MIL-DTL-38999
Connector Performance Specifications

<table>
<tr><th>Requirement</th><th>Performance Specifications</th></tr>
<tr><td>Insert Arrangements</td><td>(Meets MIL-DTL-38999, paragraph 3.4.1.4)
For hermetic connectors, the engaging end of pin and socket contacts shall be located within .004 inch (0.10 mm) diameter of true position. Test voltages for service ratings shall be as specified in table below
<table>
<tr><th colspan="5">Test Voltages, ac rms, 60 Hz</th></tr>
<tr><th>Altitude</th><th>Service Rating M</th><th>Service Rating N</th><th>Service Rating I</th><th>Service Rating II</th></tr>
<tr><td>Sea level</td><td>1300</td><td>1000</td><td>1800</td><td>2300</td></tr>
<tr><td>50,000 feet</td><td>550</td><td>400</td><td>600</td><td>800</td></tr>
<tr><td>70,000 feet</td><td>350</td><td>260</td><td>400</td><td>500</td></tr>
<tr><td>100,000 feet</td><td>200</td><td>200</td><td>200</td><td>200</td></tr>
</table></td></tr>
<tr><td>Supported Wire Size</td><td>(Per MIL-DTL-38999, paragraph 3.4.3.1)
<table>
<tr><th>Contact Size</th><td>23-22</td><td>22D</td><td>20</td><td>16</td><td>12</td><td>10</td></tr>
<tr><th>Wire Gauge</th><td>26, 24, 22</td><td>28, 26, 24, 22</td><td>24, 22, 20</td><td>20, 18, 16</td><td>14, 12</td><td>10</td></tr>
</table></td></tr>
<tr><td>Thermal Shock</td><td>(Meets MIL-DTL-38999, paragraph 3.7)
After cycling the connector between two water baths of approximately 1 cubic foot, not to exceed +4°C for the first and no less than +90°C for the second, it will meet all applicable electrical and mechanical requirements.</td></tr>
<tr><td>Air Leakage</td><td>(Meets MIL-DTL-38999, paragraph 3.10)
There shall be no evidence of leakage in excess of .01 micron ft^3/h (1E-7 cm^3/s)</td></tr>
<tr><td>Coupling and Uncoupling Torque</td><td>(Meets MIL-DTL-38999, paragraph 3.11)
Coupling torque for mating and the uncoupling torque for unmating of counterpart plugs and receptacles, mating of connectors to and from protective covers, and mating plugs to and from dummy stowage receptacles, shall meet the requirements in Coupling and Uncoupling Torque table.
<table>
<tr><th colspan="3">Coupling and Uncoupling Torque</th></tr>
<tr><th rowspan="2">Shell size</th><th>Maximum engagement and disengagement</th><th>Minimum disengagement</th></tr>
<tr><th>Pound inch</th><th>Pound inch</th></tr>
<tr><td>8</td><td>8</td><td>2</td></tr>
<tr><td>9</td><td>8</td><td>2</td></tr>
<tr><td>10</td><td>12</td><td>2</td></tr>
<tr><td>11</td><td>12</td><td>2</td></tr>
<tr><td>12</td><td>16</td><td>2</td></tr>
<tr><td>13</td><td>16</td><td>2</td></tr>
<tr><td>14</td><td>20</td><td>4</td></tr>
<tr><td>15</td><td>20</td><td>3</td></tr>
<tr><td>16</td><td>24</td><td>4</td></tr>
<tr><td>17</td><td>24</td><td>3</td></tr>
<tr><td>18</td><td>28</td><td>5</td></tr>
<tr><td>19</td><td>28</td><td>3</td></tr>
<tr><td>20</td><td>32</td><td>6</td></tr>
<tr><td>21</td><td>32</td><td>5</td></tr>
<tr><td>22</td><td>36</td><td>7</td></tr>
<tr><td>23</td><td>36</td><td>5</td></tr>
<tr><td>24</td><td>36</td><td>7</td></tr>
<tr><td>25</td><td>40</td><td>5</td></tr>
</table></td></tr>
<tr><td>Durability</td><td>(Meets MIL-DTL-38999, paragraph 3.12)
Not applicable to lanyard release plugs. No electrical or mechanical defects after 500 cycles of engagement and disengagement.</td></tr>
</table>

Dimensions in Inches (millimeters) are subject to change without notice.

