Greenkote treated bolts helping to repair Leadenhall Building

London's Leadenhall Building, or as it is more popularly known, the "Cheesegrater" hit the headlines again recently when news emerged that three of the giant studs securing the exoskeleton had suddenly snapped and fallen, in one case from the 15th floor, before landing on the ground.

UK fastener specialists TC Bolts were commissioned to identify a suitable solution and specified Greenkote treated fasteners to replace the damaged and missing studs. Greenkote treated bolts are widely used in challenging engineering environments, such as in the assembly of the new safe containment shelter to encase the Chernobyl reactor in the Ukraine.



An analysis of the problem revealed the cause of failure at the Cheesegrater as hydrogen embrittlement, which occurs when hydrogen atoms diffuse into the steel and weaken the overall molecular structure, making it brittle and subject to sudden failure. Hydrogen embrittlement generally occurs from exposure to acids during the forming and manufacturing process. Hydrogen exposure can occur during cleaning (pickling), welding and coating. Often, corrosion

protection coatings for steel, such as electroplating or hot-dip galvanizing are the culprits in inducing hydrogen embrittlement. However, as the original Cheesegrater studs were not galvanized, hydrogen embrittlement most likely resulted from another source in the manufacturing process.

Mark Gore, CEO of Greenkote commented, "Greenkote's thermal diffusion process offers exceptional corrosion protection and critically in this instance, protection against hydrogen embrittlement, as the coating process does not use aggressive acids at any stage. We are delighted that our system has been chosen to help repair this iconic new building so helping to ensure its success as a significant London landmark."

The Greenkote coating process offers a number of other critical advantages, depending upon the application, such as excellent paint adhesion and exceptional levels of coating consistency. When coating threads, neither internal nor external surfaces need to be reworked. A number of companies globally, including TC Bolts and Anochrome in the UK, are licensed to provide the Greenkote coating process. Some of the studs used in the construction of the 738 ft. tower are reported as being approximately 72mm diameter. The distinctive wedge-shaped 52 floor tower is 738ft tall and is close to both the Lloyds Building and the Gherkin. It opened in July 2014 and was designed by Rogers Stirk Harbour + Partners.





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