

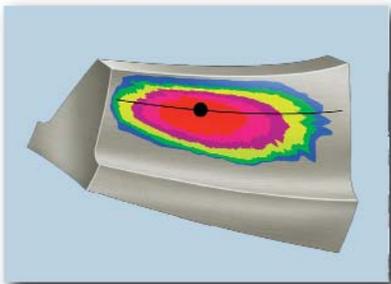
On Demand

Ground Tooth Spiral Bevel Gears

From Arrow Gear Company



The Cost Effective Solution for High Precision



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A Cost Effective Solution

The impact of the sagging economy and the fierce demands of global competition are unfortunate realities to most manufacturers. The fallout of these realities, which has been widely reported, has manifested itself in the form of lost revenue and the elimination of millions of jobs.

However, at Arrow Gear Company, we are taking steps that can assist manufacturers in their efforts to gain a competitive edge.

Arrow Gear is widely known in the gear industry as a top producer of high precision gears – supplying numerous industries. In fact, Arrow produces more loose gearing for jet engine applications than any other gear company in the world.

Arrow's more than 50 years of acquired expertise is now being directed into an enhanced product offering termed our "On-Demand" Ground Tooth Spiral Bevel Gear Program. Through this offering,

Arrow is able to produce ground tooth spiral bevel gears from a wide variety of our stock gears, and do so in a fraction of the time when compared to producing a ground tooth gear from scratch. This ability promises to offer many benefits to manufacturers of power transmission systems.

Specifically, the On-Demand Program will include a full range of ground tooth spiral bevel gears, suitable for numerous design applications. This offering positions Arrow Gear as the only gear producer in the world to provide such a diverse selection.

Extensive Benefits

At first, the extensive benefits of On-Demand ground tooth spiral bevel gears may not seem apparent. However, utilizing these products in prototype development and low volume production runs can save a manufacturer tens of thousands of dollars.



Arrow Gear's On-Demand Program offers 57 different combinations of ground tooth spiral bevel gears - available for shipping in a matter of days.

According to Arrow Gear founder, CEO and Chairman of the Board, James J. Cervinka, the On-Demand Program is expected to have a significant impact on the industry.

"Our On-Demand products are unique for several reasons. First, no one else in the world offers the fast turnaround on ground tooth spiral bevel gears in the variety that we do. Secondly, our engineers are available to assist the customer in developing an exact contact pattern to accommodate box deflections and the impact of thermal dynamics as well as other physical characteristics to meet the customer's specific requirements. And finally, by using our On-Demand gears, customers can save a great deal of expense," Cervinka states.



Arrow Gear has a long-standing reputation as a respected leader in the high precision gear industry.

High Precision and Variety

Arrow's On-Demand Program is vastly different when compared to gears available from other stock gear suppliers. First is the fact that Arrow's offering consists of 57 different combinations of ground tooth spiral bevels – reaching up to 16 inches in diameter and quality levels of Q13. The parts are also carburized and hardened, as opposed to through hardening, which is common for most stock gears.

To further enhance the value to engineers of power transmission systems, these gears can be extensively modified, through the assistance of Arrow's engineers, while still serving as a dramatic cost saving alternative to custom gearing.

