

Quality is more than a word

ESPEC

German Automotive Manufacturer Testing Standards

Introduction to LV 124 Compliant Products & Services



What is LV 124?

Overview

- LV 124 is a quality and reliability test standard jointly established by German automotive manufacturers in 2013.
- The standard consists of Part I : electrical requirements and tests and Part II : environmental requirements and tests.

Applicable Products

- LV 124 applies to in-vehicle electric components for the 12V electrical system. Electric, electronic, and mechatronic components and systems

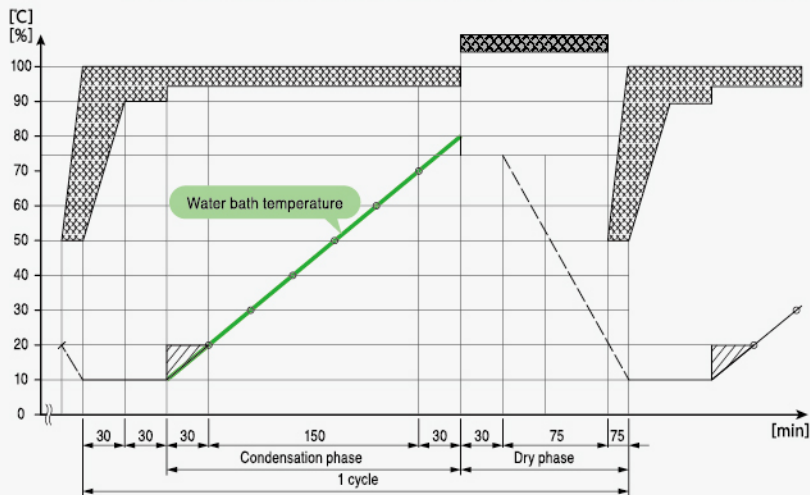
◎ LV 124 is required for all suppliers of German OEMs.

◎ Espec provides products that perform tests that are unique to LV 124, including the following.

<K-15 a> Condensation test with assemblies

Purpose : This test simulates condensation on in-vehicle electronic components (assemblies). It is used to evaluate the resistance of electronic assemblies against condensation.

Features : In the condensation phase, the temperature of a special-purpose water bath is controlled and the relative humidity of the test room is maintained at 95 to 100%. (Climate control for air temperature and humidity is switched off.)



K-15 a-compliant testing chamber



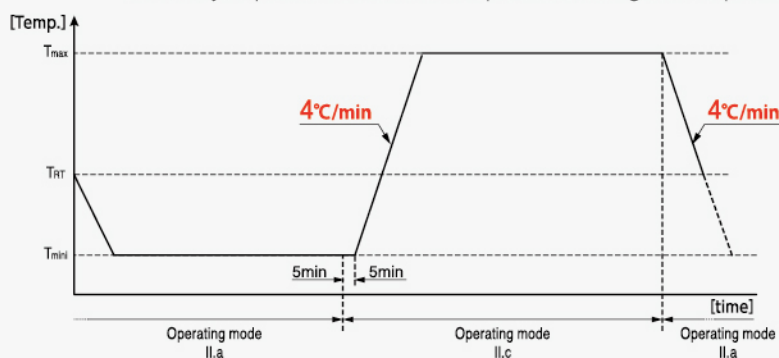
Water bath

<L-03> Life test - temperature cycle test

Purpose : This test simulates in a compact format the thermal load on a component due to temperature changes that occur during vehicle service life.

The test serves to verify the quality and reliability of a component as a result of faults that occur due to thermomechanical loads.

Features : The test exposes a specimen to a temperature gradient of 4°C/minute. The ability to perform advanced temperature changes is required.



Environmental Stress Chamber Rapid-Rate Temperature Cycle Type

Espec offers a wide variety of products that can perform temperature, humidity, condensation, and splash testing according to LV 124 Part II standards.

