# PSC Tech Topics

## Flexible Disc Coupling Background


**Why Choose PSC Disc Couplings?**

- Longer equipment life with industry leading high torque density and low restoring forces
- Quick and easy installation with self piloting, fully assembled, and collapsible disc pack cartridges
- Better balance with precisely manufactured components and piloting features

PSC Couplings

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- When properly selected and applied, flexible disc couplings can run for a very long period of time with often described as an infinite life. For example, many disc couplings run for decades without requiring service.
- Flexible disc couplings are non-lubricated, so maintenance is not required to re-lubricate the coupling assembly. Since there is no lubricant, flexible disc couplings avoid the mess that can result from maintaining or running a greased coupling.
- Flexible disc couplings can be designed with relatively tight tolerances to provide a well balanced coupling assembly. A well balanced coupling has a low magnitude of imbalance.
- Imbalance is inherent in every coupling assembly. The imbalance will create a radial force when the coupling is rotated. The magnitude of the force increases as the rotating speed (RPM) increases. The relationship of the radial force to the rotating speed is a squared function. In other words, doubling the speed results in four times the radial force, and tripling the speed results in nine times the radial force.
- In the unlikely event of a fracture, flexible disc couplings are generally expected to fracture in a progressive manner beginning at the outer disc of the disc pack. When this occurs, the coupling will run and perform with almost no loss of function. The fracture may eventually progress into the subsequent discs. Most often the progression of the fractures becomes evident during a visual inspection. Alternately, there would be a noticeable increase in vibration. In critical applications, a vibration sensor can be used to automatically shut down the equipment.
- Flexible disc couplings may be visually inspected to observe the flexible disc and hardware by removing the guard and observing the components. This inspection is best performed when the rotation is stopped and the guard is removed. A strobe light can be used to inspect a rotating coupling, and care should be exercised and safety should be evaluated before approaching any rotating assembly.

## Key Differences between Residual Balancing (ISO) and Potential Balancing (AGMA)

Any coupling can be residually balanced. Because of this, most manufacturers just residually balance everything. This allows them to make loose tolerance low, cost parts then just correct the imbalance. The big problem with this is the lack of part interchangeability. Once you drive down the residual imbalance of a coupling assembly, it is now a unit that cannot be switched and swapped with other spare parts. This can make proper coupling maintenance a real headache as well as costly. A true AGMA coupling has completely interchangeable components. This means all parts are manufactured with tight geometric tolerances to insure the center of mass is as close to the center of rotation as possible.

## Specifying a Coupling Balance

Prior to ordering an AGMA Class coupling, make sure to ask for the balancing calculations. This is a simple root mean square analysis of the manufacturing tolerances. This analysis determines whether or not the coupling is actually AGMA Class compliant.

As an example, a great step to insure a true AGMA Class 9 rated coupling is being supplied is to ask for a barrel to bore run out of 0.002” or outer flange to Bore run-out of 0.002”. This simple request will instantly tell if you are really receiving a true AGMA Class 9 coupling.