

Close the lid - flatten the record
The beautifully crafted AFI flat. is not just
practical, it looks great too.



RECORD FLATTENER



Back *to* flat

Ulrich Kathe loathed his warped records. He wanted corrective action. Within three years the engineer developed a record flattener for warped vinyl records. We tested the AFI flat.

Records should be flat that much is simple. They're not, however: after pressing, the records usually fall on top of each other on the spindle and have to cool for a certain amount of time. However, if they are accidentally removed from the pile too soon they can warp and become distorted, annoying the listener and notes and timbres become shaky, choirs whimper and pianos howl.

In general this means a new record needs to be purchased, because the defect is irreversible – even if some vinyl junkies aren't willing to accept this, and suggest

everything from baking the dished records in the oven at 60C between two plates of glass to professional solutions. We've been unconvinced by this: surely once a record is warped the material is stretched, and can't be restored, just as a dented panel in a car is equally hard to restore completely for the same reasons.

We were therefore sceptical when Stuttgart hifi dealer Oliver Wittmann, who also sells Okki Nokki's low-cost record cleaning machines, praised his newest purchase: the „flat.“ made by the one-man company, Audio Fidelity Improvement (AFI) in Ludwigsburg. This man is Ulrich Kathe, doctor of chemistry, and thus presumably familiar with how materials behave.

Precisely calculated heating

Kathe had been looking for a way to flatten his dished records and asked Wittmann about relevant devices. When Wittmann responded that he had nothing to offer, the native Swabian decided to build it himself. For the next 18 months Kathe, whose main expertise is in sensor technology for drinking and wastewater testing systems, worked on his ambitious project. It raised many questions, not least of which was how high a vinyl record can and must be heated for it to be flattened without risking damage? The engineer determined that heating



Audio Fidelity Improvement AFI flat.
around 2850 Euro
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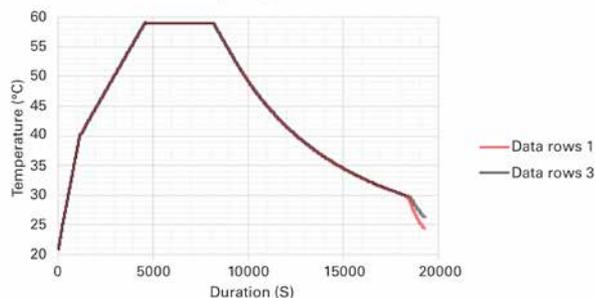
to 59C – yes, not 60C! – would be on the safe side in every respect.

But there's more to it than that: the record must not be heated too quickly, as any humidity trapped in the vinyl would leak to the outside and damage the record, according to Kathe, who substantiated his findings and theses with graphs he presented to us on his laptop.

Experiments showed how important it was to heat and cool the entire surface of the record equally to prevent tensions in the material, and that this method can improve the sound as well by 'relaxing' the material, making the flat. not just a record flattener but also a sound optimizer.

40cm wide, 50 cm deep, and just 6cm tall when closed, the flat. device is controlled by a microprocessor offering three programs: „Standard“ for dished records; „Relax“ for improving the sound of flat records to free them from material tension by heating; and „Expert“. Each of these programs can be manually controlled to adjust the individual phases with regard to temperature and duration.

Heating temperature upper and lower parts, "standard" program



The record is heated in two steps to a temperature of 59 degrees. It stays at this level for a specific amount of time until the controlled cooling begins. Total duration of a treatment: over five hours.

The many-faceted record flattener is easy to use and control, using the stylus supplied to operate the four 'buttons' on the panel, beside which a small display provides information about the status, including the amount of time left in the process. The record, which

"I PROCEEDED SCIENTIFICALLY."

Ulrich Kathe developed the technology behind the record flattener with know-how, research, experimenting - and with the help of his friends.

STEREO: We are amazed that someone who is not a HiFi expert was able to build the "flat."

Kathe: In my work in the field of water analysis, developments are the order of the day. Of course I had to familiarize myself with the subject, but my knowledge of material sciences helped me clarify whether theory could be put into practice. I purchased warped records at garage sales, dished others myself, and even fitted one with 17 thermal sensors to find out how best to heat a record evenly and cool it off again. I really took a scientific approach to the subject.

Why are so many of our records warped?

It can be the result of bad storage conditions, but many records are often distorted when new, presumably when they're not given enough time to cool during the production process.

