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## DEUTSCH\* DRC22-50PXX Series Connector System

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### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) DRC22-50PXX Series Connector System.

#### 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 2 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

#### 1.3 Successful qualification testing on the subject product line was completed in 2001. The Qualification Test Report number for this testing is [501-151073](#). These documents are on file at and available from Product Engineering, Industrial Commercial Transportation (ICT).

### 2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

#### 2.1 TE Connectivity (TE) Documents

- [109-1](#) General Requirements for Testing
- [108-151052](#) DRC26 Product Specification
- [408-151007](#) Instruction Guide DEUTSCH Extraction Tools
- [501-151052](#) DRC26 Qualification Test Report
- [501-151073](#) DRC22-50PXX Qualification Test Report
- Product Drawings

XX refers to 01 to 10 keys

DRC22-50PXX	50pin Receptacle
DRC26-50SXX	50pin Plug

#### 2.2 Industry Documents

- DIN 72551-6: Road Vehicles—Low-Tension Cables—Part 6: Single-Core, Unscreened with Thin Insulation Wall; Dimensions, Materials, Marking
- ISO 6722: Road Vehicles—60 V and 600 V Single-Core Cables—Dimensions, Test Methods, and Requirements
- SAE J1128: Low Voltage Primary Cable

### 3. REQUIREMENTS

#### 3.1 Design and Construction

Product shall be of the design, construction, materials and physical dimensions specified on the applicable product drawing.

#### 3.2 Ratings

- Voltage: 250 VAC/VDC
- Current (Amp): See Figure 1

Contact Size	Wire Size AWG [mm <sup>2</sup> ]	All Circuits Energized (A)
20	16 [1.5-1.0]	7.5
	18 [0.8-0.75]	
	20 [0.5]	
	22 [0.35]	5

Figure 1

- Temperature: -55°C to +125°C
- Ingress Protection (IP): Not tested
- Flammability: Not tested. Housing material is UL V-0.

### 3.3 Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

Test Description	Requirement	Procedure												
Visual Inspection	Free of defects that could affect the electrical or mechanical performance of the part or degrade the long term performance of the part.	Examine samples for defects or damage (i.e. torn seals, cracked plastic, missing parts, arching, charring, identification, finish, interchangeability, workmanship, etc.)												
<b>ENVIRONMENTAL</b>														
Temperature Life	There shall be no evidence of cracking, distortion, or detrimental damage.	Mated connectors shall be exposed to a temperature of $120 \pm 3 \text{ }^\circ\text{C}$ for 500 hours.												
Thermal Cycle	There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test.	<p>The test samples shall be cycled between <math>-40^\circ\text{C}</math> to <math>120^\circ\text{C}</math> temperature extremes.</p> <ol style="list-style-type: none"> <li>Cool the test samples to the lower operating temperature limit. The minimum dwell times at the temperature extremes are a function of the mass of the sample and are listed below.</li> <li>Bring the environmental chamber to the opposite temperature limit at a rate of <math>2^\circ\text{C}</math> to <math>5^\circ\text{C}</math> per minute. Dwell at the limit temperature for at least the minimum time per below table.</li> <li>Repeat step 2 39 times for a total of 20 cycles. For ease of testing, samples may be held at the temperature extremes for extended time, such as overnight. On the last cycle, thoroughly soak the test samples to <math>-50^\circ\text{C}</math> for 8 hours.</li> </ol> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>WEIGHT OF SPECIMEN (GRAMS)</th> <th>MINIMUM TIME (HOURS)</th> </tr> </thead> <tbody> <tr> <td>&lt;136</td> <td>0.5</td> </tr> <tr> <td>136 TO 1.36 K</td> <td>1.0</td> </tr> <tr> <td>1.36 K TO 13.6 K</td> <td>2.0</td> </tr> <tr> <td>13.6 K TO 136 K</td> <td>4.0</td> </tr> <tr> <td>&gt;136</td> <td>8.0</td> </tr> </tbody> </table>	WEIGHT OF SPECIMEN (GRAMS)	MINIMUM TIME (HOURS)	<136	0.5	136 TO 1.36 K	1.0	1.36 K TO 13.6 K	2.0	13.6 K TO 136 K	4.0	>136	8.0
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Water Immersion	Inspect for leakage inside dried sample	Place the wired mated connectors in an oven at $50 \pm 5^\circ\text{C}$ for 2 hours. Immediately immerse samples in a container of $21 \pm 5^\circ\text{C}$ tap water (electrically conductive) to a depth of 90 cm for 120 minutes. The container shall be large enough, so the sample does not increase the water temperature more than $1^\circ\text{C}$ . The wire leads shall be long enough to extend outside the container with sealed ends.												

