

## Vision Quality Components Inc.

OFFERS  
HIGH STRENGTH  
P/M GEARS

Vision Quality Components, Inc. of Clearfield, PA, has developed a cost-effective, high-strength powder metal process developed for gears and other parts.

“Our goal was to develop a high-strength process with fewer operations and less variability, providing a greater value for our customers,” says Bob Aleksivich, co-owner and VP of engineering. Aleksivich was also the developer of the process, marketed as VISION 736 MAX STRENGTH.

According to Aleksivich, the process achieves high density compacting through a special powder metal material mix, in conjunction with creative tool design and specifically designed press functions. “We had to radically re-think the tooling” says Ernie Wheeler, director of sales. The result is the ability to press green parts with densities as high as 7.40 gms/cc, which is approximately 94% of the theoretical density of alloy wrought steel. “Mission accomplished,” Aleksivich says.

The process provides cost savings, Aleksivich adds, because many secondary operations necessary to achieve high strength with other powder metal technologies aren’t necessary with VISION 736 MAX STRENGTH.



Tools used to manufacture gears with the VISION 736 MAX STRENGTH process, including compacting die (top right), upper and lower punches (lower left) and core rod (at center). The finished part is shown at bottom.

Those secondary operations often include copper infiltration, double press/double sinter or forging. Without those operations, Vision’s process can achieve tensile strength of nearly 200,000 psi or Charpy impact as high as 13–15 ft./lbs.

VISION 736 MAX STRENGTH was developed for manufacturing simple spur gears, but it can also be used for manufacturing dual gears, bevel gears and helical gears.

“The optimum strength is best achieved on single-level spur gears or structural parts,” Aleksivich says. “More complicated and fragile tools, such as on helical or bevel gears, mean we have to reduce the density slightly, resulting in a little lower strength.”

According to Aleksivich, a variation in the process, called VISION 716 MAX STRENGTH, is available for those more complicated shapes. The result is still stronger than most conventional P/M parts, he says.

In some applications, Vision’s process can be used to manufacture gears at a considerable cost savings versus gears machined from bar stock.

“We believe most gears or other simple structural parts produced from general purpose wrought steel, such as AISI 1018, 12L14 or similar carbon steels, are targets for VISION 736 MAX STRENGTH,” Aleksivich says. “High volumes are not always necessary with our process. We can quote as few as 10,000 a year or as many as 10,000 a week.”

Cost savings and related volume are the key to paying back the initial tooling costs, Aleksivich says, adding that a typical set of tools for a 2" diameter spur gear costs approximately \$7,500, a one-time charge.

The Vision process is capable of producing parts to AGMA Q8 quality levels without any secondary operations. Depending on the size, inside diameters can be held to as little as

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0.0015" total tolerance without bur-nishing or honing. Tolerances for overall length are approximately 0.005" total.

Parts manufactured using the process have many heat treatment options, including through-hardening and temper or case carburizing. Other possible post-manufacturing treat-ments include oil impregnation, black oxidizing or steam treating.

Depending on the geometry, the pro-cess is capable of making gears with outside diameters up to 2–3" and thickness up to 1", says Wheeler. Also, Wheeler adds, Vision's engineers can help customers optimize their designs for the powder metal process.

Vision has been making parts with this process for about a year and a half, Wheeler says, for customers in the gearmotor and hardware industries. Parts manufactured have included spur gears, dead bolt locks, hubs/cams, special fasteners and draw bars. A heli-cal gear is currently in a customer's testing program.

Many other industries are potentials for the process, Wheeler says. Those include speed reducers, industrial trans-missions, power take-offs, gear pumps, and gear-driven motion control. ■



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## Bison Gear

Unveils New 1.5 HP AC GEARMOTORS



Bison Gear & Engineering Corp., located in St. Charles, IL, has intro-duced an all-new series of parallel-shaft AC gearmotors. Available in five gear ratios ranging from 5.8:1 to 42.8:1, the 880 series gearmotors produce up to 1,060 in.-lbs. of continuous-duty torque.

Applications for these totally enclosed, fan-cooled gearmotors include food preparation, chemical mixers, automatic feeders and packaging equipment.

Two 1.5-hp motor options provide the specifier with the option of a single-phase 115/230 VAC 50/60 Hz motor or a three-phase 230/460 VAC 50/60 Hz motor for greater efficiencies and heavy-duty inverter applications.

Each motor features permanently lubricated, shielded bearings that have been preloaded to reduce end play and a dynamically balanced rotor shaft for smooth running.

The three-phase motor includes a Class F UL-recognized insulation sys-tem designed to meet NEMA MG1 Section 31 standards and protect

against voltage spikes. Both versions of the motor bear the UL, CE and CUL marks.

The 880 series can be equipped with a two- or three-stage integral gearbox, which includes precision hobbled gears (AGMA class Q9) that have been induction heat-treated. The helical high-speed mesh is skive hobbled for minimum gear noise.

According to the company's press release, oil bath lubrication in the per-manently sealed gear cases assures long gear and bearing life and allows for mounting in any position. Also, the gearmotors use heavy-duty ball and needle bearings to help minimize noise and maximize life. ■

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