

# RAILWAYS

## REVIEW

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**Cover Page :** SuperTherm coating being applied on LHB Coach at RCNK.

**Picture Courtesy :**  
Resonant Innovative Technologies LLP

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# SuperTherm thermal insulation aims to cut energy usage, reduce maintenance cost of Indian Railways Coaches.

SuperTherm is a Green certified patented ceramic heat reflective high-performance coating. This coating has been successfully applied on coaches for Northern Railway, Integral Coach Factory and Southern Railways, with an aim to deliver comfortable passengers experience and longer asset life. This coating is expected to get wider acceptance in multiple areas of Indian Railways on the backdrop of the solutions competitive thermal insulating qualities. **Railways Review** reports.

**S**uperTherm heat reflective coating exclusively distributed by Resonant Innovative Technologies ([www.ritcoatings.com](http://www.ritcoatings.com)) was recently selected by Northern Railway



*SuperTherm coating was applied on the AC chair car coaches at RCNK belonging to premium Shatabdi Express*

(NRLY). It was considered for applying on the roof shell exteriors of LHB air-conditioned coaches which were undergoing refurbishment at a newly commissioned, state of the art Sonipat Rail Coach Naveenikaran Karkhana (RCNK) of Northern Railway. SuperTherm coating was applied on the AC chair car coaches belonging to premium Shatabdi Express (numbered 061179 NR LWSCZAC and 07902 NR LWACCN) at the workshop during their periodic overhaul.

NRLY's preference for SuperTherm application for their coaches was due to numerous reasons. The critical criteria were to reduce power consumption for running the air conditioning systems, enabling its effective performance for better passenger comfort. This is while running the trains in heat infested zones. Other criteria were to have higher coaching stock availability through reduced maintenance. This is because of the fact that SuperTherm stops transfer of heat through the roof of the coaches by blocking 99.5

percent of the infrared 'short wave' from the sun. This would result in blocking the heat load from the sun while preventing expansion and contraction of the roof surface caused by heat from radiation and altogether prevent corrosion due to condensation. Having applied, SuperTherm has yielded positive results on coaches at various workshops of Indian Railway. So far SuperTherm has been applied on over 170 Indian Railways coaches across ICF, Southern Railway and Northern Railway with many more planned for application. The product can be applicable on general sitting, sleeper, or suburban EMU, MEMU compartments or even locomotives roof of Indian Railways.

**Mr. Mehul Shah, CEO, Resonant Innovative Technologies (RIT)** says, "SuperTherm is a waterborne combination of high-performance aliphatic acrylics, urethanes, resins and selective additives. This produces a tough, yet flexible coatings film designed for performance and

durability. SuperTherm is a patented technology created in collaboration with US NASA that works on the principal of Emissivity with its unique ceramics to block heat gain into the surface upon which the coating film is applied. It resists 95 percent of the solar heat blocking visual light, ultraviolet and infrared. This keeps the AC coach interiors comfortable.

SuperTherm is flexible membrane with low permeability. This can greatly reduce expansion and contraction of the roof and prevent corrosion and surface deterioration resulting in lower maintenance of the coaches." He adds, "It also has the ability to resist dirt, molds, mild dew and pollution to increase longevity and reduce maintenance. This is because of a thermal moisture barrier SuperTherm stops water penetration while preventing corrosion and surface deterioration with a thin application of 250 microns DFT (Dry Film Thickness) to outperform fiberglass in real life testing."

*NRLY's preference for SuperTherm was to reduce power consumption for running the air conditioning systems, enabling its effective performance for better passenger comfort. This is while running the trains in heat infested zones. SuperTherm stops transfer of heat through the roof of the coaches by blocking 99.5 percent of the infrared 'short wave' from the sun.*





*SuperTherm being applied on ICF coach at Southern Railway Perambur Workshop. SuperTherm is flexible membrane with low permeability. This can greatly reduce expansion and contraction of the roof and prevent corrosion and surface deterioration resulting in lower maintenance of the coaches.*

Resonant Innovative Technologies (RIT) is the exclusive importers and distributors for SuperTherm along with entire range of anti-corrosive performance coatings for the India and surrounding Territories.

SuperTherm can also contribute greater savings in free standing coolers and freezers in the buffet cars of LHB coaches. Moreover,

with Indian Railways laying more emphasis on passenger safety, SuperTherm with its Class "A" Fire rating in case of fire, will help to prevent transfer of fire, heat and curb flame spread." Mentions Mr. Shah.

**ADVANCED HEAT INSULATION, SOUNDPROOF & FIRE RETARDANT**

SuperTherm coating can ensure better energy efficiency for driving the air conditioning systems and carriage fans. The other attribute of this product is that it offers sound reduction. This is not only for railway carriages and railway industrial facilities but also residential apartments and office buildings along with other benefits described above.

Most sound that the human ear can detect is reflected in the mid-range frequencies Hz. SuperTherm works best in these frequencies for use on walls of apartments, hospitals, office buildings, etc. The low frequency is a foghorn which is not the normal range of sound. Midrange sound vibration or frequencies are the main frequencies of sound. Looking at the frequencies and knowing how SuperTherm works at the midrange frequencies,

SuperTherm performs into the range of sound deadening required by building codes.

Some of the crucial laboratory tests successfully performed on SuperTherm with positive results includes NASA (National Aeronautics and Space Administration): NHB 8060.1B/C Test 1- Flammability testing ("0" Burn, Class "A" rating) (Passed),



*SuperTherm being applied at ICF on LHB coach at shop no 54. SuperTherm, has the ability to resist dirt, molds, mild dew and pollution to increase longevity and reduce maintenance.*

NHB 8060.1C, Test 7 - Toxic Off gassing ("K" no Toxic off gassing / "K" Rating for toxicity). SuperTherm has passed DNV (Det Norske Veritas) Audit and DNV Compliant Approved for worldwide salt water and maritime use complies with DNV's interpretation of SOLAS 1974 convention as amended low flame spread material, not generating excessive quantities of smoke nor toxic products in fire DNV rules for classifications of ships and mobile offshore units. DNV Certification for SuperTherm (available upon request).

Some other successful positive laboratory tests on SuperTherm includes, ASTM (American Society for Testing and Materials): ASTM B117 - Salt spray (fog) corrosion tests, 450h exposure ASTM C177 - Standard Test Method for Steady -State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus (Passed). Other tests by American

Society for Testing and Materials are ASTM C236 - Standard Test Method for Steady -State Thermal Performance of Building Assemblies by Means of a Guarded Hot Box - Testing for measuring R values ASTM C411 - Standard Test Method for Hot-Surface Performance of High Temperature Thermal Insulation (Passed) ASTM C1371 - Standard Test Method for Determination of

Emission of Materials Near Room Temperature Using Portable emissometers.

### **EASE OF APPLICATION & TECHNICAL SUPPORT**

SuperTherm can be applied to metal, concrete, masonry and wood. The application can be through spray, brush, or roller. For specific instructions for surface preparations, mixing and application manufacturer's instructions should be followed. SuperTherm needs to be applied at minimum WFT-wet film thickness (450 microns) and DFT-dry film thickness (250 microns).

Resonant Innovative Technologies (RIT) have appointed certified application experts to execute all the applications at Indian Railways for SuperTherm. To make the technical support holistic, RIT renders pre and post sales technical application support services as required in any Indian industries including Indian Railways. **RR**



*SuperTherm applied on inspection car at Thiruvananthapuram Workshop, Kerala, Southern Railway. The product can be applied on general sitting, sleeper, or suburban EMU, MEMU compartments or even locomotives roof of Indian Railways.*