



2007 FLC Midwest Region Awards

Excellence in Technology Transfer Award

This regional award is presented to an employee or team of employees of a Midwest Region member laboratory in recognition of outstanding work during the transfer of a technology between a federal laboratory and another entity. This year, the award winners are:

Near Frictionless Carbon Coatings, Argonne National Laboratory. Argonne National Laboratory developed a coating system to produce and deposit near-frictionless carbon (NFC) coatings that are many times slicker than Teflon. The coefficient of friction of the NFC coatings is less than 0.001, approximately 20 times lower than the previous record holder. Under the same conditions, Teflon's coefficient of friction is around 0.04. Thin NFC films can be deposited on virtually any substrate by ion-beam deposition, sputtering, or chemical vapor deposition methods at low temperatures.

In 1998, the technology won an R&D 100 Award, given by *R&D Magazine*. Argonne ultimately selected CemCon-USA to become a licensee of the technology from the more than 5,000 inquires that resulted from the scientific and commercial "splash." Since commercial development of the NFC coating technology required significant investment by CemeCon, the final Cooperative Research and Development Agreement (CRADA) was structured to afford the manufacturer a managed-risk path toward market evaluation and development. The general approach was a relatively low-cost Option to License within a specific time period. The Option to License contained the complete license agreement as well as a trigger to convert the option to a license based on a defined sales event or written notice to Argonne.

The NFC coating process will lead to products that combine extreme wear resistance with ultra-low friction. These properties are extremely important for improving the performance, durability, and energy efficiency of all types of machine components. Some of the most promising applications for the coating are automobile and engine parts. Other potential applications include oil-less bearings, spacecraft mechanisms, biomedical implants, machining and manufacturing dies and tools, rolling and sliding bearings for ultrahigh-vacuum instruments, and micro-electromechanical systems.

The Near Frictionless Carbon Coating Team is made up of the following individuals:

- Ali Erdemir

- Osman Erylimaz
- George Fenske
- William Ingle, III