

Harmonizing CAD, CAM and CNC

Applying the New to the Old

The world renowned guitar craftsmen at Lakewood Guitars have been building their famous guitars for many years. Certainly the olden days of hand craftsmanship has yielded a path for newer technologies that allow the transposition of master design to efficient production.

What are the tools that make this possible for Lakewood?

Says Moritz Sattler, lead designer and CNC programmer at Lakewood, states that “Rhinoceros and RhinoCAM are an indispensable link in the production chain. With the help of Rhino, we recently launched a guitar configurator, i.e. a virtual guitar planning tool, which allows creation of guitar 3D models before actually building them. Customers can create their own individual instruments on-screen and view it from all angles.”

Their Story

Here is Moritz’s recollection of the introduction of these new technologies:

One sunny day about 8 years ago all of a sudden a big hole was cut into the wall of our workshop building in Giessen - Roedgen and a Fadal work-center was moved into the hall. The staff sniffed at the new contraption rather suspiciously and wondered ‘what is this gizmo doing in our workshop, where a traditional craft – guitar building – is pursued?’”

In fact musician and builder both think that guitar making is a craft like very few others. A craft which is characterized by three aspects:

- First of all it is the artistry of the craftsman,
- Second it the knowledge of the best use of the sound properties of the wood, and
- Third it is an innate sense for ergonomic and equally harmonic shape.



“ Rhinoceros and RhinoCAM are an **indispensable link** in the production chain. ”

Moritz Sattler
Lakewood Guitars

RhinoCAM®

MecSoft

Naturally, there were doubts if these new technologies could live up to these expectations. For example, how to design a guitar neck which lies comfortably in the hand – and these instructions must be given in a language he understands. Therefore a CAD program was needed. Early attempts with CAD programs for users who are happy with some lines and arcs were less than encouraging. Additionally there was the problem of transferring the design data precisely to the work-center.



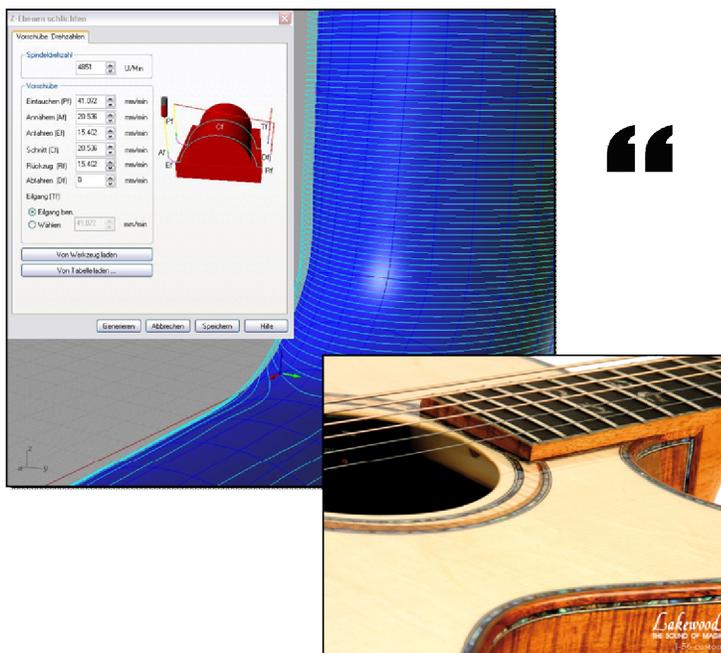
But then we tested 'Rhino' and finally found exactly what we had been looking for. Since then we cannot imagine any production without 'Rhino' anymore. With the help of a curve analysis, we can easily test if a body has a harmonic curve shape. A neck cross section scan can be smoothly transformed into a curve from which the neck can then be designed. The curved rib, which is adjusted to the curves of the top and bottom sides of the body, can be unwrapped. The shape that actually comes about at a later stage can be cut from the start – to name only a few examples of the design features.

The second problem was solved by RhinoCAM, which gives our Fadal the required precision and craftsmanship. In terms of data exchange with suppliers and service providers, we have always been able to rely on the export tools of the program.

Last year the release of an online guitar configurator on our website was a large and ambitious project. With the configurator the customers can create and visualize their own individual instrument from our workshop online at home. All geometry data for this project were supplied by 'Rhino'.

As for myself, I have to admit that my experiences in recent years have changed my attitude towards my profession. When other guitar builders ask me about my duties at Lakewood I say with a twinkle in my eye but not without pride: 'I build virtual guitars!'

...Sometimes I get some strange looks for that."



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We would not want to work without Rhino/RhinoCAM at Lakewood Guitars anymore...

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RhinoCAM[®]



Here at MecSoft, we don't give people strange looks for their work. Instead, we support the type of innovation and creativity that Lakewood practices in their work. There's a degree of artistry involved in every production – and we're proud to provide the technology that binds together to create a perfect harmony between the oftentimes dissonant worlds of CAD, CAM and CNC.

About Lakewood Guitars

Lakewood Guitars was founded in 1986 by Martin Seeliger with one purpose in mind – to build very special instruments for their customers.

Custom guitar building has become a core part of Lakewood's business and is renowned worldwide for their quality craftsmanship. Musicians such as Dave Matthews (of the Dave Matthews Band) and Ritchie Blackmore of Blackmore's Night (formerly of Deep Purple, the band that penned "Smoke on the Water", the most often played rock song in the planet) have used Lakewood guitars in their famed careers.

For more information about Lakewood Guitars, go to <http://www.lakewood.de> to check out their guitars, philosophy, and other [featured artists](#).

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