

# GAR-DUR® UHMW Machined Parts

GAR-DUR® UHMW Polyethylene machined parts are made from ultra-high molecular weight (UHMW) polyethylene having a molecular weight of 4.2 million or greater. Beginning in the 1950's, Garland Manufacturing Company pioneered the U.S. market for, and continues to specialize in this true UHMW polymer. Its ability to resist abrasion and corrosion while delivering a low-friction surface have made GAR-DUR® UHMW the logical, cost-effective choice for a wide range of industrial applications. For decades, Garland's custom, CNC-machined UHMW parts have aided thousands of industrial companies by replacing metal or other less effective materials, improving performance, reducing operating costs, eliminating lubrication and minimizing costly downtime.

## APPLICATIONS

GAR-DUR® UHMW parts are custom-engineered for and used every day in such demanding industries as mining, pulp and paper operations, refrigeration, chemical plants, material handling and automotive assembly plants, to name just a few. The relative ease and reduced cost of machining UHMW makes these parts an even better value. Indeed, if you think your operation would benefit from replacing metal parts with longer-lasting, lower maintenance, non-corroding, quieter UHMW parts, Garland can CNC-machine them for you.

## ADVANTAGES

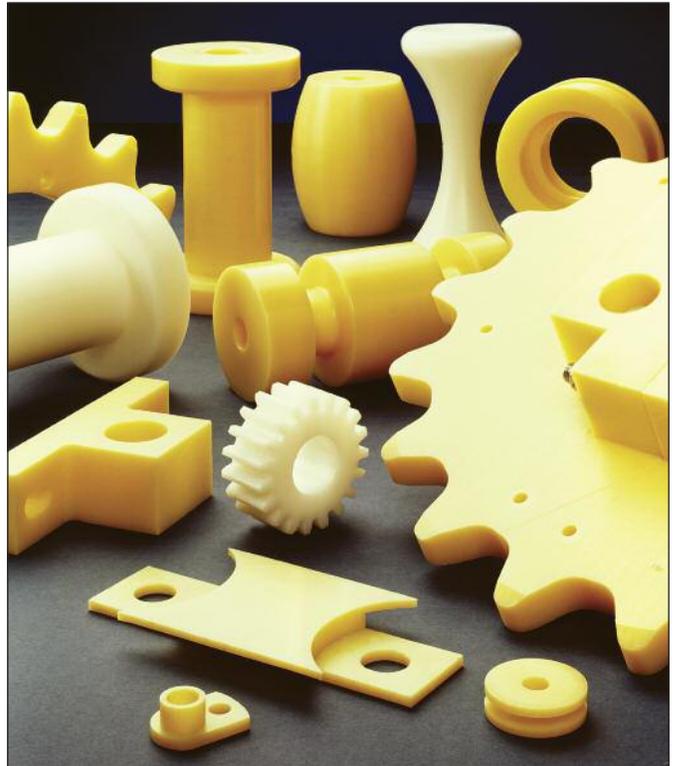
GAR-DUR® UHMW is designed to function well in corrosive and harsh chemical environments, in extreme cold, and where abrasion resistance is required. It is durable, has a very low coefficient of friction and high impact resistance. UHMW is much quieter than metals, and it won't absorb fluids.

## EXAMPLES

**Material Handling Machinery and Systems.** Low friction, noise abatement, energy savings and reduced maintenance and lubrication are a few of the key reasons GAR-DUR® UHMW parts are used in both automated and non-automated materials handling equipment and systems. From postal sorting to bulk material conveying, GAR-DUR® UHMW wear parts solve problems fast.

**General and Specialty Machine Use.** Self-lubrication, wear resistance, and noise and shock suppression are the principal reasons that UHMW parts are used extensively in a wide range of industrial machine designs.

**Wastewater Treatment Plants.** For many years, the



high-volume Coney Island Wastewater Treatment Plant in New York has used GAR-DUR® UHMW for wear rails, wear shoes, scraper blades and sprockets. In this harsh environment, the UHMW material doesn't absorb fluids, prevents sludge buildup, and requires replacement far less frequently than steel. GAR-DUR® UHMW keeps the machinery working smoothly, without lubrication and with considerably less downtime than when metal parts had been employed.

**Other Applications.** Bushings, Cams & Followers, Feedscrews, Gears, Idlers, Pulleys, Rotating Bearings & Seals, Sliding Bearings, Sprockets, Wheels and many other uses.

## COMPARISONS

The diagrams on the back of this sheet show some of the relative advantages of machined GAR-DUR® UHMW polyethylene parts.

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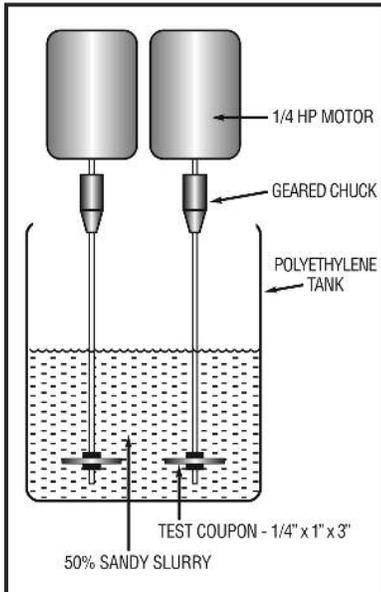
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# MEASURING RELATIVE ABRASION RESISTANCE



## SAND SLURRY TEST

The abrasion resistance of GAR-DUR® UHMW is clearly demonstrated by measuring its loss of volume against other materials. Test samples are spun for a total of 7 hours at 1,750 rpm in a water-sand mixture.

GAR-DUR® UHMW plastic was assigned an abrasion rating of 10; results for the other materials tested are shown in relation to this baseline.

Even though GAR-DUR® UHMW is exceptionally durable, it works very well with other materials. GAR-DUR® UHMW can significantly increase the wear life of in-contact moving surfaces, out-wearing steel three to one in most wear applications.

Material	Relative Abrasion Index
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GAR-DUR® UHMW Plastic	10
Nylon 6-6	24
Polyurethane (D-70)	27
TFE	72
HDPE	80
304 Stainless Steel	84
Polycarbonate	96
Carbon Steel	100
Polyacetal	110
Aluminum	120
Phosphor Bronze	190
Phenolic Laminate L.E.	200
Yellow Brass	400
Hard Neoprene Rubber	800
Hickory Wood	950

# RELATIVE COEFFICIENT OF SLIDING FRICTION

This chart compares various materials to GAR-DUR® UHMW. GAR-DUR® does not typically require lubrication, so maintenance is easier, quicker, and less costly. Its extremely low coefficient of friction makes equipment operations much smoother. It can replace steel parts, and makes an excellent bearing material, reducing friction and drag, as well as wear and abrasion.

Material Used	Relative Coefficient of Sliding Friction
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Steel to Steel	0.30-0.40
GAR-DUR® UHMW to Rolled Steel	0.14
GAR-DUR® UHMW to Stainless Steel	0.14
Urethane to Steel	0.70
Nylon to Steel	0.20
Teflon to Steel	0.11
Acetal to Steel	0.20