



Case Study

Plastic bearing significantly improves performance

Custom-designed precision plastic bearing resolves distortion and disassembly problems as well as increasing load bearing capabilities for mobile satellite antenna.



FEBRUARY 2006



When the world's leading provider of mobile satellite communications and TV-based antennas, KVH Industries Inc, began to experience problems with their own bearing failing to meet the high standards the product demands, they commissioned BNL to find a solution.

KVH's original bearing was distorting and disassembling in operation, pushing apart at very low loads. It was also complex to create and the high cost due to the machining process was also unsatisfactory. The brief to BNL was to resolve these problems quickly.

The bearing - at 242mm in diameter, BNL's largest regularly manufactured part - is being used in two of KVH's sophisticated satellite TV antenna systems - the *TracVision L2* land mobile antenna and *TracVision G6* marine antenna. Such sensitive state-of-the-art equipment demands a precision bearing that is able to move precisely and accurately in order to maintain a consistent and uninterrupted satellite signal as the vehicle moves.

"BNL's knowledge of plastics processing, together with their previous experience with applications similar to ours made them the obvious choice of partner for us on this project. Not only did BNL solve the disassembly problem, but during our testing of the products we found that load bearing capabilities had increased by 20 times. Distortion was also eliminated and the feel and rotational performance of the bearing greatly improved - the cost savings were an added bonus, covering the tooling costs in only four months."

Chris Watson - Communications Co-Ordinator - KVH Industries, Inc.

An azimuth bearing, injection moulded from acetal with stainless steel balls, the BNL solution offers significant improvements over the original bearing's performance. The re-design of the raceways has increased push apart force by 300 times avoiding disassembly in operation, and the company's tooling strategy has meant the minimising of machining operations, cutting the piece part cost by over 25%. The team was also able to integrate additional features such as pads to provide more stability for the end product.

"One of the challenging aspects of this bearing was to manufacture thin section parts with tight tolerances over large dimensions whilst allowing free running and stability" explains BNL's R&D Manager, Jason Gregory. "The development undertaken at BNL enabled us to add a planar deflection of the races of 3mm (peak to peak) with little increase in rotational inertia enabling us to be confident that the parts could be attached to a non flat surface without unduly effecting the bearing's capabilities."