Figure 2

Test Description	Requirement	Procedure										
Fluid Resistance	Inspect for damage, such as cracked housing, seal displaced from housing, loose parts, inability to mate or unmate or couple housing, etc.	<p>Test sample are to be tested in a temperature chamber with the fluid stabilized to the chamber temperature listed below. Test sample shall be properly assembled and mated connectors. One sample is required for each fluid. On day 1 the sample shall be dipped for 5 seconds, removed and allowed to drip dry for 1 hour at the chamber temperature. Repeat test 6 times and allow sample to drip dry overnight at the chamber temperature. Fluid shall not be drained from recesses on sample. Repeat the 7 immersions for 4 more days.</p> <table border="1" data-bbox="992 653 1528 795"> <thead> <tr> <th data-bbox="992 653 1344 693">FLUIDS</th> <th data-bbox="1344 653 1528 693">FLUID AND CHAMBER TEMPERATURE</th> </tr> </thead> <tbody> <tr> <td data-bbox="992 693 1344 720">DIESEL FUEL</td> <td data-bbox="1344 693 1528 720">60±3°C</td> </tr> <tr> <td data-bbox="992 720 1344 747">ENGINE OIL</td> <td data-bbox="1344 720 1528 747">100±3°C</td> </tr> <tr> <td data-bbox="992 747 1344 774">ETHYLENE GLYCOL (50%)-WATER (50%)</td> <td data-bbox="1344 747 1528 774">100±3°C</td> </tr> <tr> <td data-bbox="992 774 1344 795">BRAKE FLUID</td> <td data-bbox="1344 774 1528 795">25±3°C</td> </tr> </tbody> </table>	FLUIDS	FLUID AND CHAMBER TEMPERATURE	DIESEL FUEL	60±3°C	ENGINE OIL	100±3°C	ETHYLENE GLYCOL (50%)-WATER (50%)	100±3°C	BRAKE FLUID	25±3°C
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Figure 2 End

**i** **NOTE**

a) *All cavities wired with the minimum approved wire gauge per SAE J1128 suitable for the terminal size and with enough length to accommodate testing. Wire insulation shall be minimum diameter per SAE J1128 and shall be verified to be within the connector wire sealing range. Crimp characteristics (i.e. height, width, etc.) shall be checked prior to testing.*

*All unsealed cavities shall be secured with sealing plugs. To prevent capillary action on the sealed connector, all free wire ends and test points (i.e. millivolt test connection) shall be sealed with alcohol-based RTV silicone or equivalent and covered with heat shrink tubing.*

b) *Specimens shall be prepared in accordance with applicable production drawings and shall be selected at random from current production.*

3.4 Product Qualification and Requalification Test Sequence

TEST OR EXAMINATION	TEST GROUP (a)	
	1	2
	TEST SEQUENCE (b)	
Visual Inspection	1,8	1,6
Temperature Life	3	2
Thermal Cycle	5	
Water Immersion	2,4,6	3,5
Fluid Resistance	7	4



**NOTE**

(a) Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production.

- Groups 1-2, Specimens shall consist of 50 position connectors with DEUTSCH Stamped and Formed Terminal System size 20 gold sockets with 20 AWG wire.

(b) Numbers indicate sequence in which tests are performed.

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### 3.5 Revision History

Rev Ltr	Brief Description of Change	Date	Dwn	Apvd
A	Initial Release	21-Oct-2019	DM	DM