

NANO STATISTICS

Nano Science, Technology and Industry Scoreboard



Production of a Nanocoating to Boost the Durability of the Pipes Used in Oil and Gas Industry

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Ener-Corr Company announced it has produced anticorrosion nanocoatings to protect the pipes that are used in oil and gas industry. The nanocoatings can increase the strength and durability of the pipes 3 to 8 times.

Erosion and corrosion are among the grave challenges in oil and gas pipelines, and they cost oil and gas industry more than \$1.4 billion every year [\[i\]](#). Environmental factors such as heat and chemicals can increase corrosion in pipes, which results in the increase in the maintenance cost.

One of nanotechnology potentials is to use nanocoatings to prevent corrosion and to increase the durability of substrates. [Ener-Corr](#) Company has announced that it has manufactured anticorrosion nanocoatings to protect the pipes that are used in oil and gas industry. The nanocoatings can increase the strength and durability of the pipes 3 to 8 times.

The coating, which is named NanoTech HPC, is a durable coating. It is a nanocomposite that creates a molecular bond with the steel surface. In this nanocoating, the high durability properties and resistance against corrosion have been combined and a product has been made that is suitable for the hard conditions of the pipes that are used in oil and gas industry. One of the advantages of this nanocoating is its permanent connection to the surface.

A covalent bond is created between the coating and the pipe's surface in NanoTech HPC nanocoating. In fact, the chemistry of the surface of the nanocoating is in a way that it creates a very firm bond between the nanocomposite and the steel surface, which does not undergo erosion or corrosion after being exposed to various environmental factors.

Despite its firmness, NanoTech HPC is very flexible too. A type of thermoplastic has been used in this nanocomposite, whose durability is similar to that of ceramic materials, but it is very flexible because of its plastic nature. Ener-Corr Company has succeeded in combining the two features firmness and flexibility at a low cost.

Another feature of this nanocoating is its high resistance against heat to the extent that it can tolerate a temperature of 800° F (425° C). As most of oil and gas sites are located in hot areas and the pipes can be exposed to sunlight without any

cover, this feature is a big advantage for its use in oil and gas industry.

This nanocoating is both hydrophobic and omniphobic too. The base material used in this nanocoating is hydrophobic and it repels water completely and has a low friction with the passing water. By adding some components, however, the coating can be modified in a way that it has the hydrophobicity and omniphobicity features simultaneously.

The structure of the nanocoating has been designed in a way that it is very smooth to the extent that its smoothness can be compared with glass. This morphology reduces the fluid's friction with the pipe surface and consequently, reduces the energy required to pump the fluid.

NanoTech HPC can be used for pipes and tanks in various shapes and it does not need a secondary formation. This nanocoating can be applied on the surface in a thickness of 10-20 microns and the coating does not create problems such as galling or seizing.

So far, 38 products have been registered in oil and gas industry coatings section of [Nanotechnology Products Database](#), 19 of which belong to [United States](#) .

The coatings used in oil and gas industry have a vast market. According to the published reports, the coatings market in this industry will have a 4.5% annual growth from 2015 to 2020, and it will reach \$11.63 billion in 2020.

It must be added that thermoplastic coatings are the most used ones in pipes, and PVC, PP, and PE are the main materials for thermoplastic coatings. The oil and gas industry is the biggest consumer of pipe coatings.

Ener-Corr Company started working in 2010 with the aim to be active in the field of green energy. The company has produced various products in the field of oil and gas industry especially anticorrosion coatings. One of the main policies of the company is to analyze the state and federal laws and directives in United States in order to develop its products in accordance with them.