



## DEUTSCH\* DTHD Series Connector System

### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) DTHD Series Connector System.

#### 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Test Requirements and Procedures Summary sections shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

#### 1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed in 1999. The Qualification Test Report number for this testing is [501-151020](#). These documentations 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
- [114-151002](#) Application Specification for DEUTSCH Size 12 S&F Pin & Socket
- [114-151006](#) Application Specification for DEUTSCH Size 12 S&F Pin & Socket
- [114-151004](#) Application Specification for DEUTSCH Size 4-20 Solid Pin & Socket
- [114-151020](#) Application Specification for DEUTSCH DTHD Series Connector System
- [408-151007](#) Instruction Guide DEUTSCH Removal Tool for Rear-Released Connectors
- [501-151020](#) DTHD Qualification Test Report

Product Drawings (XXXX = product modification)

<a href="#">DTHD04-1-4P</a>	REC, 1P, BLK, N, SIZE 4
<a href="#">DTHD04-1-4P-E003</a>	REC, 1P, BLK, N, SIZE 4, CAP
<a href="#">DTHD04-1-4P-L009</a>	REC, 1P, BLK, N, SIZE 4, FLANGE
<a href="#">DTHD04-1-4P-L013</a>	REC, 1P, BLK, N, SIZE 4, REVERSE FLANGE
<a href="#">DTHD04-1-8P</a>	REC, 1P, BLK, N, SIZE 8
<a href="#">DTHD04-1-8P-E003</a>	REC, 1P, BLK, N, SIZE 8, CAP
<a href="#">DTHD04-1-12P</a>	REC, 1P, BLK, N, SIZE 12
<a href="#">DTHD04-1-12P-E003</a>	REC, 1P, BLK, N, SIZE 12, CAP
<a href="#">DTHD06-1-4S</a>	PLG, 1P, BLK, N, SIZE 4
<a href="#">DTHD06-1-4S-E003</a>	PLG, 1P, BLK, N, SIZE 4, CAP
<a href="#">DTHD06-1-8S</a>	PLG, 1P, BLK, N, SIZE 8
<a href="#">DTHD06-1-8S-E003</a>	PLG, 1P, BLK, N, SIZE 8, CAP
<a href="#">DTHD06-1-12S</a>	PLG, 1P, BLK, N, SIZE 12
<a href="#">DTHD06-1-12S-E003</a>	PLG, 1P, BLK, N, SIZE 12, CAP

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:

Contact Size	Wire Size AWG [mm <sup>2</sup> ]	All Circuits Energized (A)
4	6 [16.0-13.0]	100
8	8 [10.0-8.0]	60
	10 [6.0-5.0]	40
12	10 [6.0-5.0]	25
	12 [4.0-2.5]	
	14 [2.0]	18

- Temperature: -55°C to +125°C
- Ingress Protection (Inline): Not tested
- Flammability (Inline): Not tested. Parts are made out of V-0 material.

3.3. Test Requirements and Procedures Summary

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

**VISUAL**

3.3.1. Examination of Product

- A. Procedure: Not Applicable
- B. Method: A visual examination for identification of product, torn seals, cracked plastic, etc.
- C. Requirement: The connectors shall be correctly constructed, marked and shall show good quality and workmanship.

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**ELECTRICAL**

- 3.3.2. Insulation Resistance
  - A. Procedure: Not Applicable
  - B. Method: Check each contact to all other contacts. Test to be performed using a 500 VDC megohmmeter.
  - C. Requirement: 1000 MΩ minimum for mated connectors.
- 3.3.3. Dielectric Withstanding Voltage
  - A. Procedure: Not Applicable
  - B. Method: Check each contact to all other contacts and the shell to determine current leakage.
  - C. Requirement: Current leakage not to exceed 2.0 mA for mated connector.
- 3.3.4. Contact Resistance
  - A. Procedure: MIL-STD-1344, Method 3004.1
  - B. Method: 6 AWG: 100A; 8 AWG: 60A; 10 AWG: 40A; 12 AWG: 25A; 14 AWG: 18A
  - C. Requirement: 60 mV max
- 3.3.5. Low Level Contact Resistance
  - A. Procedure: MIL-STD-1344, Method 3002.1
  - B. Method: Test sample connectors to MIL-STD-1344, Method 3002.1
  - C. Requirement: 6 mΩ max.

