


# RAILWAYS REVIEW

An Assorted Research Publication

Created in collaboration with 

Corrosion and Thermal Insulation Solutions

## RUST GRIP ANTI CORROSIVE PAINT GIVES NEW LIFE TO INDIAN RAILWAYS COACHES



Hirect begins SIV Fitment in Eastern Railway ◀

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# Rust Grip, 'One Part' universal anti corrosive paint system gives a new life to LHB coaches at Sonipat Rail Coach refurbishment facility



*Rust Grip was selected by RCNK to have a longer asset life of the LHB coaches for the coach structure, precisely the under frames, bogie bolsters and the end walls*

With its competitive properties involving significantly high tensile strength and one pack system, Rust Grip aims to bring down maintenance costs of LHB Coaches at Sonipat Rail Coach Refurbishment Facility. Not the least, extend the service life of the coaches. **Railways Review** reports

One of the key scope of maintenance work at Indian Railway's Sonipat Rail Coach Naveenikaran Karkhana (RCNK) is applying anti corrosive coating treatment to the LHB coaches, being brought in for refurbishment and periodic overhaul. Given the scope, apparently the RCNK unit has not left any scope for compromise, in selecting one of the best anti-corrosion solutions available,

globally. This is so as to have longer service interval for the coaches, while significantly reducing maintenance costs incurred due to prevalence of corrosion in passenger coaches in Indian Railways.

“During Mid life Rehabilitation of LHB coaches at RCNK, we have observed corrosion in underframe particularly on members of front part falling under toilet, doorway area and





*Rust Grip's properties of one pack system drastically curtails application costs and time. One pack characteristics, more numbers of coaches and wagons can be refurbished*

gang way area. In order to address this issue, RCNK selected "Rust Grip" a high performance Anti-Corrosive paint from Resonant Innovative Technologies, LLP (RIT) of Mumbai on the basis of its approval under ICF/MD/SPEC-357 and its applications on underframes, bogie coach sets and RDSO's instructed trials on steel girder bridges along with Rust Grip's approval and its availability on Government eMarketplace (GeM)" said **Mr. Anil Kumar, CWM Sonipat Rail Coach Naveenikaran Karkhana Northern Railway.**

According to **Mr. Mehul Shah, CEO, Resonant Innovative Technologies, LLP** "The major reason for selection of 'Rust Grip' by RCNK was to have a longer asset life of the LHB coaches for the coach structure, precisely the under frames, bogie bolsters and the end walls, in the vestibule portion, behind the toilets. This is an area, where maximum levels of corrosion occur on the coaches. 'Rust Grip' with its competitive properties, much in contrast to epoxy paints, will be able to well

assure to deliver longer coach asset life through its life cycle."

RCNK selected "Rust Grip" a high performance world class anti-corrosive paints and other coatings is developed in collaboration with NASA, USA and manufactured by its principal OEM, Superior Products International. RIT is the exclusive importers and the distributors of Rust Grip for India territory. Rust Grip has been successfully applied in fair numbers of permanent assets globally, delivering longer asset life. Rust Grip anti corrosive coating system solution has been applied on permanent way railway assets in India involving bridge girders, passenger foot over bridges and on ICF Coaches at Matunga Workshop of Central Railway.

Besides several Rust Grip applications throughout different zonal plants of Indian Railways, Rust Grip was recently applied on the first two numbers of LHB air-conditioned chair car coach, numbering 06179 NR LWSCZAC, belonging to Shatabdi Express

and another 07902 NR LWACCN that was refurbished at RCNK.

"Rust Grip optimally does away with corrosion. Further, given its properties of one pack system it drastically curtails application costs and time. With the given, one pack characteristics, more numbers of coaches and wagons can be refurbished. This commensurately results higher the rolling stock out turn volumes as there are capacity constraints at most of the Indian Railway workshops, given the very high work load at present". Mentions Mr. Anil Kumar.

Sharing details he informs, Rust Grip® was designed as a one-coat system. It serves both as the primer and topcoat. Most urethanes are part of a three-coat system and individually don't have the wicking ability to serve as a primer or the overall strength to serve as a stand-alone coating."

