

## The Greenbrier Companies VIRTUAL SAMPLE RAILCAR™



### An innovative, cost-effective, time-saving way to inspect and approve build quality.

Quality, time and cost are three attributes customers seek in a relationship with a supplier. At The Greenbrier Companies, where long-term relationships with the customers who acquire our railcars are the foundation of how we conduct business, we're always looking to deliver the highest-quality equipment in a time- and cost-effective way. It's all about value. Virtual Sample Railcar™ (VSR™), our innovative way for customers to remotely inspect build quality, right down to the welds, is big part of our value equation.

VSR™ brings customers into Greenbrier's six North American carbuilding plants from the convenience of a conference room or home office, providing full access to a sample railcar, with all the information needed to determine it meets all specifications and will be delivered as ordered. A narrated high-resolution "walk the line" video follows a carbody-to-coupler build with tools like high-resolution photos and

360-degree views, concluding with a live-stream inspection from the plant's buy-off area. The traditional in-person process normally requiring three or more days, limiting the number of people who can participate in an inspection, now requires about an hour, accommodating multiple participants. Travel time and cost are no longer limiting factors.

VSR™, first rolled out in 2020, is rapidly evolving into its second iteration, which we call "2.0." We've learned a lot in the past three years and have gotten the process down to a science. Drawing upon best practices from all our North American plants, the technology and equipment have improved, requiring only modest infrastructure investments. VSR™ 2.0, customized to individual customer requirements, offers a recording option, with hi-res images stored safely and securely on a cloud platform. Such features as live lining millage thickness measurements have been added.

Christian Garza, Quality Coordinator and Administrator at Greenbrier's GIMSA plant in Monclova, Mexico, describes typical VSR™ steps:

"Our four priorities are safety, quality, respect for people, and customer satisfaction, which carry through the entire inspection process. We

start with a safety inspection, showing that blue flags and wheel stops are in place. We explain to the customer the different activities we will be doing during the inspection—for example, operating couplers and hand brakes, showing every component and its supplier. We verify compliance with Rule 16 of the AAR Field Manual, which applies to coupler operation; Rule 22, uncoupling levers and support brackets; Rule 13, handbrakes; safety appliances like footboards and side ladders; slack adjusters; and exterior markings. We verify transponder information. On a tank car, for example, we operate the bottom outlet valve handles and open the manway. We read the thickness of the exterior paint. We verify capacity, in gallons. We show all the reports and readings our Quality department takes during the process. So, our customer has a complete view of their entire railcar."

Railcar interior linings are difficult to show with live streaming video, so we've employed 360-degree cameras that take detailed, gigapixel-level high-resolution photos, which are included in the VSR™ live session.

The VSR™ process is more interactive and collaborative than an in-person inspection. Consider space: An in-person inspection is

limited in the number of people that can be around a railcar. A customer will send one or two people to an inspection, but they might have a whole team of a dozen or more who would like to have the experience as a training tool. With VSR™, we can accommodate them (one customer had more than 25 people join a call). Component suppliers can join a call if the customer requests it. We can get a lot more voices and people involved. A sample car inspection with Greenbrier's engineering and production teams can be accomplished in just one call, whereas traditionally, it could take an entire day. And sending people to an in-person inspection isn't as cost-effective: Whether it's one person or two or three, travel and lodging are expensive and time consuming.

"Over the past few years, we have purchased several hundred railcars from Greenbrier," says Bobby Triesch, Vice President and Regional General Manager, SA Recycling. "With our most recent tranche of railcars, they told me of their new VSR™ experience and proposed that we use this process to confirm our approval and acceptance of the railcars. We agreed and participated in the VSR™ experience, and it was very impressive. I was able to see very-high-resolution photos and videos of the exterior and interior of the cars, as well as all of their mechanical systems. I truly believe I was able to see and inspect more of the railcar than was done with me walking in the plant next to the railcars. This is a great technology improvement, as well as a cost saver and efficiency tool. This new experience is the future. We were happy to participate, and would encourage others to consider VSR™ for their organizations."

"Most of our customers have signed off on VSR™ and are using it with confidence," notes Greenbrier Vice President of Marketing Tom Jackson. "We're confident that this Greenbrier innovation is meeting their expectations for quality, time and cost."

"In a given year, we conduct more than 100 sample railcar inspections," adds Greenbrier Senior Sales and Marketing Manager Mallory Moran. "Think about it: 100 hours versus 300 days, with better collaboration among more people, and all the information they need to ensure that their railcar is exactly what they ordered, with the build quality upon which they've come to depend."

