

# Future Stock

What will a vintage acoustic guitar collection look like in 100 years?

Earlier this year, *AG* put a question to the guitar lovers who follow the magazine's social media pages: Which acoustic guitars of today will be the classic, collectible vintage instruments of tomorrow? Opinions varied wildly.

Some enthusiasts commented that guitars made from modern technology—new composites and high-tech construction techniques—will be the collectible items a century from now. Others said it's all in the rich tonewoods that have made acoustic guitars look and sound beautiful for hundreds of years. Still others suggested that collectors of vintage instruments tend to gravitate to what were once considered cheap instruments, and that will be the same for collectors in the future.

In this issue's special focus on Future Vintage guitars, you will find the voices of your fellow acoustic-guitar aficionados, along with stories about guitar companies that are using medical technology to learn more about antique acoustic instruments ("Call the Doctor," page 62); the process of torrefaction, a wood-aging treatment that makes new woods on contemporary instruments look, feel, and sound like very old wood ("Everything New is Old Again," page 53); and a San Francisco guitar company that makes oddball composite guitars that you can play . . . in Antarctica ("Extreme Pickin'," page 56).

Enjoy *AG*'s excursion into the future of vintage.

## COMMENTS FROM AG SOCIAL MEDIA

Vintage is a subjective topic where guitars are concerned. What we may think will be a coveted vintage instrument may not be so in 100 years. I have owned vintage guitars, and own vintage guitars—not because of that cache, but because they work as I require them to work. I have let vintage instruments worth thousands go because they do not work as I require them to work, meaning that while they are "old" and have "vintage" value, they have no value to me if they do not work right. Over 40 years as a professional, I've played just about everything, guitars- and amps-wise. Many instruments produced today are as good, and even better, than the sought-after originals they emulate.

**GEOFF ARNOLD**  
PORTLAND, OREGON

There may not be any sort of "vintage" guitars 100 years from now. I believe the very idea of a "vintage" acoustic guitar is a relatively recent phenomenon, something that has come about because of the baby boomer generation with ingrained nostalgic tendencies and the relative affluence to act on them. Today's most soughtafter "vintage" acoustics are not even 100 years old—they are under 75 years old, give or take—and when those guitars were being built, probably no one dreamed that one day they'd be considered "vintage" and thus command such obscene prices. If they had any inkling that this was to come to pass, there would have been a lot more people buying and preserving a lot more pre-war Martins.

**JUD HAIR**  
APEX, NORTH CAROLINA

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# Everything New is Old Again

Guitar builders are using a technique called torrefaction to accelerate the wood-aging process for better tone and stronger instruments

BY ADAM PERLMUTTER



Martin  
CS-00S-14

A few years ago, the luthier Dana Bourgeois—an *AG* contributing columnist—received a sample of spruce, which he later fashioned into a guitar's soundboard. After the instrument was completed, a violin-making friend asked Bourgeois to shine a flashlight on the top, and to comment on its permeability to light.

When Bourgeois reported that it was opaque, his friend said, "Congratulations, you've discovered the holy grail of violin forgery."

The violin maker was referring to the dark side of instrument building, in which counterfeiters make copies of rare and expensive 18th-century violins with imitation scratches, varnish wear, and a variety of other simulated tricks. One thing that has historically been impossible to fake, though, is the way wood's structure transforms as it ages; a soundboard or back that admits light is a dead giveaway to an instrument's forgery. But for the spruce top on Bourgeois' guitar, the luthier had used a wood-aging treatment called torrefaction—an organic process that renders fresh wood nearly indistinguishable from wood that has aged naturally. That's why the light had a hard time peeping through.

As acoustic-guitar makers turn to period-correct materials like hide glue and varnish finishes to create guitars that emulate their prewar counterparts, it is only natural that torrefied wood is gaining traction.

Bourgeois has gotten satisfying results from these materials, as have bigger companies, including Martin and Yamaha. "This is probably the most important technological advance I've seen in decades of guitar making," Bourgeois says.

But is the aged-wood look for a guitar just a fad, like 1980s stonewashed jeans? Hardly, says Bourgeois. Torrefaction doesn't just make a guitar look old, it gives it the opened-up sound that's prized in actual vintage guitars. "Luthiers are just beginning to discover its depth of possibilities," he says.

