CASE STUDY:

Grain

TIVAR® 88 High Performance Lining Solution

THE CASE IN BRIEF

Application: Loading Spouts
Quantity: 6 Spouts
Liner: TIVAR® 88-2 Antistatic, 1/4" Thick
Bulk Material: Grain
Substrate: Mild Steel
Problem: Wear
Date Installed: 2000-2001

TIVAR® 88-2 LINERS ECONOMICALLY SOLVE GRAIN TERMINAL WEAR PROBLEMS

Background: United Grain Growers (now called Agricore United) in Thunder Bay, Ontario is one of Canada's largest agribusiness firms, marketing commodities both domestically and internationally. Maintenance personnel at the plant are encouraged to find creative ways to reduce maintenance time and expenses, and have recently focused those efforts on identifying new uses for TIVAR® 88-2 liners.

The Agricore facility, located in Thunder Bay, Ontario.

Problem: This terminal ships 450,000 tons of grain (wheat, canola, mustard, feed peas and durham wheat) annually on the Great Lakes. The ships are loaded through three 15" I.D. steel gas pipes that must be replaced every 4 to 5 years because of wear. Typically, these pipes/spouts are rotated approximately 1/4 turn each year in order to achieve uniform wear throughout the diameter of the pipe. Periodic inspection is required to evaluate the structural integrity of these spouts because of the wear. Replacing a pipe with new steel pipe costs approximately $10,000 U.S. dollars.

Agricore staff manually rolled the **TIVAR® 88-2** antistatic liner and clamped it with a steel collar.

Solution: United Grain Growers (UGG) partnered with a Quadrant Engineering Plastic Products distributor to tackle these wear problems by lining the 40 and 50 ft. long steel spouts with 1/4"-thick TIVAR® 88-2 antistatic. This material was chosen for its wear and corrosion resistance properties as well as its availability in long lengths due to material weldability. It was also one-third the cost of a new steel pipe. Quadrant Engineering Plastic Products supplied the material in coil form 4 ft. wide by the appropriate 40 ft. or 50 ft. length.

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The steel collar devised to help roll the liner at it's pulled into the pipe.

Ropes and the steel collar guide the **TIVAR® 88-2** liner into the pipe.

"H" profiles secure the liner's longitudinal seam after it has been completely inserted.

Solution (cont.): Upon receipt, maintenance personnel quickly devised a unique method for inserting the TIVAR® 88-2 liner into the pipe by pulling it through the pipe. They manually rolled the leading edge and clamped it together. They then made a steel collar large enough that it would not slide into the pipe, but would help roll the TIVAR® 88-2 liner into the correct diameter as it was being pulled through the collar and pipe. Once inside the pipe, the longitudinal seam running the entire length of the pipe was held in place by inserting a series of "H" shaped profiles in the seam. These 4" long profiles were machined to a specific dimension that forced the sheet tight against the pipe's inside diameter and prevented it from collapsing.

Results: After one full season, there is no measurable wear on the TIVAR® 88-2 surface and at one-third the cost of a new steel pipe, this was an economical solution to the wear problem. UGG is estimating the TIVAR® 88-2 life to be approximately 5 years, which is the same time frame required to replace the steel pipe but at a lower price. Additional benefits of the TIVAR® 88-2 liner include faster ship loading and reduced maintenance.

Spout is discharged after the **TIVAR® 88-2** installation.

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