Arrow's ability to produce our On-Demand gears for meeting specific

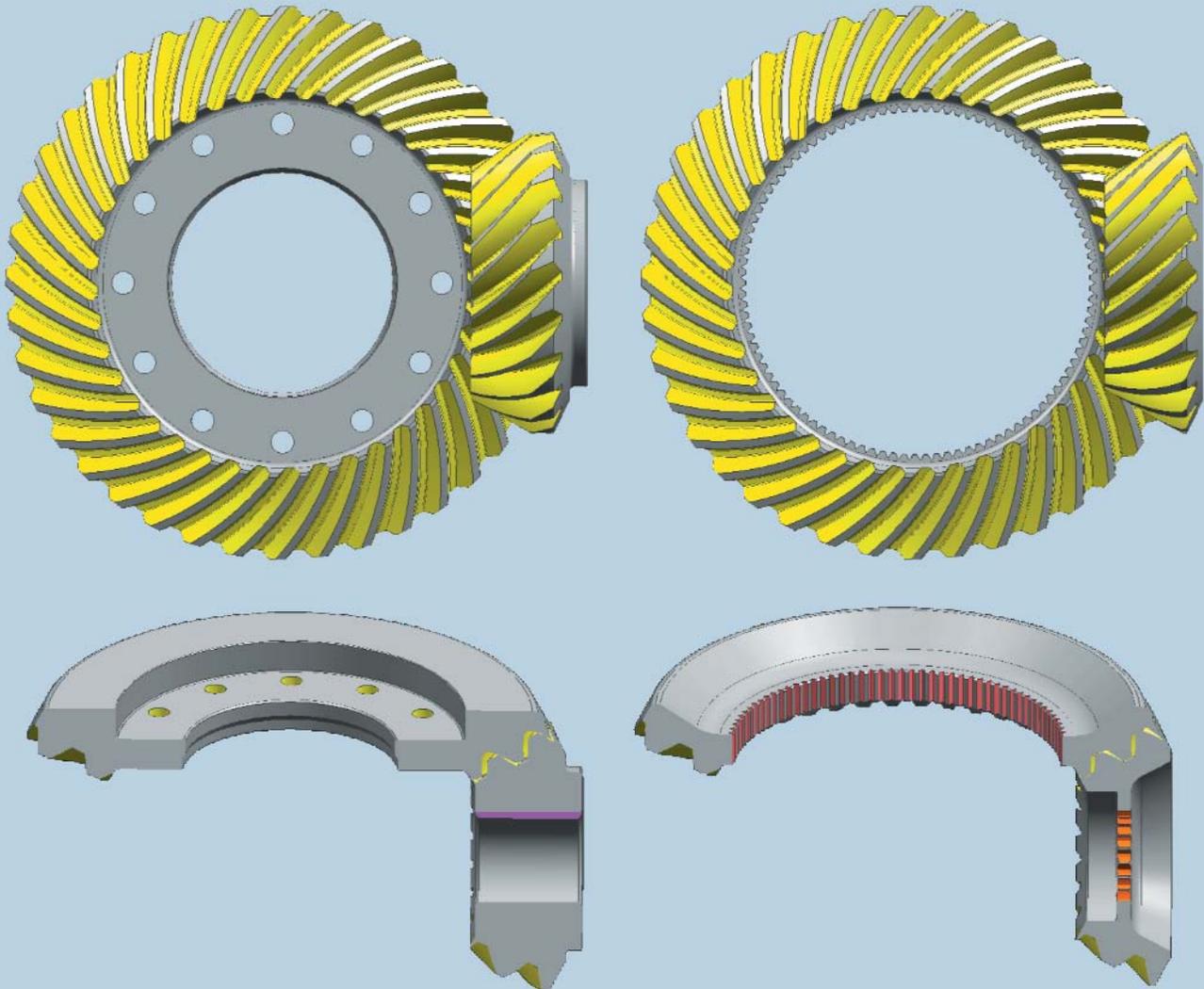
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Arrow's Engineering Department is available for assistance in gear modification to meet customer requirements.

Modification Means Flexibility

The illustration below is an example of an option for modification that is available on Arrow's On-Demand products. The gear on the left represents the stock design weighing 22 pounds. The gear on the right represents the modified gear weighing 12.5 pounds.



requirements is a significant benefit to the customer. Modifications to the blank, in order to meet the customer's gearbox envelope requirements can often be done in only two weeks. In addition, only the teeth are carburized and

Using our On-Demand products, the customer can take delivery in a matter of days instead of months.

hardened, which simplifies the modification process.

But Arrow's capabilities for modification run deep. Often, a specific contact pattern is required to account for gearbox deflections and the impact of thermal dynamics. Working with technical data provided by the customer, Arrow engineers have the capability of performing contact pattern development utilizing specialized software for Fully Loaded TCA (Tooth Contact Analysis) and Finite Element Analysis. While this process obviously will take more time than modifications to the blank, the customer will still realize significant savings from both a time and cost perspective.

"Developing a new spiral bevel gear design from scratch is very costly and the process can take months. Using our On-Demand products, the customer can take delivery in a matter of days instead of months. And even when the gears are modified, the customer

can save up to 50% in comparison with other costly alternatives for prototype or low volume production runs. In today's market, the ability to get your product to market faster than the other guy is a strong component for competition," stated Joe Arvin, Arrow Gear President.

With the flexibility of our On-Demand products, engineers now have the choice to use high quality, precision gearing in their prototype phase. Even in aerospace applications, our products can be used for the initial testing of their application without the months of waiting for a completely new design.

Arrow has offered stock gears for many years. Although a few ground tooth sets were available, the line consisted mainly of lapped

gears for less critical applications. However, there are new challenges facing manufacturers. Among these are the need for lower costs, shorter lead times, and the improvement of quality - yielding increased life, quiet operation and smooth running systems for registry or positioning.

Industry Impact

With such a wide range of ground tooth spiral bevel gears with the On-Demand Program, we anticipate a high level of demand for this expanded product offering.

"With a product line such as ours, and its inherent benefits for prototype and low volume production, we feel that our customers will find it to be a highly valuable solution to filling a rather substantial void," stated Arvin.

"In view of the brutal competition that many companies are now facing, we feel that our line of On-Demand ground tooth spiral bevel gears can serve as a powerful resource for a manufacturer's competitive posture."



James J. Cervinka
CEO / Chairman of the Board
Arrow Gear Company



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