

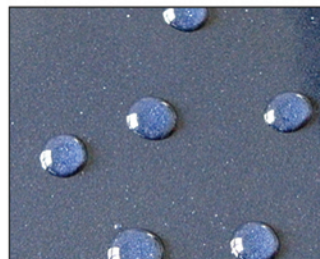
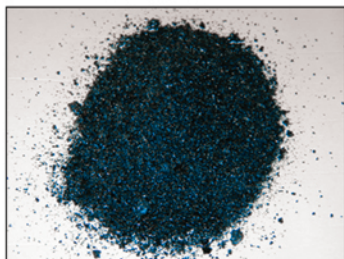
# DuraTEC™ - Tempered Enamel Coating



## Overview

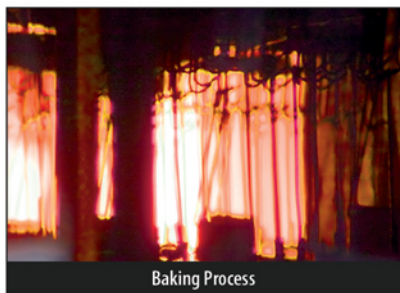
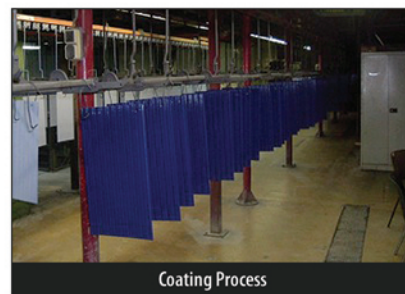
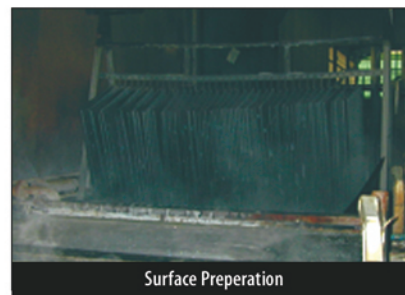
DuraTEC™ – Tempered Enamel Coating is specifically designed to eliminate the chronic problem of plugging and corrosion in airheaters as well as fouling caused by Ammonia Bisulfate (ABS) on units equipped with SCRs. The objective of this revolutionary technology is to provide a longer life span of the heating element as well as improve or maintain the designed thermal performance of the surface configuration.

DuraTEC™ is a state-of-the-art technology advancement that incorporates metal oxide nano-particles a ceramic matrix, and special additives to produce a vitreous enamel coating that that minimizes cracking and deterioration in vertical or horizontal airheaters. The corrosion resistant properties consist of proprietary frit formulation (fused material that is the basis for enamels) and the use of special techniques and processes that are applied in multiple layers.



## Features & Benefits

- DuraTEC™ is highly elastic, flexible and impact resistant. It incorporates properties that eliminate cracking problems associated with current enameled element and make it well suited for use in industrial applications such as airheaters.
- DuraTEC™ incorporates a patent pending technology that gives it self-healing properties that minimizes cracks from propagating throughout the coating thereby extending useful life.
- The DuraTEC™ surface is smooth, lubric and incorporates a “non-stick” nano-technology to reduce the surface wetability, creating a “Lotus Effect” similar to the properties of a lotus petal sitting on a pond. The surface cannot be wetted by water or acid, which provides additional resistance to buildup of ash, ABS and other deposits.
- DuraTEC™ utilizes various application techniques (wet enameling, dry electrostatic enameling and a combination of both) in conjunction with nano-technology to produce a strong amorphous bond with the steel. The enamel and steel “melt” together without delineation between the two layers. The advantage of this amorphous bond is that if the top layer of enameling is lost the underlying steel is still protected and resistant to corrosion.
- DuraTEC™ can also be supplied with SCR catalyst embedded on the surface of the coating to allow the hot layer of the airheater to utilize ammonia slip and act as an additional catalyst layer to enhance the reduction of NOx emissions.
- DuraTEC™ has enhanced corrosion resistant properties that help address the harsh conditions that can be encountered in an airheater. DuraTEC™'s enhanced corrosion resistance is due to an improved manufacturing process for forming and cutting the element sheets. The process includes two separately formulated layers of vitreous enamel, a unique application method to assure uniform edge and ridge coverage, as well as proprietary steel that produces an additional corrosion resistant layer underneath the steel/enamel amorphous bond. The combination of technologies and improved manufacturing processes gives DuraTEC™ un-surpassed corrosion resistance well above that of standard enameling.

