Dura-Bar®
Continuous Cast Iron Bar Stock

Application

Balance Shaft Gear

Industry	Automotive- Combustion Engine
Dura-Bar Grade	Gray Iron
Original Material	Carbon Steel
Problems Solved	Reduced Noise, Improved Machining Productivity

Converting this balance shaft gear application from carbon steel to Dura-Bar G2 to reduce noise and improve machining productivity proved to be a seamlessly successful conversion based on one factor : **GRAPHITE!**

Dura-Bar's G2 gray iron contains an abundance of carbon which precipitates out upon solidification as graphite flakes. To illustrate, imagine a bowl of corn flakes in gelatin: the corn flakes represent the graphite flakes which are spaced-out in random-orientation and shape suspended in gelatin, being that of the iron, metal matrix. **Why is this so important?**

Noise and vibration produced within a system or singular part is damped significantly by the graphite flake in Dura-Bar G2 gray iron. When vibration or sound waves are produced they will travel through materials. In the case of steel, the sound resonates through the material with little diminishment to the wave amplitude. Graphite flakes act as obstructions that waves must now hurdle. Each instance where a wave meets a flake, the amplitude is lessened, redirected, or even bounces back canceling the remaining wave out. All this commotion within the material deadens the vibration/sound waves – nearly 5 to 25 times the attenuation as compared to steel!

And, as if these graphite flakes weren't already providing enough benefit, they also play a significant factor in machining. Steel does not contain the graphite flakes because the carbon levels are low and will bond with the metal instead of precipitating out as a flake. Dura-Bar G2 gray iron can machine more efficiently because the flakes act as chip breakers and heat dissipation. Steel can only be "pushed" as fast as to not allow heat build-up on the insert edge, degrading the tool life. With the "natural" chip breaker inherent in Dura-Bar's G2 gray iron, the material can be pushed harder as heat is transferred to the chip and evacuated away from the insert edge. This results in more aggressive machining parameters at comparable tool insert life.

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