Graphite is one of the most effective dry lubricants; the molecular structure of graphite forms an extremely thin film on moving parts. This film is virtually indestructible. Graphite combats friction at both slow and fast speeds. Graphite products will not seize or gall in the most severe applications. Line2Line graphite coatings are widely used in racing engines.

Line2Line’s Abradable Additive Powder Coatings create the perfect fit between moving parts without adding friction. This technology enhances the manufacturability, efficiency, and peak performance life of devices such as engines, pumps, blowers, compressors, and turbos. The noise, vibration and harshness (NVH) signature of devices often improves dramatically when secondary motions of active components are reduced. Wear modes can be mitigated or eliminated when NVH is minimized. Thermal transfer also improves when mating components are in better contact through the operating cycle.

The success of an AAPC application relies on its ability to be assembled easily, polish to fit quickly, and then last ‘forever.’ With proper balance of these factors, Line2Line AAPC’s deliver robust performance every day in a job shop or production environment. Finished cost is low because the coatings do not require post-machining, are relatively low in cost, and are applied with conventional powder coating equipment.

Many applications are tribologically intensive, so it is important to broaden the operating range of AAPC’s in terms of thermal, mechanical, and chemical resistance. This class of materials have proven effective in many applications, but there is huge potential to broaden the environments they are used in by optimizing formulations for harsh environments.

The ‘polish to fit’ nature of AAPC’s additive coatings allows components to be assembled into devices with minimal clearance or even light interference fits. Upon initial operation, the coated components lap in to create the ‘perfect’ geometry to fit the mating parts. Precision devices can be manufactured to a perfect fit with reduced tolerancing, fewer stack-up issues and lower cost. Because they achieve their final shape during operation, AAPC’s also adapt to assembly torque and thermal expansion distortions and yield the highest efficiency and durability for devices.

In turbos, engines, compressors, pumps, and blowers, the improved fit can yield dramatic improvements in sealing, volumetric efficiency, noise reduction, and service life at peak performance.

AAPC’s provide an extra measure of component survivability with scuff protection by providing a barrier, retaining lubricants and shedding lubricant particles during oil-starved conditions. Coatings can also act as a sponge to hold oil at mechanical interfaces during long periods of storage.

Being relatively soft compared to substrate and mating component materials, AAPC’s help devices tolerate foreign particles. Because there is absolute minimum clearance between running surfaces, foreign particles have less chance to get between components. If particles do penetrate the interface, AAPC’s allow hard particles to ‘permanently’ imbed safely in the coating. If a particle generates a scratch in the coating, lubricant particles are released, and importantly, no ‘plow-marks’ are raised adjacent to the scratch, so the oil film remains stable. Therefore the destructive progression from foreign particles can be stopped early.

This technology promises to deliver tangible performance benefits, life cycle cost reduction and fuel savings in a variety of equipment.