In his Aged Tone series, Bourgeois offers dreadnoughts and OM's with torrefied soundboards, finished with Isocyanate, a material that mimics the thinness and hardness of the aged nitrocellulose lacquer which, according to many builders, contributes to a vintage guitar's tone. Bob Minner, a master flatpicker known for his work with country singer Tim McGraw, owns both a specially ordered Bourgeois

slope-shouldered dreadnought and an OO from the Aged Tone series.

"I've got a bunch of vintage guitars that I love, and I'd stack up these new guitars against any comparable old model," Minner says. "The great thing about them is that you get this dry, aged tone."

## ROASTED WOOD

Torrefaction is a process by which wood is heated in a controlled environment, cooking off the volatiles—the oils, sugars, and resins that naturally vacate the wood but only after many decades of drying. "Imagine a cross section of raw bacon, part meat and part fat," says Tim Teel, director of instrument design at C.F. Martin & Co. "Then visualize a cooked piece, in which the fat has been rendered out. This is kind of what happens with a piece of wood that's been torrefied."

"It's an environmentally friendly, non-chemical process that yields excellent musical results," says Armando Vega, project manager for Yamaha, which calls its wood-aging process Acoustic Resonance Enhancement.



In most commercial applications, wood is torrefied inside a kiln or chamber, whose interior is low in oxygen and can withstand high temperatures. Everything is monitored with sensors programmed to respond to characteristics unique to different species of wood.

A typical procedure involves first slowly heating the wood to about 250 degrees, keeping it there for 20 hours, and then gradually lowering the heat until nearly all of the moisture is removed. The next step is to reheat the wood to about 400 degrees, lowering the temperature a final time while using water vapor to add moisture. This last step ensures that the end product is useable by woodworkers. Wood that is too brittle will not work.

Torrefied wood has a honeycomb-like cellular structure resembling that of timber that's had many decades to transform. Because of this, in Bourgeois' assessment, it has a more opened-up sound. "If properly treated, its stiffness-to-weight ratio improves," he says. "This results in an enhanced velocity of sound—the quickness with which sound travels through wood—which produces the vintage tone that's typically been all but elusive in a new instrument."

Of course, not all old guitars sound stellar, and that's because not all wood has the properties that make it an excellent transmitter of sound. So, torrefaction cannot be used to produce a fine-sounding guitar top out of, say, a piece of suboptimal spruce. "Torrefaction can't make a bad piece of wood sound good," Bourgeois says. "For use in guitars, the process has to start with a selection of fine tonewood."

The natural spruce tops of new, vintage-style guitars are typically treated with aging toners that darken the wood to simulate oldness. But in the torrefaction process, as a wood's structure changes, so does its coloration; therefore, the aged look is more authentic. "Spruce can receive this beautiful, dark, rich hue that removes the need for toner," Bourgeois says.

## FROM VIKING BOATS TO MODERN PORCHES

Torrefaction involves the use of modern technology, but the idea of aging wood is not new. Stone-age hunters hardened their wooden spear points on open flames. And as early as the 8th century, the Vikings were known to heat wood to enhance its functionality in boatbuilding.

For decades, the aged-wood process has been employed extensively in Scandinavian countries, where it's seen a range of uses in buildings. For exterior purposes, like porch planks, aged wood is resistant to rotting; for interior flooring, it remains stable during the

climate changes that can cause expansion or contraction in untreated wood, resulting in buckling and other structural problems. And as with guitars, torrefied wood in other applications is sometimes used to simulate oldness.

"There's a historic district of Amsterdam where the buildings have been around for 500 years," Bourgeois says. "Torrefied wood has worked quite effectively for maintenance, as it looks aesthetically correct."

In Finland, torrefaction is known as "thermo treatment" and has been used by various wood producers since it was patented in 1990. The Tampere University of Technology, together with a handful of Finnish instrument makers, initiated a study of thermo-treated tonewoods in 1996, culminating in a 2002 paper reporting the musical benefits of the process. This was a revelation for many builders in that country.

"Juha Ruokangas started torrefying everything in his instruments," says Bourgeois, referring to the luthier who specializes in electric guitars and basses. "Even organ builders found it was great for church instruments, whose cabinets were prone to swelling in those large halls."

