

Speaker Cable Break-in

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Abstract

Many of us know how important it is to break-in audio cables. Many speaker cables do not sound anyway near its potential before break-in. The more resolving playback systems we have, the bigger the differences are before and after break-in. We also know that there is a big difference in how long break-in will take. It is well known that cables with PTFE (teflon) as the insulation material closest to the conductor need significantly longer break-in time compared with many other insulation materials.

This is a short guide on how to break in speaker cables efficiently without playing music for many hours in the speakers. And you can do this without any specific technical knowledge or burn-in equipment. What is described here also applies to interconnect cables for analog audio as well as for coupling capacitors in amplifiers.

Technical background

How can a cable change its characteristics after some time of usage?

First, it is not about any type of molecular or structural change in the conductor or insulator materials. The reason for this effect is that there is an electrostatic charge on the surface between the conductor and the insulation that will gradually decay as alternating voltage is applied to the cable - as it does when we use it in the system.

The break-in time depends on the insulation material and the air gap between the conductor and on the insulation material characteristics. In general, it is often true that a better cable takes longer time to break in. But of course it is not as simple as that. The heart of the problem is the electric charge on the surface of the insulator material that is close to the conductor. PTFE (teflon), which is in many aspects the best insulation material, also has the largest electronegativity together with being a good insulator. It is this surface charge of the insulator that gradually reaches an equilibrium with the metal surface when applying an alternating voltage on the conductor. The rate of change depends on the insulation material characteristics, if there is an air gap and the voltage and mix of frequencies applied. Air gaps decrease the signal losses but increase the break-in time.



Until an equilibrium is obtained between the surface on the conductor and insulator, the electrical field caused by the audio signal in the conductor will be affected. We can call this a kind of distortion that gradually decays during the cable break-in process. This also means that it is the alternating voltage and not the current that we need to apply in order to break-in a speaker cable. It is exactly the same process that applies to coupling capacitors, filter capacitors and interconnect cables.

Guide

How to break-in a cable?

Listening tests we have made show that music or music-like noise stabilize the sonic performance of cables best. Wide band white noise for break-in shows that such a process must be followed by a period of music or music-like noise for the sound to stabilize.

This guide suggests musical noise (M-noise) to be used as the most efficient type of signal. There are a few advantages compared with plain music;

- M-Noise has a more dense frequency spectrum than many types of music. This makes the break-in process shorter.
- M-Noise has a similar crest factor as “average” music. This means there is no settlement time after break-in.
- You don't have to think about what music to use during break-in.

But no one likes to listen to noise..

There is actually no reason to connect the speakers during speaker cable break-in as this process only has to do with the distortion of the electrical fields. It is the alternating voltage of the audio signal that creates these fields, and not the current. The current in the cable creates a magnetic field. So, here is how to do it,

1. Download M-noise wav-file from <https://regalaudio.se/documents/>
2. Burn the file to CD or just use any kind player that supports wav-files.
3. Disconnect one pole of the speaker cable at each speaker. Ensure that there is no risk for short cuts. If there might be any risk for this, use insulation tape on the disconnected connector.
4. Play the M-noise file on repeat with appr. 75% volume level on the amplifier. The high volume setting on the amplifier will make the break-in process more efficient.
5. If the manufacturer says 100 hours break-in time. Listen carefully to the sound after half this time using well recorded music (do not forget to stop the playback and lower the volume of the amplifier before listening to music).
6. Continue with the M-Noise break-in process without connected speakers for 25% of the recommended break-in time. If there are no noticeable differences, the cable has reached an equilibrium and the impact due to the insulation of the cable has reached its minimum.