**MECHANICAL**

- 3.3.6. Maintenance Aging
  - A. Procedure: Not Applicable
  - B. Method: Ten complete cycles of contact removal
  - C. Requirement: There shall be no visible change or damage to the contact cavities.
- 3.3.7. Contact Retention
  - A. Procedure: Not Applicable
  - B. Method: The same cavities used for maintenance aging are subjected to a load pulling the terminal from the rear of the connector.
  - C. Requirement: Minimum pull out force shall be 35 lbf (size 4 & 8) and 30 lbf (size 12).
- 3.3.8. Durability
  - A. Procedure: Not Applicable
  - B. Method: The connector is mated and unmated 100 cycles.
  - C. Requirement: No evidence of damage to the contacts, contact plating, connector housing or seals which may be detrimental to reliable connector performance.
- 3.3.9. Tool Abuse
  - A. Procedure: Not Applicable
  - B. Method: The removal tool is inserted into the connector, rotated 180° and then removed along with the terminal.
  - C. Requirement: Inspect cavity for torn grommet, missing contact retention fingers or any other damage that may be detrimental to reliable connector performance.

### 3.3.10. Vibration

A. Procedure: Not Applicable

B. Method:

- Sine Sweep: 10 to 2000 Hz
- Initial Displacement: .007 inch DA
- Maximum Acceleration: 20G
- Test Duration: 12 hours
- Time Per Axis X, Y, Z: 4 hours. Current applied for the first three hours. During the last hour monitor for discontinuities in excess of 1 microsecond at 20mV and 100 $\mu$ A.

C. Requirement: Discontinuity not to exceed 1  $\mu$ s at 100 mA during last hour of vibration in each axis.

### 3.3.11. Impact

A. Procedure: Not Applicable

B. Method: Wired and mated connectors dropped from four feet on cement floor a total of five times.

C. Requirement: There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test. Small chips and dents that do not adversely affect the connector shall be disregarded.

### 3.3.12. Insert Retention

A. Procedure: Not Applicable

B. Method: Apply a 25 lb. load to the wires that exit the rear for one minute.

C. Requirement: There shall be no evidence of cracking, distortion or detrimental damage to the connector following the test.

## ENVIRONMENTAL

### 3.3.13. Temperature Life

A. Procedure: Not Applicable

B. Method: Wired and mated connectors subjected to 1000 hours at 125°C.

C. Requirement: Connectors to show no visible damage.

### 3.3.14. Salt Spray

A. Procedure: Not Applicable

B. Method: The connector is mated and submerged in a fine mist of 5% by weight salt solution for 96 hours.

C. Requirement: There should be no evidence of corrosion on the connector or terminals after the connector is removed from the test and cleaned with tap water.

### 3.3.15. Fluid Immersion

A. Procedure: Not Applicable

B. Method: Each sample to one fluid only. Mated connectors are submerged for 5 minutes each day for 5 days in the following fluids.

- Motor Oil at +25°C
- Brake Fluid at +60°C
- Gasoline at +25°C
- Diesel Fuel at +60°C
- 50/50 Antifreeze/Water at +60°C

C. Requirement: Connectors to show no visible damage.

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### 3.3.16. Thermal Cycle

- A. Procedure: Not Applicable
- B. Method: Cycle mated connectors from -55°C to +125°C at a rate of 3° per minute. Connectors remain at each temperature extreme for one hour minimum. Connectors subjected to 20 cycles.
- A. Requirement: No evidence of cracking, chipping or other detrimental damage to the normal operation of the connector.

### 3.3.17. Water Immersion

- A. Procedure: Not Applicable
- B. Method: Heat mated connectors to +125°C for two hours. Submerge connectors in water to a depth of 3 feet for four hours.
- C. Requirement: Test samples must meet insulation resistance.

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**4. REVISION HISTORY**

Rev Ltr	Description of Change	Date	Dwn	Apvd
A	Initial Release	27-Aug-2021	DM	IG