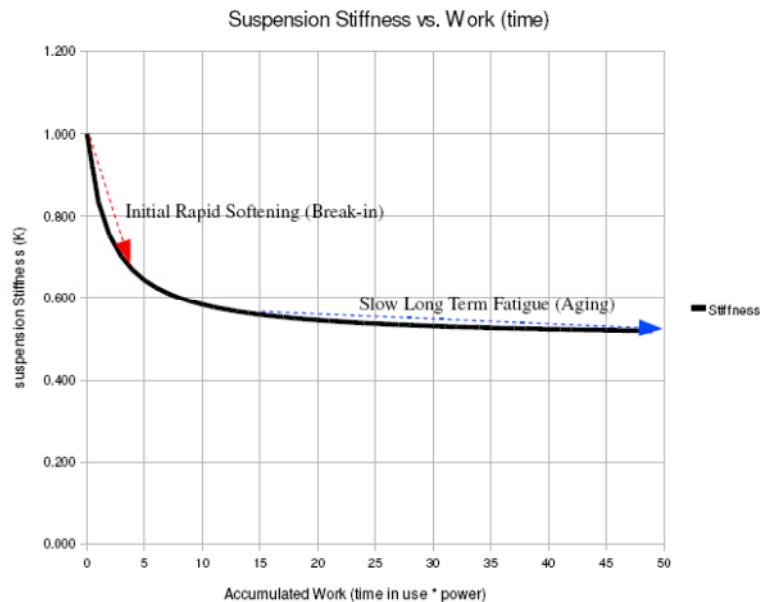


What is Conditioning (break-in)?

Conditioning, what some people call “break-in” or “blossoming,” describes the process whereby sound of a new loudspeaker undergoes a noticeable improvement in performance after it has been played for many hours. People differ in their ability to perceive the change, but it is very real. This improvement is due to the suspension of the speaker reaching its optimum stiffness range.

One important parameter that affects the sound of a loudspeaker is the suspension stiffness. The suspension is made up of a combination of flexible parts that allow the speaker diaphragm (cone/dome, etc.) to move in and out to generate the sound you hear.

The suspension becomes softer over time. This is a natural consequence of the suspension material properties. Materials commonly used are synthetic rubber polymers and impregnated Nomex cloth. Fresh from the factory, these materials are stiff and crisp, like a new pair of jeans or leather boots. As they are used, small predictable irreversible changes take place in the microstructure of the material, leading to the materials becoming softer. The initial change is quite rapid - just as with boots and jeans. The rapid initial change is called break-in or conditioning. As the suspension breaks in, the changes slow and become imperceptible, this is now aging. With proper design, materials, and use, aging proceeds very slowly and the speaker will provide many years of enjoyment.



When Definitive designs a speaker, the effects of break-in are taken into account. How? Well, we use industry standard life tests such as CEA-426B. This test requires a high power pre-conditioning before the test begins. The speaker parameters are measured after the pre-conditioning and after the life test. There can be no significant changes in the parameters measured after the life test.

Why doesn't Definitive pre-condition all speakers? It would drive the price of the speakers drastically upwards. Like your car, your boots, and your jeans, your speakers are tested just long enough to ensure

that they are built correctly. You probably wouldn't want your new car to come with 500 miles on the odometer, or your new boots or jeans to be pre-worn (yuck).

How to Condition New Speakers

You may be wondering how much conditioning a typical speaker needs and how to go about doing it. In most cases people are so happy with the sound of their brand new speakers that they don't feel the need to do anything special. They just come to find that the speakers improve over a few weeks of normal use. There's nothing wrong with that. But if you want to get to peak performance faster we can help. Since you probably don't have access to the measurement equipment and test signals here are some easy home brew pre-conditioning tips for the next time you buy new speakers (you should buy new speakers once a month. I need a new car).

- Place the two speakers face to face about an inch apart; connect them to your amplifier or receiver but wire one speaker with correct polarity (+ to +, - to -) and the other one with incorrect polarity (+ to -, - to +) so that the two speakers are out of phase with each other. This will keep down the audible sound during the conditioning period so that your spouse/children/roommates/neighbors don't feel compelled to exile you to Siberia in retaliation for the racket you're making. If you live alone, and have a high tolerance for test signals or music played over and over and over again, you can skip this method and just hook the speakers up normally.
- If you have a pink noise source such as is sometimes found on test CDs, run that on a continuous repeat loop. The volume should be set loud enough that you can hear the noise but it doesn't need to be really loud. In fact, too loud could be bad for your amp. If you don't have a pink noise source (normal people usually don't), use a pop or rock CD on repeat loop.
- Check the receiver's or amplifier's top panel after a half hour. If the top is hot to the point of nearly burning your hand, turn the volume down. If the amp is just warm, you're OK.
- About 24-48 hours of this kind of use will be more than enough for the vast majority of speakers. You can do it in a continuous period or you can run them in shifts. Do not leave the system running while you're out of the house.

In conclusion, break-in is a natural process of initial change inherent to all loudspeakers. The changes are easily measured, but are not audible by all people. Definitive speakers are designed to have a rapid initial change to reach a consistent predictable performance point, which will then remain stable throughout the life of the speaker.

Reference:

- 1 **Klippel, Wolfgang: *Mechanical Fatigue and Load-Induced Aging of Loudspeaker Suspension*, 131st Convention of the AES. New York, 2011 October 20-23, paper no. 8474.**