



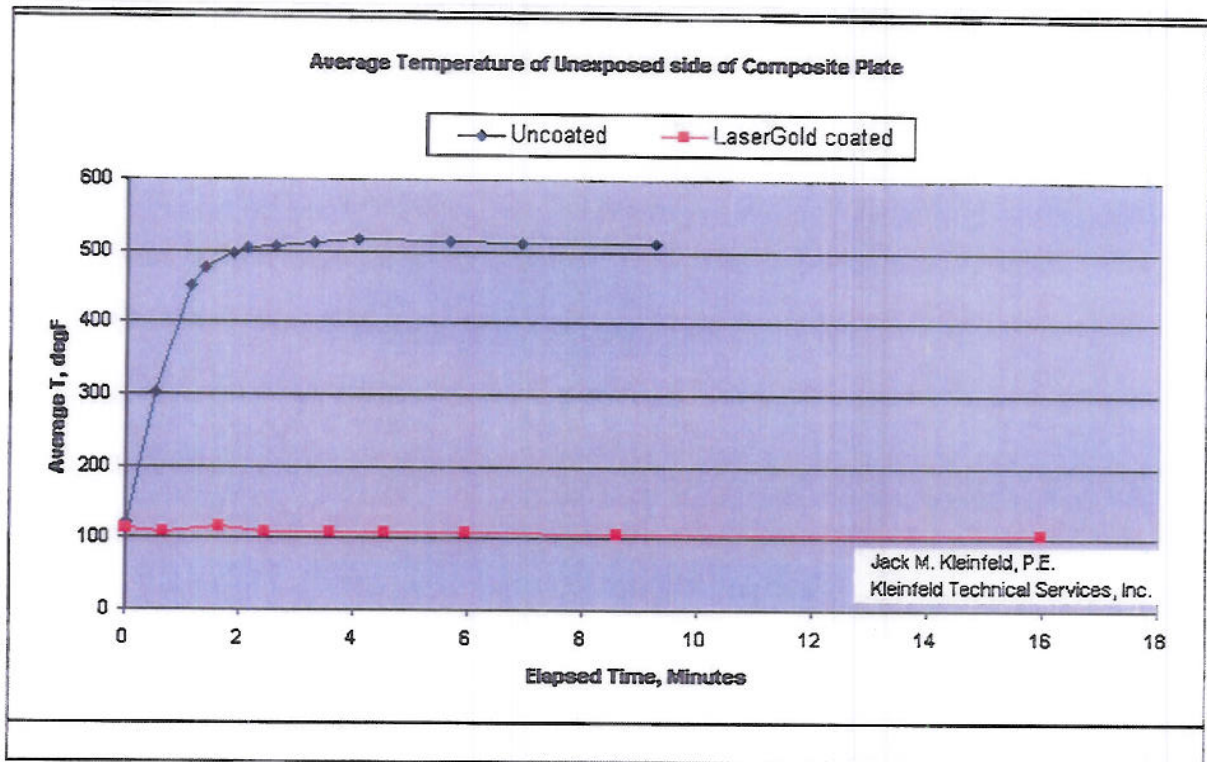
Report to David Epner
Of
Epner Technology
On
Infrared Testing of the Impact of Laser Gold as a Radiative Shield on the
Thermal Response of Pyromeral Composite
By
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The Problem

A unique ceramic infused carbon fiber composite material has been used as a thermal shield foil protecting body components of an order Formula-1 Race Car from the intense heat of the brake system. This material was not performing its function as designed, and so an attempt was made to use a layer of Laser Gold® as an additional thermal barrier to solve this problem. The test was structured to prove that Laser Gold will solve this problem. The summary of the test is as follows:

Summary of the Solution

Testing showed that the addition of a layer of Epner Technology's Laser Gold plated directly onto one side of a Pyromeral carbon fiber ceramic panel (Pyrosic) that was exposed to a high temperature radiant heat source, reduced the temperature of the unexposed side from 514°F to 107°F (268°C to 42°C). This is equivalent to reducing the rise above ambient from 444°F to 37°F (247°C to 21°C); a 92% reduction in temperature rise. The temperature of the source was approximately 816°F (436°C) with an emissivity of 0.94. This is equivalent to a black body source (emissivity of 1) temperature of 796°F (425°C).



Summary

Testing showed that the addition of a layer of Kleinfeld's LaserGold plate located upon one side of a Pyroclon carbon fiber composite panel that was exposed to a high temperature radiant heat source, reduced the temperature of the unexposed side from 500 to 100 (260°C to 37°C). This is equivalent to reducing the heat energy entering from one side of the panel by approximately 90% (1600 BTU to 160 BTU) with no loss of strength. This is equivalent to a technical system consisting of a combination of 100% (200%)

Average Temperature Rise Above Ambient for Uncoated Side of Composite Plate

