

For many rigs, it's about what's under foot

In a day and age where sterile charts, line graphs and hard science dominate the world of innovation, keeping a person's attention can be difficult. So when a story comes along that combines the dry, boring numbers and company that had to roll up their sleeves, sharpen your



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pencil and solve one problem for the industry and become a backyard entrepreneur in the process.

The story begins with BCE Structural, the largest structural engineering firm in Montana with four offices. Their firm recently released a study involving rig mats reporting quite a jump in new load data.

"Our firm helped work through solutions for walking rigs, and the 4L mat tested the best," said Matthew Schmidt, BCE Engineers. "Now, like every energy job, it depends on the conditions and circumstances, but the 4L is the best strength for the least amount of weight."

For me, the interesting part of the company's press release was the source behind the scientific study, MT Rig Mat. A modern day group of backyard entrepreneurs from the little town of Charlo, Mont. Charlo is located between Kalispell and Missoula, in the Montana Flathead Lake region.

"We have never seen a rig mat company go to these lengths to ensure a safe and sound product," Schmidt said. "Studies like this really do show hard numbers and facts so professionals can have an intelligent conversation to highlight strengths and also dispel any myths about the product."

MT Rigmat emerged from the 2009 recession after the Flathead Lake area was hit hard. Jordan, a certified electrician, became Montana's first rig mat company in the state with the help of a team of certified welders.

"The 2009 recession left a glut of unemployed electricians in our area. Actually anything that dealt with building or construction was hit hard. Even the logging industry was hit pretty hard," Jordan said. "I had to reinvent myself, my business with keeping my faith and family values in tact. I very well couldn't ship a wired house, and I saw a need for the rig mats. We had a group of certified welders and electricians hungry for work, so we set out to build a quality

product by dedicated and hard working professionals."

Since then, MT Rig Mat has grown their little business to a real viable asset to oil fields and the Charlo community. MT Rig Mat started small shipping mats to North Dakota and Montana, according to Jordan. Since then, the company has grown to be able to ship all over the United States and even into Canada and Australia.

During the early days, Jordan, like many, had to solve some unforeseen problems with the ever-changing energy industry.

"In the beginning we saw our competitors' mats breaking, we saw some of our rig mats getting broken." Jordan said. "We knew this was something bigger than a couple tweaks, we knew we had to make it stronger and better. So we hired a structural engineering firm to get load ratings for everything we did. There has been a lot of talk about using CLT for mats lately. We had this engineered and found that our improved design is now 7-9 times stronger than using CLT, so we keep building our improved design. It is important to not just believe everything you hear."

Jordan said the goal was to determine the strongest design that could build for the walking rigs. He said he was pleasantly surprised when the engineering proved that, with some small changes their original 4-Rail Heavy Duty mats are now 10 times stronger than a steel-framed laminated wood (CLT) mats.

"Steel is really 19x times stronger than wood," Schmidt said. "Wood is a great product for its weight, but with today's rigs the combination works very nice. Essentially it serves as a spine or a backbone and distributes the weight."

Innovation doesn't stop there, now the linguistic innovation begins. This part of the process is very apparent to Jordan, which essential becomes how to communicate your findings to the industry? Or better yet how does a small group of blue collar workers in the mountains of Montana let the world know about their research? Jordan hasn't the foggiest idea, but he does have a good strategy to bring together people.

"What we've seen is almost a disconnect between the rig mat manufactures, the oil companies and the geotech engineers. We've got structural guys on the engineering side, we've got the geotech, but nobody really pays attention to what's below the rig," Jordan said. "One of the challenges for us and new employees is learning a new language."

Many of the industries are becoming so specialized they have their own language so there was a learning process



Custom rig mat with 2-by-6 foot laminate timber by MT Rig Mat

Submitted photo

for us to learn their language so we could communicate and understand on a new level. It takes a little time, but it is worth it when everyone can be on the same page."

Jordan was quick to learn which variables to focus on when applying innovation.

"In the oil field weight is not as much of a concern as strength. We must get as high of strength as possible out of that product." Jordan said. "Steel is 20-times stronger than wood, but an all steel rig mat would be too heavy. So we had to back that down and engineer the highest strength for the weight that we can while working within the industry standards and needs."

The difference became close to tenfold. The rating from a wood rig mat comes in around 30, while ones constructed with the steel cross beam, distributing the weight record a 300 score.

"We can say for certain the steel and wood mat are a very good product," Schmidt said.

Jordan cites an example to better illustrate how it gets applied to the industry.

"Take any rig, today they have walking pads, that walking pad size had not changed, but the rigs size did," Jordan said. "The mat is a stiff product, but the loads we are starting to look at are getting quite large," Jordan said. "There was a day when the loading was not a big, the rigs are three times as big as they used to be. Back in the day they were overbuilt, now they are just barely built strong enough."

Jordan continued explaining the new technology.

"So when we add 150,000 pounds on a 6-by-6 (foot) pad on a 45-foot-PCI-soil, we wanted to eliminate the central focus of the pressure point and the transfer

of center loading," Jordan said. "What we have been able to essentially do is transfer that load to the outer beams to share that load, rather than create stress points. It becomes much more intuitive for day to day and future reclamation of the land."

According to Schmidt, one of the biggest benefits to this whole study is the proactive reclamation practices with the rig mats.

"Basic economics of trying to bring in a road base in soupy clays, so you bring in a bunch of gravel. That gets expensive," Schmidt said. "In lieu of that, you remove one of those rig mats and you are not destroying the landscape. In fact in many cases you are preserving native fauna roots that might be very difficult to find if they are destroyed by gravel, rock and wear and tear of trucks."

In the end, the one thing that may be the most satisfying to Jordan is peace of mind. Knowing that his and his team's hard work is making a difference in the industry while being validated by outside sources for their innovation.

"Getting everyone on the same page, speaking close to the same language has allowed us to remove the anecdotal data like 'it looks pretty soft today' to real data and facts we can truly measure," Jordan said. "We are not into guessing anymore."

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