## 'Torrefaction can't make a bad piece of wood sound good'

—DANA BOURGEOIS



Sean Watkins of Nickel Creek, with a Bourgeois Aged Tone Slope D (below left). Torrefied and un-torrefied Adirondack spruce tops (right).



## Torrefaction on a Budget

Yamaha rolls out a line of affordable guitars with an aged-wood look and sound

Though torrefied woods are mostly associated with high-priced boutique instruments made in small numbers, Yamaha has begun the process on less expensive guitars. The company refers to its version of torrefaction as A.R.E., which stands for Acoustic Resonance Enhancement. It was first applied in the late 1990s to violin-family instruments.

"A lot of people don't realize that we've been making violins and pianos for more than 125 years," says Yamaha's Armando Vega. "So woodworking technology is something that comes naturally to us."

In Yamaha's A.R.E. treatment, the wood is placed inside a pressurized vessel, in



which the internal temperature and humidity are controlled in stages to alter the structure of the wood, increasing crystallization of the cellulose while reducing the hemicellulose. Initially, Yamaha only used torrefied woods on its high-end Japanese-made guitars that are not available for export. But the smartly priced guitars in Yamaha's L series, most of which sell for less than \$1,000, feature soundboards made from torrefied Engelmann spruce.

"We're making affordable guitars that sound 30 or 40 years old right out of the box," says Vega.

—A.P.

## THE MISSING ELEMENT

Teel often found something lacking when he compared high-quality replicas to the original Martin guitars. He just couldn't quite pinpoint what it was. Two years ago, when Martin used a sample of torrefied Sitka spruce for the soundboard of an HD-28, he figured it out.

"It had the missing element," Teel says. "A really dry, chimy, ringing tone that is the hallmark of a great vintage guitar."

Martin donated the HD-28 to a charity auction whose organizers were not careful when handling the instrument. Displayed in a case under a hot light, the guitar had become dangerously dehydrated, developing sharp fret ends but just a hairline crack on the soundboard. Considering the circumstances, it was a relatively minor injury.

"The winner sent us the guitar for revitalization," Teel says, "and one of our repair guys got confused. The department sees guitars that have been through so many different adverse circumstances, and on a guitar as dry as the HD-28 had become, much more extensive soundboard cracking would be expected. The torrefied spruce really minimized the damage on this guitar."

Bourgeois took one of his own treated guitars home in the dead of a particularly harsh

Northeastern winter. "I didn't bother to humidify the guitar, but throughout the winter and into the spring, it barely moved; this just blew me away," he says. "I lent it to Courtney Hartman [of the string band Della Mae] and she took it out on the road without even a setup needed."

In its factory, Martin has an environmental chamber, which subjects test guitars to a wide range of temperatures and humidity levels for the purpose of quality control. That chamber has confirmed the stability of other guitars built from torrefied woods. "We've tried a couple guitars with back and sides made from torrefied maple, which holds up great and sounds excellent while adding a beautiful amber color to the wood," Teel says.

## NOT A REPLACEMENT

Though it would be possible to torrefy all woods used to build an instrument, the process reportedly causes denser tropical specimens, such as rosewoods, to become brittle and susceptible to cracking. Instrument makers have so far focused mainly on applying torrefaction to the top, which is usually considered the most important tone-producing wooden part of an acoustic guitar. Bourgeois has found that the

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## COMMENTS FROM AG SOCIAL MEDIA

In a hundred years? An American-made Ovation will probably be collectible.

EMMETT FRANK GLICK  
NORWALK, CONNECTICUT

Composite Acoustics are very nice sounding and playing, to my ear. They are their own thing. They don't sound like a D-28 or my Yairi, but I like them for what they are, rather than what they recapture. I don't picture them being slobbered over 50 years from now, though. My real guess: something being made now that is as close as possible to things made 40 to 60 years ago. That's the future.

BILL KNELL  
STRATFORD, CONNECTICUT

I think the Bourgeois Aged Tone guitars will be in the forefront of future vintage instruments due to both their limited production numbers and the innovation of the torrefied tops.