Another vital attribute, of Rust Grip which is much in relevance for refurbishment of railway rolling stocks assets which has to be turned out at quicker levels, is that Rust Grip was designed with special resins and additives. This allows it to be applied directly over existing, firmly bonded paint or rust without any loss of performance. Urethanes in a three-part system normally require surface prep of a white metal blast (SSPC SP-5) or a near white metal blast (SSPC SP-10). Since the greatest expense in the coating process comes from surface prep and the containment of that residue, Rust Grip will greatly reduce the overall cost of a project.

## HIGH SURFACE TENSILE STRENGTH

Justifying the rationale of



*Post twenty one days of application, Rust Grip, will achieve a surface tensile strength of 6,780 psi and over 12,000 psi when fully cured*

application of Rust Grip® on exposed surfaces of railway carriages and wagons, which are highly susceptible to corrosion in India, Mr. Shah says, "After twenty-one days, Rust Grip, will achieve a surface tensile strength of 6,780 psi and over 12,000 psi when fully cured. Normal urethanes will have a surface tensile strength between 1,000 and 2,000 psi. The difference between ordinary surface coatings and Rust Grip® is that, a surface coating does not have the solvent carrier to allow penetration into the pores of a substrate and to carry the body of the coating with it. A surface coating will simply adhere to anything above the pore area and

attach to the profile or roughness on the surface like a 'Band Aid' which is only a temporary fix until the surface of the coating is exposed to weathering resulting in formation of microscopic rust almost immediately. This exposure increases the permeability of a surface coating and allows moisture (in the form of vapor or humidity), salts, and acids to penetrate into the pores of the substrate. As a result, corrosion forms and migrates under the coating itself. In addition, the corrosion process creates off-gassing that causes pressure that may be as high as only 1000 psi. Surface coatings, when totally cured, have only a surface

tensile strength of 600-800 psi. Therefore, as pressure increases from the off-gassing, the surface coating will separate and lift from the surface exposing an already rusted surface underneath."

RUST GRIP® is made with special patented solvent carriers that allow the coating to penetrate into the pores carrying the body of the coating with it. Once the body of the coating is in the pores, it begins to absorb the moisture from the atmosphere and gases itself or does a microscopic swell inside the pores. This action allows Rust Grip® to become part of the actual surface of the substrate, which is different than

most all other industrial coatings or paints. When cured, RUST GRIP® maintains an extremely low permeability which eliminates the penetration of moisture, salts, and acids and the opportunity for corrosion to develop.

RUST GRIP® is an aromatic urethane with a high molecular weight and is extremely



*RUST GRIP® is made with special patented solvent carriers that allow the coating to penetrate into the pores carrying the body of the coating with it. Bogie frame being applied Rust Grip Coating at RCNK*



*RUST GRIP® maintains an extremely low permeability. This eliminates the penetration of moisture, salts, and acids and the opportunity for corrosion to develop. Bogie bolster being coated with Rust Grip at RCNK*

tough and resistant to acids. Its non-leaching metallics allow an encapsulation of the surface and add additional toughness and UV control to its surface. Because RUST GRIP® hardens to a minimum surface tensile strength of 6780 psi, any pressure that may develop from any off-gassing from remaining rust on the surface is not sufficiently strong to cause RUST GRIP® to separate from the surface of the substrate.

### **DERIVING OPTIMAL PERFORMANCE, COMPATIBILITY ON WELDED SURFACE**

Though agreeing Rust Grip® is designed with special resins and additives that allow it to be applied directly over existing, firmly bonded paint or rust without any loss of performance, Mr. Shah clarifies, "For optimal performance, before applying Rust Grip on a heavily rusted surface, heavy rust and mill scale must be removed by grip blasting or power tool cleaning method followed by Rust Grip application on completely dry flash rust or firmly bonded commercial paints surfaces on any steel. On the first coat which is the most

critical applied coat, it must be applied heavily with a hard brush so that Rust Grip goes deep into the pores. Hard bristle brush for the first coat application needs to be used. The second coat needs to be applied, with a soft bristle brush or spray. Apply a third coat to assure we have a minimum of 150 Microns DFT over the top of the tallest peak."