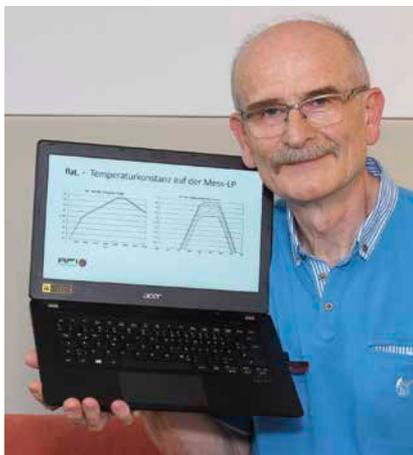
Warm records can distort. The entire manufacturing process seems flawed because the records are not cooled over their entire surface, but from the inside out. This creates tension in the material, which the flat. "Relax" program audibly counters.

Much more than just understanding is needed for a product such as yours. How did the AFI flat. become reality?

At the concept stage, I was able to acquire the interest of some hifi-savvy friends with technical backgrounds, and got a lot of valuable help this way. The attractive housing was created by a friend who is a designer, and I needed a highly professional industrial partner to manufacture the flat., to ensure the faultless function – and the flawless finish.

When you look at the result, was it worthwhile?

Absolutely! When I see how precisely my turntable is built and what effort has gone into adjusting it, I'm glad I no longer need have its performance ruined by dished records.





The flat.de is operated by means of hall sensors and a magnetic stylus, while another magnet fixes the stylus to the device, so it is always ready for use.

according to Kathe ought to be washed before the treatment, is placed between two layers of special felt material in the AFI device. A few prods with the stylus and the heating process begins.

Now you have to be patient, as the standard program takes five and a half hours - and the Relax mode is not much faster. However, the effect is impressive. The flat. evened out warped and dished records, making them absolutely flat. My colleagues and I brought a number of very warped 'victims', and after the treatment, they showed hardly any signs of their previous state.

A vinyl remastering of Mahler's Second Symphony, recorded by Decca in the Sofiensaal in Vienna in 1975, while not really bad, was visibly warped – after a turn in the flat., the previous fluctuations in the tonality of the choir in the final movement, caused by the ups and downs of the pick-up, were gone. It was as though the sound quality had been smoothed out.

Saved a favorite record

One of my favorite records is Steve Kuhn's „Motility“, a unique secondhand bargain signed by the musicians. Unfortunately, a dent on the outer rim produces a narrow, high and quietly crackling distortion and makes the first minute practically impossible to hear. The AFI could not do much to rectify the disturbance, however, it pushed away the peak displacement, significantly reducing the ups and downs of the cartridge. The next time I looked, I saw that a cutting flaw was responsible - in the form of a flat groove that ran through the outer rim. However, the AFI reduced the negative effects to such a degree that I was at last able to enjoy playing the

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|----------------------|------------------------|
| Programm Standard | Aufheizen 1 30.6 °C |
| Programm Relax | Aufheizen 2 41.1 °C |
| Programm Expert | Heizung aus 41.1 °C |

Whereas the „standard“ and „relax“ programs operate according to a predefined time and temperature curve, „experts“ can select the duration of the heating program in short steps, between 15 minutes and six hours, and target temperatures between 40 and 60 degrees. Irrespective of the mode the flat.'s display continuously provides information about the status as well as the current temperature of the record. The user is always informed about the „progress“.

beginning of „The Rainforest“ - side 1, track 1.

In the course of the weeks that the AFI record flattener enhanced our daily editorial work, there was seldom a day it was not put to use. Word had gotten round that the appeal of the well-designed device lies not only in flattening, but in the way it could also make beloved vinyl treasures sound better. How? Well, the Relax program is said to dissolve tension by converting the polycarbonate molecules, which are present in jumbled knots after cutting, into a more ordered, a crystalline state.

To test the effect of this program we washed two copies of the STEREO listening test LPII with the same machine, checked them for identical sound and them „tempered“ one copy in the AFI. It worked: Antonio Forcione's guitar acquired more body and richer colors in „Visions“ while Sabina Sciubba's voice regained its velvety timbre, slightly glazed on the untreated record, and the soulful track radiated more emotion. In the Blues Company bass-strong „If I Could“, lead singer Toscho's voice acquired a sonorous touch in the flat. „relaxed“ record, and the backing vocals clearly contrasted with the musicians.

Okay, so these weren't huge differences – but for listeners who know their records and only expect and want the best for them, they were both definitely evident and very worthwhile. Praise, then, for Dr. Ulrich Kathe for going to such great lengths to smooth the way for flatter records. **MB**

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