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<table>
<tr><th>Requirement</th><th>Performance Specifications</th></tr>
<tr><td>Insulation Resistance</td><td>(Meets MIL-DTL-38999, paragraph 3.14.1)
At Ambient Temperature insulation resistance between any pair of contacts and between any contact and the shell shall be greater than 5,000 megohms. Insulation resistance after altitude immersion shall be 1,000 megohms minimum. Insulation resistance after humidity shall be 100 megohms minimum. IAW EIA-364-21.
(Meets MIL-DTL-38999, paragraph 3.14.2)
At Elevated Temperature Unmated connectors shall be tested in accordance with test procedure EIA/ECA-364-21</td></tr>
<tr><td>Dielectric Withstanding Voltage</td><td>(Meets MIL-DTL-38999, paragraph 3.15)
Wired, unmated connector, maximum leakage current shall be 2 milliamperes, and there shall be no evidence of electric breakdown or flashover. IAW EIA-364-20 method A. Magnitude of the test voltage shall be as specified per insert arrangement requirement, Test Voltages Table (See MIL-STD-1560 for service rating of insert arrangement).</td></tr>
<tr><td>Insert Retention</td><td>(Meets MIL-DTL-38999, paragraph 3.16)
When tested IAW EIA-364-35, unmated connectors shall retain their inserts in their proper location in the shell and there shall be no evidence of cracking, breaking, separation from the shell, or loosening of parts when subjected to 100 PSI (25 PSI minimum) force</td></tr>
<tr><td>Salt Spray (Corrosion)</td><td>(Meets MIL-DTL-38999, paragraph 3.17)
When tested in accordance with EIA-364-26, meets appropriate electrical and mechanical requirements and shows no exposure of base metal after 500 hours of salt spray.</td></tr>
<tr><td>Contact Resistance at 25° C</td><td>(Meets MIL-DTL-38999, paragraph 3.18) Hermetic connectors with sockets only
Contacts in the mated condition shall meet the contact resistance requirements of the table shown below. Appropriate compensation may be made for resistance in the measured value which is due to an additional length of wire included in the measurement.
<table>
<tr><th rowspan="2">Class</th><th rowspan="2">Contact Size</th><th rowspan="2">Wire Size</th><th rowspan="2">Test Amperes</th><th colspan="2">Millivolt Drop Maximum</th></tr>
<tr><th>Initial</th><th>After Conditioning</th></tr>
<tr><td rowspan="5">H, N and Y</td><td>12</td><td>12</td><td>17</td><td>85</td><td>100</td></tr>
<tr><td>16</td><td>16</td><td>10</td><td>85</td><td>100</td></tr>
<tr><td>20</td><td>20</td><td>5</td><td>60</td><td>75</td></tr>
<tr><td>22D</td><td>22</td><td>3</td><td>85</td><td>95</td></tr>
<tr><td>23-22</td><td>22</td><td>3</td><td>85</td><td>95</td></tr>
</table></td></tr>
<tr><td>Bayonet Coupling Pin Strength</td><td>(Meets MIL-DTL-38999, paragraph 3.21)
Applicable to series I and II only. Bayonet coupling pins shall withstand a load of 50 +5/-0 pounds without displacement or perceptible loosening of coupling pins.</td></tr>
<tr><td>Environmental Contact Retention Connectors</td><td>(Meets MIL-DTL-38999, paragraph 3.24)
The axial displacement of the contact shall not exceed .012 inch (0.30 mm).
No damage to contacts or inserts shall result.</td></tr>
<tr><td>Vibration</td><td>(Meets MIL-DTL-38999, paragraph 3.27)
There shall be no electrical discontinuity and there shall be no disengagement of mated connectors, backing off of the coupling mechanism, evidence of cracking, breaking, or loosening of parts.</td></tr>
</table>

