FormulaFX™
Friction Modifiers
FormulaFX™ Benefits:

- **Improves brake pad compressibility** - RGC™ is a proven solution to increase cold and hot compressibility.
- **Reduces vibration and noise** - Damping capacity reduces noise caused by different vibrations occurring at various frequencies.
- **Reduces fading at high temperature** - Promotes a strong bond with the phenolic matrix which results in the reduction of fading phenomena, especially at high temperatures.
- **Dissipates heat** - Increases thermal conductivity in brake pads in desired directions due to high porosity and strong anisotropic morphology.
- **Reduces Speed and Temperature Sensitivity** - Ideal blending ratio of RGC™, synthetic and coke from the FormulaFX™ series reduces temperature and speed variability due to the Coefficient of Friction.

**Why Choose FormulaFX™:**

**Technology** - Superior Graphite’s Electro-Thermal Treatment/Purification Technology is applied to select carbon material powders at temperatures approaching 3000°C creating unique products with increased resiliency, lubrication, graphiticity and purity.

**Variety** - Superior Graphite offers the whole range of materials from natural flake, amorphous, and vein as well as synthetic graphites, coalescence and thermally purified natural, coke and synthetics.

**Replacing Copper** - Graphite is thermally conductive and is therefore considered a potential replacement for copper. Primary properties of graphite shown in the diagram above, such as morphology, purity, degree of graphitization, porosity and particle size distribution contribute to thermal dissipation. Therefore, not all graphite types are suitable to replace copper. Anisotropic graphitic materials contribute more to conductivity in the desired directions than fully isotropic products.
FormulaFX™ is an alternative to copper in brake pads due to its morphology, purity, degree of graphitization, porosity, and particle size distribution contributing to its thermal conductivity.

**Thermal Conductivity and Copper Replacement**

![Graph showing thermal conductivity comparison](image)

**FormulaFX™** increases brake performance and driver comfort while decreasing noise and vibration by replacing synthetic graphite with RGC™ to increase both hot and cold compressibility.

**Change in Compressibility of NAO Formulations from Increased Ratio of RGC™ Material**

![Graph showing compressibility comparison](image)
FormulaFX™ Products

**FormulaFX™ Calcined Petroleum Coke (CPC)** - CPC provides the mechanical strength, but is also used as an optimal “carrier” for other ingredients. Its relatively hard structure contributes to the base Coefficient of Friction (CoF). Fine grades can be used as a “soft” abrasive and cleaning material.

**FormulaFX™ Natural Graphite** - amorphous graphite (micro-crystalline) and flake graphite (macro-crystalline) with good lubrication properties allow an adjustment of the CoF.

**FormulaFX™ Synthetic Graphite** - primary or secondary in origin, synthetic graphite is used in almost all formulations for lubrication purposes and for its thermal conductivity, which is related to its high level of crystallinity and purity.

**FormulaFX™ Thermally Purified Grades** - Superior Graphite’s unique Electro-Thermal Treatment/Purification Technology is an ideal tool to overcome the purity deficit of natural materials such as flake graphite. An improvement of the crystalline structure resulting in electrical and/or thermal conductivity enhancement of synthetic graphite is also achieved at temperatures approaching 3,000°C.

**FormulaFX™ Graphitic Coke Grades** - our Electro-Thermal Treatment/Purification Technology imparts graphitic properties to amorphous raw materials like CPC, resulting in unique materials like Resilient Graphitic Carbons (RGC™), which have proven advantages in brake pad compressibility and vibration dampening. Depending on the morphology of the feed material other specialty graphitic materials can also be produced. RGC™ can easily be differentiated from other carbonaceous materials by the extremely high resiliency (spring back effect) that they exhibit under pressure.

Our Mission:

We create value for our customers by providing SUPERIOR SOLUTIONS - utilizing our unique technologies, processes and talents - while contributing to the company’s long-term success.

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