PRODUCT TESTING
CASE STUDY

Injection Molded UHMW-PE Drag Paddles For Grain Handling

Independent Testing of Wear and Abrasion Resistance

Before making the switch from extruded, machined plastic drag paddles to injection molded UHMW-PE paddles as a cost saving measure, our customer put things to the test.

THE PROJECT

Independent Testing of DPI's Injection Molded UHMW-PE Components

As one of the world's largest manufacturers of drag flight conveyors for the grain handling industry, it was important for our customer to ensure there would be no performance issues or material property loss in making the change to an injection molded part. Their drag paddles are large, thick plastic components that need to withstand the grain load when in a vertical position and also have extreme resistance to wear when continuously conveying through grain.

Although the grain equipment manufacturer was already using DPI's injection molded UHMW-PE for other products, their engineering team wanted to conduct testing both internally and with a third-party lab to eliminate any potential bias.

THE CHALLENGE

Putting DPI's Proprietary, Injection Molded UHMW-PE Drag Paddles to the Test

Few manufacturers can mold plastic parts and components as large and thick as what Diversified Plastics can do. So, it only makes sense that an engineering team may want to see plastic parts prototypes or production methods thoroughly tested before releasing new parts into the field. For this study, the customer's engineering team wanted to test both deflection and the wear resistance to abrasion of our injection molded UHMW-PE drag paddles.

Testing of maximum load, flexural strength, tensile strength, and abrasive wear was conducted by an independent lab. Naturally, the customer wanted conclusive evidence that DPI's injection molded UHMW-PE drag paddles were equal to their existing machined drag paddles before making the change in part-production methods.

Performance data comparing our customer's current extruded and machined drag paddles against the new injection molded UHMW-PE drag paddles prototypes was collected and analyzed so that all parties could see the results.

Independent testing of DPI injection molded UHMW-PE drag paddle prototypes as a potential replacement for current extruded and machined plastic drag paddles

Abrasion tests were conducted on both the new DPI injection molded UHMW-PE drag paddles and the customer's current extruded and machined plastic drag paddles

THE RESULTS

Uncompromised Performance and Cost Savings is Achieved

In the plastic drag paddle testing report's conclusion, it was determined there was no significant difference in the material wear nor mechanical properties and performance between the existing extruded and machined parts and the newly-developed, injection molded UHMW-PE parts.

Following the testing and approval of the injection molded UHMW-PE plastic drag paddle parts, our grain handling equipment manufacturer customer is now enjoying the benefits of a reduced price point for these parts, helping to optimize profitability on their end. Additionally, they are now able to have the drag paddles molded in a specific company color and add any part IDs and logos without the extra costs of machining in these important features.

DPI plastic parts and components produced for today's agricultural industry.

