Technical information sheet

Dewing test according to GS 95011-4 (K-15 of LV 124)

WHY	WHAT	HOW
The identification of possible functional defects in electrical assemblies subject to condensation.	A climate test chamber with condensation capability is required to carry out the standard test.	The modification for the climate chambers of **weiss**technik® and the plastic hood enable the dewing test to be carried out.

WHY – The challenge.

Motor vehicles are exposed to a wide variety of climates, which inevitably results in condensation on electrical assemblies - this can lead to malfunctions when the vehicle is running.

The **GS 95011-4** standard (also known as K-15 of LV 124 or BMW Condensation Test) describes the sequence of a condensation procedure used to test electronic assemblies used in motor vehicles. The purpose of this test is to identify any functional deficiencies of the assembly subjected to condensation during the development phase of assemblies.

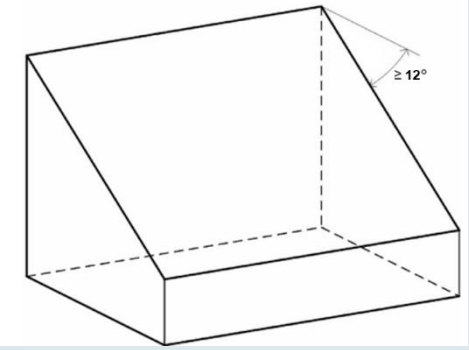


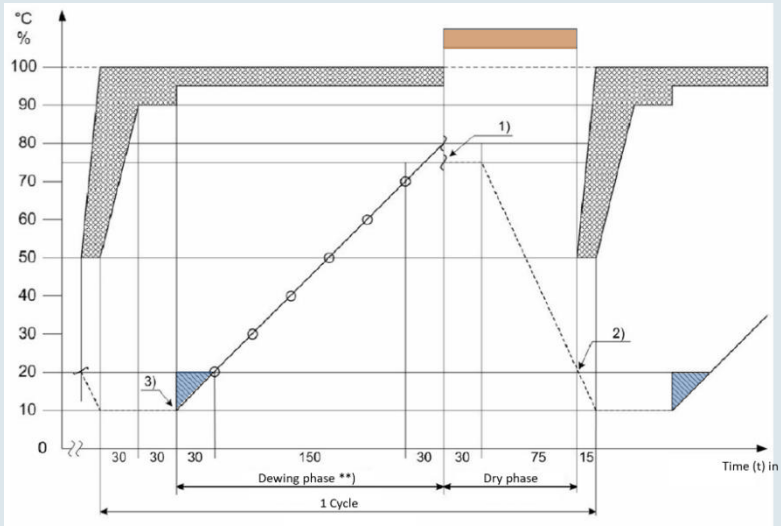
Figure 1 Standard excerpt from GS 95011-4 Plastic hood

WHAT – The Test

The dewing test can only be carried out in a climate test chamber equipped with a dewing option. The temperature control of the climate test chamber is switched from test space to water bath during the dewing phase (see *Figure 2*).

Water should deposit on the cold test specimen. If dewing of the assembly occurs frequently this can result in electrochemical migration (dendritic growth). This in turn leads to permanent damage or failure of the assembly.
The test specimen must be dry between each cycle. The standard specifies that in point 2) the humidity must be <50% RH (see *Figure 2*). In addition, contamination should become concentrated with each cycle. Therefore, this should happen in 5 cycles in a row.

In order to achieve the desired dewing result with this procedure, the climate test chamber used must produce temperature differences between the inside wall of the test space and the test space which are smaller than the temperature difference in temperature between the test specimen and the testing temperature. The difference between water bath and test space temperature must be <15 K.
(GS 95011-4, 2010)



1) Start of the drying after reaching 75 °C air temperature
2) Test specimen shall be dry, relative humidity <50% RH
3) Switchover from test space temperature control to water bath control

Function test
Water bath temperature ±1 °C
Test space temperature ±3 °C

Test space humidity
Water bath temperature <20 °C
Humidity not defined

**) Recording of test space humidity and temperature, temperature difference between test space and water bath <15

Figure 2 Standard excerpt from GS 95011-4 test drive

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HOW – The Solution.