Rust Grip can be applied apply on MIG or TIG welded surfaces since TIG or MIG or Arc Welding develop a bi-metallic or galvanic corrosion on the surface. But Rust Grip can stop any type of corrosion. This could be uniform corrosion, pitting corrosion, crevice corrosion and galvanic corrosion with its encapsulation properties. The welded areas must be wire brushed to open the pores allowing Rust Grip to penetrate and anchor the pores.

Knowing Indian Railways also uses a metal arc welding process. Complications arise from slag inclusions and from the reaction of the molten metal with the various gasses in metal arc welding. However, Rust Grip can apply slag inclusion areas. It is

recommended to level up these undulations with light grinding to remove the sharpness of slags. An additional Stipe coat should be applied before the first coat of Rust Grip to build up the required DFT.

In many cases during rolling stock asset rehabilitation of Indian Railways, following bonding of the plates through welding, red oxide is traditionally applied on the repaired patch surface. This is followed by application of weather rust proof paint to prevent further corrosion. Using Rust Grip there is no need to apply any red oxide primer after rolling stock asset rehabilitation process. In Rust Grip coating process, there is no need of primers since Rust Grip coating penetrates into the pores, swells and anchors itself into the metal surfaces, then sets up to 470 bar (6780 psi) surface tensile strength and with the aluminum metallic can repel UV for weathering and corrosion resistant properties. All in one coat.

### **TECHNICAL SUPPORT**

RIT's appointed application experts execute all the applications at Indian Railways for Rust Grip and SuperTherm Thermal Insulations. However, Mr. Shah informs, "we have in place a pre-sale and post-sale technical application services as required at any Indian industries including Indian Railways. At Sonipat RCNK our application team has carried out the application." Resonant has in place certified paint technologist to serve Indian Railways. **RR**

# Indian Railway's new Sonipat LHB coach repair facility entails wide scope of refurbishment and overhaul



*The scope of refurbishment work stipulates that exterior painting to be done after complete shot blasting of coach's shell*

The scope of work for refurbishment cum periodic overhaul at Indian Railways, Rail Coach Navineekeran Karkhana at Sonipat for the LHB Coaches refurbishment and periodic overhaul (POH) is quite comprehensive, abiding RDSO's directives. Noticeable is the scope of maintenance work for the air brake systems along with the allied components. **Railways Review** takes a look

**R**efurbishment work for the first two LHB coaches at Rail Coach Navineekeran Karkhana (RCNK) has been under the assistance of Jagadhari POH Workshop of Northern Railways. The refurbishment work was as per

the maintenance directives of RDSO. Similar will be the process for the set of second batches of 10 LHB coaches, for which NSR has been generated for the turnkey contract.

One of the key areas for maintenance will be the air brake

systems. This will essentially involve conversion to two pipe system. Maintenance and replacement of the pipes and clamps will be on condition basis. Ferrules to be replaced with threaded joints. DV control panel to be overhauled. Under the maintenance work, replacement

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## 'Rust Grip' and 'Super Therm'

performance coatings are currently used in the Indian Railways on Bridges, Coaches and Wagons Under frames, Bogie frames, Bogie Bolsters and Coach Roof

### Rust Grip

- Rust Grip is an universal 'ONE PART' Anti- Corrosive World Class High Performance coating.
- It is extremely tough, durable, long-lasting, and requires minimal surface preparation and is very easy to apply.
- Salt Spray Test : Rust Grip has passed 15000 hours salts spray (ASTM B 117) test.
- Surface Tensile Strength : It hardens to over 7000 PSI upon curing adding tremendous strength to the substrate giving it much longer life.
- USDA Approved for use in and around food preparation areas

### Super Therm

- Super Therm is a ' ONE PART' water-based High Performance coating to block and repel 95% of the radiation heat (UV, Short Wave and Long Wave).
- It prevents heat load into the surface.
- Super Therm is a flexible membrane with low permeability that can greatly reduce expansion and contraction.
- It is a sound barrier and prevents surface deterioration.
- Class 'A' Fire rated.
- USDA Approved for use in and around food preparation areas.



## Resonant Innovative Technologies LLP

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