

OPTIMIZING THE SOUND



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**C. BECHSTEIN PRODUCES
ITS OWN HAMMER HEADS**

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Pre-fabricated hammer heads
for various Bechstein models.
Photo: Dürer

C. Bechstein produces its own hammer heads

By: Carsten Dürer

Regardless of their production depth and with just a handful of exceptions, all European piano manufacturers traditionally outsource some processes. This particularly applies to the action assembly and the hammer heads. Nonetheless, C. Bechstein has now ventured into uncharted territory by producing its own hammer heads at its factory in Seifhennersdorf, Saxony. We wanted to witness this with our own eyes and experience how it has changed the “Bechstein sound”.

More than two years have passed since Bechstein began toying with the idea of making its own hammer heads. After a series of disappointing experiences with suppliers, Bechstein’s new owner, Stefan Freymuth, began to wonder how difficult it could be to join three different parts into a hammer head. “Even though this

factory is very old,” he explains, “our goal is to keep improving and looking to the future. So, with this in mind, we beefed up our R&D team and invested a lot of money.”

The management felt that the hammer heads delivered by suppliers were no longer up to the C. Bechstein standard. And talks failed to improve

the situation, either, as Freymuth recalls: *“It was very difficult to get the suppliers to come round to our way of thinking,”* he says, describing the situation. Leonardo Duricic, Chief Technical Officer and member of the Management Board at C. Bechstein Pianoforte AG, adds: *“We realized that, although the European hammer head manufacturers produce at a very high level, something important was lacking in their production processes: a test bank. As our voicing specialists could fit a hammer quickly, voice it and thus check the quality, we entrusted one of them with managing the production of the hammer heads.”* Needless to say, hammer head manufacturers don’t have this option. But Freymuth remains unimpressed: *“No, they haven’t got that option, but that’s no excuse in my book. They didn’t show any willingness to do something about it, either. We could have set up a couple of instruments there and got a voicing specialist to check the quality of the hammer heads. Anyway, the feedback time would have been just too long, as we don’t install the hammer heads straightaway. If something turns out to be wrong with them, it’s hard for the supplier to pinpoint which felt and which process might have been faulty. But I demand this service and excellence.”*

Matthias König, Manager of the Seifhennersdorf factory, highlights the advantages of producing hammer heads in-house: *“Now, of course, we have a better control of our instruments. We can adapt all the processes, starting from the raw material: for one particular hammer head model, for instance, we might remove a bit more felt to improve the mass and the*

sound; we can choose the material and design the hammer core freely, which means we can gear all the production steps for a particular instrument right from the first chip of wood.” This also means that henceforth Bechstein can alter the production of the hammer heads to match minor alterations to any other piano part.

Bechstein hammer heads

As there’s no secret in hammer head manufacturing, we asked Matthias König to explain us the different production steps at Bechstein.

The wood for the hammer cores is pre-selected: hornbeam for the W.Hoffmann Vision and Tradition lines, mahogany for Bechstein and W. Hoffmann Professional, and walnut for the C. Bechstein instruments. Why such a differentiation? Partly for aesthetical and traditional reasons. However, Matthias Klingsing (head voicing specialist) and Thomas Kumpe (piano-maker and voicing specialist in charge of the hammer heads) prefer mahogany as it’s the hardest and performs the best during processing. Klingsing explains the difference between the hammer heads made by Bechstein and those delivered by suppliers: *“It’s very easy to stick the voicing needle into our hammer heads, which means you don’t have to use force during the voicing process. The result is a voicing of much greater precision as every needle prick is efficient.”*

The wood is cut to size in Seifhennersdorf, where the wood for all the Bechstein brands is processed,



The hammer head production factory floor with the new machines.
Photo: Dürer

Raw material: wood for the hammer cores
(from left: walnut, mahogany and hornbeam).
Photo: Dürer



Hammer moldings shaped on a CNC mill.
Photo: Dürer

Raw material: white felt for the
upper hammer felt.
Photo: Dürer



Raw material: blue felt for the under felt.
Photo: Dürer

before being shaped on one of the CNC mills. Naturally, the hammer cores are milled into the shape of a molding and subsequently cut up. In the next step, the bar arrives in the hall with new machines designed by Bechstein's R&D department: several felt cutting machines, a CNC mill to shape the upper and under felts, and the presses to glue the felts to the hammer head cores. The felt comes from Germany, as does most of the wood – or from neighboring European countries. The white felt for the upper hammer felt and the new, deep blue felt for the under felt is supplied in sheets. Both types of felt are cut roughly, then milled into triangular bars to be glued onto the wooden hammer cores later on. However, Bechstein wants to be sure that the hammer heads will also perform well in any climate around the world and not contain too much or too little moisture. Consequently, the thick upper hammerfelt layers are conditioned in a climatic chamber prior to gluing.