The new climate test chambers ClimeEvent from weisstechnik are prepared for carrying out the dewing test according to GS 95011-4. A water bath sensor is installed by default to control the water bath temperature during the dewing phase. With the new ClimeEvent, even the critical part in the drying phase, marked with a red circle in ***Fehler! Verweisquelle konnte nicht gefunden werden.***, is no problem, since the appropriate dehumidification capacity is installed to achieve a humidity value <50% RH. To carry out GS 95011-4, all that is required is the plastic hood shown on *Figure 1* and the test in the test field required by the standard including recording of the test run in the control software*.
Further information you'll find in the test run with a new ClimeEvent below (see ***Fehler! Verweisquelle konnte nicht gefunden werden.***).

Dewing test according to GS 95011-4_2010-06 (K-15 of LV 124)

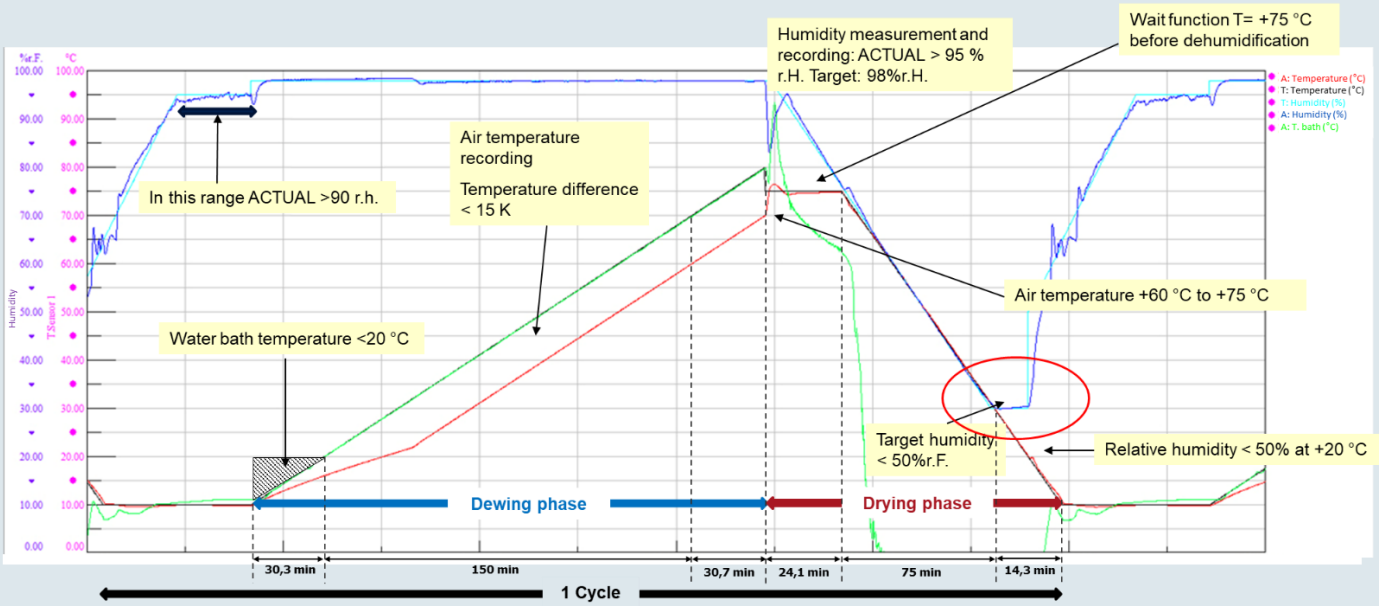

*Figure 3 weisstechnik test run**

*In the center of the test space and at steady state, +25 °C ambient temperature, 400 V/50 Hz nominal voltage, without test specimen and without heat compensation. The ratio between the mass and surface area of the test specimen plays a significant role in the dew formation behavior. Therefore, we recommend the use of compressed air for the reliable fulfillment of the test requirements when loaded.

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