Mechanical requirements and tests	Test	Purpose	Compliant Products & Services
	M-01 Free fall	This test simulates to the floor free fall of a component that may occur before installation of the component. The test is used to ensure that a component installed in a vehicle does not have any hidden damage or pre-damage. Ex. : Internal part peeling or cracking.	
	M-02 Stone impact test	This test simulates the mechanical load on a component imposed due to impact from stones. The test serves to verify the resistance of a component to faults, such as deformation or cracks.	
	M-03 Dust test	This test simulates the dust load on a component during vehicle operation. The test serves to verify the resistance of a component to electrical and mechanical faults.	✓
	M-04 Vibration test	This test simulates the vibrational load on a component during driving operation. The test serves to verify the resistance of a component to faults such as component displacement or material fatigue.	
	M-05 Mechanical shock	This test simulates the mechanical load on a component when driving around a curve or at the time of an accident. The test serves to verify the resistance of a component to faults such as cracks or component displacements.	
	M-06 Endurance shock test	This test simulates the acceleration forces of components that are installed in doors, hoods or liftgates and are subjected to high accelerations during opening and closing. The test serves to verify the resistance of a component to faults such as component displacement or material fatigue.	
Climatic requirements and tests	K-01 High-/low-temperature storage	This test simulates the thermal load on a component during storage and transport. The test serves to verify the resistance to high or low temperatures during the transport of a component. Ex. : Plane and ship containers	✓
	K-02 Incremental temperature test	This test simulates the operation of a component at different ambient temperatures. The test serves to verify the resistance of a component to faults that may occur within a small interval of operating temperature range. Ex. : Verifying operation by incrementally varying the ambient temperature. Operation at ambient temperature X°C → Operation at ambient temperature X + 5°C → Operation at ambient temperature X + 10°C	✓
	K-03 Low-temperature operation	This test simulates a load on a component at low temperatures. The test serves to verify the function of a component after an extended period of parking or driving at extremely low temperatures.	✓
	K-04 Repainting temperature [+130°C ⇒ +110°C]	The test serves to verify the resistance of a component to faults under a thermal load. Ex. : Cracking (in soldered joints, adhesive joints, and welded joints), and poor connections (in seals or housings)	✓
	K-05 Temperature shock (component)	This test simulates a thermal load on a component as a result of sudden shock-type temperature changes (thermal shock) during vehicle operation. This test conforms to IEC 60068-2-14 Na (rapid temperature change) and No (two-liquid tank rapid temperature change) tests.	✓

Climatic requirements and tests

Test	Purpose	Compliant Products & Services
<p>K-06 Salt spray test with operation, exterior</p> <p>K-07 Salt spray test with operation, interior</p>	<p>K-06 and K-07 This test simulates a load on a component as a result of air and water containing salt that may occur in certain areas of the world. The test serves to verify the resistance of a component to faults under a salt load. Ex. : Short circuits and leakage currents caused by the ingress of salt into a component</p> <p>K-06 only This test simulates a load on a component as a result of air and water containing salt that may occur in winter road conditions.</p>	
<p>K-08 Damp heat, cyclic</p>	<p>This test simulates a thermal load on a component as a result of cyclic temperature changes at high humidity during vehicle operation. The test serves to verify the resistance of a component to damp heat.</p>	<p>✓</p>
<p>K-09 Damp heat, cyclic (with frost)</p>	<p>This test simulates a thermal load (including frost) on a component as a result of cyclic temperature changes at high humidity during vehicle operation, which may cause pressure differentials that could lead to "breathing" as distinct from the absorption of moisture. The test serves to verify the resistance of a component to damp heat.</p>	<p>✓</p>
<p>K-10 Water protection - IPX0 to IPX6K</p>	<p>This test simulates the load on a component when subjected to water. The test serves to verify functioning of a component, e.g. when exposed to condensed water, rain, or spray water.</p>	<p>✓</p>
<p>K-11 High-pressure cleaning [IPX9K]</p>	<p>This test simulates the load on a component when subjected to water during vehicle cleaning. The test serves to verify functioning of a component when exposed to high-pressure cleaning.</p>	<p>✓</p>
<p>K-12 Temperature shock with splash water</p>	<p>This test simulates the load on a component when exposed to splash water as it occurs when driving through puddles. The test serves to verify functioning of a component when subjected to shock-type cooling by means of water.</p>	<p>✓</p>
<p>K-13 Temperature shock -immersion [IP X7]</p>	<p>This test simulates the load on a component when immersed in water. The test serves to verify functioning of a component when subjected to immediate cooling by means of immersion of a heated component. Ex. : Cracking (in soldered joints, adhesive joints, and welded joints), and poor connections (in seals or housings)</p>	<p>✓</p>
<p>K-14 Damp heat, constant</p> <p>Constant damp heat - severity 1 [40°C 93%rh]</p>	<p>This test simulates the load on a component through damp heat. The test serves to verify the resistance of a component to faults due to high temperature and high humidity. Ex. : Corrosion, migration/dendrites, and swelling and degradation of plastics, seals, and filling compounds</p>	<p>✓</p>

