.0 X 10 <sup>4</sup> MΩ	≥ 1.0 X 10 <sup>4</sup> MΩ
体积电阻	D-257	C-96/35/90	.015-.125	1.0 X 10 <sup>8</sup> MΩ-cm	1.0 X 10 <sup>8</sup> MΩ-cm	≥1.0 X 10 <sup>6</sup> MΩ-cm	≥1.0 X 10 <sup>6</sup> MΩ-cm
<b>机械性能</b>							
粘结强度	D-229	A D-48/50	.500 .500	2,900 lbs 2,800 lbs	12.9 kN 12.5 kN	≥ 2,200 lbs ≥ 2,000 lbs	≥ 9.8 kN ≥ 8.9 kN
压缩强度 侧向	D-229	A 纵向 横向	.250-1.000 .250-1.000	60.0 ksi 48.0 ksi	413.7 MPa 331.0 MPa	≥ 52.0 ksi ≥ 42.0 ksi	MPa ≥ 358.5 ≥ 289.6
弯曲强度	D-229	A 纵向 横向	.125 .125	80.0 ksi 62.0 ksi	551.7 MPa 427.6 MPa	≥ 60.0 ksi ≥ 48.0 ksi	MPa ≥ 413.7 ≥ 331.0
剪切强度	D-2733	A 纵向 横向 45°	.500-1.000 .500-1.000 .500-1.000	7.0 ksi 6.7 ksi 6.7 ksi	48.3 MPa 46.2 MPa 46.2 MPa	≥ 5.2 ksi ≥ 5.0 ksi ≥ 5.0 ksi	MPa ≥ 35.9 ≥ 34.5 ≥ 34.5
冲击强度 侧向 缺口	D-256	E-48/50 纵向 横向	.125-.500 .125-.500	15.2 ft-lbs/in 9.2 ft-lbs/in	.81 J/mm .49 J/mm	≥ 10.0 ft-lbs/in ≥ 6.3 ft-lbs/in	≥ .53 J/mm ≥ .34 J/mm
拉伸强度	D-229	A 纵向 横向	.020-.500 .020-.500	56.0 ksi 43.0 ksi	386.1 MPa 296.5 MPa	≥ 45.0 ksi ≥ 30.0 ksi	MPa ≥ 310.3 ≥ 206.9
<b>物理性能</b>							
密度	D-792	A	All	.067 lbs/in <sup>3</sup>	1.85 g/cm <sup>3</sup>	≥ .064 lbs/in <sup>3</sup>	≥1.78g/cm <sup>3</sup>
吸水性	D-229	D-24/23	.031 .062 .125 .500	0.20% 0.10% 0.06% 0.04%	0.20% 0.10% 0.06% 0.04%	≤ 0.40% ≤ 0.20% ≤ 0.10% ≤ 0.07%	≤ 0.40% ≤ 0.20% ≤ 0.10% ≤ 0.07%

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