



Urethane wiper improves scraper systems used in free stall barns

PLASTICS IN
AGRICULTURE

by Larry Searl

Over the last 20 years, Wisconsin's family farms have grown into some very large operations. Forty and 50 cow farms have turned into 2,000 and 3,000 cow businesses. What used to be a once-a-day chore, milking, is now a 24-hour job with cows being milked three times a day and shifts of workers performing specific jobs on the farm. The traditional stanchion barn with one cow per stall is being rapidly replaced with free stall sheds with hundreds or thousands of cows being moved in and out all day long. That large number of cows in one place has created a problem with handling all the manure they generate.

Several types of scraper systems have been tried with varying results, but generally it was a steel bar scraper moving on a concrete floor which didn't work too well. One of these systems was a steel automated scraper that was designed to move large amounts of manure to a slurry

flume where it was flushed to a tank until it is ready to be distributed to the fields as fertilizer. It basically consisted of two steel bars in a V shape being pulled by a cable back and forth on a concrete floor. Each end of the bars had a steel guide that would ride against the wall on either side of the walkway. The floor had grooves in it to give the cows some traction while walking around. The cable pulling the scraper moved at about five or six feet per minute. The shed is 700-foot-long and the scraper is running 24 hours a day.

With a rough concrete floor, a heavy steel wiper and tons of manure, the wear on the components was tremendous. The whole scraper system would not last one year without having to be completely replaced. Dan Thiel of Badger Plastics and Supply, Inc. working with Cross Farms of Oshkosh, Wisconsin, had a better idea. Dan knew he needed a material that could take some abuse against the concrete, yet still wipe the floor to the customer's satisfaction. His idea was to put a wiper made of a 75-85A durometer urethane molded onto a 10-gauge steel bar that could then be plug welded onto the bottom of the existing scrapers. The part was 3/4" thick overall and was 4" wide by 80" long. The combination of urethane on a steel back would make for an easy change if needed, but still be soft enough to move the manure with no noise and hopefully no wear.

Next, Thiel tackled the steel guide ends that ride against each side of the walkway. He cut those ends off and machined a UHMW-PE guide that is bolted into the end of each arm of the scraper. These were rounded so that if they would wear on one side in the future they could be just turned around and used again on the other side. The whole system is being pulled by a cable and winch on each end of the 700-foot-long shed. Thiel also replaced the brass bushing with MD nylon ones that are press fit into the pulleys to help prevent wear on the pins they go around.

Cross Farms has 16 scrapers in service, all with the same set-up that Thiel has



Wiper made of a 75-85A durometer urethane molded onto a 10-gauge steel bar that is plug welded onto the bottom of the scraper.

recommended, and couldn't be happier with the results. The new system is going on its fourth year with no visible wear on any of the components. The cows are calm with much less noise and the floors are much cleaner making for a safer environment for them to walk. There are now different versions of these scrapers throughout the state. Most of them have some type of urethane wiper that Thiel developed. ■

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An automated scraper system used in barns to move large amounts of manure is improved when steel components are replaced with plastic.



Guide machined with UHMW-PE and bolted into the end of each arm of the scraper.