	Test	Purpose	Compliant Products & Services
Climatic requirements and tests	K-14 Damp heat, constant Constant damp heat - severity 2 [65°C 93%rh]	This test simulates in a compact format the load on a component through damp heat during vehicle service life. The test serves to verify the quality and reliability of components against faults caused by damp heat. Ex. : Corrosion, migration/dendrites, and swelling and degradation of plastics, seals, and filling compounds	✓
	K-15 a Condensation test with assemblies	This test simulates condensation on in-vehicle electronic components (assemblies). The test serves to verify the resistance of electronic assemblies against condensation.	✓
	K-15 b Climate test for components with watertight housings	This test simulates in a compact format the load on a component through damp heat during vehicle service life. The test considers waterproof effects of the waterproof housing (components covered by the case). The test is used to evaluate the quality and reliability of components against faults caused by damp heat. Ex. : Corrosion, migration/dendrites, and swelling and degradation of plastics, seals, and filling compounds	✓
	K-16 Temperature shock (without housing)	The test serves to detect weak spots in the mechanical joints on electronic assemblies (for example, solder points). It is not a simulation of an actual use environment.	✓
	K-17 Solar radiation	This test simulates the influence of solar radiation (radiation from sunlight) and UV light onto the component. The test serves to verify the resistance of a component against damages caused by material fatigue such as cracks and or discolorations.	
	K-18 Harmful gas test	This test simulates the influence of harmful gases on a component, particularly on plug contacts and switches. The test serves to verify the resistance of a component to faults, such as corrosion and component damage.	
Service-life tests	L-01 Life test - mechanical /hydraulic endurance test	This test simulates the functioning/actuation cycles of the component during vehicle service life. The test serves to verify the quality and reliability of a component as a result of functioning/actuation cycles. Ex. : Brake actuation, seat adjustment, switch actuation	✓
	L-02 Life test - high-temperature endurance test	This test simulates in a compact format the thermal load on a component during vehicle service life. The test serves to verify the quality and reliability of a component as a result of faults that occur due to thermal load. Ex. : Diffusion, migration and oxidation	✓
	L-03 Life test - temperature cycle test	This test simulates in a compact format the thermal load on a component during temperature changes that occur during vehicle service life. The test serves to verify the quality and reliability of a component as a result of faults that occur due to thermomechanical loads. Ex. : Aging and cracking (in soldered joints, adhesive joints, and welded joints), and poor connections (in seals or housings)	✓

Heat dissipation caused by the specimen may have an impact on test conditions.
Please conduct preliminary testing for verification.

Compliant Products & Services

Product Lineup



Platinous J Series
Temperature (& Humidity) Chamber



Bench-Top Type
Temperature (& Humidity) Chamber



Global-N



Walk-in Type Temperature (& Humidity) Chamber



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