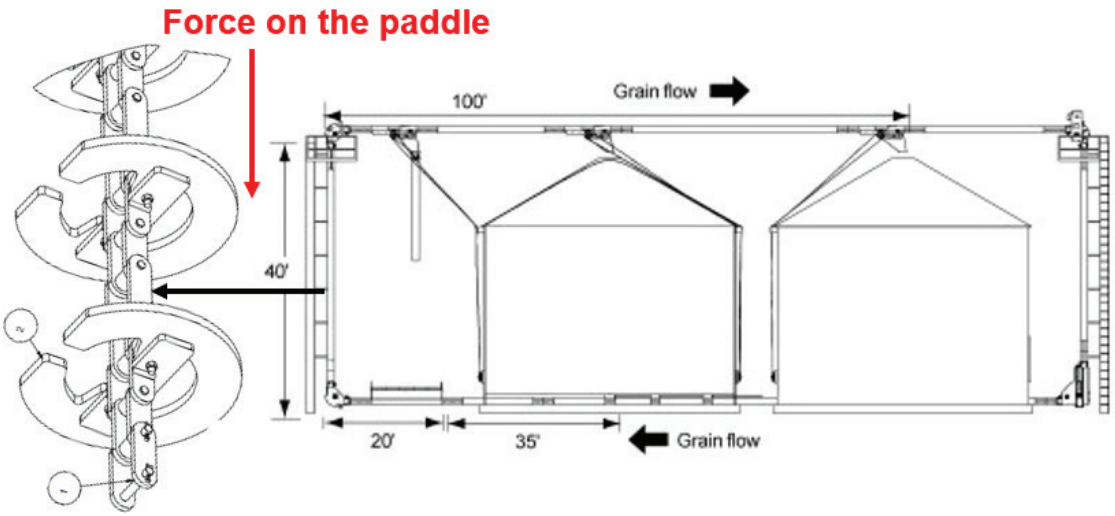
THE SPECS

A Closer Look at Testing to Ensure Durability

Maximum load, flexural strength, tensile strength, and abrasive wear were tested by an independent lab.

DURABILITY IN THE FIELD

Drag paddles need to be able to withstand the grain load when they are in the vertical position, and they need to have extreme resistance to wear as these parts are continuously conveying through grain.



TEST RESULTS

Based on independent test results, there are no significant differences in wear or performance when the original parts machined from an extruded sheet are compared against the new DPI injection molded UHMW-PE parts.

Test	Extruded Sheet	Injection Molded UHMW-PE
In Service Load Test	2411 lbs	2406 lbs
Flexural Strength	3074 psi	2939 psi
Tensile Strength	2934 psi	2902 psi
Abrasion Resistance	No Loss	0.30 Grams Loss

CHAIN LOOP SPECS

Tube Dia.	Max. Cap. (Bph)	Chain Travel (Fpm)	Tubing Gauge, Galv.	Corner Housing Thickness, Galv	Paddle Thickness (UHMW)	Corner Shaft Dia.	Conveyor Chain – Standard	Conveyor Hp Required Vertical (Per Foot Of Conveyance)	Conveyor Hp Required Horizontal (Per Foot Of Conveance)	Weight (Per Ft.) Of Tubular Conveyor Empty Lbs.	Weight (Per Ft.) Of Tubular Conveyor Full 56 Per Bu. Material
8”	4,000	325	12	8 gauge	3/8”	2”	81XHH	.35	.08	12 lbs.	28 lbs.
10” SD	6,000	325	12	7 gauge	1/2”	3”	81XHH	.50	.11	15 lbs.	40 lbs.
10” HD	6,000	325	12	5 gauge	1/2”	3”	81XHH	.50	.11	15 lbs.	40 lbs.
12”	10,000	400	7	5 gauge	1/2”	-7/16”	81XHH	.75	.18	24 lbs.	59 lbs.

DPI has the unique capabilities to injection mold drag paddles and other parts in large sizes and thickness gauges.

For study data details, visit: https://www.dpiplastics.com/injection-molded-uhmw-drag-paddles/

DPI UHMW
DRAG PADDLES

DPI's Injection Molded UHMW-PE Drag Flights Are Used in Industries **Ranging From Grain Handling and Coffee Production to Pharmaceutical Product Conveyance.**

THE BENEFITS OF DPI'S PROPRIETY INJECTION MOLDED UHMW-PE

- Extremely durable, yet lightweight, engineered plastic material
- An excellent material for parts that require structural strength, low friction, lubricity, abrasion resistance, and corrosion resistance
- Proprietary injection molding process reduces production time and costs – an advantage to your parts supply chain

LEARN MORE

Discover the Possibilities With Plastic From DPI

The capability to injection-mold UHMW-PE is something you'll find only at DPI. Our proprietary injection molding allows for custom and precision parts work, faster cycle times, reduced material waste, cost efficiencies, and high production runs. Why machine it when you can mold it?

Learn more about innovative plastics solutions from Diversified Plastics for the agricultural industry. Whether your goal is to update designs, simplify components, improve wear life, reduce costs, or boost productivity, our team will show you what's possible with plastic.

For information or pricing quotes, call 800-321-0084 or contact us at dpiplastics.com

DIVERSIFIED PLASTICS