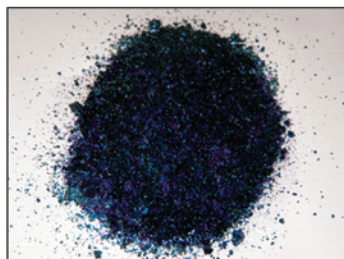




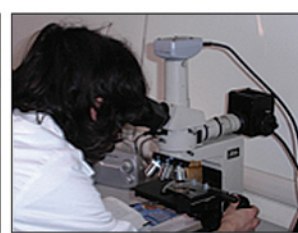
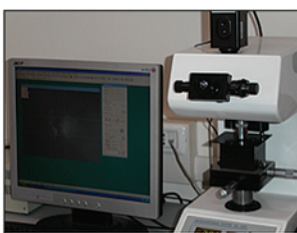
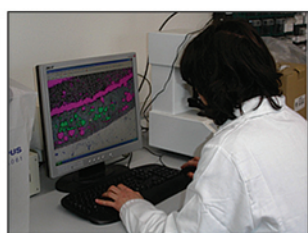
# DuraTEC™ - Tempered Enamel Coating

## Technology

DuraTEC™ uses nano-technology to insure optimum adherence and bonding of the proprietary ceramic-vitreous frit to the pure and specifically prepared surface of the base metal. The application of this technology is achieved in six carefully monitored processes:



- Proprietary steel selection
- Raw material cleansing
- Six stage surface preparation
- Wet flow nano-modified frit integration and application
- Electrostatic ceramic-vitreous matrix implementation
- Temperature controlled heat treatment & cool down



The result of these processes enables the heating elements to have flexibility, corrosion resistance and a slick finish that can withstand severe environments.

This advanced nano-technology used in both the steel and the coatings achieve strong adherence to the base metal and between the multi-layered enamel surfaces.

The propriety nano-particle matrix additives achieve self-healing properties that stop and minimize crack propagation in the enamel.

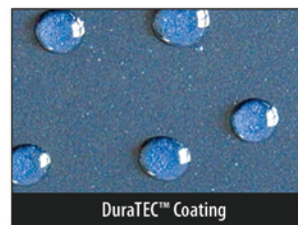
Nano-modified enamel formulation produces elastic properties in the enamel that result in significant mechanical resistance of the enamel in both bending and impact loads.

The proprietary surface preparation technique of the base metal allows the materials to bond and create a unique corrosion resistant surface layer underneath the base coat enamel coating. There are three corrosion resistant layers under the exposed enamel:

- The base enamel coat
- The amorphous bond layer between the base coat and the steel
- The modified grain structure of the steel under the amorphous layer

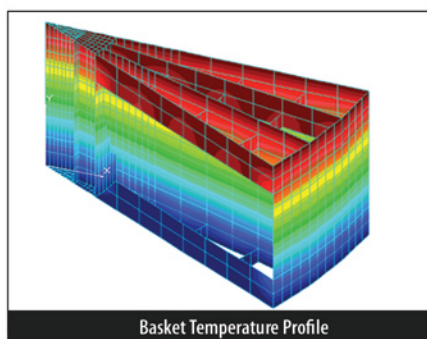


Standard Enameling

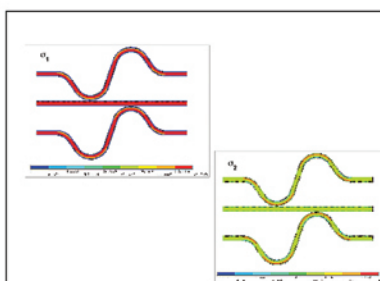


DuraTEC™ Coating

The surface preparation enables the base metal to build a proprietary surface texture that works in a synergistic manner with the nano-particles to produce an amorphous bonding layer (the enamel morphs and becomes part of the base metal material similar to the manner in which a weld is formed in steel.)



Basket Temperature Profile



Residual Stress and Compression Testing