BOB MINNER  
MOUNT JULIET, TENNESSEE

Various, less common woods will be sought after since age will enrich the sound quality. The American guitars will, I feel, remain top choice for collectors since more and more guitars are being made out-of-the-country these days and less good-quality American guitars will be found in good condition.

JOYCE CASTONA  
MILWAUKEE, WISCONSIN

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process works particularly well for Adirondack spruce, because of its hardness.

“Before we use a piece of torrefied wood, we cut off a little sliver, to examine its fibers; longer fibers will have more integrity,” Bourgeois says. “We feel on safe ground with torrefied Adirondack. It tends to be pretty tough, generally with better long-grain integrity than the European species commonly used in guitar building.”

Martin faces the conundrum of recreating its original designs with dwindling supplies of traditional materials. Five years ago, when the company began searching for an alternative to ebony for its bridges and fingerboards, torrefied wood seemed like a promising solution.

“We got some torrefied maple and had it ebonized, or darkened, for the appropriate look. But we weren’t quite satisfied with the results,” Teel says. “The wood was too lightweight and not very efficient, tonally, which torrefaction could not address in this application. The fingerboard and bridge are key in transmitting string vibrations efficiently into the body—for that famous Martin growl—and torrefied maple just didn’t cut it.”

Despite its successful experiment with that HD-28, Martin has learned that for all of the enhancements, torrefied wood can be more difficult to work with than non-aged wood. “It becomes a little more brittle, so extra care is needed in the manufacturing process,” Teel says. “Because torrefied wood loses cellular material, it doesn’t have the spongelike quality that new wood does, and therefore, if a little dent is made on a guitar that’s being built, it can’t easily be steamed out.

“It’s not a direct replacement for normal spruce,” Teel adds.

So far, Martin’s experimentations with torrefied woods have resulted in only one model, the limited-edition CS-00S-14, with a treated Swiss spruce top. The guitar blends traditional elements—a 12-fret 00 body and hide-glue construction—with modern touches like a carbon-fiber neck reinforcement and Fishman Aura VT electronics. “We’ve done a lot of testing on torrefied woods and so far haven’t seen anything negative associated with it. But we’re tiptoeing into the pond, so to speak,” Teel says.

As new torrefied guitars hit the market, some players who feel that a guitar should earn its age will worry about how a torrefied guitar will stand up over time; others will suspect the process is a gimmick. The real test is whether players and collectors of all stripes embrace guitars made with torrefied woods in the way that a small number of devotees like Bob Minner have.

“Quote me on this,” Minner says. “My Bourgeois guitars with torrefied tops will be coveted on the vintage market long after I’m gone.” **AG**

# Extreme Pickin’

Mixing high-tech materials with hillbilly ingenuity, Blackbird Guitars creates some innovative—and nearly indestructible—instruments

BY GREG OLWELL



Blackbird is putting the limitations of travel guitars, er... on ice.

PHOTO BY HENRY KAISER

**G**uitarists interested in Blackbird’s carbon-fiber instruments often have a goal in mind, one that’s outside of what many would think of as normal.

Take Henry Kaiser. Like most players, the guitarist—known for his adventurous free-jazz excursions and world-music projects with fellow iconoclast David Lindley—likes to relax after a long day at work by playing an acoustic. But what Kaiser does with his Blackbird Rider travel guitar goes way beyond any manufacturer’s specifications.

“It seems normal to me to go outside with a guitar in minus-80 [degrees] in Antarctica,” Kaiser says. The guitarist, who’s also a professional research diver, brings his instrument on regular trips to the ice-covered desert continent whose zero-percent humidity would wreak havoc on a wood guitar, making it unplayable in a matter of days.

Kaiser doesn’t just take his Blackbird to his unconventional workplace, though. In a series of videos he posted on YouTube, he filmed a fellow diver playing the guitar as the team swam beneath 20 feet of ice in the Ross Sea.

Why would anybody do that?

“Because it’s a fun joke and it’s a useful image,” Kaiser says. “And because we can do it and nobody else can. Fewer people dive under the ice [in Antarctica] than have been in space.”

Henry Kaiser’s antics represent the boundary-pushing extreme of usability and durability that Blackbird Guitars’ founder Joe Luttwak had in mind when he started the company in 2005. His mission remains the same: to change people’s ideas about where they can take their instruments.