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<tr><td>Shock</td><td>(Meets MIL-DTL-38999, paragraph 3.28)
There shall be no electrical discontinuity and there shall be no disengagement of mated connectors, evidence of cracking, breaking, or loosening of parts.
Standard shock (all series). Connectors shall be tested in accordance with test procedure EIA-364-27 and any additional details noted.
High-impact shock. Applicable to series I, III and IV only. Wired and mated connectors shall be tested in accordance with MIL-S-901, grade A and in accordance with any modifications or additions noted. The wire bundle shall be provided with a straight, environmental, backshell, category 2B in accordance with SAE-AS85049, the longest length available per shell size. Discontinuity monitoring shall be performed in accordance with EIA-364-46.</td></tr>
<tr><td>EMI Shielding</td><td>(Meets MIL-DTL-38999, paragraph 3.32)
EMI shielding, low frequencies Applicable frequency range is 100 to 1,000 MHz only.
EMI shielding, high frequencies. Applicable frequency range is 1,000 to 10,000 MHz only. The EMI shielding effectiveness of mated connectors with EMI backshells shall be measured using the mode-stirred technique in accordance with test procedure EIA-364-66.
EMI shielding capabilities of mated shells with spring fingers shall not be less than that specified in table at the specified frequencies below.
<table>
<tr><th rowspan="2">Frequency MHz</th><th colspan="4">Leakage Attenuation (dB) Minimum</th></tr>
<tr><th>Series I</th><th>Series II</th><th>Series III & IV (Class N)</th><th>Series III & IV (Class H &Y)</th></tr>
<tr><td>100</td><td>90</td><td>65</td><td>90</td><td>80</td></tr>
<tr><td>200</td><td>88</td><td>60</td><td>88</td><td>75</td></tr>
<tr><td>300</td><td>88</td><td>55</td><td>88</td><td>73</td></tr>
<tr><td>400</td><td>87</td><td>55</td><td>87</td><td>71</td></tr>
<tr><td>800</td><td>85</td><td>45</td><td>85</td><td>66</td></tr>
<tr><td>1,000</td><td>85</td><td>45</td><td>85</td><td>65</td></tr>
<tr><td>1,500</td><td>69</td><td>—</td><td>76</td><td>59</td></tr>
<tr><td>2,000</td><td>65</td><td>—</td><td>70</td><td>55</td></tr>
<tr><td>3,000</td><td>61</td><td>—</td><td>69</td><td>52</td></tr>
<tr><td>4,000</td><td>58</td><td>—</td><td>68</td><td>50</td></tr>
<tr><td>6,000</td><td>55</td><td>—</td><td>66</td><td>48</td></tr>
<tr><td>10,000</td><td>50</td><td>—</td><td>65</td><td>45</td></tr>
</table></td></tr>
<tr><td>Fluid Immersion</td><td>(Meets MIL-DTL-38999, paragraph 3.34)
Designed to function in all fluids encountered in any modern military or aerospace environment. Tested in accordance with test procedure EIA-364-10. Connectors shall be tested for coupling torque and dielectric withstanding voltage at sea level within 3 hours of fluid immersion cycles.</td></tr>
<tr><td>Contact engagement and separating force</td><td>(Meets MIL-DTL-38999, paragraph 3.42)
Applicable to hermetic connectors with sockets only
When tested as specified in 4.5.38, contact engagement and separating forces shall be within the limits specified in SAE-AS39029.</td></tr>
<tr><td>Resistance to Probe Damage</td><td>(Meets MIL-DTL-38999, paragraph 3.43)
Applicable to hermetic connectors with sockets only
Contacts shall withstand the bending moment and depth of test probe insertion without evidence of damage that would interfere with the mechanical or electrical performance.</td></tr>
<tr><td>Fungus</td><td>(Meets MIL-DTL-38999, paragraph 4.2.2)
Materials used in the construction of these connectors shall be fungus inert per certification of method 508.4 of MIL-STD-810.</td></tr>
</table>

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