Tech Bulletin

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This electronic Tech Bulletin is produced by

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Tech Bulletins are technical newsletters from Metal Powder Products Company, and are published and e-mailed approximately 5-6 times per year. In each issue, we address specific technical issues, answer technical questions, and communicate useful information about processes, services, new equipment, and the ever-expanding capabilities of Metal Powder Products Company. This Tech Bulletin is devoted to an overview of our Precision Cold Forming (PCF) process.

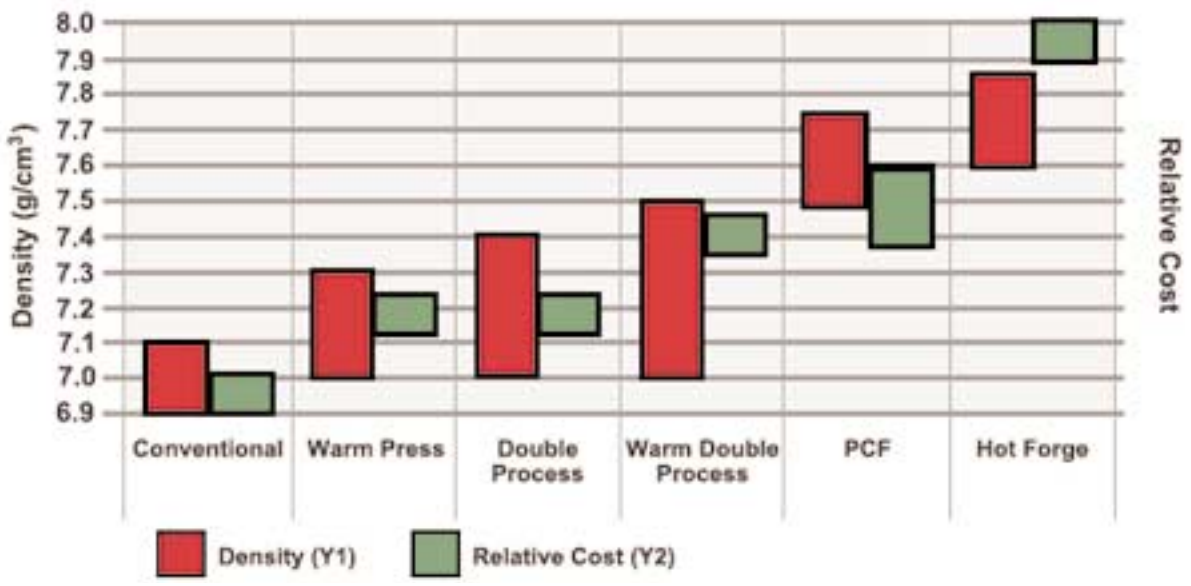
This fourteen-tooth bevel gear used in a high-performance garden tractor application was developed, using PCF technology, to replace a cut steel gear.

Precision Cold Forming

Developed by Metal Powder Products Company, Precision Cold Forming (PCF) is an innovative technical breakthrough. PCF technology produces gears and other components that exhibit excellent endurance and fatigue characteristics.

PCF combines several technologies to produce gearing with P/M economics and cut wrought gear performance. Typically, as can be seen in the chart below, increasing performance results in ever-increasing costs. PCF offers the design engineer the ability to obtain enhanced performance and improved economics.