The gluing process uses machines that work with heat, pressure and special glue that holds under the strain of playing but doesn't harden the hammer felt. The felt layer is weighed before gluing, however. Why? Thomas Kumpfe knows the answer: *"We want to ensure that we have enough mass on every hammer head. The felt can easily contain an invisible hole, which affects the weight, i.e. gives us the wrong mass. And as our quality requirements are high, there is little room for error here."* After the gluing process, due to the wooden hammer cores being pre-cut, one can clearly witness the resilience of the hammer felt.

Then comes the really fiddly work: every bar is cleaned by hand to remove any excess felt, sanded by hand and finally cut up into individual hammers. In contrast to other manufacturers, Bechstein doesn't rivet the felt onto the hammer core. *"In all our experiments, we discovered that even a rivet won't hold the felt to the wood if the gluing process is faulty. Moreover, the pressure exerted on the felt during playing can cause the rivet to burst,"* explains Matthias König. *"But we've found a glue that doesn't require any riveting."* And it doesn't alter the mass of the entire hammer head, either.

During our visit, however, we noticed that the under felts were all red, not blue. *"We wanted to get the production rolling,"* says König, *"but had to wait for the blue felt as it was dyed especially for us. It's such a unique blue that people will immediately recognize our hammer heads."* And Bechstein hammer heads are about to become even easier spot as the company is currently working on burning its logo onto every single hammer head with a laser robot. *"It's early days yet, but the results look promising,"* explains Freymuth.

The result: a better sound

What ultimately counts, however, is the sound. Of course, it's the result of numerous factors and not just the hammer heads, but Bechstein has constantly been optimizing these factors over the decades with a view to increasing the quality of its instruments. The Bechstein staff in Berlin and Seifhennersdorf has something in mind as regards the

optimal sound of their upright and grand pianos. What is it like? Leonard Duricic tries to describe the sound they are striving for: *“String musicians in orchestras can immediately identify with the Bechstein sound thanks to its extremely clear definition. It isn’t sterile and sharp, but rather clear and powerful. For us, it’s all about warmth of the tone. Our instruments must be strong enough to stand out in front of an orchestra, but also be ideal for a dolce in a solo recital.”*

After a shift towards agraffes, through which the strings run, Bechstein only started using capo bars on its instruments again in the early 1990s. Duricic adds: *“The silvery sound of agraffe instruments worked well until World War II as it was in keeping with the taste of the time. With the advent of jazz and other styles, however, this sound pattern suddenly seemed outdated. Nonetheless, Bechstein had a hard time letting go. Even with the fresh start in the 1980s when Karl Schulze took over the company, we were reluctant to stop using agraffes on the new models that were already being designed as we were afraid of losing the brand’s sound identity. Then, in 1994, we began to abandon these notions: we initially fitted smaller grands with capo bars and eventually used this solution for concert grands four years later. So you could say that we gradually reintroduced an old method that Carl Bechstein already used back in 1860 – An old method for creating a modern sound, of course.”*

Alterations that influence the sound are implemented to adapt pianos’ sound to the general tastes of the time. *“Of course, you already have an idea of where you want to go on the drawing board, i.e. when you’re designing a new instrument, so you actually have to think about what the final tone should be from the word go,”* explains König. It goes without saying, however, that you need to produce a lot of instruments before you can check whether you have succeeded in creating the sound originally intended. Feedback from musicians and piano dealers is extremely important here.

Matthias König, who has been dealing with in-house production and the quality of hammer head felt for quite some time now, mentions another novelty at Bechstein’s production site. In the past, the back frame, i.e. the solid beams visible from behind on an upright and from below on a grand, would be delivered by a supplier. Meanwhile, Bechstein builds the back frames itself – out of solid pine for the C. Bechstein grands, unlike most other manufacturers, who use spruce. Moreover, the back posts are now slotted together instead of merely glued. These are just two examples that highlight Bechstein’s strategy to stand out with top-quality products: more independence from suppliers and the constant improvement of its instruments.

