

As a result of articles published in the USA, inquiries have been increasingly received concerning the question:

Does a record suffer from wet playing ?

Phonograph records are seldom or never reproduced with the assistance of water or water-based liquids in professional operations. A major hinderance is the somewhat involved and therefore time-consuming manual procedure involved.

On the other hand, the use of liquids is standard practice in turntable test procedures, especially for distortion measurements. It is recognized that; after a record has been played with a liquid, hissing and popping noises are heard when subsequently played dry. One plausible theory explains this occurrence as being caused by dust particles washed up by the stylus in the playing liquid and subsequently deposited on the walls of the groove as the liquid evaporates.

PH-level measurements, chemical investigations conducted by American investigators before and after wet reproduction using deionized water, have indicated that the concentration of acid ions thereby increases twenty to thirty times. In this study, it was concluded that the water had reacted with the material of the pressing, roughening the vinyl groove faces. This surface alteration would then be responsible not only for the increased noise but also for higher distortion levels when the record was subsequently reproduced in a dry state.

An expert on wet-groove reproduction in Switzerland was motivated by these experimental results to relate the chemical processes associated with record liquids to general considerations of the problem. His conclusions lie at variance to previous theories:

The record material does not generally consist of PVC alone but instead represents a copolymerisate in which other molecular groups, preferentially vinyl acetate, are built into the vinyl chloride chains. Special chemical agents such as stabilizers, lubricants, and fillers are added to the mixture. Such a composite material absorbs only infinitesimal quantities of water, even over a long period of time, and therefore cannot contribute moisture to chemical processes. The changes assumed in the USA to have taken place after a short penetration period thus appear rather improbable to this Swiss researcher.

In his opinion, the phenomena observed could possibly be explained as follows. During the warm, plastic state which prevails when a record is pressed, changes occur in the macromolecular chains, and traces of hydrochloric and acetic acids are formed. For the most part, the acids are bound by the stabilizers mentioned above, forming water-soluble salts. Under the influence of humidity, and together with traces of the lubricants, the substances produced during pressing form a uniformly distributed film which, because of its homogenous composition, cannot be detected with an electron microscope. When wet playback is employed; the salts contained in this film are dissolved in the surface liquid. In the subsequent drying phase, the traces of dissolved salt are found primarily at molecular chains which have been altered by the warming process, as these exhibit a more pronounced affinity for water. When the liquid has totally evaporated from the surface, crystallization of the salt components thus occurs predominantly at these locations. During subsequent wet reproduction, the salts are again dissolved in the liquid and do not influence the tracing of groove modulations. The increase in the concentration of acid ions measured in America supports this conjecture. In fact, however, reproduction with a liquid only enables measurement data to be collected for a phenomenon which has already taken place when the record was pressed.

It should be noted that these remarks refer expressly to chemically pure deionized water. No general comment may be made concerning the additional ingredients contained in most commercial cleaning liquids, which may produce entirely different effects. As a rule, pickup cartridge corrosion is probably caused by aggressive ingredients; such corrosion is observed on cartridges used extensively for wet-groove reproduction.

When a surface liquid is employed for measurements, the recommendations of the proponents of this technique should be observed:

\*Only extremely pure water may be employed for the surface liquid, which preferably should be obtained in the vapor phase of double distillation.

\*20 % - 25 % pure ethyl alcohol is to be added to the water to lower the surface tension of the liquid and hasten evaporation.

\*Under no circumstances may denatured alcohol (spiritus) be employed.

\*The liquid film on the surface of the record should be as thin as possible.