Density and Cost Comparison



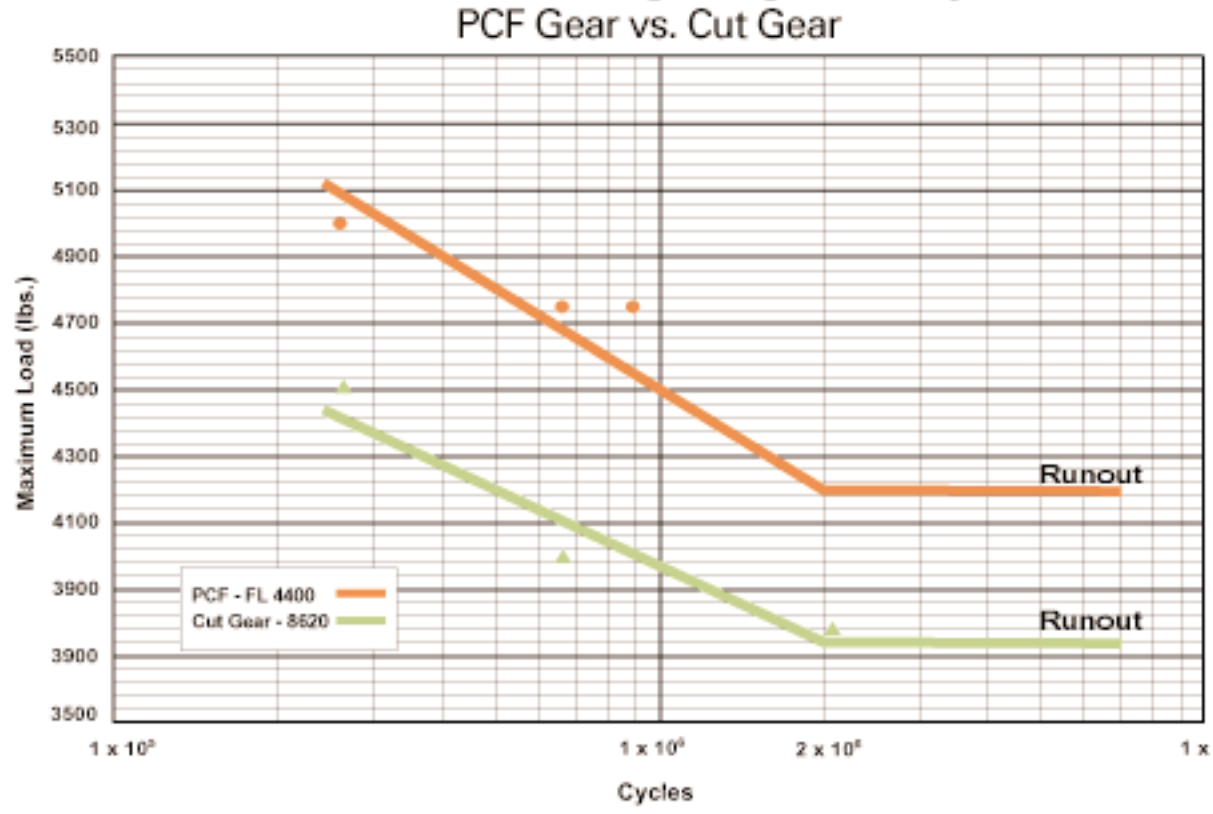
MPP has used the PCF process to develop products such as bevel gears used in high-performance garden tractor applications (see photo at left) to replace cut steel gears. MPP-produced PCF bevel gears achieved superior results in testing conducted by a major transmission manufacturer in the Lawn and Garden market. In a series of accelerated life, test track, and flywheel inertia tests, the PCF gears exceeded test goals by 10% to 200% with only minimal wear.

Other potential applications for this technology include demanding applications such as truck and automotive differentials, PTOs, and similar right-angle gearboxes used for the transfer of motion. Static and dynamic test results have been extremely positive, and PCF has proven to provide better fatigue properties (see chart below).

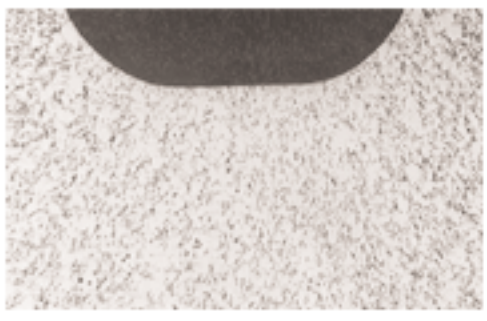
CLICK HERE for the latest MPP newsletter and to visit the MPP website.

Double Tooth Bending Fatigue Comparison

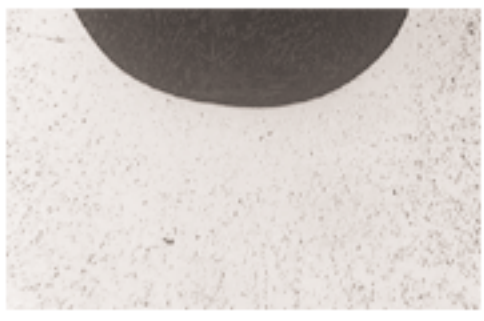
PCF Gear vs. Cut Gear



PCF processing significantly impacts the porosity of powdered metal parts. The photomicrographs shown below compare the porosity of the root section of a pressed and sintered bevel gear preform before *(left)* and after *(right)* PCF processing.



Pressed and sintered preform before PCF (at 20X magnification)



Pressed and sintered bevel gear root area after PCF (at 20X magnification)

To order a free copy of the MPP capabilities brochure CLICK HERE.

For more information about Precision Cold Forming, contact Dr. Chaman Lall at 317.580.2420 or via e-mail at mpp@metalpowderproducts.com.

To learn more about MPP and to read other Tech Bulletins and technical articles, please visit our web site at www.metalpowder.com.