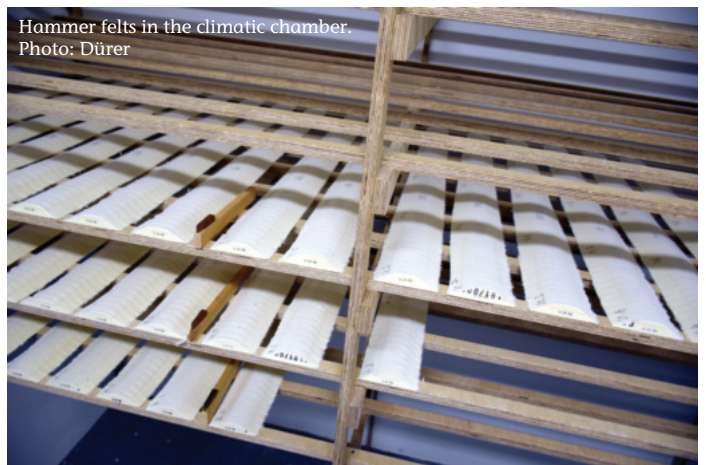
As the number of uprights and grands made in Europe keeps plummeting, the suppliers of the piano manufacturers find themselves in a predicament where they either have to hike up their prices to survive or seemingly cut corners in quality control. As Duricic points out, however, a joint-stock company like Bechstein is required by law to show two suppliers when it buys semi-manufactured products, which is easier said than done ...



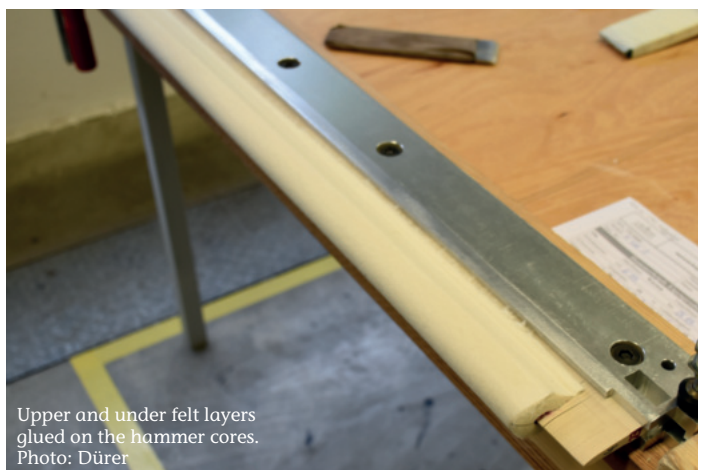
The first cut for the hammer felt.
Photo: Dürer



Triangular hammer felt bars after milling.
Photo: Dürer



Hammer felts in the climatic chamber.
Photo: Dürer



Upper and under felt layers glued on the hammer cores.
Photo: Dürer



Thomas Kumpfe sanding the hammer felt by hand.
Photo: Dürer

The step towards independence – by producing your own individual parts using your expertise in processing wood and other materials – is therefore a no-brainer. *“However, we won’t start working metal, that’s for sure,”* says Freymuth.

But back to Bechstein’s own hammer heads and the impact of in-house production. In the voicing room, two C. Bechstein D 282 grands stand side by

side: one with pre-voiced hammers made by a supplier, the other with unvoiced Bechstein hammers. *“Mr. Kumpfe,”* Klingsing explains, *“just extended the upright piano hammers a little so we could install them in the grand.”* Of course, the mass of an upright hammer is much lower than that for a grand. Nonetheless, the sound of the second piano is already impressive: much warmer and rich in



Complete hammer head sets waiting for the processing.
Photo: Dürer

overtones, it seems to unfold much easily. The attack point also seems different: more controllable, especially when playing quietly, less harsh and more malleable. The sound fits such an instrument perfectly and harks back to the warm, lyrical voice of yesterday's Bechstein pianos. Nonetheless, it is very powerful and lives up to today's notions of what a grand piano should sound like.

The two top-range Concert 8 C. Bechstein uprights that stand in the nearby company's showroom, voiced and ready for sale, provide another example of the superior quality of the new hammer heads. You immediately notice what already stood out with the concert grands containing unvoiced hammers: a lyrical and warm, yet voluminous sound and improved control in the dynamics as the hammers respond to the gentlest of touches.

As our visit draws to a close, Stefan Freymuth reiterates that the new developments are still ongoing before adding that our next visit might be about the entire action assembly. *"It's bound to happen someday,"* he explains. Watch this space!



Hammer head set for an upright piano placed in a C. Bechstein D 282 concert grand.
Photo: Dürer



Three different sorts of hammer heads for the various lines of brands.
Photo: Dürer



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